

SEE SHEET 3 FOR PLAN SHEET LAYOUT  
AT TIME OF INVESTIGATION

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-040156	1	

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:
- THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
  - BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

M. STANBURY, PG

C. STEPHENS, GIT

B. SMITH, PG

SUBTERRA EXP.

INVESTIGATED BY B. SMITH, PG

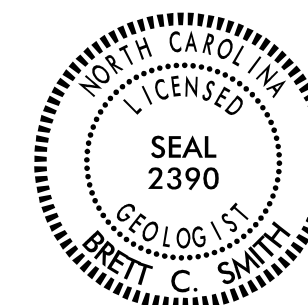
DRAWN BY B. SMITH, PG

CHECKED BY S. JOHNSON, PE, PG

SUBMITTED BY B. SMITH, PG

DATE JUNE, 2024

PREPARED IN THE OFFICE OF:



DocuSigned by:  
[Signature] 7/2/2024

D2AD1A971B6F428 SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

REFERENCE: SF-040156

PROJECT: BPII.R046

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ROADWAY  
SUBSURFACE INVESTIGATION

COUNTY ASHE

PROJECT DESCRIPTION REPLACE BRIDGE 040156 ON  
SR 1169 (PINE SWAMP RD) OVER W. FORK PINE  
SWAMP CREEK

INVENTORY

# NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

## SUBSURFACE INVESTIGATION

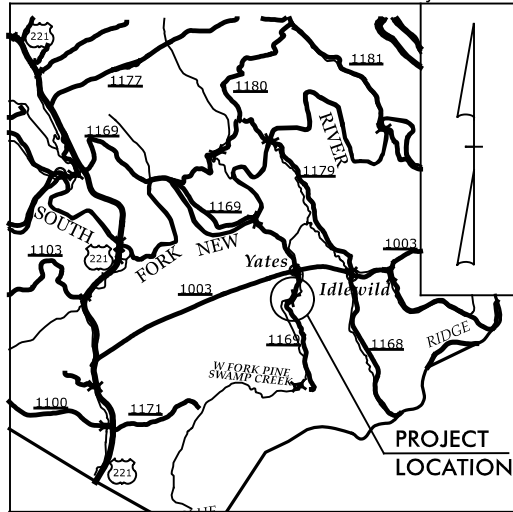
### SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																																																																								
<p>SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 208, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>										<p><b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. <b>UNIFORMLY GRADED</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.</p>										<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>										<p><b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA. <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. <b>ARTESIAN</b> - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <b>ROCK QUALITY DESIGNATION (RQD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <b>SILL</b> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. <b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <b>STRATA ROCK QUALITY DESIGNATION (SROD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. <b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																								
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ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT	[Symbol]					AUGER BORING					SOUNDING ROD																																																																																																																																																																											
INFERRED SOIL BOUNDARY	[Symbol]					CORE BORING					TEST BORING WITH CORE																																																																																																																																																																											
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TIP PROJECT: BP11.R046

CONTRACT:

See Sheet 1A For Index of Sheets  
See Sheet 1B For Conventional Plan Sheet Symbols



VICINITY MAP (NTS)

