

# **Skiffes Creek Connector - Geotechnical Investigation Description**

State Project No.: 0060-047-627, P101, R201, C501, B619, B620

Federal Project No.: STP-5A03(455)

Contract ID Number: C00100200DB104

DATE: April 19, 2019

## **Skiffes Creek Connector – Geotechnical Investigation Description**

(April 19, 2019)

### Summary and Purpose

VDOT's Alternative Project Delivery Division recently became aware that an entity not associated with VDOT (Entity) for the Skiffes Creek Connector project (Project) gained access through a land use permit to perform a geotechnical boring within the Project area. VDOT has made the determination that the opportunity to access the same Project area will be granted to any other firm that requests do so. The additional geotechnical investigation/evaluation will only be granted for the hatched area depicted in Exhibits 1-1 and 1-2 (Attached). In addition the stream restoration and the wetland area depicted on the exhibit shall not be disturbed during the investigation. VDOT shall not be responsible for any cost incurred for conducting any additional geotechnical investigations. The Project area may be accessed one time only and the deadline for accessing the Project area and conducting the investigation will be the date of the Technical Proposal submission.

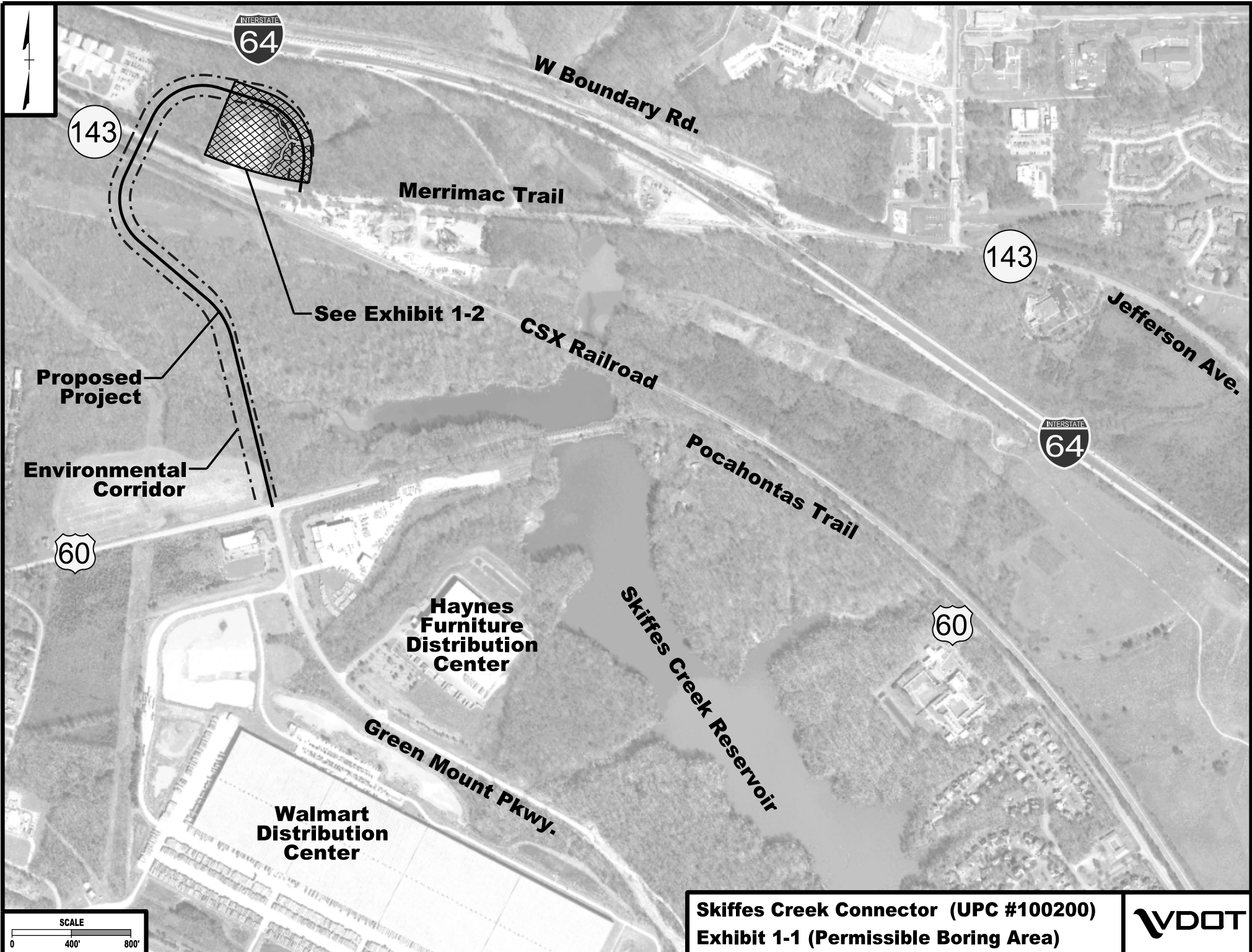
Please note that all access to conduct such investigations will require a Land Use Permit. Please contact Glenn Brooks, P.E., Area Landuse Engineer, Williamsburg Residency at (757)-253-4015 or [glenn.brooks@vdot.virginia.gov](mailto:glenn.brooks@vdot.virginia.gov) to apply for the Land Use Permit. Also note per RFQ Section 11.2.7, that GET Solutions is listed as a firm that will not be allowed to participate as a Design-Build Team member on this Project.

Attached are VDOT's draft Boring Logs and draft Cone Logs. The Final Boring logs and Cone logs will be included as part of the Request for Proposal (RFP).

Also attached is the Boring Log and supporting laboratory results performed by the Entity. This information is considered supplemental and is solely for the information of the Offeror, which each Offeror may use at their own risk and as they deem appropriate. VDOT does not represent or warrant that this boring information and lab results performed by the Entity are suitable for designing this project.

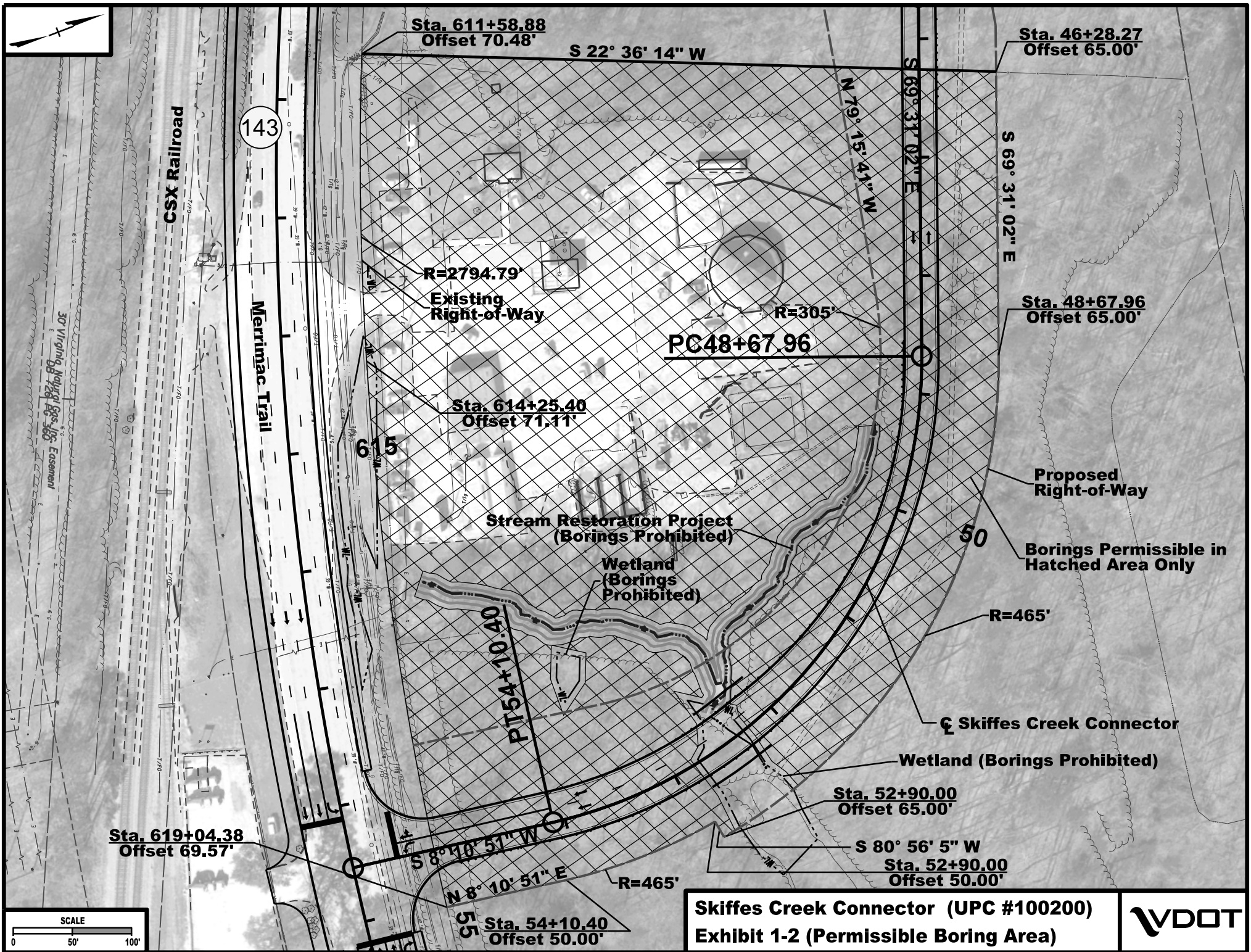
Scope Validation - VDOT has determined that any scope issues related to subsurface conditions within the hatched area in Exhibit 1-1 and 1-2 will not be considered for any relief for Contract Price and/or Contract Time(s) under the Scope Validation provision per Part 4, Section 2.2 of the design-build contract.

**Exhibit 1-1 and Exhibit 1-2  
Permissible Boring Area**



**Skiffes Creek Connector (UPC #100200)**  
**Exhibit 1-1 (Permissible Boring Area)**





Sta. 611+58.88  
Offset 70.48'

S 22° 36' 14" W

Sta. 46+28.27  
Offset 65.00'

143

CSX Railroad

Merrimac Trail

R=2794.79'  
Existing  
Right-of-Way

R=305'

PC48+67.96

Sta. 614+25.40  
Offset 71.11'

615

Stream Restoration Project  
(Borings Prohibited)

Wetland  
(Borings  
Prohibited)

Sta. 48+67.96  
Offset 65.00'

Proposed  
Right-of-Way

Borings Permissible in  
Hatched Area Only

50

R=465'

Skiffes Creek Connector

Wetland (Borings Prohibited)

Sta. 52+90.00  
Offset 65.00'

S 80° 56' 5" W

Sta. 52+90.00  
Offset 50.00'

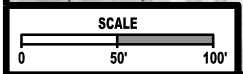
S 8° 10' 51" W

R=465'

N 8° 10' 51" E

Sta. 54+10.40  
Offset 50.00'

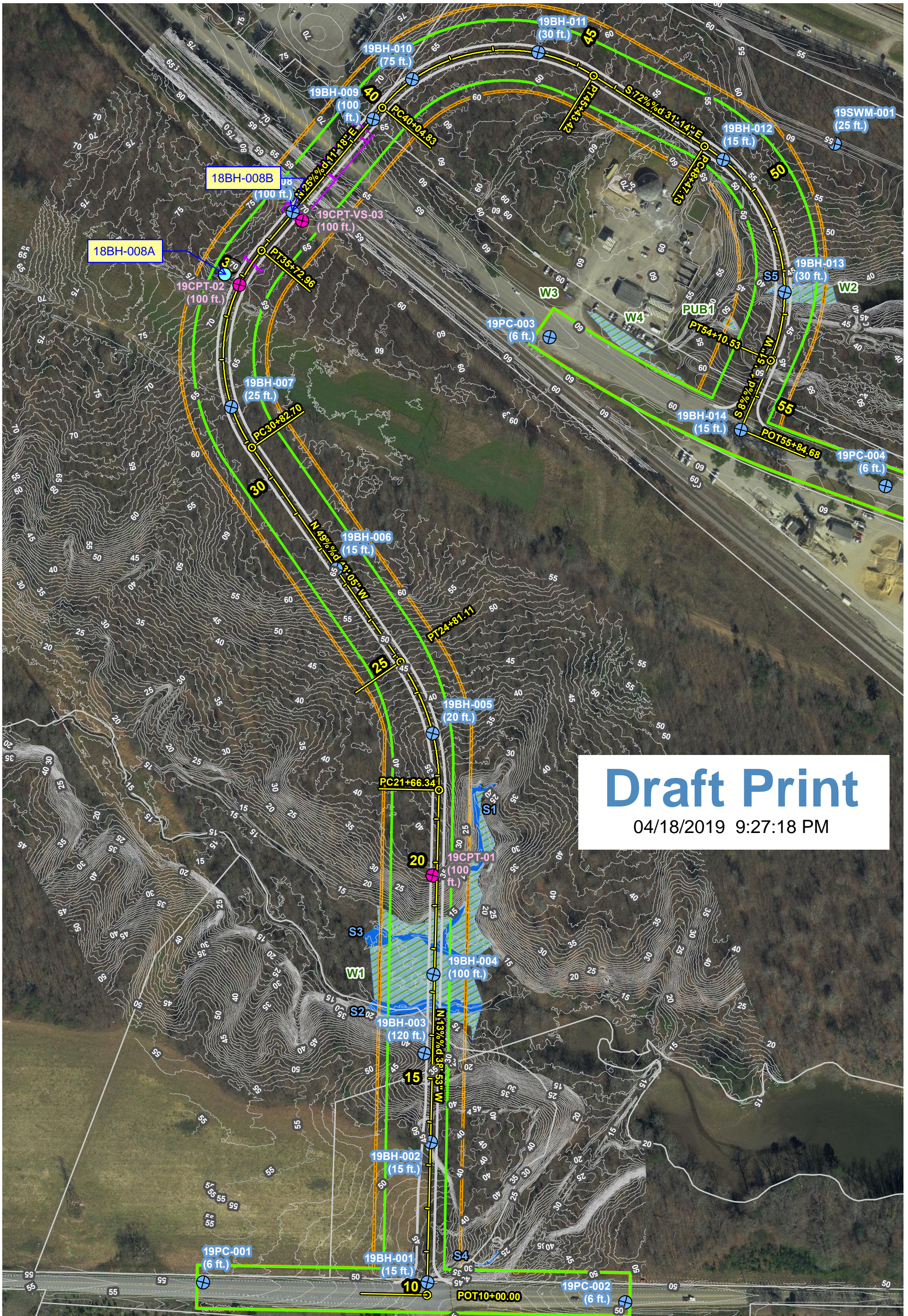
Sta. 619+04.38  
Offset 69.57'



Skiffes Creek Connector (UPC #100200)  
Exhibit 1-2 (Permissible Boring Area)



