

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 14SP.20441.1 F.A. PROJ. N/A
COUNTY Haywood
PROJECT DESCRIPTION Bridge No. 175 on SR 1332 (Waterville Road)
over Big Creek

CONTENTS

<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2, 2A	LEGEND
3	SITE PLAN
4	BORING LOCATION PLAN
5	PROFILE SHEET
6-15	BORE LOG AND CORE REPORTS
16-21	ROCK CORE PHOTOS
22-23	BORE LOG REPORTS - RET WALL

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CAUTION NOTICE

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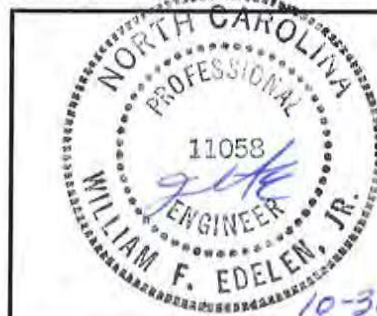
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THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR 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 MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS 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.

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DRAWN BY: M. Brewer, E.I. / W. Edelen, P.E.







**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

SOIL DESCRIPTION										GRADATION									
SOIL IS CONSIDERED TO BE THE 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 STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLES: <i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HEAVY PLASTIC, A-7-6</i>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.									
SOIL LEGEND AND AASHTO CLASSIFICATION										MINERALOGICAL COMPOSITION									
GENERAL CLASS. GRANULAR MATERIALS (≤ 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS										MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.									
GROUP CLASS. A-1, A-3, A-2, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7										COMPRESSIBILITY									
SYMBOL										SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50									
% PASSING #10, #40, #200										PERCENTAGE OF MATERIAL									
LIQUID LIMIT, PLASTIC INDEX, GROUP INDEX										ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL									
USUAL TYPES OF MAJOR MATERIALS										TRACE OF ORGANIC MATTER 2-3% 3-5% TRACE 1-10% LITTLE ORGANIC MATTER 3-5% 5-12% LITTLE 10-20% MODERATELY ORGANIC 5-10% 12-20% SOME 20-35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE									
GEN. RATING AS A SUBGRADE										GROUND WATER									
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30										▽ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING ▽ 24 STATIC WATER LEVEL AFTER 24 HOURS ▽ PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA ○ SPRING OR SEEP									
CONSISTENCY OR DENSENESS										MISCELLANEOUS SYMBOLS									
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SPT DPT DMT TEST BORING SOIL SYMBOL AUGER BORING TEST BORING W/ CORE ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT CORE BORING SPT N-VALUE INFERRED SOIL BOUNDARY MONITORING WELL SPT REFUSAL INFERRED ROCK LINE PIEZOMETER INSTALLATION ALLUVIAL SOIL BOUNDARY SLOPE INDICATOR INSTALLATION DIP & DIP DIRECTION OF ROCK STRUCTURES CONE PENETROMETER TEST SOUNDING ROD									
TEXTURE OR GRAIN SIZE										ABBREVIATIONS									
U.S. STD. SIEVE SIZE OPENING (MM) 4, 10, 40, 60, 200, 270, 4.75, 2.00, 0.42, 0.25, 0.075, 0.053										AR - AUGER REFUSAL FRAGS. - FRAGMENTS BT - BORING TERMINATED HL - HIGHLY CL - CLAY MED. - MEDIUM CPT - CONE PENETRATION TEST MICA - MICACEOUS CSE - COARSE MOD. - MODERATELY CT - CORING TERMINATED NP - NON PLASTIC DMT - DILATOMETER TEST ORG. - ORGANIC DPT - DYNAMIC PENETRATION TEST PMT - PRESSUREMETER TEST e - VOID RATIO SAP - SAPROLITIC EMBANK. - EMBANKMENT SOY - SANDY F - FINE SL - SILT, SILTY FOSS. - FOSSILIFEROUS SLL - SLIGHTLY FRAC. - FRACTURED, FRACTURES TCR - TRICONE REFUSAL									
BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CSE, SD.), FINE SAND (F SD.), SILT (SL.), CLAY (CL.)										w - MOISTURE CONTENT v - VERY WEA. - WEATHERED Z - UNIT WEIGHT γ _d - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO									
SOIL MOISTURE - CORRELATION OF TERMS										EQUIPMENT USED ON SUBJECT PROJECT									
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:									
LL LIQUID LIMIT - SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE										<input type="checkbox"/> MOBILE B- <input type="checkbox"/> CLAY BITS									
PL PLASTIC LIMIT - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE										<input type="checkbox"/> BK-51 <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER									
OM OPTIMUM MOISTURE - MOIST - (M) SOLID AT OR NEAR OPTIMUM MOISTURE										<input type="checkbox"/> CME-45C <input type="checkbox"/> HARD FACED FINGER BITS									
SL SHRINKAGE LIMIT - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE										<input checked="" type="checkbox"/> CME-75 <input type="checkbox"/> TUNG-CARBIDE INSERTS									
PLASTICITY										<input type="checkbox"/> PORTABLE HOIST <input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER									
NONPLASTIC 0-5 VERY LOW LOW PLASTICITY 5-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH										<input type="checkbox"/> TRICONE _____ STEEL TEETH <input type="checkbox"/> TRICONE _____ TUNG-CARB. <input checked="" type="checkbox"/> CORE BIT									
COLOR										CORE SIZE: <input type="checkbox"/> -B <input checked="" type="checkbox"/> -H Q2 <input type="checkbox"/> -H									
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY), MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.										HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST									