DRPS PLANS

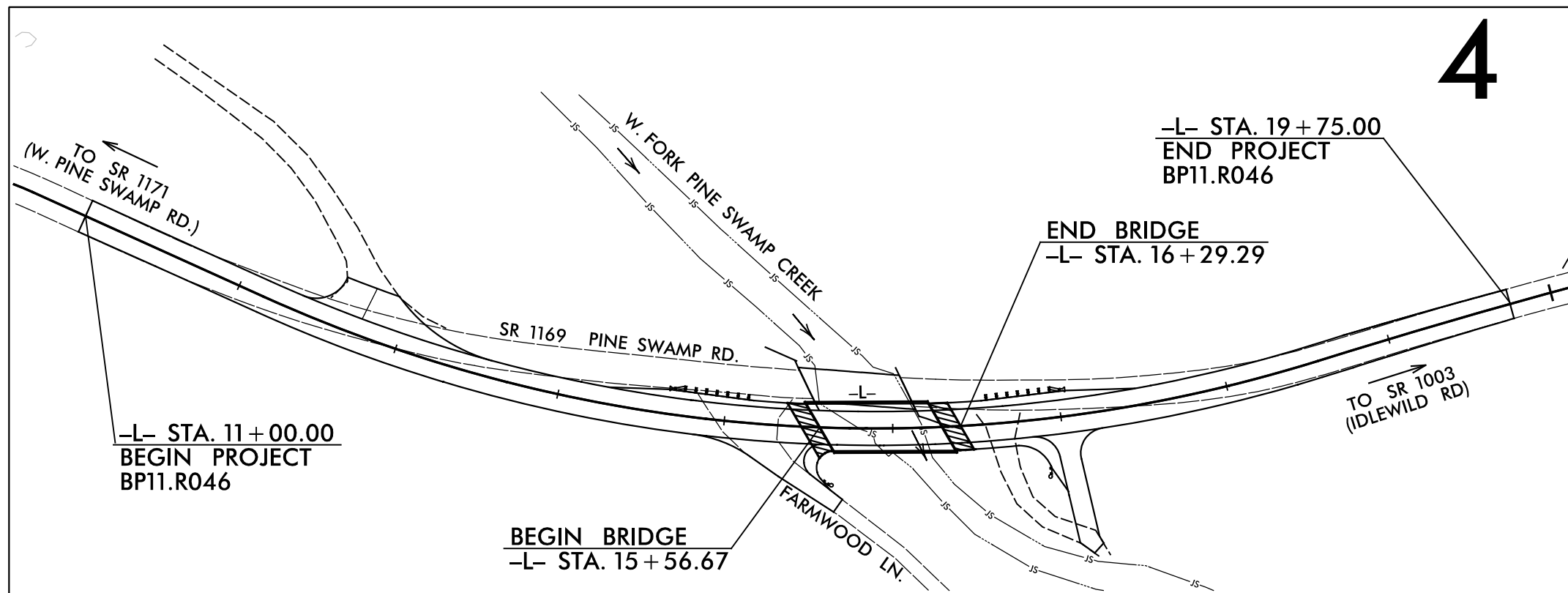
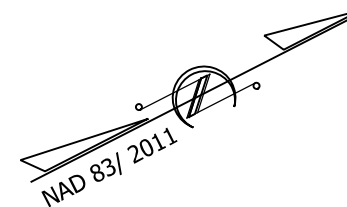
# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

## ASHE COUNTY

LOCATION: *BRIDGE #040156 OVER W. FORK PINE SWAMP  
ON SR 1169 (PINE SWAMP ROAD)*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, AND STRUCTURE*

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP11.R046	3	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
BP11.R046.1	N/A	PE	
BP11.R046.2	N/A	RW & UTIL.	
BP11.R046.3	N/A	CONST.	