**Draft Boring Layout Plan, and  
Draft Boring and Cone Logs by  
VDOT**



# Draft Print

04/18/2019 9:27:18 PM



**LEGEND**

- Proposed Boring Locations
- Cone Penetrometer Test (CPT) Sounding

- Alignment
- Stream
- Wetland
- Delineation Area

- Curb (Design)
- Project Area (Design)
- Bridge (Design)
- Parcel Boundary



1 inch = 200 feet  
 0 100 200  
 Feet

**BORING LAYOUT PLAN - PHASE I**  
**SKIFFES CREEK**  
**FIGURE 1**



PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: ROADWAY

19BH-001  
 PAGE 1 OF 1

STATION:  
 LATITUDE: 37.208075° N  
 SURFACE ELEVATION: 47.0 ft

OFFSET:  
 LONGITUDE: 76.599070° W  
 COORD. DATUM: NAD 83

FIELD DATA										LAB DATA							
DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK			STRATA LEGEND	Date(s) Drilled: 04/10/2019 - 04/10/2019	Drilling Method(s): Mud Rotary w/ SPT	SPT Method: Automatic Hammer	Other Test(s): Not Applicable	Driller: James Owens/GET Solutions, Inc	Logger: Joe Wallen, PE/HDR	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION										
										<b>GROUND WATER</b>							
										NOT ENCOUNTERED DURING DRILLING							
										NO LONG TERM MEASUREMENTS TAKEN							
										<b>FIELD DESCRIPTION OF STRATA</b>			LL PI				
46	4	3	75	1				0.0 / 47.0	8.5" Asphalt								
2	3	2	75	3				0.7 / 46.3	3.5" Aggregate								
44	1	1	65	5				1.0 / 46.0	<i>Fluvial</i> , Brown, LEAN CLAY WITH SAND (CL), contains shell fragments, firm, moist								
4	3	3	70	7					<i>Fluvial</i> , Brown, LEAN CLAY WITH SAND (CL), firm, moist								
42	2	3	70	9					<i>Fluvial</i> , Brown, LEAN CLAY WITH SAND (CL), stiff, moist								
6	3	4	70	11					<i>Fluvial</i> , Brown, LEAN CLAY WITH SAND (CL), firm, moist								
40	WOH	2	55	13					<i>Fluvial</i> , Brown, LEAN CLAY WITH SAND (CL), firm, moist								
8	2	2	55	15					<i>Fluvial</i> , Brown, LEAN CLAY WITH SAND (CL), firm, moist								
38	1	2	60					9.0 / 38.0	<i>Fluvial</i> , Brown, fine to medium CLAYEY SAND (SC), loose, moist								
10	2	3	60						<i>Fluvial</i> , Brown, fine to medium CLAYEY SAND (SC), loose, moist								
36	3	3	60						<i>Fluvial</i> , Brown, fine to medium CLAYEY SAND (SC), loose, moist								
12									<i>Fluvial</i> , Brown, fine to medium CLAYEY SAND (SC), loose, moist								
34	3	2	60					12.5 / 34.5	<i>Fluvial</i> , Gray and brown, mottled, LEAN CLAY WITH SAND (CL), firm, moist								
14	2	4	60						<i>Fluvial</i> , Gray and brown, mottled, LEAN CLAY WITH SAND (CL), firm, moist								
32	3	3	60						<i>Fluvial</i> , Gray and brown, mottled, LEAN CLAY WITH SAND (CL), firm, moist								
										Bottom of borehole at 15.0 feet. Bulk samples taken from 1.0 to 5.0 feet.							

REMARKS: Rig Type: CME 45C Truck. Soil relative density and consistency descriptions based on N60 values.

PAGE 1 OF 1  
 19BH-001

SPT\_LOG:W:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:06:18:10:4/18/19





PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: ROADWAY/EMBANKMENT

19BH-002

PAGE 1 OF 1

STATION:  
 LATITUDE: 37.208944° N  
 SURFACE ELEVATION: 44.0 ft

OFFSET:  
 LONGITUDE: 76.599310° W  
 COORD. DATUM: NAD 83

**FIELD DATA**

Date(s) Drilled: 03/22/2019 - 03/22/2019  
 Drilling Method(s): Mud Rotary w/ SPTs  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Praveen Gopallawa, HDR

**LAB DATA**

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**GROUND WATER**  
 NOT ENCOUNTERED DURING DRILLING  
 NO LONG TERM MEASUREMENTS TAKEN

**FIELD DESCRIPTION OF STRATA**

LL PI

DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK				STRATA LEGEND	
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °		STRATA
2	42	2	75							
2	40	2	85							
4	38	5	70							
6	36	6	75							
8	34	7	65							
10	32	9								
12	30	2								
14		3	85							
15		4								

0.0 / 44.0  
 3.0" Topsoil  
 0.3 / 43.7  
*Fluvial*, Brown, fine to medium CLAYEY SAND (SC), contains organics, loose, moist

*Fluvial*, Brown, fine to medium CLAYEY SAND (SC), medium dense, moist

*Fluvial*, Light gray and brown, fine to medium CLAYEY SAND (SC), contains mica, loose, moist

11.5 / 32.5  
*Fluvial*, Tan-brown, fine to medium SILTY SAND (SM), contains shell fragments, medium dense, moist

Bottom of borehole at 15.0 feet.  
 Boring backfilled with surface soils.

**REMARKS:** Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.  
 Cave-in Depth at 9.4 feet

PAGE 1 OF 1

19BH-002

SPT\_LOGW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:06:18:10:4/18/19





**PROJECT #:** 10148980  
**LOCATION:** Williamsburg, VA  
**STRUCTURE:** BRIDGE ABUTMENT

**19BH-003**

**PAGE 2 OF 5**

**STATION:** OFFSET:  
**LATITUDE:** 37.209480° N **LONGITUDE:** 76.599508° W  
**SURFACE ELEVATION:** 40.0 ft **COORD. DATUM:** NAD 83

**FIELD DATA**

Date(s) Drilled: 03/24/2019 - 03/24/2019

**LAB DATA**

Drilling Method(s): Mud Rotary w/ SPTs  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Praveen Gopallawa, HDR

**GROUND WATER**  
 ▽ FIRST ENCOUNTERED AT 13.0 ft DEPTH

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**FIELD DESCRIPTION OF STRATA**

LL PI

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL		ROCK				STRATA LEGEND											
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °		STRATA	JOINTS									
	26	14																		
0.5	28	12	1																	
			2																	
			3																	
	30	10		2	100															
	32	8		4																
			4																	
	34	6		5	100															
			5																	
			9																	
	36	4																		
	38	2		4																
			4																	
	40	0		6	100															
			6																	
			7																	
	42	-2																		
	44	-4		5	100															
			5																	
			6																	
	46	-6																		
	48	-8		3																
			3																	
			3																	
	50	-10		4	95															
			4																	
			3																	

25

26.5 / 13.5

Fluvial, Gray, FAT CLAY WITH SAND (CH), contains shell fragments, firm, moist

31.5 / 8.5

Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, medium dense, moist

36.5 / 3.5

Fluvial, Gray, fine to medium CLAYEY SAND (SC), contains shell fragments. contains mica, medium dense, wet

41.5 / -1.5

Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, contains mica, medium dense, moist

48

Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, contains mica, loose, moist

**REMARKS:** Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

**PAGE 2 OF 5**

**19BH-003**

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19







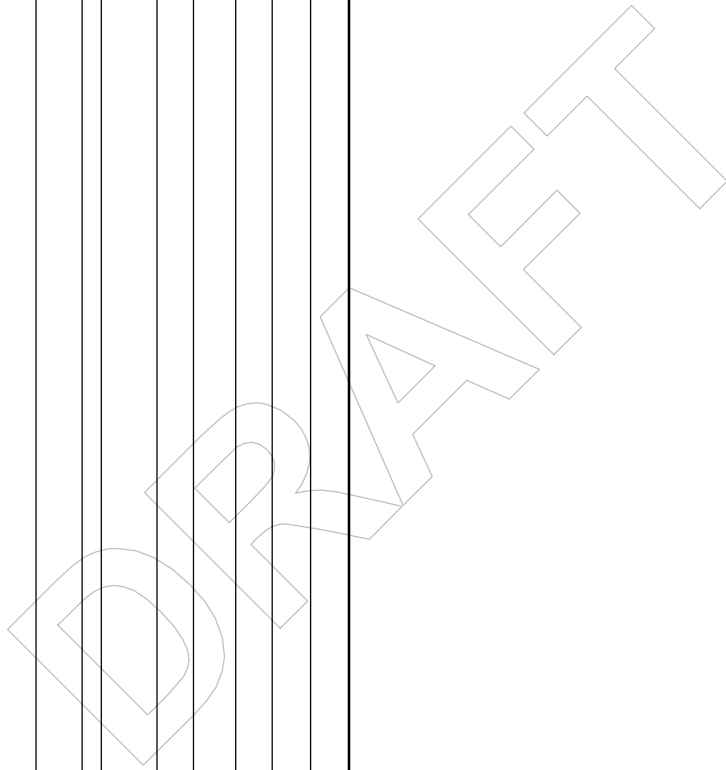
PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: BRIDGE ABUTMENT

**19BH-003**

PAGE 5 OF 5

STATION: OFFSET:  
 LATITUDE: 37.209480° N LONGITUDE: 76.599508° W  
 SURFACE ELEVATION: 40.0 ft COORD. DATUM: NAD 83

FIELD DATA											LAB DATA			
PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK					LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)	
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	DIP °				JOINTS
						100								
<b>GROUND WATER</b> ⚡ FIRST ENCOUNTERED AT 13.0 ft DEPTH														
<b>FIELD DESCRIPTION OF STRATA</b> Bottom of borehole at 100.0 feet. Shelby tube collected from 55.0 to 57.0 feet bgs. No recovery in tube. Boring backfilled with surface soils.											LL	PI		



REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

PAGE 5 OF 5

**19BH-003**

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19



PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: BRIDGE PIER

19BH-004

PAGE 1 OF 5

STATION:  
 LATITUDE: 37.209979° N  
 SURFACE ELEVATION: 14.0 ft

OFFSET:  
 LONGITUDE: 76.599607° W  
 COORD. DATUM: NAD 83

**FIELD DATA**

Date(s) Drilled: 04/11/2019 - 04/11/2019  
 Drilling Method(s): Mud Rotary w/ SPT  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Joe Wallen, PE/HDR

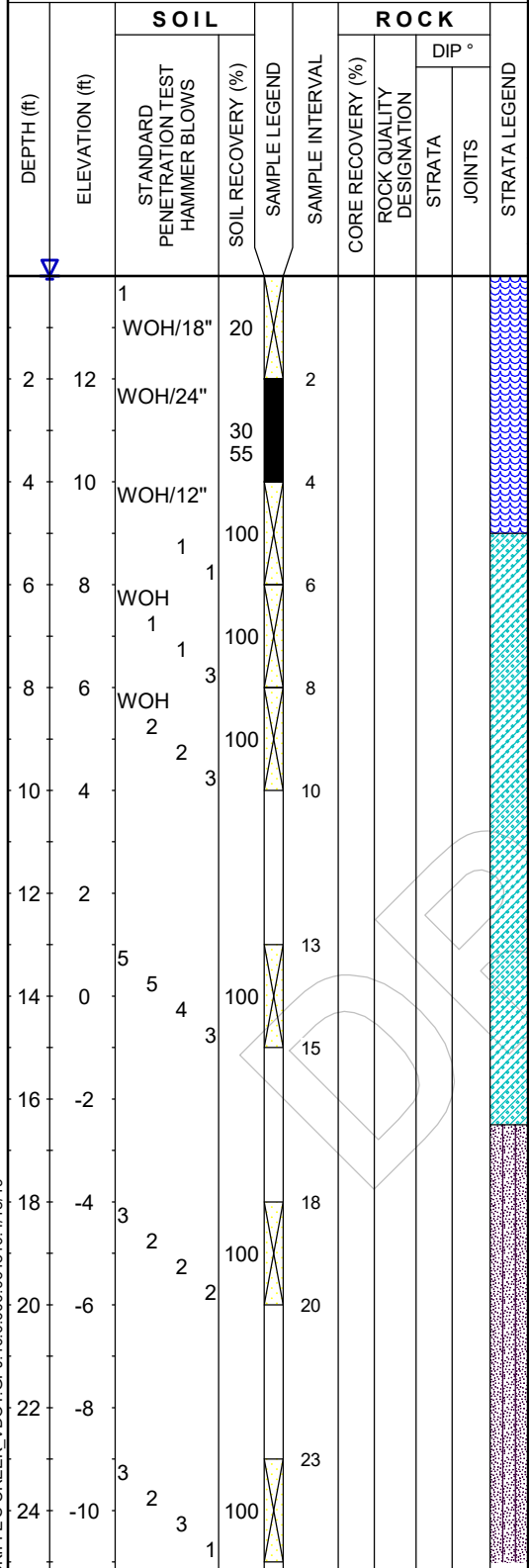
**LAB DATA**

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**GROUND WATER**  
 ▽ FIRST ENCOUNTERED AT 0.0 ft DEPTH  
 NO LONG TERM MEASUREMENTS TAKEN

**FIELD DESCRIPTION OF STRATA**

LL PI



SPT\_LOG:W:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:06:1810:4/18/19

REMARKS: Rig Type: CME 45C Truck. Soil relative density and consistency descriptions based on N60 values.

PAGE 1 OF 5

19BH-004



PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: BRIDGE PIER

19BH-004

PAGE 2 OF 5

STATION:  
 LATITUDE: 37.209979° N  
 SURFACE ELEVATION: 14.0 ft

OFFSET:  
 LONGITUDE: 76.599607° W  
 COORD. DATUM: NAD 83

**FIELD DATA**

Date(s) Drilled: 04/11/2019 - 04/11/2019  
 Drilling Method(s): Mud Rotary w/ SPT  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Joe Wallen, PE/HDR

**LAB DATA**

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**GROUND WATER**  
 ▽ FIRST ENCOUNTERED AT 0.0 ft DEPTH  
 NO LONG TERM MEASUREMENTS TAKEN

**FIELD DESCRIPTION OF STRATA**

LL PI

DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK			STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LL	PI	MOISTURE CONTENT (%)
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION					
26	-12								26.5 / -12.5			
28	-14	2	100						<i>Fluvial</i> , Gray, LEAN CLAY WITH SAND (CL), contains shell fragments, stiff, moist			
30	-16	3	100									
32	-18	5	100						31.5 / -17.5			
34	-20	6	90						<i>Fluvial</i> , Gray, fine to medium SILTY SAND (SM), contains shell fragments, medium dense, moist			
36	-22	9	8									
38	-24	3	100						36.5 / -22.5			
40	-26	4	100						<i>Fluvial</i> , Gray, fine to medium CLAYEY SAND (SC), contains shell fragments, medium dense, moist			
42	-28	6	100									
44	-30	3	100									
46	-32	5	100									
48	-34	3	100						46.5 / -32.5			
50	-36	4	100						<i>Fluvial</i> , Gray, fine to medium SILTY SAND (SM), contains shell fragments, medium dense, moist			

SPT\_LOG:W:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:06:18:10:4/18/19

REMARKS: Rig Type: CME 45C Truck. Soil relative density and consistency descriptions based on N60 values.