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ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, 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 8.1 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:

WEATHERED ROCK (WR)		NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)		FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)		FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CPS)		COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SL)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SL)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED WOULD YIELD SPT REFUSAL.</i>
SEVERE (SEV)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED YIELDS SPT N VALUES > 100 BPF.</i>
VERY SEVERE (V SEV)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED YIELDS SPT N VALUES < 100 BPF.</i>
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. COUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR COUGED 0.85 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROOVED OR COUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FEET
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.000 - 0.03 FEET
THINLY LAMINATED	< 0.000 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
AQUIFER - A WATER BEARING FORMATION OR STRATA.
ARGILLACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.
ARTESIAN - 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.
CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOCCED FROM PARENT MATERIAL.
FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
ROCK QUALITY DESIGNATION (RQD) - 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.
SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
SILL - 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.
SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - 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 8.1 FOOT PER 60 BLOWS.
STRATA CORE RECOVERY (SRC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
STRATA ROCK QUALITY DESIGNATION (SRQD) - 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.
TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

NOTES:

BENCH MARK: Survey information provided by Vaughn & Melton, Inc.
 BMI, N76R4, E783854 - RR Spike in root of 50' sycamore
 ELEVATION: 1438.86 FT.




SITE

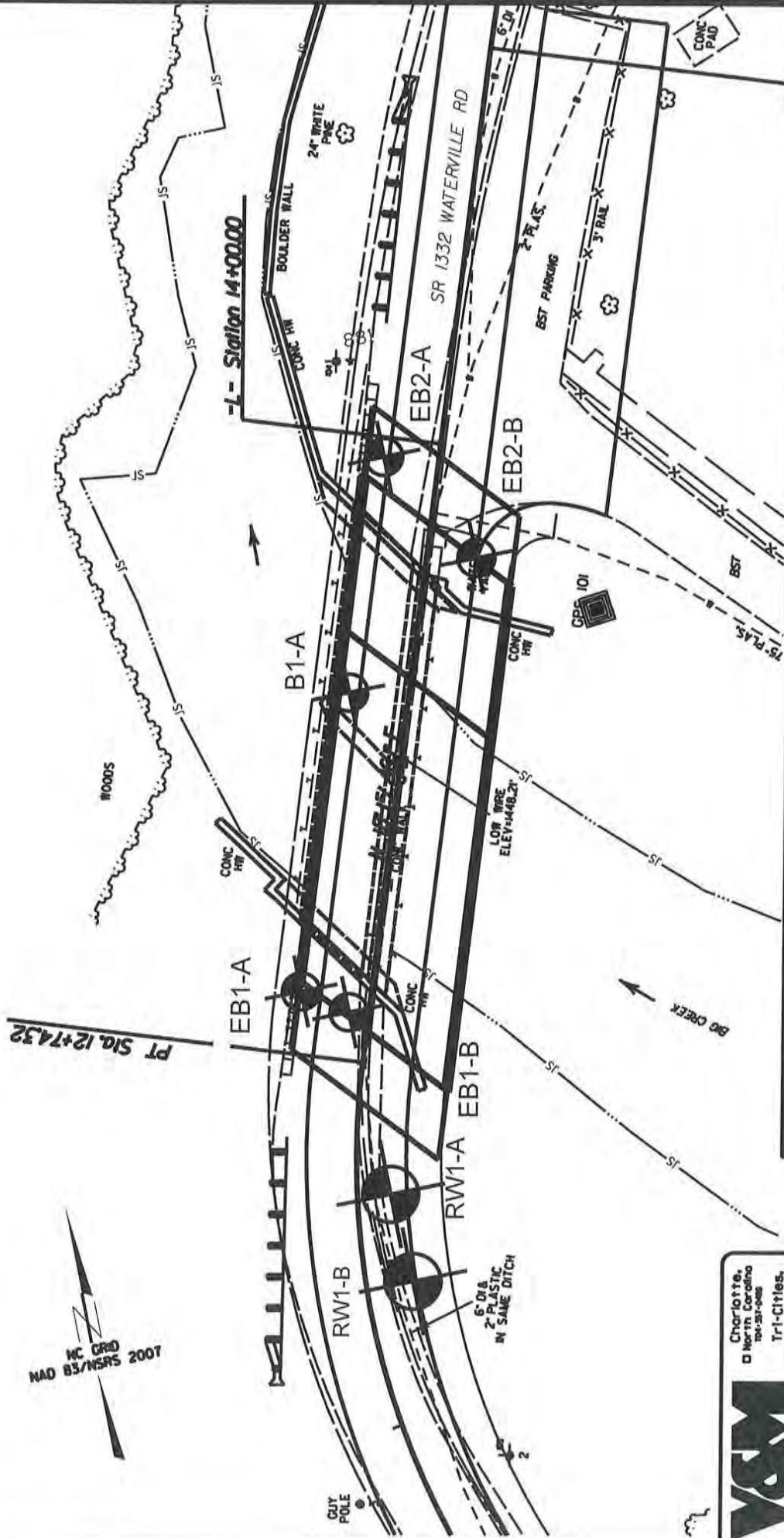
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SITE LOCATION PLAN
 Bridge No. 175 on SR 1332
 (Waterville Road) over Big Creek

Scale: N.T.S. DR: DMB CH: MJW REV:

Prepared For:
 NCDOT WBS No.: 14SP.20441.1

 Froehling & Robertson, Inc.
 2505 Hutchison-McDonald Road
 Charlotte, North Carolina



TEST SITE PLAN
 PROJECT REFERENCE NO.: 14SP.20441.1 F&R PROJECT NO.: 63R-3026-0175
 I.D. NO.: N/A F.A. PROJECT NO.: N/A COUNTY: HAYWOOD
 PROJECT DESCRIPTION: Bridge No. 175 on SR 1332 (Waterville Road) over Big Creek
 SITE DESCRIPTION: Bridge No. 175 on SR 1332 (Waterville Road) over Big Creek
 DRAWN BY: M. Brewer, E.I. CHECKED BY: M. Walko, P.E.
 DATE: Dec 2013/REV: Oct 2016 SCALE: 1"=30'

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PROJECT REFERENCE NO. MSP 201411

ENGINEER: [Signature]