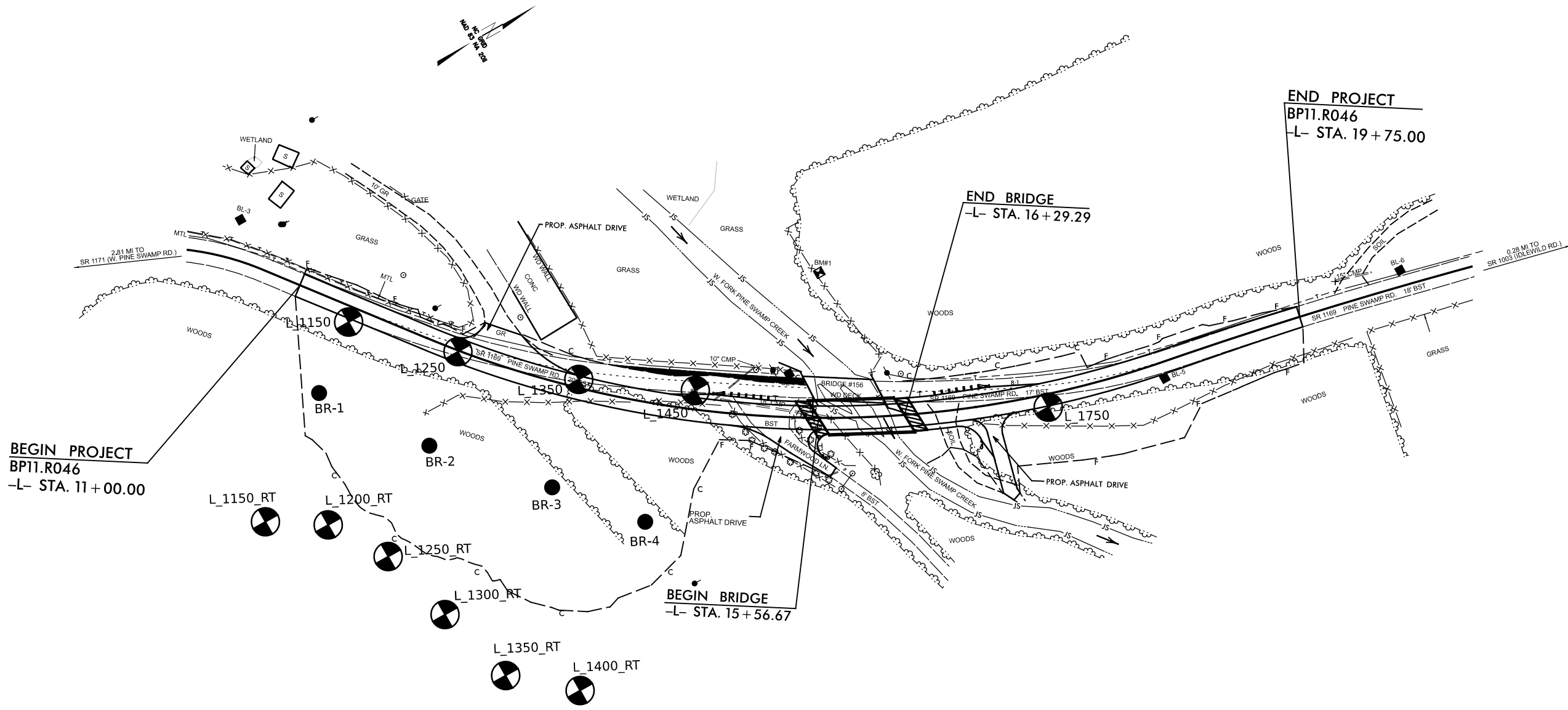


*CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III  
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES*

INCOMPLETE PLANS  
DO NOT USE FOR R/W ACQUISITION  
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

<p><b>GRAPHIC SCALES</b></p> <p>50 25 0 50 100 PLANS</p> <p>50 25 0 50 100 PROFILE (HORIZONTAL)</p> <p>10 5 0 10 20 PROFILE (VERTICAL)</p>	<p><b>DESIGN DATA</b></p> <p>ADT 2025 = 190 ADT 2045 = 230 T = 6 % * V = 50 MPH * TTST = 3% DUAL = 3%</p> <p>FUNC CLASS = LOCAL RURAL SUBREGIONAL TIER</p>	<p style="text-align: center;"><b>PROJECT LENGTH</b></p> <p>LENGTH OF ROADWAY PROJECT BP11.R046 = 0.152 MILES LENGTH OF STRUCTURE PROJECT BP11.R046 = 0.014 MILE TOTAL LENGTH OF PROJECT BP11.R046 = 0.166 MILES</p>	<p>NCDOT CONTACT: ROB N. WEISZ, PE</p> <div style="display: flex; justify-content: space-between;"> <div style="font-size: small;"> <p><b>TGS ENGINEERS</b> 201 W. MARION ST. SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO. C-0275</p> </div> <div style="font-size: small;"> <p>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION II 801 STATESVILLE RD NORTH WILKESBORO, NC 28659</p> </div> </div> <p>2024 STANDARD SPECIFICATIONS</p> <p>RIGHT OF WAY DATE: NOV. 2024</p> <p>LETTING DATE: AUG. 2025</p>	<p>HYDRAULICS ENGINEER</p> <p style="text-align: right;">P.E.</p> <p>SIGNATURE: _____</p> <p>ROADWAY DESIGN ENGINEER</p> <p style="text-align: right;">P.E.</p> <p>SIGNATURE: _____</p>	
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# BRIDGE# 040156 SR 1169 (PINE SWAMP RD.) WEST FORK PINE SWAMP CREEK