PAGE 2 OF 5

19BH-004





PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: BRIDGE PIER

19BH-004

PAGE 3 OF 5

STATION:  
 LATITUDE: 37.209979° N  
 SURFACE ELEVATION: 14.0 ft

OFFSET:  
 LONGITUDE: 76.599607° W  
 COORD. DATUM: NAD 83

**FIELD DATA**

Date(s) Drilled: 04/11/2019 - 04/11/2019  
 Drilling Method(s): Mud Rotary w/ SPT  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Joe Wallen, PE/HDR

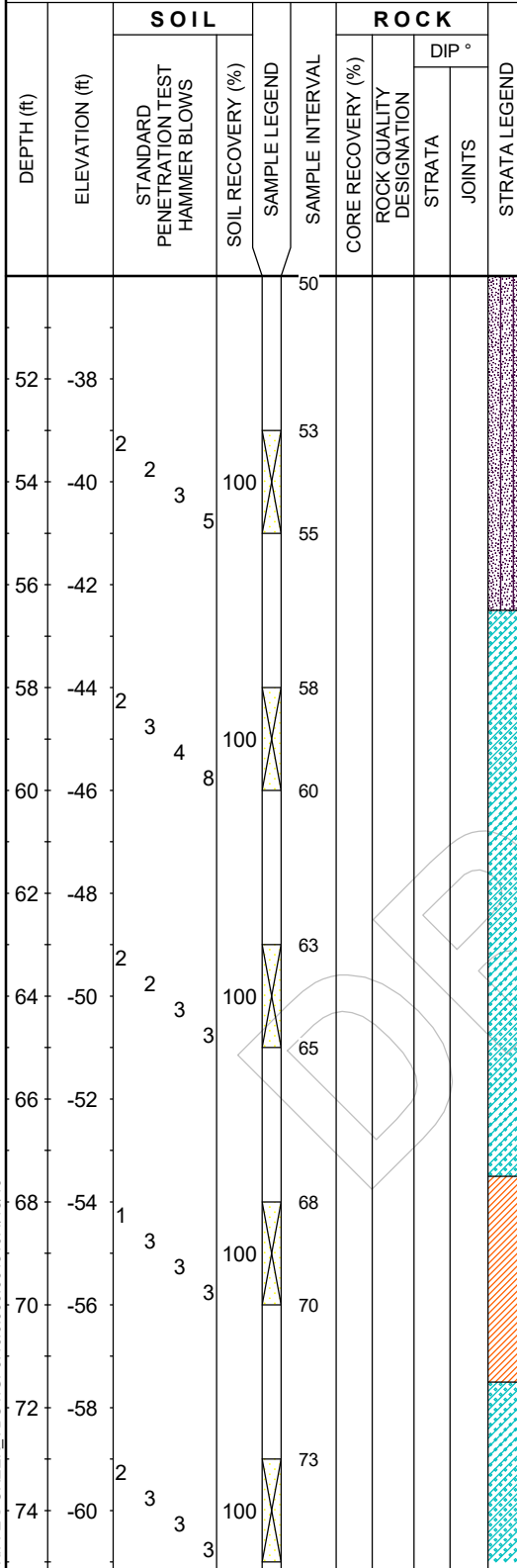
**LAB DATA**

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**GROUND WATER**  
 ▽ FIRST ENCOUNTERED AT 0.0 ft DEPTH  
 NO LONG TERM MEASUREMENTS TAKEN

**FIELD DESCRIPTION OF STRATA**

LL PI



56.5 / -42.5  
 Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, loose, moist

67.5 / -53.5  
 Fluvial, Gray, fine CLAYEY SAND (SC), contains shell fragments, loose, moist

71.5 / -57.5  
 Fluvial, Gray, SANDY LEAN CLAY (CL), contains shell fragments, firm, moist

Fluvial, Gray, fine CLAYEY SAND (SC), contains shell fragments, loose, moist

REMARKS: Rig Type: CME 45C Truck. Soil relative density and consistency descriptions based on N60 values.

PAGE 3 OF 5

19BH-004

SPT\_LOG\\W:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:06:18:10:4/18/19



PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: BRIDGE PIER

19BH-004

PAGE 4 OF 5

STATION:  
 LATITUDE: 37.209979° N  
 SURFACE ELEVATION: 14.0 ft

OFFSET:  
 LONGITUDE: 76.599607° W  
 COORD. DATUM: NAD 83

**FIELD DATA**

Date(s) Drilled: 04/11/2019 - 04/11/2019  
 Drilling Method(s): Mud Rotary w/ SPT  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Joe Wallen, PE/HDR

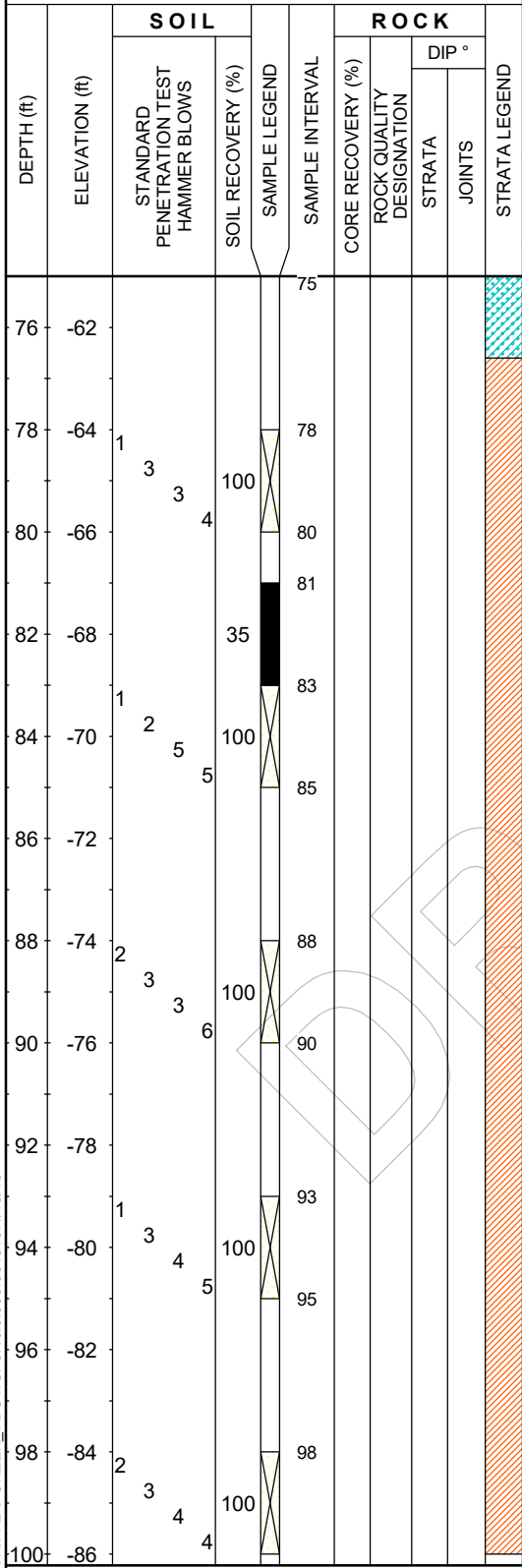
**LAB DATA**

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**GROUND WATER**  
 FIRST ENCOUNTERED AT 0.0 ft DEPTH  
 NO LONG TERM MEASUREMENTS TAKEN

**FIELD DESCRIPTION OF STRATA**

LL PI



76.6 / -62.6

Fluvial, Gray, LEAN CLAY WITH SAND (CL), contains shell fragments, firm, moist

Fluvial, Gray, LEAN CLAY WITH SAND (CL), contains shell fragments, stiff, moist

Fluvial, Gray, LEAN CLAY WITH SAND (CL), contains shell fragments, firm, moist

Fluvial, Gray, LEAN CLAY WITH SAND (CL), contains shell fragments, stiff, moist

SPT\_LOG\\W:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:06:18:10:4/18/19

REMARKS: Rig Type: CME 45C Truck. Soil relative density and consistency descriptions based on N60 values.

PAGE 4 OF 5

19BH-004



PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: BRIDGE PIER

**19BH-004**

**PAGE 5 OF 5**

STATION:  
 LATITUDE: 37.209979° N  
 SURFACE ELEVATION: 14.0 ft

OFFSET:  
 LONGITUDE: 76.599607° W  
 COORD. DATUM: NAD 83

**FIELD DATA**

**LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK				STRATA LEGEND
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °	
					100				

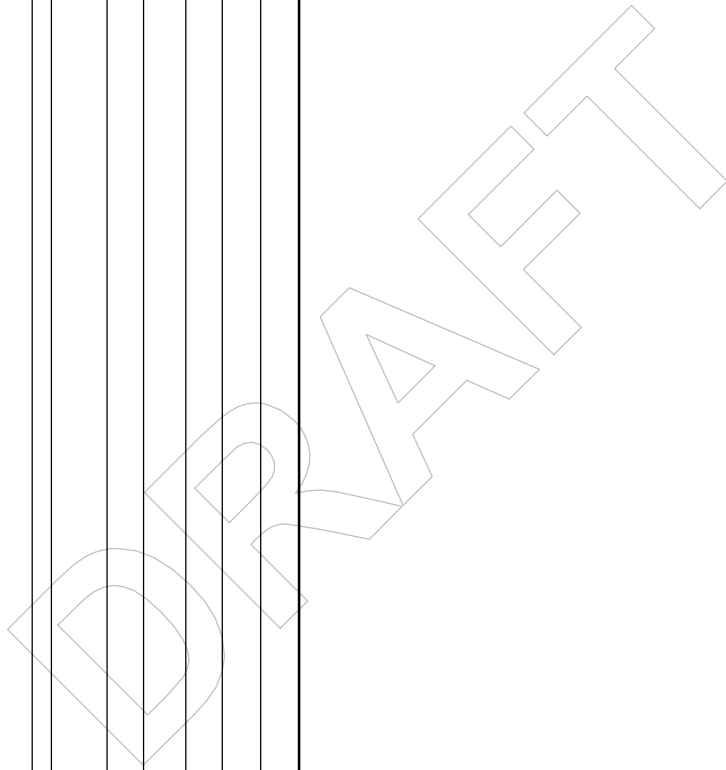
Date(s) Drilled: 04/11/2019 - 04/11/2019  
 Drilling Method(s): Mud Rotary w/ SPT  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Joe Wallen, PE/HDR

**GROUND WATER**  
 FIRST ENCOUNTERED AT 0.0 ft DEPTH  
 NO LONG TERM MEASUREMENTS TAKEN

LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)
LL	PI	

**FIELD DESCRIPTION OF STRATA**

Bottom of borehole at 100.0 feet.  
 Shelby tube collected from 2.0 to 4.0 feet, and 81.0 to 83.0 feet.  
 Boring backfilled with surface soils.



**REMARKS:** Rig Type: CME 45C Truck. Soil relative density and consistency descriptions based on N60 values.

**PAGE 5 OF 5**

**19BH-004**

SPT\_LOG:W:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:06:18:10:4/18/19



**PROJECT #:** 10148980  
**LOCATION:** Williamsburg, VA  
**STRUCTURE:** ROADWAY/EMBANKMENT

**19BH-005**  
**PAGE 1 OF 1**

**STATION:** OFFSET:  
**LATITUDE:** 37.211462° N **LONGITUDE:** 76.600073° W  
**SURFACE ELEVATION:** 35.0 ft **COORD. DATUM:** NAD 83

FIELD DATA										LAB DATA		
DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK			STRATA LEGEND	FIELD DESCRIPTION OF STRATA	LL	PI	MOISTURE CONTENT (%)
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION					
<p>Date(s) Drilled: 03/18/2019 - 03/18/2019            Drilling Method(s): Mud Rotary w/ SPTs            SPT Method: Automatic Hammer            Other Test(s): Not Applicable            Driller: Dave Wikoff/GET Solutions, Inc            Logger: Praveen Gopallawa, HDR</p>										<p><b>GROUND WATER</b>            ▽ FIRST ENCOUNTERED AT 6.0 ft DEPTH            ▽ STABILIZED AT 9.2 ft</p>		
<p><b>FIELD DESCRIPTION OF STRATA</b></p>												
2	34	2	85					0.0 / 35.0 4.0" Topsoil				
2	32	2	55					0.4 / 34.6 Fluvial, Dark brown-brown, fine to medium CLAYEY SAND (SC), contains organics. trace gravel, loose, moist				
4	30	2	60					Fluvial, Brown, fine to medium CLAYEY SAND (SC), contains quartz fragments, loose, moist				
6	28	1	20					6.0 / 29.0 Fluvial, Brown, fine POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), loose, wet				
8	26	1	55					8.0 / 27.0 Fluvial, Orange-brown, SILT WITH SAND (ML), firm, moist				
10	24	3										
12	22	2	90					11.5 / 23.5 Fluvial, Gray, fine SILTY SAND (SM), contains shell fragments, loose, moist				
14	20	3										
16	18	3										
18	16	3	80					16.5 / 18.5 Fluvial, Gray, fine CLAYEY SAND (SC), contains shell fragments. some silt, loose, moist				
20		7						Bottom of borehole at 20.0 feet. Boring backfilled with surface soils.				

SPT\_LOGW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:06:18:10:4/18/19

**REMARKS:** Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

**PAGE 1 OF 1**  
**19BH-005**



PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: ROADWAY/EMBANKMENT

19BH-006

PAGE 1 OF 1

STATION:  
 LATITUDE: 37.212331° N  
 SURFACE ELEVATION: 65.0 ft

OFFSET:  
 LONGITUDE: 76.601124° W  
 COORD. DATUM: NAD 83

**FIELD DATA**

Date(s) Drilled: 03/19/2019 - 03/19/2019  
 Drilling Method(s): Mud Rotary w/ SPTs  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Praveen Gopallawa, HDR

**LAB DATA**

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**GROUND WATER**  
 NOT ENCOUNTERED DURING DRILLING  
 NO LONG TERM MEASUREMENTS TAKEN

**FIELD DESCRIPTION OF STRATA**

LL PI

DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK			STRATA LEGEND
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	
2	64	2	85					
2	62	2	80					
4	60	2	15					
6	58	4	70					
8	56	6	75					
10	54	8						
12	52	6						
14	50	9	65					

0.0 / 65.0  
 4.0" Topsoil  
 0.4 / 64.6  
*Fluvial*, Brown, fine to medium CLAYEY SAND (SC), contains organics, loose, moist

*Fluvial*, Yellow-brown, fine to medium CLAYEY SAND (SC), trace gravel, medium dense, moist

*Fluvial*, Light gray, fine to medium CLAYEY SAND (SC), trace gravel, trace quartz fragments, medium dense, moist

Bottom of borehole at 15.0 feet.  
 Bulk sample taken from 1.0 to 5.0 feet bgs. Boring backfilled with surface soils.

REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

PAGE 1 OF 1

19BH-006

SPT\_LOG:W:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:06:18:10:4/18/19



**PROJECT #:** 10148980  
**LOCATION:** Williamsburg, VA  
**STRUCTURE:** ROADWAY/APPROACH

**19BH-007**

**PAGE 1 OF 2**

**STATION:** OFFSET:  
**LATITUDE:** 37.213168° N **LONGITUDE:** 76.602242° W  
**SURFACE ELEVATION:** 64.0 ft **COORD. DATUM:** NAD 83

**FIELD DATA**

Date(s) Drilled: 03/18/2019 - 03/18/2019

**LAB DATA**

Drilling Method(s): Mud Rotary w/ SPTs  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Praveen Gopallawa, HDR

**GROUND WATER**  
 ▽ FIRST ENCOUNTERED AT 28.0 ft DEPTH  
 ▽ STABILIZED AT 18.8 ft

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**FIELD DESCRIPTION OF STRATA**

LL PI

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL		ROCK				STRATA LEGEND
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	JOINTS	
			1						
			1	85					
			2						
2	62		2	1	2				
			2	75					
4	60		2	3	4				
			4	100					
6	58		2	6	6				
			6	75					
8	56		5	9	8				
			5	65					
10	54		7	8	10				
			7						
12	52		7		13				
14	50		6	50	15				
			6						
16	48								
18	46		4		18				
			4	35					
20	44		6	WOH	20				
22	42								
0.25				WOH/12"	23				
24	40		1	25					
				WOH					

0.0 / 64.0  
 4.0" Topsoil  
 0.33 / 63.67  
*Fluvial*, Brown, fine to medium CLAYEY SAND (SC), trace gravel, loose, moist

*Fluvial*, Brown, fine to medium CLAYEY SAND (SC), trace gravel, medium dense, moist

11.5 / 52.5  
*Fluvial*, Brown, fine to medium POORLY GRADED SAND WITH SILT (SP-SM), trace gravel, medium dense, moist

*Fluvial*, Brown, fine to medium POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), medium dense, moist

21.5 / 42.5  
*Fluvial*, Brown and red-brown, FAT CLAY (CH), trace sand, very soft, moist

**REMARKS:** Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

**PAGE 1 OF 2**

**19BH-007**

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19



PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: ROADWAY/APPROACH

19BH-007

PAGE 2 OF 2

STATION: OFFSET:  
 LATITUDE: 37.213168° N LONGITUDE: 76.602242° W  
 SURFACE ELEVATION: 64.0 ft COORD. DATUM: NAD 83

FIELD DATA										LAB DATA									
PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK				STRATA LEGEND	Date(s) Drilled: 03/18/2019 - 03/18/2019	Drilling Method(s): Mud Rotary w/ SPTs	SPT Method: Automatic Hammer	Other Test(s): Not Applicable	Driller: Dave Wikoff/GET Solutions, Inc	Logger: Praveen Gopallawa, HDR	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA										
	26	38				25													
	28	36	3			28													
	30	34	3	30		30													
										GROUND WATER									
										FIRST ENCOUNTERED AT 28.0 ft DEPTH STABILIZED AT 18.8 ft									
										FIELD DESCRIPTION OF STRATA			LL	PI					
										26.5 / 37.5  <i>Fluvial</i> , Yellow-brown, fine to coarse POORLY GRADED GRAVEL WITH SILT (GP-GM), trace sand, loose, wet									
										Bottom of borehole at 30.0 feet. Boring backfilled with surface soils.									

REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

PAGE 2 OF 2

19BH-007

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19

**STATION:** OFFSET:  
**LATITUDE:** 37.213932° N **LONGITUDE:** 76.602316° W  
**SURFACE ELEVATION:** 68.0 ft **COORD. DATUM:** NAD 83

FIELD DATA											LAB DATA											
PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL				ROCK				STRATA LEGEND	Date(s) Drilled: 03/18/2019 - 03/19/2019	Drilling Method(s): Mud Rotary w/ SPTs	SPT Method: Automatic Hammer	Other Test(s): Not Applicable	Driller: Dave Wikoff/GET Solutions, Inc	Logger: Praveen Gopallawa, HDR	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)		
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	JOINTS											DIP °	
											<b>GROUND WATER</b>											
											▼ FIRST ENCOUNTERED AT 28.0 ft DEPTH ▼ STABILIZED AT 22.4 ft											
											<b>FIELD DESCRIPTION OF STRATA</b>							LL PI				
1		2	2	70								0.0 / 68.0	4.0" Topsoil									
2	2	66	2	85	2							0.4 / 67.6	Fluvial, Brown, LEAN CLAY (CL), contains organics. trace sand, firm, moist									
2	4	64	2	85	4							4.0 / 64.0	Fluvial, Brown, LEAN CLAY WITH SAND (CL), contains organics, stiff, moist									
6	6	62	2	90	6							6.0 / 62.0	Fluvial, Brown, SILT WITH SAND (ML), very stiff, moist									
8	8	60	4	80	8							6.0 / 62.0	Fluvial, Brown, fine to medium CLAYEY SAND (SC), contains mica, medium dense, moist									
10	10	58	7	70	10							11.5 / 56.5	Fluvial, Brown, SANDY SILT (ML), stiff, moist									
12	12	56	3	65	13							16.5 / 51.5	Fluvial, Yellow-brown, medium CLAYEY SAND (SC), medium dense, moist									
14	14	54	4	70	15							21.5 / 46.5	Fluvial, Yellow-brown, LEAN CLAY WITH SAND (CL), soft, moist									
16	16	52	5	70	18							0.25										
18	18	50	6	70	20																	
20	20	48	8	90	23																	
22	22	46	1	90																		
24	24	44	2																			

**REMARKS:** Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.



FIELD DATA										LAB DATA									
PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK				STRATA LEGEND	Date(s) Drilled: 03/18/2019 - 03/19/2019	Drilling Method(s): Mud Rotary w/ SPTs	SPT Method: Automatic Hammer	Other Test(s): Not Applicable	Driller: Dave Wikoff/GET Solutions, Inc	Logger: Praveen Gopallawa, HDR	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA										
											<b>GROUND WATER</b> ▼ FIRST ENCOUNTERED AT 28.0 ft DEPTH ▼ STABILIZED AT 22.4 ft								
											<b>FIELD DESCRIPTION OF STRATA</b>					LL	PI		
	26	42		100			25												
	28	40	3				27												
			3				28												
			3	20			30												
	30	38					33												
			2				34												
	32	36					35												
			5				38												
	34	34	7	50			40												
			6				43												
			6				44												
	36	32					48												
			5				50												
	38	30	6	85															
			4				43												
	40	28	4				45												
			4				48												
			4																
	42	26																	
			4				43												
	44	24	3	60			45												
			4				48												
			8																
	46	22																	
			4																
	48	20	3																
			2																
			1																
	50	18																	
			3																

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19

REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.



PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: CSX BRIDGE

19BH-008A

PAGE 3 OF 5

STATION: OFFSET:  
 LATITUDE: 37.213932° N LONGITUDE: 76.602316° W  
 SURFACE ELEVATION: 68.0 ft COORD. DATUM: NAD 83

**FIELD DATA**

Date(s) Drilled: 03/18/2019 - 03/19/2019  
 Drilling Method(s): Mud Rotary w/ SPTs  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Praveen Gopallawa, HDR

**LAB DATA**

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**GROUND WATER**  
 ▽ FIRST ENCOUNTERED AT 28.0 ft DEPTH  
 ▽ STABILIZED AT 22.4 ft

**FIELD DESCRIPTION OF STRATA**

LL PI

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL		ROCK				STRATA LEGEND	
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	JOINTS		
	52	16								
	54	14	2 2	100						
	56	12								
	58	10	2 2	100						
	60	8	4 5							
	62	6								
	64	4	4 5 6	100						
	66	2								
	68	0	5 6	100						
	70	-2	5							
	72	-4								
	74	-6	5 4 3 4	100						

*Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, medium dense, moist*

*Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, loose, moist*

REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

PAGE 3 OF 5

19BH-008A

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19

STATION: OFFSET:  
 LATITUDE: 37.213932° N LONGITUDE: 76.602316° W  
 SURFACE ELEVATION: 68.0 ft COORD. DATUM: NAD 83

FIELD DATA										LAB DATA				
PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL		ROCK					STRATA LEGEND	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)	
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA					JOINTS
	76	-8												
	78	-10	4											
			3											
			4	95										
	80	-12	6											
	82	-14												
			2											
	84	-16	2	100										
			4											
			5											
	86	-18												
	88	-20	5											
			6											
			8	95										
	90	-22	8											
	92	-24												
			10											
	94	-26	26	80										
			26											
			31											
	96	-28												
	98	-30	10											
			9											
			14	90										
			13											
	100	-32												

Date(s) Drilled: 03/18/2019 - 03/19/2019  
 Drilling Method(s): Mud Rotary w/ SPTs  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Praveen Gopallawa, HDR

**GROUND WATER**  
 FIRST ENCOUNTERED AT 28.0 ft DEPTH  
 STABILIZED AT 22.4 ft

**FIELD DESCRIPTION OF STRATA**

75  
 78  
 80  
 83  
 85  
 88  
 90  
 91.5 / -23.5  
 93  
 95  
 96.5 / -28.5  
 98

*Fluvial*, Gray, fine to medium SILTY SAND (SM), contains shell fragments, medium dense, moist

*Fluvial*, Gray, fine POORLY GRADED SAND WITH SILT (SP-SM), contains shell fragments, very dense, moist

*Fluvial*, Gray, fine to medium CLAYEY SAND (SC), contains shell fragments, dense, moist

REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19



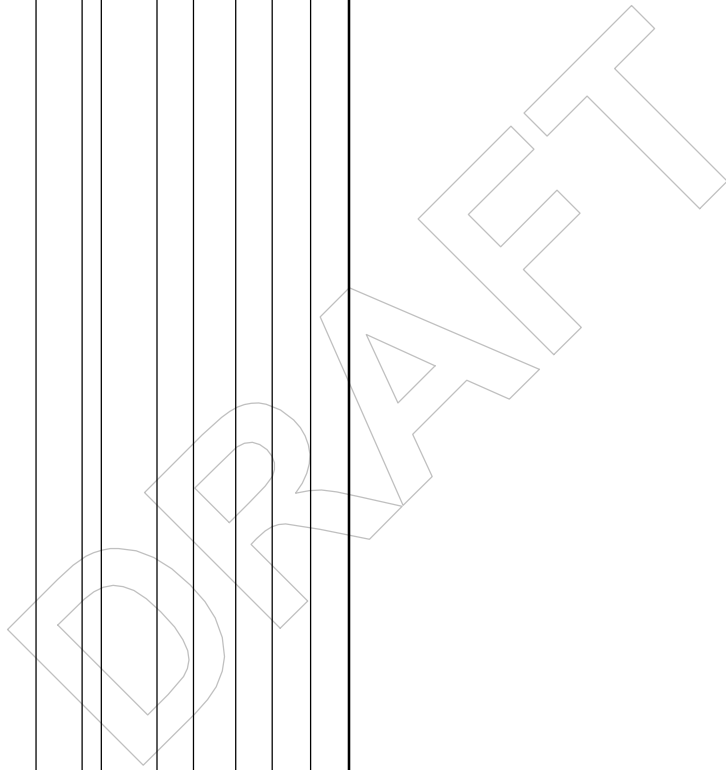
PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: CSX BRIDGE

19BH-008A

PAGE 5 OF 5

STATION: OFFSET:  
 LATITUDE: 37.213932° N LONGITUDE: 76.602316° W  
 SURFACE ELEVATION: 68.0 ft COORD. DATUM: NAD 83

FIELD DATA											LAB DATA			
PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK					LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)	
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	DIP °				JOINTS
						100								
<p>Date(s) Drilled: 03/18/2019 - 03/19/2019</p> <p>Drilling Method(s): Mud Rotary w/ SPTs</p> <p>SPT Method: Automatic Hammer</p> <p>Other Test(s): Not Applicable</p> <p>Driller: Dave Wikoff/GET Solutions, Inc</p> <p>Logger: Praveen Gopallawa, HDR</p>														
<p><b>GROUND WATER</b></p> <p>▼ FIRST ENCOUNTERED AT 28.0 ft DEPTH</p> <p>▼ STABILIZED AT 22.4 ft</p>														
<p><b>FIELD DESCRIPTION OF STRATA</b></p> <p>Bottom of borehole at 100.0 feet.</p> <p>Shelby tube collected from 25.0 to 27.0 feet bgs. Boring backfilled with surface soils.</p>											LL	PI		



SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19

REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

PAGE 5 OF 5

19BH-008A







PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: CSX BRIDGE

19BH-008B

PAGE 3 OF 5

STATION: OFFSET:  
 LATITUDE: 37.214462° N LONGITUDE: 76.602139° W  
 SURFACE ELEVATION: 69.0 ft COORD. DATUM: NAD 83

**FIELD DATA**

Date(s) Drilled: 03/19/2019 - 03/19/2019  
 Drilling Method(s): Mud Rotary w/ SPTs  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Praveen Gopallawa, HDR

**LAB DATA**

**GROUND WATER**  
 ▽ FIRST ENCOUNTERED AT 33.0 ft DEPTH

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**FIELD DESCRIPTION OF STRATA**

LL PI

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL		ROCK				STRATA LEGEND											
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °		STRATA	JOINTS									
		18																		
0.25	52	16	2																	
	54	14	3	100																
	56	12	4																	
	58	10	3	85																
	60	8	5																	
	62	6	4																	
	64	4	4	100																
	66	2	5																	
	68	0	9	100																
	70	-2	7																	
	72	-4	7																	
	74	-4	4	70																
	76	-6	3	4																

51.5 / 17.5  
 Fluvial, Gray, ELASTIC SILT WITH SAND (MH), contains shell fragments, firm, moist

56.5 / 12.5  
 Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, loose, moist

Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, medium dense, moist

Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, loose, moist

REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

PAGE 3 OF 5

19BH-008B

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19



PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: CSX BRIDGE

19BH-008B

PAGE 4 OF 5

STATION: OFFSET:  
 LATITUDE: 37.214462° N LONGITUDE: 76.602139° W  
 SURFACE ELEVATION: 69.0 ft COORD. DATUM: NAD 83

FIELD DATA										LAB DATA										
PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL		ROCK					STRATA LEGEND	Date(s) Drilled: 03/19/2019 - 03/19/2019	Drilling Method(s): Mud Rotary w/ SPTs	SPT Method: Automatic Hammer	Other Test(s): Not Applicable	Driller: Dave Wikoff/GET Solutions, Inc	Logger: Praveen Gopallawa, HDR	GROUND WATER ▽ FIRST ENCOUNTERED AT 33.0 ft DEPTH	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA											
FIELD DESCRIPTION OF STRATA																	LL	PI		
		-8																		
		-10	4	3	7	80														
		-12				5														
		-14																		
		-16	2	3	6	100														
		-18				6														
		-20	4	4	5	100														
		-22				9														
		-24	10	18	22	80														
		-26				17														
		-28																		
		-30	13	11	12	85														
						11														

REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

PAGE 4 OF 5

19BH-008B

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19





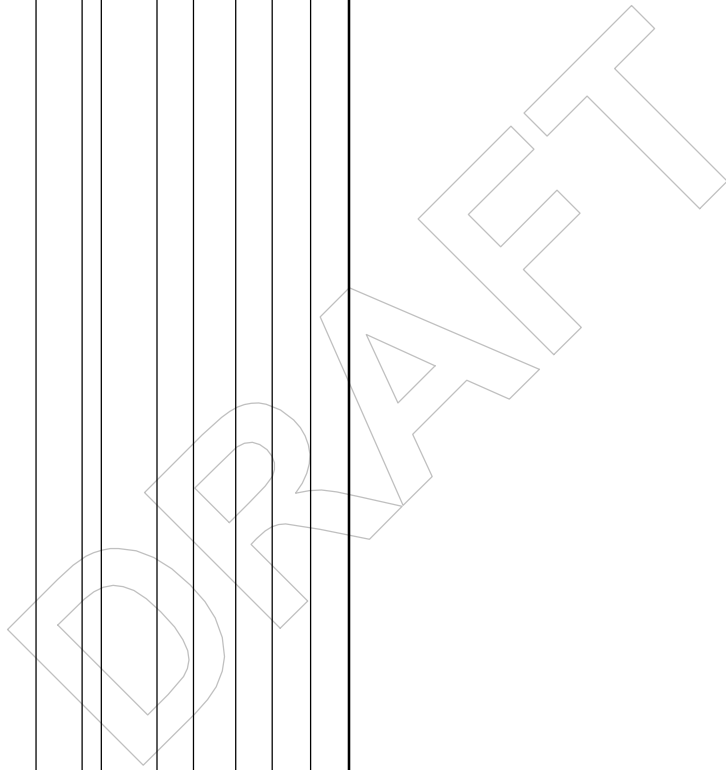
PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: CSX BRIDGE

19BH-008B

PAGE 5 OF 5

STATION: OFFSET:  
 LATITUDE: 37.214462° N LONGITUDE: 76.602139° W  
 SURFACE ELEVATION: 69.0 ft COORD. DATUM: NAD 83

FIELD DATA											LAB DATA			
PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK					LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)	
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	DIP °				JOINTS
						100								
<p><b>GROUND WATER</b>            ▽ FIRST ENCOUNTERED AT 33.0 ft DEPTH</p>														
<p><b>FIELD DESCRIPTION OF STRATA</b></p>											LL	PI		
<p>Bottom of borehole at 100.0 feet.            Shelby tube collected from 30.0 to 32.0 feet bgs. Boring backfilled with surface soils.</p>														



REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

PAGE 5 OF 5

19BH-008B

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19







PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: CSX BRIDGE

19BH-009

PAGE 3 OF 5

STATION: OFFSET:  
 LATITUDE: 37.215158° N LONGITUDE: 76.601695° W  
 SURFACE ELEVATION: 66.0 ft COORD. DATUM: NAD 83

**FIELD DATA**

Date(s) Drilled: 03/22/2019 - 03/22/2019

**LAB DATA**

Drilling Method(s): Mud Rotary w/ SPTs  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Praveen Gopallawa, HDR

**GROUND WATER**

▼ FIRST ENCOUNTERED AT 28.0 ft DEPTH  
 ▼ STABILIZED AT 15.9 ft

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**FIELD DESCRIPTION OF STRATA**

LL PI

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL		ROCK				STRATA LEGEND
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	JOINTS	
				25					
	52	14							
			2						
	54	12	3	100					
			5						
			8						
	56	10							
	58	8	3	100					
			5						
			6						
	60	6	9						
	62	4							
			4						
	64	2	5	85					
			8						
			13						
	66	0							
	68	-2	5	95					
			5						
			4						
	70	-4	5						
	72	-6							
			7						
	74	-8	6	80					
			5						
			7						

52.5 / 13.5  
 Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, medium dense, moist

REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

PAGE 3 OF 5

19BH-009

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19





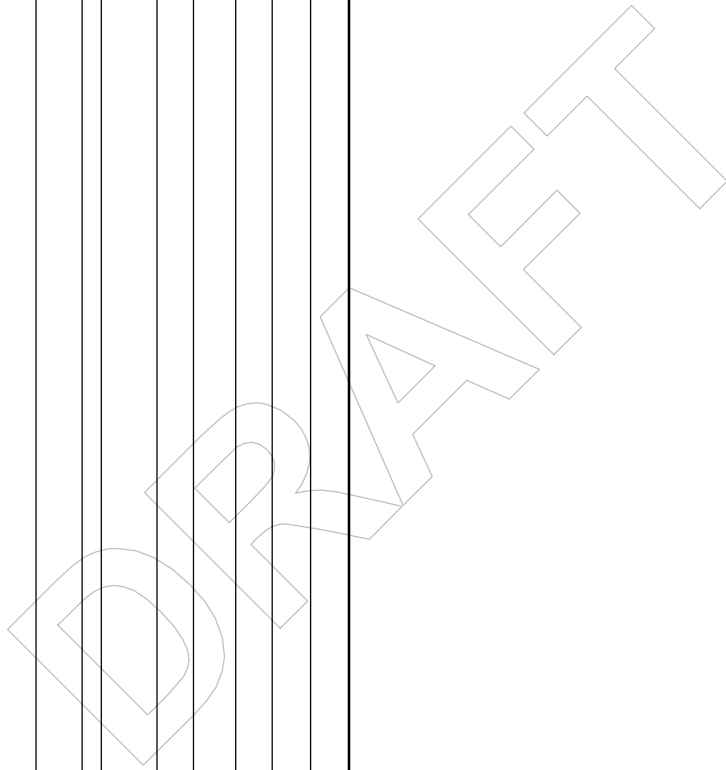
PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: CSX BRIDGE

19BH-009

PAGE 5 OF 5

STATION: OFFSET:  
 LATITUDE: 37.215158° N LONGITUDE: 76.601695° W  
 SURFACE ELEVATION: 66.0 ft COORD. DATUM: NAD 83

FIELD DATA											LAB DATA			
PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK					LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)	
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	DIP °				JOINTS
						100								
<p>Date(s) Drilled: 03/22/2019 - 03/22/2019</p> <p>Drilling Method(s): Mud Rotary w/ SPTs</p> <p>SPT Method: Automatic Hammer</p> <p>Other Test(s): Not Applicable</p> <p>Driller: Dave Wikoff/GET Solutions, Inc</p> <p>Logger: Praveen Gopallawa, HDR</p>														
<p><b>GROUND WATER</b></p> <p>▼ FIRST ENCOUNTERED AT 28.0 ft DEPTH</p> <p>▼ STABILIZED AT 15.9 ft</p>														
<p><b>FIELD DESCRIPTION OF STRATA</b></p> <p>Bottom of borehole at 100.0 feet.</p> <p>Shelby tubes collected from 20.0 to 22.0 feet and 50.0 to 52.0 feet bgs. Boring backfilled with surface soils.</p>											LL	PI		



REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

PAGE 5 OF 5

19BH-009

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19



**PROJECT #:** 10148980  
**LOCATION:** Williamsburg, VA  
**STRUCTURE:** ROADWAY/APPROACH

**19BH-010**

**PAGE 1 OF 4**

**STATION:** OFFSET:  
**LATITUDE:** 37.215461° N **LONGITUDE:** 76.601470° W  
**SURFACE ELEVATION:** 64.0 ft **COORD. DATUM:** NAD 83

**FIELD DATA**

**LAB DATA**

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL		ROCK				STRATA LEGEND	Date(s) Drilled: 03/20/2019 - 03/21/2019 Drilling Method(s): Mud Rotary w/ SPTs SPT Method: Automatic Hammer Other Test(s): Not Applicable Driller: Dave Wikoff/GET Solutions, Inc Logger: Praveen Gopallawa, HDR	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA					
			1	80									
			1	80									
	2	62	1	85									
			2	85									
	4	60	3	85									
			4	85									
3.5	6	58	5	80									
			5	80									
	8	56	6	65									
			7	65									
	10	54	8										
			8										
	12	52											
	14	50	3	55									
			3	55									
	16	48	4										
			4										
0.5	18	46	5										
			5										
	20	44	6										
			6										
	22	42	7										
			7										
	24	40	8										
			8										

**GROUND WATER**  
 NOT ENCOUNTERED DURING DRILLING  
 ↓ STABILIZED AT 13.9 ft

**FIELD DESCRIPTION OF STRATA**

0.0 / 64.0  
 3.0" Topsoil  
 0.3 / 63.7  
*Fluvial*, Brown, fine to medium CLAYEY SAND (SC), very loose, moist  
*Fluvial*, Brown, fine to medium CLAYEY SAND (SC), loose, moist  
*Fluvial*, Brown, fine to medium CLAYEY SAND (SC), medium dense, moist  
 6.0 / 58.0  
*Fluvial*, Red-brown, LEAN CLAY WITH SAND (CL), contains organics, very stiff, moist  
 8.0 / 56.0  
*Fluvial*, Red-brown and brown, fine to medium CLAYEY SAND (SC), medium dense, moist  
 16.5 / 47.5  
*Fluvial*, Brown, FAT CLAY WITH SAND (CH), soft, moist  
 22.5 / 41.5  
*Fluvial*, Yellow-brown, fine POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), very loose, moist

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19

**REMARKS:** Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

**PAGE 1 OF 4**

**19BH-010**







PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: ROADWAY/APPROACH

19BH-010

PAGE 3 OF 4

STATION: OFFSET:  
 LATITUDE: 37.215461° N LONGITUDE: 76.601470° W  
 SURFACE ELEVATION: 64.0 ft COORD. DATUM: NAD 83

**FIELD DATA**

**LAB DATA**

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL		ROCK				STRATA LEGEND	Date(s) Drilled: 03/20/2019 - 03/21/2019	Drilling Method(s): Mud Rotary w/ SPTs	SPT Method: Automatic Hammer	Other Test(s): Not Applicable	Driller: Dave Wikoff/GET Solutions, Inc	Logger: Praveen Gopallawa, HDR	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION										
	52	12																
	54	10	3	85														
	56	8	4															
	58	6	2	90														
	60	4	4	5														
	62	2	6															
	64	0	9	100														
	66	-2	10															
	68	-4	3	80														
	70	-6	5	12														
	72	-8	7															
1	74	-10	4	40														
			5															
			8															
			9															

**GROUND WATER**  
 NOT ENCOUNTERED DURING DRILLING  
 ↓ STABILIZED AT 13.9 ft

**FIELD DESCRIPTION OF STRATA**

Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, loose, moist

Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, medium dense, moist

71.5 / -7.5

Fluvial, Gray, FAT CLAY WITH SAND (CH), contains shell fragments, very stiff, moist

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19

REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

PAGE 3 OF 4

19BH-010



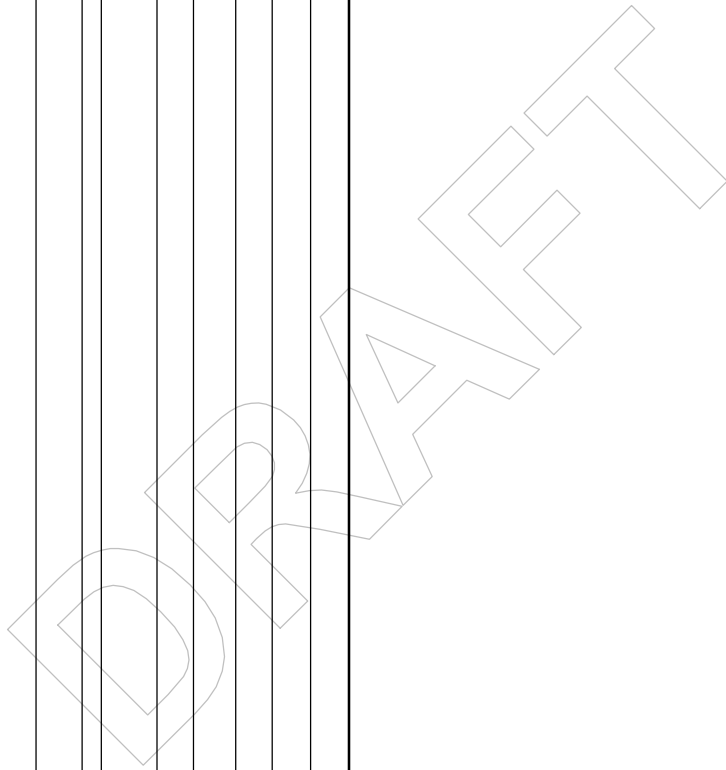
PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: ROADWAY/APPROACH

19BH-010

PAGE 4 OF 4

STATION: OFFSET:  
 LATITUDE: 37.215461° N LONGITUDE: 76.601470° W  
 SURFACE ELEVATION: 64.0 ft COORD. DATUM: NAD 83

FIELD DATA											LAB DATA					
PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK					LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)			
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	JOINTS				DIP °	STRATA LEGEND	
						75										
<p>Date(s) Drilled: 03/20/2019 - 03/21/2019            Drilling Method(s): Mud Rotary w/ SPTs            SPT Method: Automatic Hammer            Other Test(s): Not Applicable            Driller: Dave Wikoff/GET Solutions, Inc            Logger: Praveen Gopallawa, HDR</p> <p style="text-align: center;"><b>GROUND WATER</b>            NOT ENCOUNTERED DURING DRILLING            ↓ STABILIZED AT 13.9 ft</p> <p style="text-align: center;"><b>FIELD DESCRIPTION OF STRATA</b></p> <p>Bottom of borehole at 75.0 feet.            Shelby tube collected from 20.0 to 22.0 feet bgs. Boring backfilled with surface soils.</p>											LL	PI				



REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

PAGE 4 OF 4

19BH-010

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19







**PROJECT #:** 10148980  
**LOCATION:** Williamsburg, VA  
**STRUCTURE:** ROADWAY/EMBANKMENT

**19BH-012**

**PAGE 1 OF 1**

**STATION:** OFFSET:  
**LATITUDE:** 37.215438° N **LONGITUDE:** 76.598926° W  
**SURFACE ELEVATION:** 54.0 ft **COORD. DATUM:** NAD 83

**FIELD DATA**

Date(s) Drilled: 03/20/2019 - 03/20/2019

**LAB DATA**

Drilling Method(s): Mud Rotary w/ SPTs  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Praveen Gopallawa, HDR

**GROUND WATER**  
 ▽ FIRST ENCOUNTERED AT 8.0 ft DEPTH  
 ▽ STABILIZED AT 2.4 ft

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**FIELD DESCRIPTION OF STRATA**

LL PI

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL		ROCK				STRATA LEGEND
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	JOINTS	
			WOH						
			2	55					
			2						
			1						
			2						
			4	10					
			4						
			4						
			5						
			5	100					
			4						
			4						
			4	95					
			4						
			5						
			5	50					
			5						
			4						
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			5	50					
			5						



**PROJECT #:** 10148980  
**LOCATION:** Williamsburg, VA  
**STRUCTURE:** CULVERT/RETAINING WALL

**19BH-013**

**PAGE 1 OF 2**

**STATION:** OFFSET:  
**LATITUDE:** 37.214715° N **LONGITUDE:** 76.598199° W  
**SURFACE ELEVATION:** 40.0 ft **COORD. DATUM:** NAD 83

**FIELD DATA**

Date(s) Drilled: 03/20/2019 - 03/20/2019

**LAB DATA**

Drilling Method(s): Mud Rotary w/ SPTs  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Praveen Gopallawa, HDR

**GROUND WATER**  
 ▽ FIRST ENCOUNTERED AT 0.0 ft DEPTH  
 ▽ STABILIZED AT 0.5 ft

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**FIELD DESCRIPTION OF STRATA**

LL PI

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL		ROCK				STRATA LEGEND
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	JOINTS	
			WOH/12"						
	2	38	1 WOH/12"	65					
	4	36	1 WOH/18"	50					
0.25	6	34	1 WOH/18"	80					
	8	32	3	70					
	10	30	4 6 3	75					
	12	28							
	14	26	2 4 3 3	85					
	16	24							
	18	22	5 5 6 7	85					
	20	20							
	22	18							
	24	16	5 6 4 3	95					

0.0 / 40.0 2.0" Topsoil 0.2 / 39.8 Fluvial, Brown, medium POORLY GRADED SAND (SP), very loose, wet
6.5 / 33.5 Fluvial, Dark gray, FAT CLAY (CH), trace sand, soft, moist
8.0 / 32.0 Fluvial, Dark gray, fine to medium CLAYEY SAND (SC), contains shell fragments, medium dense, moist
11.5 / 28.5 Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, loose, moist
Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, medium dense, moist

**REMARKS:** Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

**PAGE 1 OF 2**

**19BH-013**

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19



PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: CULVERT/RETAINING WALL

19BH-013

PAGE 2 OF 2

STATION: OFFSET:  
 LATITUDE: 37.214715° N LONGITUDE: 76.598199° W  
 SURFACE ELEVATION: 40.0 ft COORD. DATUM: NAD 83

**FIELD DATA**

**LAB DATA**

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL		ROCK				STRATA LEGEND	Date(s) Drilled: 03/20/2019 - 03/20/2019 Drilling Method(s): Mud Rotary w/ SPTs SPT Method: Automatic Hammer Other Test(s): Not Applicable Driller: Dave Wikoff/GET Solutions, Inc Logger: Praveen Gopallawa, HDR	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION					
										<b>GROUND WATER</b> ▼ FIRST ENCOUNTERED AT 0.0 ft DEPTH ▼ STABILIZED AT 0.5 ft			
										<b>FIELD DESCRIPTION OF STRATA</b>	LL	PI	
	26	14				25							
	28	12	2			28				Fluvial, Gray, fine to medium SILTY SAND (SM), contains shell fragments, loose, moist			
	30	10	2 2 4	100		30				Bottom of borehole at 30.0 feet. Boring backfilled with surface soils.			

REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

PAGE 2 OF 2

19BH-013

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19



**PROJECT #:** 10148980  
**LOCATION:** Williamsburg, VA  
**STRUCTURE:** ROADWAY

**19BH-014**  
**PAGE 1 OF 1**

**STATION:** OFFSET:  
**LATITUDE:** 37.213802° N **LONGITUDE:** 76.598274° W  
**SURFACE ELEVATION:** 60.0 ft **COORD. DATUM:** NAD 83

FIELD DATA										LAB DATA							
DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK			STRATA LEGEND	Date(s) Drilled: 04/11/2019 - 04/11/2019	Drilling Method(s): Mud Rotary w/ SPT	SPT Method: Automatic Hammer	Other Test(s): Not Applicable	Driller: James Owens/GET Solutions, Inc	Logger: Will Riddick, GETs	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION										
										<b>GROUND WATER</b>							
										NOT ENCOUNTERED DURING DRILLING NO LONG TERM MEASUREMENTS TAKEN							
										<b>FIELD DESCRIPTION OF STRATA</b>							
2	58	2	85	1.5				0.0 / 60.0									
		3						7.5" Asphalt									
		4						0.7 / 59.3									
		4						9.3" Concrete									
4	56	2	85	3.5				1.4 / 58.6									
		3						<i>Fluvial</i> , Tan, fine to medium SILTY SAND (SM), loose, moist									
		3						3.5 / 56.5									
		5						<i>Fluvial</i> , Orange, SANDY LEAN CLAY (CL), firm, moist									
6	54	5	75	5.5				5.5 / 54.5									
		6						<i>Fluvial</i> , Orange, fine to medium POORLY GRADED SAND WITH SILT (SP-SM), medium dense, moist									
		7															
8	52	5	85	7.5													
		6															
		6															
10	50	7	90	9.5													
		8															
		8															
12	48																
14	46	3	70	14.5				13.0 / 47.0									
		6						<i>Fluvial</i> , Tan, fine to medium SILTY SAND (SM), medium dense, moist									
		6															
16	44	5		16.5													
										Bottom of borehole at 16.5 feet. Bulk sample collected from 1.4 to 5 feet. Boring backfilled with sand, hole plug and asphalt.							

SPT\_LOG:W:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:06:18:10:4/18/19

**REMARKS:** Rig Type: CME 45C Truck. Soil relative density and consistency descriptions based on N60 values.

**PAGE 1 OF 1**  
**19BH-014**





PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: ROADWAY

19PC-001

PAGE 1 OF 1

STATION:  
 LATITUDE: 37.207733° N  
 SURFACE ELEVATION: 55.0 ft

OFFSET:  
 LONGITUDE: 76.600799° W  
 COORD. DATUM: NAD 83

**FIELD DATA**

Date(s) Drilled: 04/10/2019 - 04/10/2019  
 Drilling Method(s): Mud Rotary w/ SPT  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: James Owens/GET Solutions, Inc  
 Logger: Joe Wallen, PE/HDR

**LAB DATA**

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**GROUND WATER**  
 NOT ENCOUNTERED DURING DRILLING  
 NO LONG TERM MEASUREMENTS TAKEN

**FIELD DESCRIPTION OF STRATA**

LL PI

DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK			STRATA LEGEND
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °	
54								0.0 / 55.0 6.5" Asphalt
2	2	2		1.8				0.5 / 54.5 7" Concrete
52		1	70					1.2 / 53.8 Fluvial, Gray, fine to medium CLAYEY SAND (SC), loose, moist
4	2	2		3.8				3.8 / 51.2 Fluvial, Gray, LEAN CLAY WITH SAND (CL), firm, moist
50		3	55					5.8 / 49.2 Fluvial, Gray, fine to medium CLAYEY SAND (SC), loose, moist
6	1	1	70					
48		3		7.8				

Bottom of borehole at 7.8 feet.  
 Boring backfilled with sand and asphalt.

REMARKS: Rig Type: CME 45C Truck. Soil relative density and consistency descriptions based on N60 values.

PAGE 1 OF 1

19PC-001

SPT\_LOG\\W:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:06:18:10:4/18/19



PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: ROADWAY

19PC-002

PAGE 1 OF 1

STATION:  
 LATITUDE: 37.208252° N  
 SURFACE ELEVATION: 51.0 ft

OFFSET:  
 LONGITUDE: 76.597509° W  
 COORD. DATUM: NAD 83

**FIELD DATA**

**LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK			STRATA LEGEND	Date(s) Drilled: 04/10/2019 - 04/10/2019	Drilling Method(s): Mud Rotary w/ SPT	SPT Method: Automatic Hammer	Other Test(s): Not Applicable	Driller: James Owens/GET Solutions, Inc	Logger: Joe Wallen, PE/HDR	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)	
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION											DIP °
									<b>GROUND WATER</b>									
									NOT ENCOUNTERED DURING DRILLING NO LONG TERM MEASUREMENTS TAKEN									
									<b>FIELD DESCRIPTION OF STRATA</b>						LL	PI		
50	2	2		0.9					0.0 / 51.0	10.3" Asphalt								
2	2	25		40					0.9 / 50.1	9" Aggregate base								
48	4	4		7					1.6 / 49.4	<i>Alluvium</i> , Tan and brown, fine to medium CLAYEY SAND (SC), medium dense, moist								
4	4	3		65						<i>Alluvium</i> , Tan, fine to medium CLAYEY SAND (SC), loose, moist								
46	3	3		4														
6	3	4		100														
		5																
										Bottom of borehole at 6.9 feet. Boring backfilled with sand and asphalt.								

REMARKS: Rig Type: CME 45C Truck. Soil relative density and consistency descriptions based on N60 values.

PAGE 1 OF 1

19PC-002

SPT\_LOG\\W:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:06:18:10:4/18/19



PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: ROADWAY

19PC-003

PAGE 1 OF 1

STATION:  
 LATITUDE: 37.214081° N  
 SURFACE ELEVATION: 60.0 ft

OFFSET:  
 LONGITUDE: 76.599924° W  
 COORD. DATUM: NAD 83

**FIELD DATA**

**LAB DATA**

DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK			STRATA LEGEND
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	
2	58.8	10	5	1.8				
4	56.2	7	6	3.8				
6	54.2	3	80	5.8				
		4	75	7.8				

Date(s) Drilled: 04/10/2019 - 04/10/2019  
 Drilling Method(s): Mud Rotary w/ SPT  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: James Owens/GET Solutions, Inc  
 Logger: Joe Wallen, PE/HDR

**GROUND WATER**  
 NOT ENCOUNTERED DURING DRILLING  
 NO LONG TERM MEASUREMENTS TAKEN

**FIELD DESCRIPTION OF STRATA**

0.0 / 60.0  
 6.5" Asphalt  
 0.7 / 59.3  
 7.5" Concrete  
 1.1 / 58.9  
 7.0" Aggregate  
 1.8 / 58.2  
*Alluvium*, Tan, fine to coarse SILTY SAND WITH GRAVEL (SM), medium dense, moist  
 3.8 / 56.2  
*Alluvium*, Tan, fine to medium CLAYEY SAND (SC), loose, moist

Bottom of borehole at 7.8 feet.  
 Boring backfilled with sand, hole plug and asphalt.

LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)
LL	PI	

REMARKS: Rig Type: CME 45C Truck. Soil relative density and consistency descriptions based on N60 values.

PAGE 1 OF 1

19PC-003

SPT\_LOG\\W:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:06:18:10:4/18/19



PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: ROADWAY

19PC-004

PAGE 1 OF 1

STATION:  
 LATITUDE: 37.213672° N  
 SURFACE ELEVATION: 58.0 ft

OFFSET:  
 LONGITUDE: 76.597053° W  
 COORD. DATUM: NAD 83

**FIELD DATA**

Date(s) Drilled: 04/11/2019 - 04/11/2019  
 Drilling Method(s): 3.25" HSA w/ SPTs  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: James Owens/GET Solutions, Inc  
 Logger: Will Riddick, GETs

**LAB DATA**

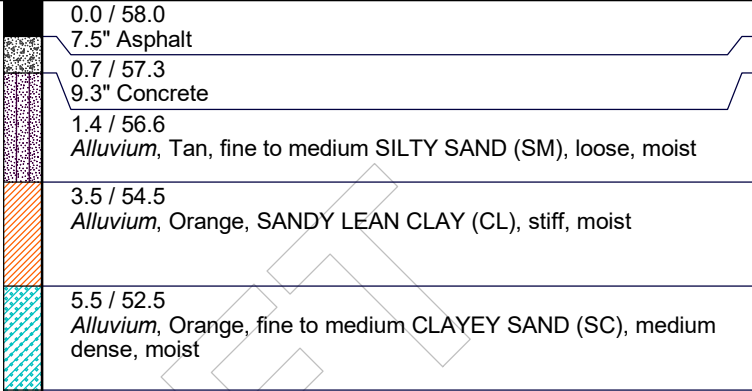
LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**GROUND WATER**  
 NOT ENCOUNTERED DURING DRILLING  
 NO LONG TERM MEASUREMENTS TAKEN

**FIELD DESCRIPTION OF STRATA**

LL PI

DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK			STRATA LEGEND
		STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	
2	56	3	70		1.5			
4	54	4	100		3.5			
6	52	5	65		5.5			
		7			7.5			



Bottom of borehole at 7.8 feet.  
 Boring backfilled with sand, hole plug and asphalt.

REMARKS: Rig Type: CME 45C Truck. Soil relative density and consistency descriptions based on N60 values.

PAGE 1 OF 1

19PC-004

SPT\_LOG\\W:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:06:18:10:4/18/19



**PROJECT #:** 10148980  
**LOCATION:** Williamsburg, VA  
**STRUCTURE:** STORM WATER POND

**19SWM-001**

**PAGE 1 OF 2**

**STATION:** OFFSET:  
**LATITUDE:** 37.215707° N **LONGITUDE:** 76.598094° W  
**SURFACE ELEVATION:** 55.0 ft **COORD. DATUM:** NAD 83

**FIELD DATA**

Date(s) Drilled: 03/20/2019 - 03/20/2019  
 Drilling Method(s): Mud Rotary w/ SPTs  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Praveen Gopallawa, HDR

**LAB DATA**

**GROUND WATER**  
 NOT ENCOUNTERED DURING DRILLING

LIQUID LIMIT  
 PLASTICITY INDEX  
 MOISTURE CONTENT (%)

**FIELD DESCRIPTION OF STRATA**

LL PI

PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL		ROCK				STRATA LEGEND
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	DIP °	
1		54	2	55	0.4				
2	2	52	3	60	2				
	4	50	3	70	4				
	6	48	5	80	6				
	8	46	3	60	8				
	10	44	4	50	10				
	12	42	4	50	13				
	14	40	5	70	15				
	16	38	2	70	18				
0.5	18	36	4	70	20				
	20	34	3	70	23				
	22	32	4	100	23				
0.25	24	30	1	100	23				
	24	30	1	100	23				

0.0 / 55.0  
 4.0" Topsoil  
 0.4 / 54.6  
*Fill*, Brown, LEAN CLAY WITH SAND (CL), trace gravel, contains organics, firm, moist  
*Fill*, Brown, LEAN CLAY WITH SAND (CL), stiff, moist

4.0 / 51.0  
*Fill*, Brown, fine to medium CLAYEY SAND (SC), contains mica, medium dense, moist

16.5 / 38.5  
*Fill*, Orange-brown, LEAN CLAY WITH SAND (CL), stiff, moist

21.5 / 33.5  
*Fill*, Orange-brown, FAT CLAY (CH), trace sand, soft, moist

**REMARKS:** Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

**PAGE 1 OF 2**

**19SWM-001**

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19



PROJECT #: 10148980  
 LOCATION: Williamsburg, VA  
 STRUCTURE: STORM WATER POND

19SWM-001

PAGE 2 OF 2

STATION: OFFSET:  
 LATITUDE: 37.215707° N LONGITUDE: 76.598094° W  
 SURFACE ELEVATION: 55.0 ft COORD. DATUM: NAD 83

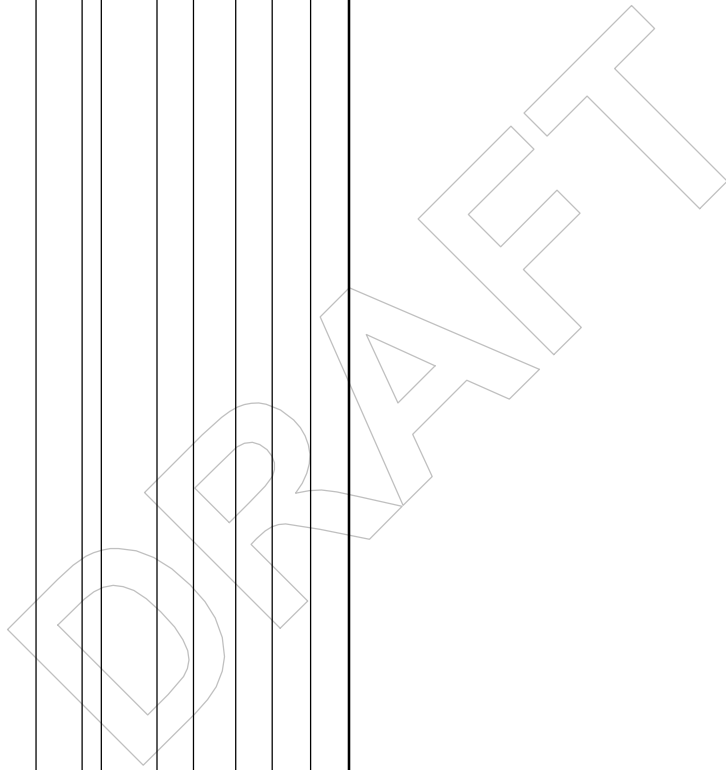
FIELD DATA											LAB DATA			
PKT. PENETROMETER (tsf)	DEPTH (ft)	ELEVATION (ft)	SOIL			ROCK					LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT (%)	
			STANDARD PENETRATION TEST HAMMER BLOWS	SOIL RECOVERY (%)	SAMPLE LEGEND	SAMPLE INTERVAL	CORE RECOVERY (%)	ROCK QUALITY DESIGNATION	STRATA	DIP °				JOINTS
						25								
<p><b>GROUND WATER</b> NOT ENCOUNTERED DURING DRILLING</p>														
<p><b>FIELD DESCRIPTION OF STRATA</b> Bottom of borehole at 25.0 feet. Bulk sample taken from 1.0 to 4.0 feet bgs. Piezometer installed to a depth of 23.0 feet bgs.</p>											LL	PI		

Date(s) Drilled: 03/20/2019 - 03/20/2019  
 Drilling Method(s): Mud Rotary w/ SPTs  
 SPT Method: Automatic Hammer  
 Other Test(s): Not Applicable  
 Driller: Dave Wikoff/GET Solutions, Inc  
 Logger: Praveen Gopallawa, HDR

**GROUND WATER**  
NOT ENCOUNTERED DURING DRILLING

**FIELD DESCRIPTION OF STRATA**

Bottom of borehole at 25.0 feet.  
 Bulk sample taken from 1.0 to 4.0 feet bgs. Piezometer installed to a depth of 23.0 feet bgs.