**TIP PROJECT: SF-040156**  
 Replace Bridge No. 040156

PROJECT REFERENCE NO.	SHEET NO.
SF-040156	5

**REFERENCE: SF-040156**

**PROJECT: BP11.R046**

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT  
SUBSURFACE INVESTIGATION  
APPENDIX A  
BORING LOGS**



# GEOTECHNICAL BORING REPORT

## BORE LOG

<b>WBS</b> BP11.R046		<b>TIP</b> SF-040156		<b>COUNTY</b> ASHE		<b>GEOLOGIST</b> Stanbury, M.										
<b>SITE DESCRIPTION</b> Replace Bridge 040156 on SR 1169 (Pine Swamp Rd) over W. Fork Pine Swamp Creek							<b>GROUND WTR (ft)</b>									
<b>BORING NO.</b> L_1200_RT		<b>STATION</b> 12+00		<b>OFFSET</b> 178 ft RT		<b>ALIGNMENT</b> -L-										
<b>COLLAR ELEV.</b> 2,994.1 ft		<b>TOTAL DEPTH</b> 31.5 ft		<b>NORTHING</b> 931,111		<b>EASTING</b> 1,275,054										
<b>DRILL RIG/HAMMER EFF./DATE</b> SEL0435 DIEDRICH D-50 91% 09/07/2023			<b>DRILL METHOD</b> H.S. Augers			<b>HAMMER TYPE</b> Automatic										
<b>DRILLER</b> Morgan, M.		<b>START DATE</b> 04/30/24		<b>COMP. DATE</b> 04/30/24		<b>SURFACE WATER DEPTH</b> N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2995														2,994.1	0.0	GROUND SURFACE
2990																RESIDUAL gray and brown, dry to moist, loose to very dense, highly micaceous, saprolitic, silty SAND (A-2-4)
2985																
2980																
2975														2,976.6	17.5	WEATHERED ROCK (Amphibolite)
2970																
2965														2,962.6	31.5	CRYSTALLINE ROCK (Amphibolite) Boring Terminated with Standard Penetration Test Refusal at Elevation 2,962.6 ft on Crystalline Rock (Amphibolite) - Alligator Back Formation  - Auger Refusal at 31.5 feet.  - No drilling behavior noted on the field log. Assume 14 feet of WR based on nearby SPT boring data. Therefore, WR assumed from 17.5 - 31.5 feet.
	2,962.6	31.5	60/0.0												60/0.0	

<b>WBS</b> BP11.R046		<b>TIP</b> SF-040156		<b>COUNTY</b> ASHE		<b>GEOLOGIST</b> Stanbury, M.										
<b>SITE DESCRIPTION</b> Replace Bridge 040156 on SR 1169 (Pine Swamp Rd) over W. Fork Pine Swamp Creek							<b>GROUND WTR (ft)</b>									
<b>BORING NO.</b> L_1250		<b>STATION</b> 12+45		<b>OFFSET</b> 1 ft RT		<b>ALIGNMENT</b> -L-										
<b>COLLAR ELEV.</b> 2,923.2 ft		<b>TOTAL DEPTH</b> 4.4 ft		<b>NORTHING</b> 931,279		<b>EASTING</b> 1,274,980										
<b>DRILL RIG/HAMMER EFF./DATE</b> SEL0435 DIEDRICH D-50 91% 09/07/2023			<b>DRILL METHOD</b> NW Casing w/ Advancer			<b>HAMMER TYPE</b> Automatic										
<b>DRILLER</b> Morgan, M.		<b>START DATE</b> 04/24/24		<b>COMP. DATE</b> 04/24/24		<b>SURFACE WATER DEPTH</b> N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2925														2,923.2	0.0	GROUND SURFACE
2920	2,922.8	0.4	9	6	6							M		2,922.8	0.4	ROADWAY EMBANKMENT Pavement (ASPHALT)
	2,919.7													2,919.7	3.5	brown and black, medium dense, silty SAND (A-2-4) with trace gravel
	2,918.8	4.4	60/0.0											2,918.8	4.4	CRYSTALLINE ROCK (Amphibolite) Boring Terminated with Standard Penetration Test Refusal at Elevation 2,918.8 ft in Crystalline Rock (Amphibolite) - Alligator Back Formation  - Hard Drilling reported at 3.5 feet was interpreted as the top of Crystalline Rock.