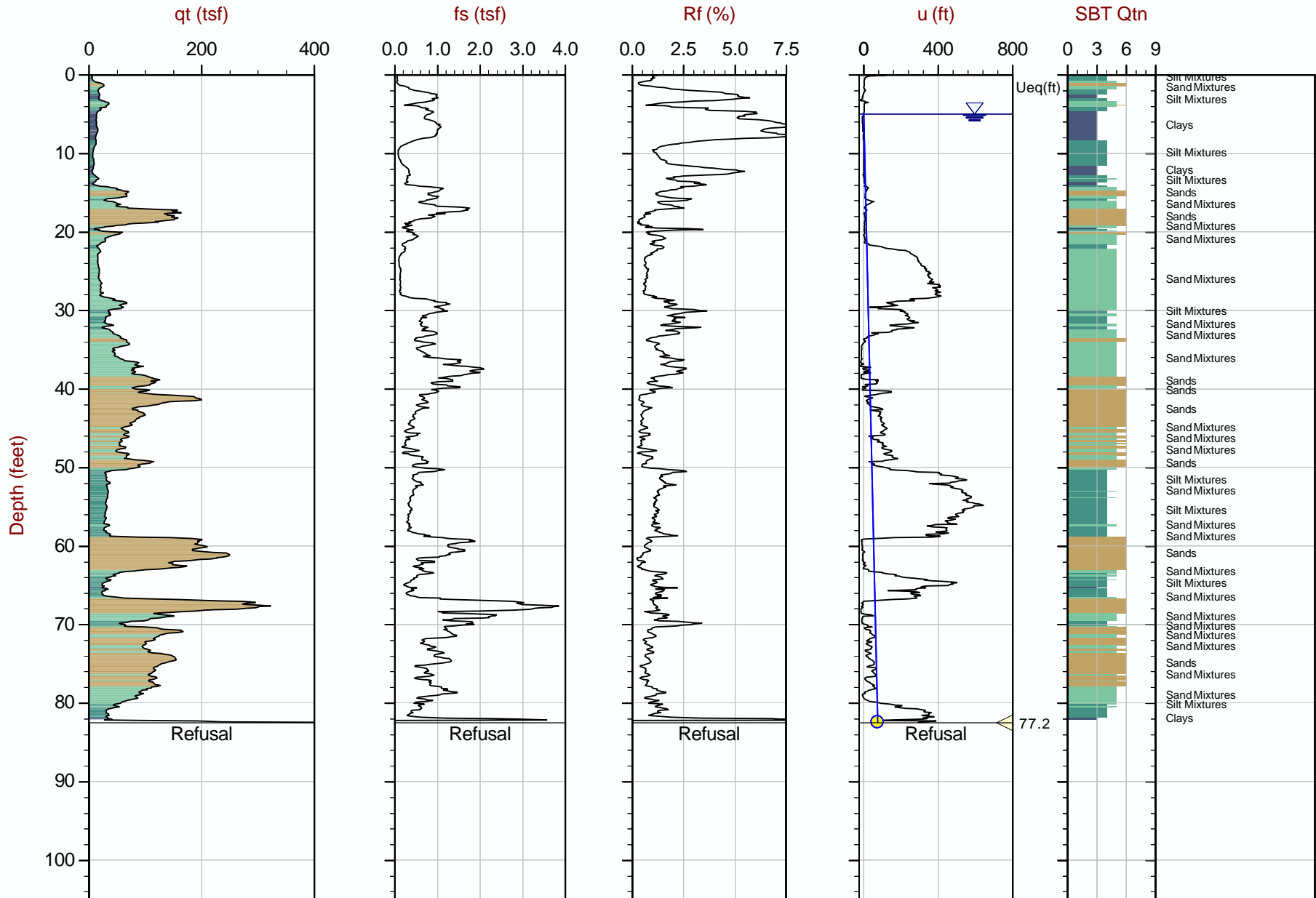


REMARKS: Rig Type: CME 55 Track Rig. Soil relative density and consistency descriptions based on N60 values.

PAGE 2 OF 2

19SWM-001

SPT\_LOGAW:SKIFFE'S CREEK\_VDOT.GPJ:10.0.000:061810:4/18/19



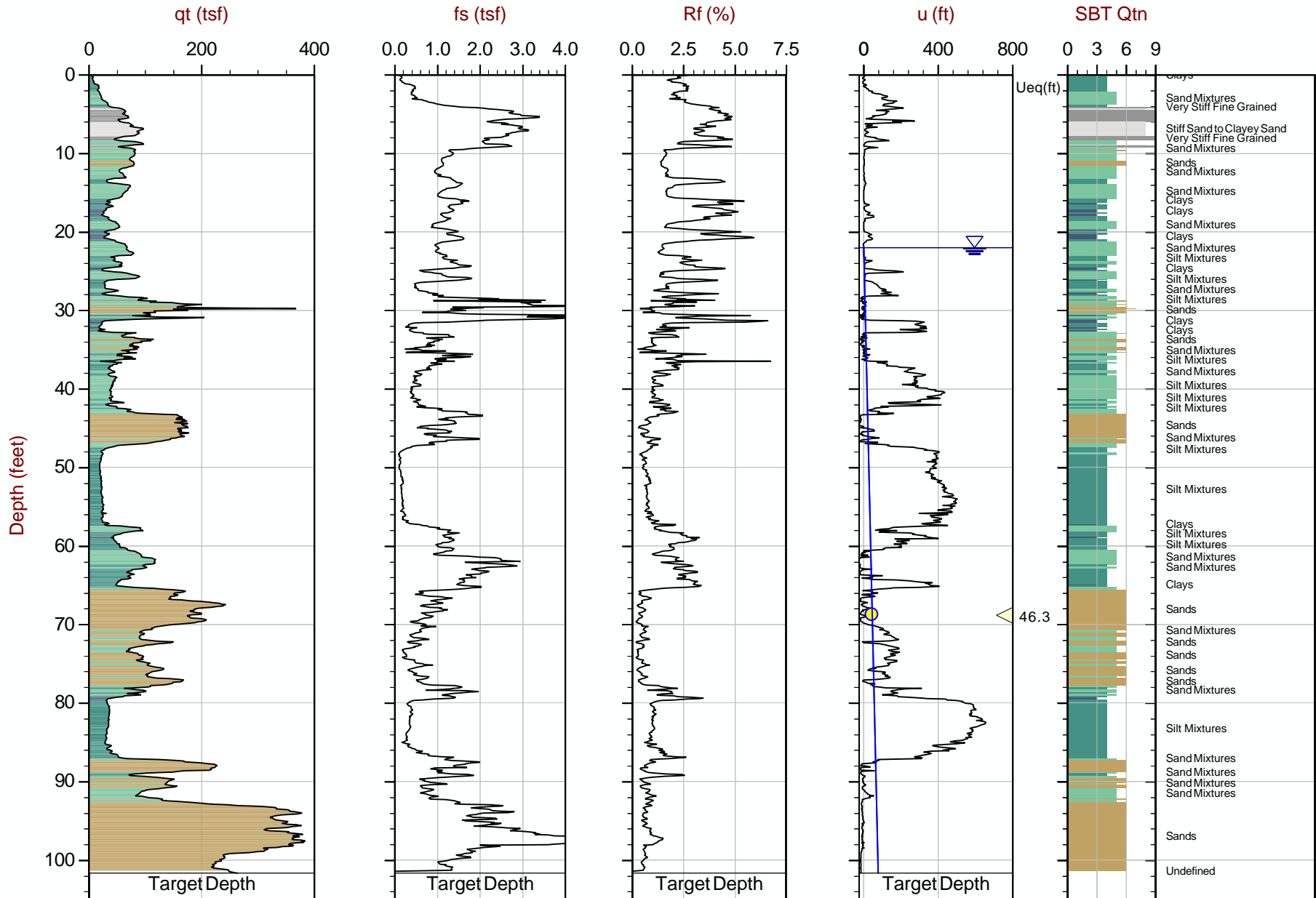
Max Depth: 25.150 m / 82.51 ft  
 Depth Inc: 0.025 m / 0.082 ft  
 Avg Int: Every Point

File: 19-54026\_CP19CPT-01.cor  
 Unit Wt: SBTQtn(PKR2009)

SBT: Robertson, 2009 and 2010  
 Coords: Lat: 37.21067 Long: -76.59987

△ Dissipation with estimated Ueq value    △ Dissipation, equilibrium not achieved    ● Equilibrium Pore Pressure (Ueq)

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Max Depth: 31.000 m / 101.70 ft  
 Depth Inc: 0.025 m / 0.082 ft  
 Avg Int: Every Point

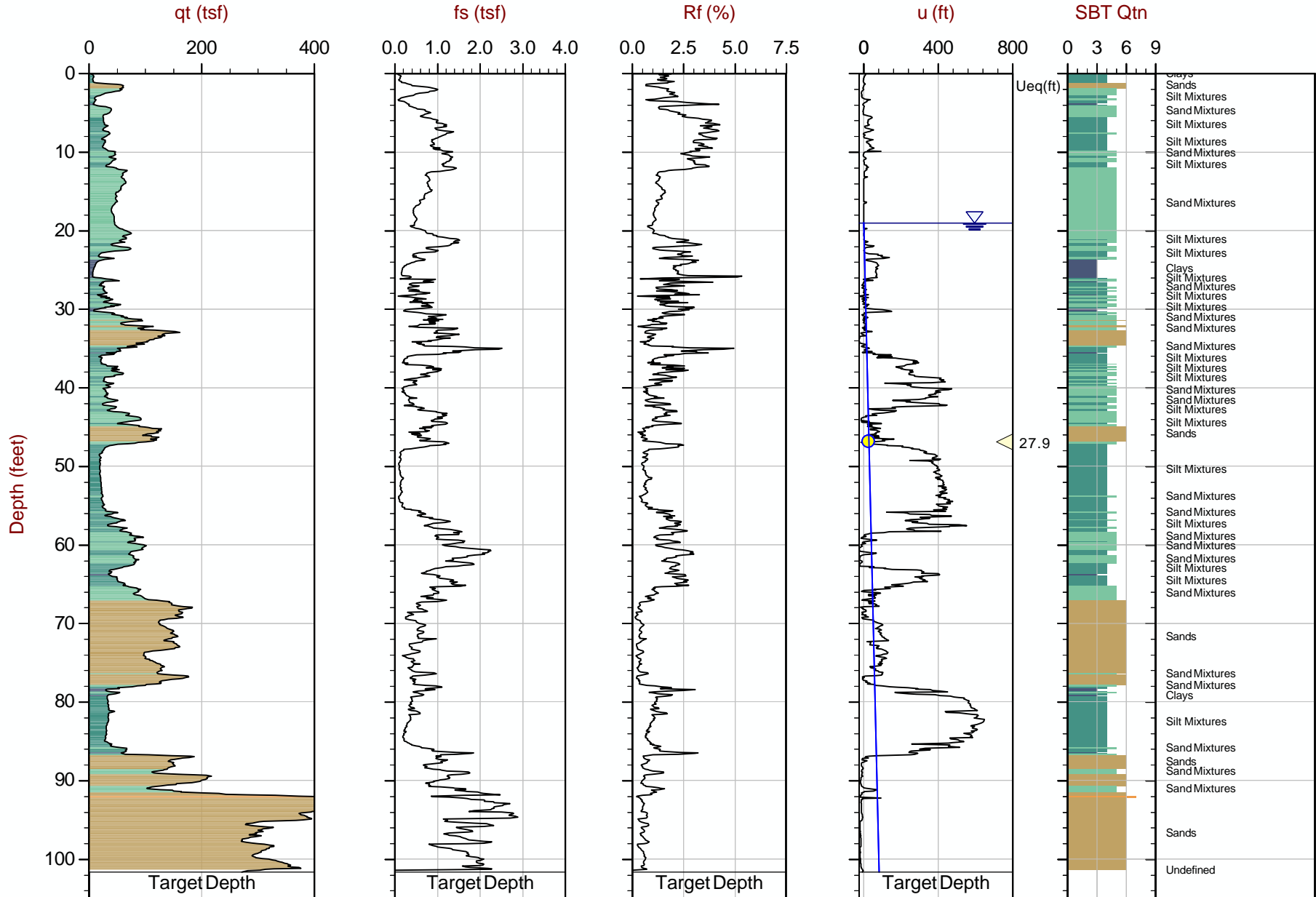
File: 19-54026\_CP19CPT-02.cor  
 Unit Wt: SBTQtn(PKR2009)

SBT: Robertson, 2009 and 2010  
 Coords: Lat: 37.21397 Long: -76.60244

△ Dissipation with estimated Ueq value    △ Dissipation, equilibrium not achieved    ● Equilibrium Pore Pressure (Ueq)

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.





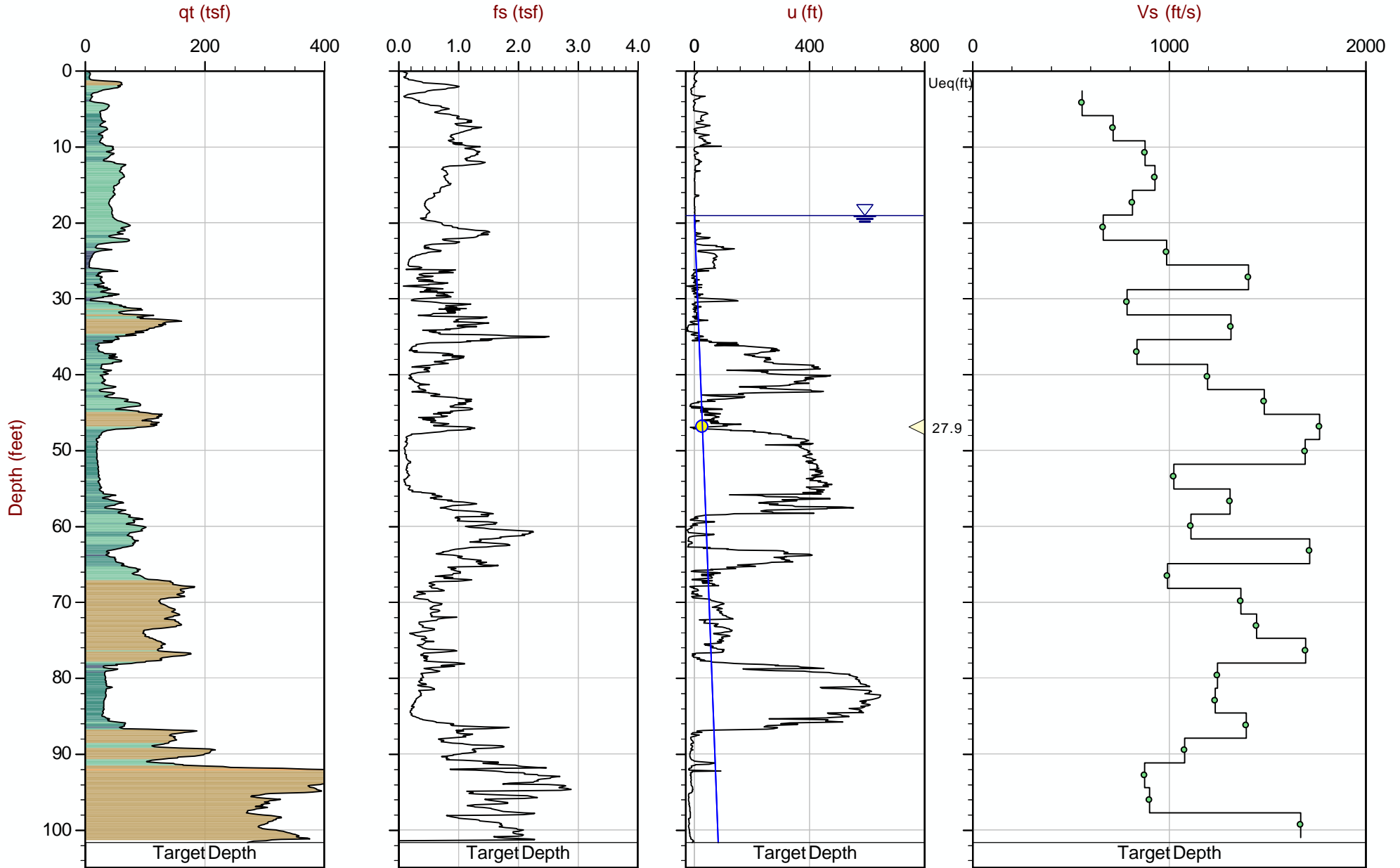
Max Depth: 31.000 m / 101.70 ft  
 Depth Inc: 0.025 m / 0.082 ft  
 Avg Int: Every Point