NCDOT BORE DOUBLE SF040156 GEO\_RDWY\_BH.GPJ NC\_DOT.GDT 6/7/24

# GEOTECHNICAL BORING REPORT

## BORE LOG

<b>WBS</b> BP11.R046		<b>TIP</b> SF-040156		<b>COUNTY</b> ASHE		<b>GEOLOGIST</b> Stanbury, M.	
<b>SITE DESCRIPTION</b> Replace Bridge 040156 on SR 1169 (Pine Swamp Rd) over W. Fork Pine Swamp Creek							<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> L_1250_RT		<b>STATION</b> 12+50		<b>OFFSET</b> 184 ft RT		<b>ALIGNMENT</b> -L-	
<b>COLLAR ELEV.</b> 2,996.1 ft		<b>TOTAL DEPTH</b> 32.8 ft		<b>NORTHING</b> 931,142		<b>EASTING</b> 1,275,102	
<b>DRILL RIG/HAMMER EFF./DATE</b> SEL0435 DIEDRICH D-50 91% 09/07/2023				<b>DRILL METHOD</b> H.S. Augers		<b>HAMMER TYPE</b> Automatic	
<b>DRILLER</b> Morgan, M.		<b>START DATE</b> 04/29/24		<b>COMP. DATE</b> 04/29/24		<b>SURFACE WATER DEPTH</b> N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
3000																
2995	2,996.1	0.0	2	2	2								D	GROUND SURFACE	0.0	
	2,993.0	3.1	5	5	6								SS-30 16%	RESIDUAL brown, soft, highly micaceous, sandy SILT (A-4) with trace gravel	2.0	
2990	2,988.0	8.1	15	35	65/0.4									red, gray, and brown, medium dense, highly micaceous, saprolitic, silty SAND (A-2-4) with little clay	8.6	
2985	2,983.0	13.1	10	9	7								D	WEATHERED ROCK (Amphibolite) RESIDUAL gray and brown, medium dense, highly micaceous, saprolitic, silty SAND (A-2-4)	10.0	
2980	2,978.0	18.1	20	80/0.3										WEATHERED ROCK (Amphibolite)	18.1	
2975	2,973.0	23.1	100/0.2												100/0.8	
2970	2,968.0	28.1	27	21	71/0.4										100/0.2	
2965	2,963.4	32.7	60/0.1												100/0.9	
															60/0.1	
															2,963.4 2,963.3	
															CRYSTALLINE ROCK (Amphibolite) Boring Terminated with Standard Penetration Test Refusal at Elevation 2,963.3 ft in Crystalline Rock (Amphibolite) - Alligator Back Formation - Auger Refusal at 32.7 feet.	32.7 32.8

<b>WBS</b> BP11.R046		<b>TIP</b> SF-040156		<b>COUNTY</b> ASHE		<b>GEOLOGIST</b> Stanbury, M.	
<b>SITE DESCRIPTION</b> Replace Bridge 040156 on SR 1169 (Pine Swamp Rd) over W. Fork Pine Swamp Creek							<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> L_1300_RT		<b>STATION</b> 13+00		<b>OFFSET</b> 215 ft RT		<b>ALIGNMENT</b> -L-	
<b>COLLAR ELEV.</b> 3,002.6 ft		<b>TOTAL DEPTH</b> 27.6 ft		<b>NORTHING</b> 931,160		<b>EASTING</b> 1,275,169	
<b>DRILL RIG/HAMMER EFF./DATE</b> SEL0435 DIEDRICH D-50 91% 09/07/2023				<b>DRILL METHOD</b> H.S. Augers		<b>HAMMER TYPE</b> Automatic	
<b>DRILLER</b> Morgan, M.		<b>START DATE</b> 04/30/24		<b>COMP. DATE</b> 04/30/24		<b>SURFACE WATER DEPTH</b> N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
3005															
3000															3,002.6
2995															GROUND SURFACE
2990															RESIDUAL gray and brown, dry to moist, loose to very dense, highly micaceous, saprolitic, silty SAND (A-2-4)
2985															WEATHERED ROCK (Amphibolite)
2980															2,985.0
2975	2,975.0	27.6	60/0.0												2,975.0
															Boring Terminated with Standard Penetration Test Refusal at Elevation 2,975.0 ft on Crystalline Rock (Amphibolite) - Alligator Back Formation - Auger Refusal at 27.6 feet.  - No drilling behavior noted on the field log. Assume 10 feet of WR based on nearby SPT boring data. Therefore, WR assumed from 17.6 - 27.6 feet.

NCDOT BORE DOUBLE\_SF040156\_GEO\_RDWY\_BH.GPJ\_NC\_DOT.GDT 6/7/24

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS BP11.R046		TIP SF-040156		COUNTY ASHE		GEOLOGIST Stanbury, M.										
SITE DESCRIPTION Replace Bridge 040156 on SR 1169 (Pine Swamp Rd) over W. Fork Pine Swamp Creek							GROUND WTR (ft)									
BORING NO. L_1350		STATION 13+50		OFFSET 7 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 2,917.3 ft		TOTAL DEPTH 14.6 ft		NORTHING 931,356		EASTING 1,275,051										
DRILL RIG/HAMMER EFF./DATE SEL0435 DIEDRICH D-50 91% 09/07/2023			DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic											
DRILLER Morgan, M.		START DATE 04/24/24		COMP. DATE 04/24/24		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2920																
	2,917.0	0.3													2,917.3	0.0
			9	7	7										2,915.5	1.8
2915	2,912.7	4.6	44	20	25											
2910	2,907.7	9.6	13	27	56											
2905	2,902.7	14.6	60/0.0												2,902.7	14.6

WBS BP11.R046		TIP SF-040156		COUNTY ASHE		GEOLOGIST Stanbury, M.										
SITE DESCRIPTION Replace Bridge 040156 on SR 1169 (Pine Swamp Rd) over W. Fork Pine Swamp Creek							GROUND WTR (ft)									
BORING NO. L_1350_RT		STATION 13+50		OFFSET 251 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 3,012.5 ft		TOTAL DEPTH 20.6 ft		NORTHING 931,179		EASTING 1,275,239										
DRILL RIG/HAMMER EFF./DATE SEL0435 DIEDRICH D-50 91% 09/07/2023			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Morgan, M.		START DATE 04/30/24		COMP. DATE 04/30/24		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
3015																
	3,012.5	0.0													3,012.5	0.0
			2	3	3											
3010	3,009.5	3.0	7	7	6											
3005	3,004.5	8.0	13	13	40											
3000	2,999.5	13.0	100/0.3													
2995	2,994.5	18.0	100/0.2													
	2,991.9	20.6	60/0.0												2,991.9	20.6

NCDOT BORE DOUBLE\_SF040156\_GEO\_RDWY\_BH.GPJ\_NC\_DOT.GDT\_6/7/24

# GEOTECHNICAL BORING REPORT

## BORE LOG

<b>WBS</b> BP11.R046		<b>TIP</b> SF-040156		<b>COUNTY</b> ASHE		<b>GEOLOGIST</b> Stanbury, M.										
<b>SITE DESCRIPTION</b> Replace Bridge 040156 on SR 1169 (Pine Swamp Rd) over W. Fork Pine Swamp Creek							<b>GROUND WTR (ft)</b>									
<b>BORING NO.</b> L_1400_RT		<b>STATION</b> 14+00		<b>OFFSET</b> 250 ft RT		<b>ALIGNMENT</b> -L-										
<b>COLLAR ELEV.</b> 3,013.4 ft		<b>TOTAL DEPTH</b> 22.7 ft		<b>NORTHING</b> 931,228		<b>EASTING</b> 1,275,281										
<b>DRILL RIG/HAMMER EFF./DATE</b> SEL0435 DIEDRICH D-50 91% 09/07/2023			<b>DRILL METHOD</b> H.S. Augers		<b>HAMMER TYPE</b> Automatic											
<b>DRILLER</b> Morgan, M.		<b>START DATE</b> 04/30/24		<b>COMP. DATE</b> 04/30/24		<b>SURFACE WATER DEPTH</b> N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
3015														3,013.4	GROUND SURFACE	0.0
3010															<b>RESIDUAL</b> gray and brown, dry to moist, loose to very dense, highly micaceous, saprolitic, silty SAND (A-2-4)	
3005																
3000																
2995														2,998.7	<b>WEATHERED ROCK</b> (Amphibolite)	14.7
														2,990.7	<b>CRYSTALLINE ROCK</b> (Amphibolite) Boring Terminated with Standard Penetration Test Refusal at Elevation 2,990.7 ft on Crystalline Rock (Amphibolite) - Alligator Back Formation  - Auger Refusal at 22.7 feet.  - No drilling behavior noted on the field log. Assume 8 feet of WR based on nearby SPT boring data. Therefore, WR assumed from 14.7 - 22.7 feet.	22.7
	2,990.7	22.7												60/0.0		60/0.0