File: 19-54026\_SP19CPT-VS-03.cor  
 Unit Wt: SBTQtn(PKR2009)

SBT: Robertson, 2009 and 2010  
 Coords: Lat: 37.21440 Long: -76.60201

△ Dissipation with estimated Ueq value    △ Dissipation, equilibrium not achieved    ● Equilibrium Pore Pressure (Ueq)

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Max Depth: 31.000 m / 101.70 ft  
 Depth Inc: 0.025 m / 0.082 ft  
 Avg Int: Every Point

File: 19-54026\_SP19CPT-VS-03.cor  
 Unit Wt: SBTQtn(PKR2009)

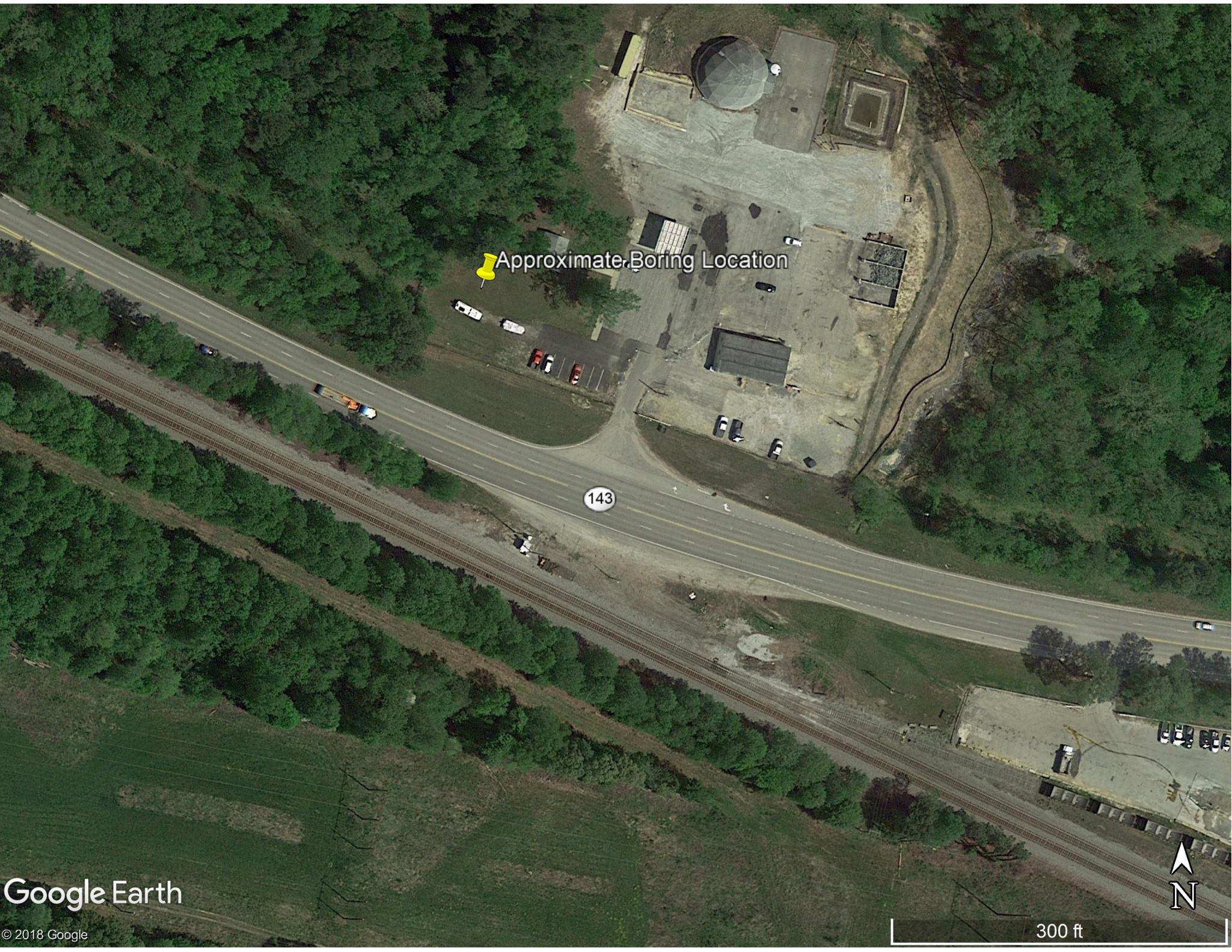
SBT: Robertson, 2009 and 2010  
 Coords: Lat: 37.21440 Long: -76.60201

△ Dissipation with estimated Ueq value    △ Dissipation, equilibrium not achieved    ● Equilibrium Pore Pressure (Ueq)

The reported coordinates were acquired from hand-held GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

# **Boring Location Plan, Boring Log, and Lab results by Entity**

Boring Log and supporting laboratory results by Entity are solely for the information of the Offeror, which each Offeror may use at their own risk and as they deem appropriate. The Department does not represent or warrant that this boring information and lab results are suitable for designing this project.



Approximate Boring Location

143





# RECORD OF SUBSURFACE EXPLORATION

Virginia Beach 5465 Greenwich Road 757-518-1703  
 Williamsburg 701 Alexander Lee Parkway 757-564-6452  
 Elizabeth City 106 Capital Trace Unit E 252-335-9765  
 Jacksonville 415-A Western Blvd Jacksonville, NC 28546 910-478-9915

## BORING ID B-1

PROJECT NAME: **Skiffes Creek Connector**  
 CLIENT: **Clark Nexsen**  
 PROJECT LOCATION: **James City County, Virginia**  
 BORING COORDINATES: **LAT: 37.214648 LONG: -76.600191**  
 DRILLING METHOD(S): **Rotary wash "mud"**  
 GROUNDWATER\*: INITIAL (ft) ▽: **16** AFTER \_\_\_\_ HOURS (ft) ▼: \_\_\_\_ CAVE-IN (ft) ○: \_\_\_\_  
*The initial groundwater readings are not intended to indicate the static groundwater level.*

PROJECT NUMBER: **WM18-189G**  
 SURFACE ELEVATION (MSL) (ft): \_\_\_\_  
 LOGGED BY: **T. Vaughn**  
 DATE STARTED: **2/14/2019**  
 DATE COMPLETED: **2/14/2019**  
 DRILLER: **GET Solutions, Inc.**

Elevation (ft)	Depth (ft)	STRATA DESCRIPTION	Strata Legend	Sample ID	Sample Type	Sample Recovery (in.)	Blow Counts (N-Values)	%<#200	TEST RESULTS					
									Plastic Limit X	Liquid Limit X	Water Content - ●	Penetration - ▨		
	0.3	3-in of Topsoil												
	2.0	Light brown and gray, moist, Sandy SILT (ML), stiff, "Possible FILL"		1		18	2-5-6-7 (11)							
		Orange-brown, moist, Clayey fine to medium SAND (SC), loose to medium dense		2		16	4-6-7-4 (13)							
	5			3		20	4-4-5-6 (9)							
	6.0	Mottled, light gray and orange-brown, moist, Clayey fine to medium SAND (SC), loose to medium dense		4		24	4-7-6-7 (13)							
	10			5		24	4-4-5-5 (9)							
	10.0	Orange-brown, moist, Clayey fine to medium SAND (SC), loose		6		24	3-3-4-4 (7)							
	12.5	Orange-brown, moist to wet, Sandy lean CLAY (CL), medium stiff		7		24	2-3-4-5 (7)	52						
	15													
	16.5	Wet below 16-ft												
	16.5	Orange-brown, wet, Clayey fine to medium SAND (SC), very loose		8		24	1-2-2-2 (4)	38						
	20													
	21.5	Light brown, wet, Silty fine to coarse SAND (SM), contains marine shell fragments, loose		9		24	2-2-3-4 (5)							
	25													
	26.5	Brown, wet, Silty fine to medium SAND (SM), contains marine shell fragments, loose		10		24	4-4-3-5 (7)							
	30													
	31.5	Dark gray, wet, Silty fine to medium SAND (SM), contains marine shell fragments, loose, "Yorktown Formation"		11		22	2-2-3-2 (5)							
	35													

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

Sample Type(s):  
 SPT - Standard Penetration Test

Notes:



# RECORD OF SUBSURFACE EXPLORATION

Virginia Beach 5465 Greenwich Road 757-518-1703  
 Williamsburg 701 Alexander Lee Parkway 757-564-6452  
 Elizabeth City 106 Capital Trace Unit E 252-335-9765  
 Jacksonville 415-A Western Blvd 910-478-9915

## BORING ID B-1

PROJECT NAME: **Skiffes Creek Connector**  
 CLIENT: **Clark Nexsen**  
 PROJECT LOCATION: **James City County, Virginia**  
 BORING COORDINATES: **LAT: 37.214648 LONG: -76.600191**  
 DRILLING METHOD(S): **Rotary wash "mud"**  
 GROUNDWATER\*: INITIAL (ft)  $\nabla$ : **16** AFTER \_\_\_\_ HOURS (ft)  $\nabla$ : \_\_\_\_ CAVE-IN (ft)  $\odot$ : \_\_\_\_  
*The initial groundwater readings are not intended to indicate the static groundwater level.*

PROJECT NUMBER: **WM18-189G**  
 SURFACE ELEVATION (MSL) (ft): \_\_\_\_  
 LOGGED BY: **T. Vaughn**  
 DATE STARTED: **2/14/2019**  
 DATE COMPLETED: **2/14/2019**  
 DRILLER: **GET Solutions, Inc.**

Elevation (ft)	Depth (ft)	STRATA DESCRIPTION	Strata Legend	Sample ID	Sample Type	Sample Recovery (in.)	Blow Counts (N-Values)	%<#200	TEST RESULTS				
									Plastic Limit X	Liquid Limit X	Water Content - ●	Penetration -	
36.5		Gray, wet, Silty fine to medium SAND (SM), contains marine shell fragments, medium dense, "Yorktown Formation"		12	24	24	5-6-9-6 (15)						
41.5		Dark gray, wet, lean CLAY (CL), contains marine shell fragments, soft, "Yorktown Formation"		13	24	24	1-2-1-3 (3)	89		X	●		
46.5		Dark gray, wet, Silty fine to medium SAND (SM), contains marine shell fragments, loose to medium dense, "Yorktown Formation"		14	24	24	3-3-4-5 (7)						
55				15	24	24	2-3-3-4 (6)						
60				16	24	24	5-7-7-10 (14)						
65				17	24	24	5-5-5-7 (10)						
70				18	24	24	4-6-5-8 (11)						

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

Sample Type(s):  
 SPT - Standard Penetration Test

Notes:



# RECORD OF SUBSURFACE EXPLORATION

Virginia Beach 5465 Greenwich Road 757-518-1703  
 Williamsburg 701 Alexander Lee Parkway 757-564-6452  
 Elizabeth City 106 Capital Trace Unit E 252-335-9765  
 Jacksonville 415-A Western Blvd Jacksonville, NC 28546 910-478-9915

## BORING ID B-1

PROJECT NAME: **Skiffes Creek Connector**  
 CLIENT: **Clark Nexsen**  
 PROJECT LOCATION: **James City County, Virginia**  
 BORING COORDINATES: **LAT: 37.214648 LONG: -76.600191**  
 DRILLING METHOD(S): **Rotary wash "mud"**  
 GROUNDWATER\*: INITIAL (ft)  $\nabla$ : **16** AFTER \_\_\_\_ HOURS (ft)  $\nabla$ : \_\_\_\_ CAVE-IN (ft)  $\odot$ : \_\_\_\_  
*The initial groundwater readings are not intended to indicate the static groundwater level.*

PROJECT NUMBER: **WM18-189G**  
 SURFACE ELEVATION (MSL) (ft): \_\_\_\_  
 LOGGED BY: **T. Vaughn**  
 DATE STARTED: **2/14/2019**  
 DATE COMPLETED: **2/14/2019**  
 DRILLER: **GET Solutions, Inc.**

Elevation (ft)	Depth (ft)	STRATA DESCRIPTION	Strata Legend	Sample ID	Sample Type	Sample Recovery (in.)	Blow Counts (N-Values)	%<#200	TEST RESULTS			
									Plastic Limit	Water Content	Penetration	Liquid Limit
71.5		Dark gray, wet, lean CLAY (CL) with Sand, contains marine shell fragments, stiff, "Yorktown Formation"		19	24	3-4-6-7 (10)	72		X		X	
76.5		Dark gray, wet, Silty fine to medium SAND (SM), contains marine shell fragments, loose to dense, "Yorktown Formation"		20	24	3-6-4-10 (10)						
				21	24	3-5-6-4 (11)						
				22	24	18-12-12-10 (24)						
				23	24	13-18-29-29 (47)						
				24	18	14-14-12-11 (26)						
100.0		Boring terminated at 100 feet below existing grade.										

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

Sample Type(s):  
 SPT - Standard Penetration Test

Notes:



GET Solutions, Inc.

# SUMMARY OF LABORATORY RESULTS

**CLIENT** Clark Nexsen

**PROJECT NAME** Skiffes Creek Connector

**PROJECT NUMBER** WM18-189G

**PROJECT LOCATION** James City County, Virginia

Borehole	Depth	Liquid Limit	Plastic Limit	Plasticity Index	Maximum Size (mm)	% <#200 Sieve	Classification	Water Content (%)	Dry Density (pcf)	Saturation (%)	Void Ratio
B-1	14.0	34	18	16	0.075	52	CL	26.0			
B-1	19.0	56	24	32	0.075	38	SC	45.0			
B-1	44.0	39	23	16	0.075	89	CL	40.0			
B-1	74.0	45	21	24	0.075	72	CL	36.0			

(1) GET - LABORATORY TEST SUMMARY - GET\_STANDARD\_DATA\_TEMPLATE(03-17-14).GDT - 4/18/19 14:18 - G:\DOCUMENTS\GET\W\GEO\TECH\2018 GEO\WM18-189G SKIFFS CREEK\BORING LOG.GPJ