<b>WBS</b> BP11.R046		<b>TIP</b> SF-040156		<b>COUNTY</b> ASHE		<b>GEOLOGIST</b> Stanbury, M.										
<b>SITE DESCRIPTION</b> Replace Bridge 040156 on SR 1169 (Pine Swamp Rd) over W. Fork Pine Swamp Creek							<b>GROUND WTR (ft)</b>									
<b>BORING NO.</b> L_1450		<b>STATION</b> 14+50		<b>OFFSET</b> 16 ft LT		<b>ALIGNMENT</b> -L-										
<b>COLLAR ELEV.</b> 2,913.6 ft		<b>TOTAL DEPTH</b> 11.2 ft		<b>NORTHING</b> 931,438		<b>EASTING</b> 1,275,108										
<b>DRILL RIG/HAMMER EFF./DATE</b> SEL0435 DIEDRICH D-50 91% 09/07/2023			<b>DRILL METHOD</b> NW Casing w/ Advancer		<b>HAMMER TYPE</b> Automatic											
<b>DRILLER</b> Morgan, M.		<b>START DATE</b> 04/24/24		<b>COMP. DATE</b> 04/24/24		<b>SURFACE WATER DEPTH</b> N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2915														2,913.6	GROUND SURFACE	0.0
	2,913.0	0.6												2,913.0	<b>ROADWAY EMBANKMENT</b> Pavement (ASPHALT)	0.6
2910			13	12	14									2,909.6	brown and gray, medium dense, silty SAND (A-2-4) with some gravel	4.0
	2,909.1	4.5													<b>ALLUVIAL</b> brown and black, medium dense, silty SAND (A-2-4) with trace gravel and organics	
2905			2	3	9									2,903.6		10.0
	2,904.1	9.5												2,902.6	<b>WEATHERED ROCK</b> (Amphibolite)	11.0
	2,902.4	11.2												2,902.4	<b>CRYSTALLINE ROCK</b> (Amphibolite) Boring Terminated with Standard Penetration Test Refusal at Elevation 2,902.4 ft in Crystalline Rock (Amphibolite) - Alligator Back Formation  - Casing Advancer Refusal at 11.2 feet.  - Hard Drilling reported at 11.0 feet interpreted as the top of Crystalline Rock.	11.2
														100/0.7		60/0.0

NCDOT BORE DOUBLE\_SF040156\_GEO\_RDWY\_BH.GPJ\_NC\_DOT.GDT\_6/7/24

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS BP11.R046		TIP SF-040156		COUNTY ASHE		GEOLOGIST Stanbury, M.										
SITE DESCRIPTION Replace Bridge 040156 on SR 1169 (Pine Swamp Rd) over W. Fork Pine Swamp Creek							GROUND WTR (ft)									
BORING NO. L_1750		STATION 17+50		OFFSET 11 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 2,921.0 ft		TOTAL DEPTH 13.6 ft		NORTHING 931,691		EASTING 1,275,267										
DRILL RIG/HAMMER EFF./DATE SEL0435 DIEDRICH D-50 91% 09/07/2023			DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic											
DRILLER Morgan, M.		START DATE 04/23/24		COMP. DATE 04/23/24		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2925																
2920	2,921.0	0.0	4	5	6									2,921.0	GROUND SURFACE	0.0
	2,919.5													2,919.5	ROADWAY EMBANKMENT brown, stiff, sandy SILT (A-4) with some clay and trace gravel	1.5
2915	2,917.4	3.6	13	13	11										RESIDUAL gray and brown, medium dense to very dense, highly micaceous, saprolitic, silty SAND (A-2-4)	
	2,912.4	8.6												2,911.9	WEATHERED ROCK (Amphibolite)	9.1
2910	2,907.4	13.6	28	63	37/0.2									2,907.4	CRYSTALLINE ROCK (Amphibolite) Boring Terminated with Standard Penetration Test Refusal at Elevation 2,907.4 ft on Crystalline Rock (Amphibolite) - Alligator Back Formation	13.6

WBS BP11.R046		TIP SF-040156		COUNTY ASHE		GEOLOGIST Smith, B.										
SITE DESCRIPTION Replace Bridge 040156 on SR 1169 (Pine Swamp Rd) over W. Fork Pine Swamp Creek							GROUND WTR (ft)									
BORING NO. BR-1		STATION 11+50		OFFSET 78 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 2,966.2 ft		TOTAL DEPTH 7.0 ft		NORTHING 931,160		EASTING 1,274,953										
DRILL RIG/HAMMER EFF./DATE N/A			DRILL METHOD Rod Sounding		HAMMER TYPE Manual											
DRILLER Smith, B.		START DATE 04/30/24		COMP. DATE 04/30/24		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2970																
2965														2,966.2	GROUND SURFACE	0.0
2960														2,959.2	Boring Terminated at Elevation 2,959.2 ft by Rod Sounding Refusal	7.0

NCDOT BORE DOUBLE\_SF040156\_GEO\_RDWY\_BH.GPJ\_NC\_DOT.GDT 6/7/24



# GEOTECHNICAL BORING REPORT

## BORE LOG

<b>WBS</b> BP11.R046		<b>TIP</b> SF-040156		<b>COUNTY</b> ASHE		<b>GEOLOGIST</b> Smith, B.								
<b>SITE DESCRIPTION</b> Replace Bridge 040156 on SR 1169 (Pine Swamp Rd) over W. Fork Pine Swamp Creek							<b>GROUND WTR (ft)</b>							
<b>BORING NO.</b> BR-4		<b>STATION</b> 14+25		<b>OFFSET</b> 100 ft RT		<b>ALIGNMENT</b> -L-								
<b>COLLAR ELEV.</b> 2,960.2 ft		<b>TOTAL DEPTH</b> 5.0 ft		<b>NORTHING</b> 931,346		<b>EASTING</b> 1,275,184								
<b>DRILL RIG/HAMMER EFF./DATE</b> N/A				<b>DRILL METHOD</b> Rod Sounding		<b>HAMMER TYPE</b> Manual								
<b>DRILLER</b> Smith, B.		<b>START DATE</b> 04/30/24		<b>COMP. DATE</b> 04/30/24		<b>SURFACE WATER DEPTH</b> N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G MOI	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2965														
2960														2,960.2 GROUND SURFACE 0.0
														2,955.2 5.0
														Boring Terminated at Elevation 2,955.2 ft by Rod Sounding Refusal

NCDOT BORE DOUBLE SF040156\_GEO\_RDWY\_BH.GPJ NC\_DOT.GDT 6/7/24

PROJECT REFERENCE NO.	SHEET NO.
SF-040156	14

**REFERENCE: SF-040156**

**PROJECT: BP11.R046**

*NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT  
SUBSURFACE INVESTIGATION  
APPENDIX B  
LABORATORY RESULTS*

### Laboratory Testing Summary

**Project Number:** BP11.R046  
**TIP Number:** SF-040156  
**County:** Ashe  
**Description:** Replace Bridge 040156 on SR 1169 (Pine Swamp Rd) over W. Fork Pine Swamp Creek

Boring No.	Sample No.	Station	Offset (feet)	Depth Interval (feet)	Lab ID	AASHTO Class.	L.L.	P.I.	% by Weight				% Retained #4 Sieve	% Passing (sieves)			% Moisture	% Organic
									Coarse Sand	Fine Sand	Silt	Clay		#10	#40	#200		
L_1150	SS-19	11+50	13'RT	0.0-1.3	24-1075	A-2-4 (0)	NP	NP	21.5	55.9	10.3	12.3	4.9	93	83	28.9	15.8%	
L_1150_RT	SS-25	11+50	196'RT	4.3-5.8	24-1076	A-2-4 (0)	NP	NP	14.8	67.9	5.0	12.3	1.0	98.4	96.1	24	17.3%	
L_1250_RT	SS-30	12+50	184'RT	3.1-4.6	24-1077	A-2-4 (0)	NP	NP	28.4	51.8	7.5	12.3	0.9	98	88.1	25.8	15.6%	
L_1350	SS-15	13+50	7'LT	0.3-1.8	24-1078	A-2-4 (0)	NP	NP	19.3	55.8	12.6	12.3	10.5	84.7	76.2	28.7	16.7%	
L_1350RT	SS-36	13+50	251'RT	0.0-1.5	24-1080	A-4 (0)	NP	NP	12.5	49.0	14.4	24.1	11.4	86.9	83	39	16.7%	
L_1750	SS-4	17+50	11'RT	0.0-1.5	24-1081	A-4 (0)	NP	NP	19.2	44.5	16.3	20.0	11.3	85	77.4	37.8	15.1%	

*Chad Hawkins*

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Certified Lab Technician Signature

147-02-0821

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Certification Number