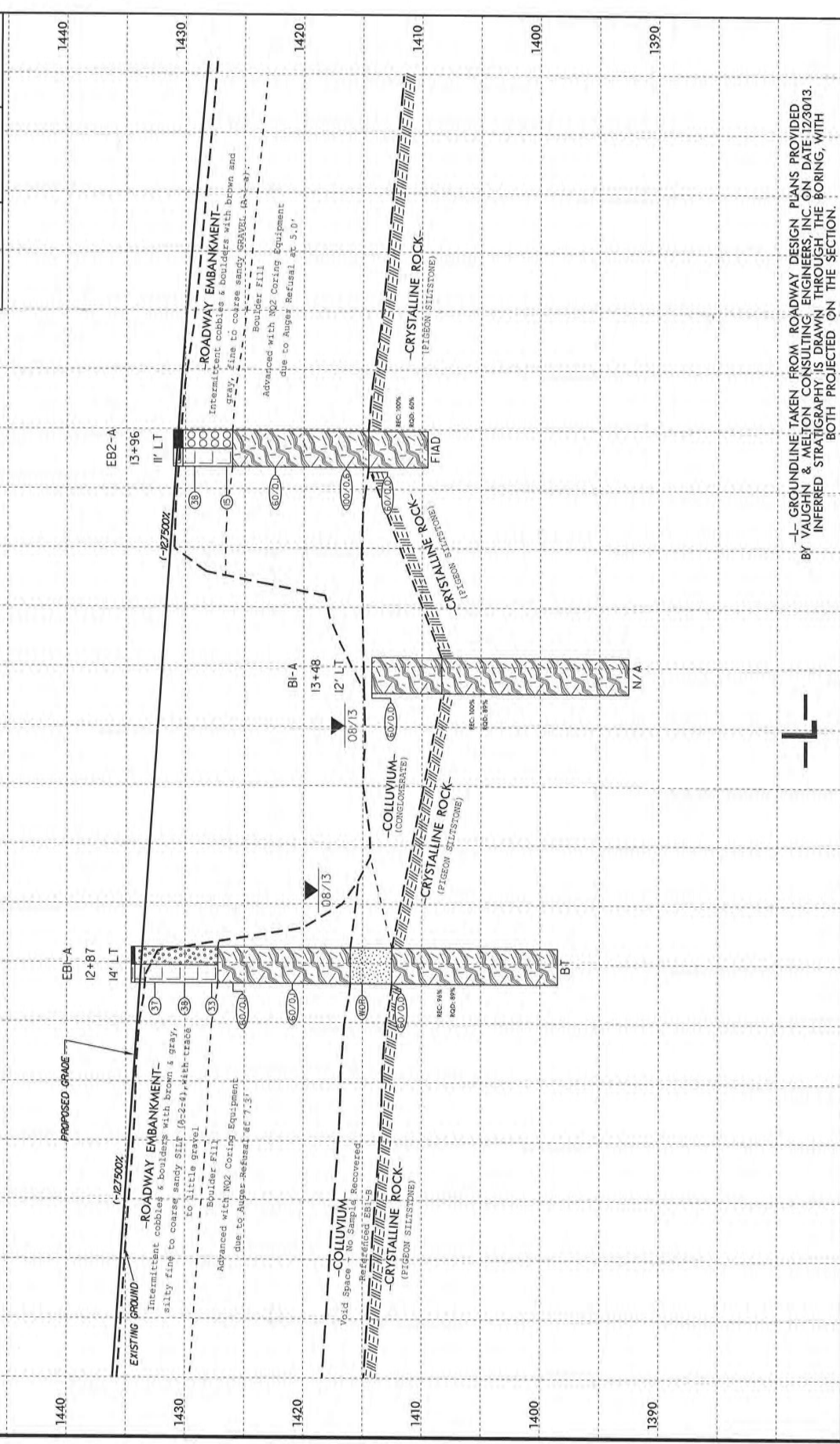
PROJECT REFERENCE NO. MSP 201411

ENGINEER: [Signature]

INCOMPLETE PLANS
DO NOT USE FOR CONSTRUCTION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SINCE 1881



— GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MATTON CONSULTING ENGINEERS, INC. ON DATE 12/30/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.



NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS 14SP.20441.1	TIP N/A	COUNTY HAYWOOD	GEOLOGIST M. Brewer
SITE DESCRIPTION Bridge No. 175 on SR 1332 (Waterville Road) over Big Creek			GROUND WTR (ft)
BORING NO. EB1-A	STATION 12+87	OFFSET 14 ft LT	ALIGNMENT -L-
COLLAR ELEV. 1,434.6 ft	TOTAL DEPTH 36.0 ft	NORTHING 761,319	EASTING 783,773
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 86% 10/5/2012		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic
DRILLER J. Fowler	START DATE 08/26/13	COMP. DATE 08/28/13	SURFACE WATER DEPTH N/A
CORE SIZE NQ2	TOTAL RUN 14.0 ft		

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	ROD (ft) %		REC. (ft) %	ROD (ft) %			
1412.6	1,412.6	22.0	5.0	N=60/0.0 5:11/1.0 4:17/1.0 4:37/1.0 4:58/1.0 3:49/1.0	(5.0) 100%	(4.6) 92%		(13.4) 96%	(12.4) 89%	[Log Pattern]	1,412.6	22.0
											Begin Coring @ 22.0 ft CRYSTALLINE ROCK Slightly weathered to fresh, dark gray, hard to very hard, (PIGEON SILTSTONE), with close fracture spacing.	
1405	1,407.6	27.0	5.0	4:37/1.0 4:33/1.0 4:55/1.0 5:30/1.0 5:42/1.0	(5.0) 100%	(4.9) 98%						
1400	1,402.6	32.0	4.0	3:21/1.0 3:26/1.0 4:01/1.0 4:00/1.0	(3.4) 85%	(2.9) 73%						
	1,398.6	36.0									Boring Terminated at Elevation 1,398.6 ft IN CRYSTALLINE ROCK (PIGEON SILTSTONE) 1) Driller indicated auger refusal at 7.3' on Boulder fill.	36.0

NCDOT CORE SINGLE 63R-3026-0175 DIV. 14 BRIDGE 175.GPJ NC_DOT_GDT_6/22/16



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 14SP.20441.1		TIP N/A		COUNTY HAYWOOD		GEOLOGIST M. Brewer							
SITE DESCRIPTION Bridge No. 175 on SR 1332 (Waterville Road) over Big Creek							GROUND WTR (ft)						
BORING NO. EB1-B		STATION 12+84		OFFSET 4 ft LT		ALIGNMENT -L-							
COLLAR ELEV. 1,434.5 ft		TOTAL DEPTH 32.0 ft		NORTHING 761,313		EASTING 783,781							
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 86% 10/5/2012				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic							
DRILLER J. Fowler		START DATE 08/28/13		COMP. DATE 08/30/13		SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75				100
1435													1,434.5 GROUND SURFACE 0.0
	1,433.7	0.8	22	22	19								1,434.1 Asphalt (0.4') 0.4
1430	1,431.0	3.5	14	9	6								ROADWAY EMBANKMENT Intermittent cobbles & boulders with brown, silty fine to coarse SAND (A-2-4), with trace to little gravel & trace clay.
1425	1,426.0	8.5	3	2	3								1,426.5 Intermittent cobbles & boulders with brown-tan, fine sandy SILT (A-4), with trace gravel. 8.0
1420													1,421.6 Boulder Fill 12.9
	1,416.6	17.9	4	1	2								Advanced with NQ2 coring equipment. 17.5
1415	1,412.5	22.0	60/0.0										1,412.5 COLLUVIAL Gray, fine to coarse sandy SILT (A-4), with trace gravel & roots. 22.0
1410													CRYSTALLINE ROCK Dark gray, (PIGEON SILTSTONE)
1405													1,402.5 Boring Terminated at Elevation 1,402.5 ft IN CRYSTALLINE ROCK (PIGEON SILTSTONE) 32.0
													1) Driller indicated auger refusal at 12.9' on Boulder fill.



NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS 14SP.20441.1		TIP N/A		COUNTY HAYWOOD		GEOLOGIST M. Brewer					
SITE DESCRIPTION Bridge No. 175 on SR 1332 (Waterville Road) over Big Creek							GROUND WTR (ft)				
BORING NO. EB1-B		STATION 12+84		OFFSET 4 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 1,434.5 ft		TOTAL DEPTH 32.0 ft		NORTHING 761,313		EASTING 783,781					
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 86% 10/5/2012		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic		0 HR. 15.8					
DRILLER J. Fowler		START DATE 08/28/13		COMP. DATE 08/30/13		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 10.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)	REC. (%)	RQD (%)			
1412.5	1,412.5	22.0	5.0	N=60/0.0 5:18/1.0 5:15/1.0 4:00/1.0 4:13/1.0 4:36/1.0	(5.0) 100%	(4.6) 92%	(9.9) 99%	(9.4) 94%	[Pattern]	Begin Coring @ 22.0 ft CRYSTALLINE ROCK Slightly weathered to fresh, hard to very hard, dark gray (PIGEON SILTSTONE), with close fracture spacing.	22.0
1410	1,407.5	27.0	5.0	5:09/1.0 5:10/1.0 5:21/1.0 3:30/1.0 4:03/1.0	(4.9) 98%	(4.8) 96%			[Pattern]		
1405	1,402.5	32.0							[Pattern]	Boring Terminated at Elevation 1,402.5 ft IN CRYSTALLINE ROCK (PIGEON SILTSTONE) 1) Driller indicated auger refusal at 12.9' on Boulder fill.	32.0

NCDOT CORE SINGLE 63R-3026-0175 DIV. 14 BRIDGE 175.GPJ NC_DOT.GDT 6/22/16



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 14SP.20441.1	TIP N/A	COUNTY HAYWOOD	GEOLOGIST M. Brewer
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SITE DESCRIPTION Bridge No. 175 on SR 1332 (Waterville Road) over Big Creek **GROUND WTR (ft)**

BORING NO. B1-A	STATION 13+48	OFFSET 12 ft LT	ALIGNMENT -L-	0 HR.	N/A
COLLAR ELEV. 1,414.3 ft	TOTAL DEPTH 21.7 ft	NORTHING 761,377	EASTING 783,794	24 HR.	N/A

DRILL RIG/HAMMER EFF. DATE F&R4637 CME-75 86% 10/5/2012 **DRILL METHOD** NW Casing W/SPT & Core **HAMMER TYPE** Automatic

DRILLER J. Fowler **START DATE** 09/30/13 **COMP. DATE** 10/01/13 **SURFACE WATER DEPTH** 2.3ft

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				
1415	1,414.3	0.0										WATER SURFACE (09/30/13)	
												GROUND SURFACE	0.0
1410			60	0	0							COLLUVIAL Intermittent Cobbles & Boulders.	
1405												CRYSTALLINE ROCK Dark gray, (PIGEON SILTSTONE).	5.9
1400													
1395													
													1,392.6
												Boring Terminated at Elevation 1,392.6 ft IN CRYSTALLINE ROCK (PIGEON SILTSTONE)	
												Began Coring at 0.7' after seating Casing in Colluvial Boulders	

NCDOT BORE SINGLE 63R-3025-0175 DIV. 14 BRIDGE 175.GPJ NC_DOT_GDT 6/22/16



NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS 14SP.20441.1		TIP N/A		COUNTY HAYWOOD		GEOLOGIST M. Brewer					
SITE DESCRIPTION Bridge No. 175 on SR 1332 (Waterville Road) over Big Creek							GROUND WTR (ft)				
BORING NO. B1-A		STATION 13+48		OFFSET 12 ft LT		ALIGNMENT -L-	0 HR. N/A				
COLLAR ELEV. 1,414.3 ft		TOTAL DEPTH 21.7 ft		NORTHING 761,377		EASTING 783,794	24 HR. N/A				
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 86% 10/5/2012				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic					
DRILLER J. Fowler		START DATE 09/30/13		COMP. DATE 10/01/13		SURFACE WATER DEPTH 2.3ft					
CORE SIZE NQ2		TOTAL RUN 21.7 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	ROD (%)	REC. (%)	ROD (%)			
1414.3										Ground Surface	
	1,414.3	0.0	4.7	N=60/0.0 NA/0.7 15:47/1.0 3:38/1.0 6:20/1.0 8:16/1.0	(3.7) 79%	(2.5) 53%	(4.9) 83%	(3.6) 61%	COLLUVIAL	Intermittent Cobbles and Boulders, (CONGLOMERATE).	
	1,409.6	4.7							5.9		
			5.0	11:26/1.0 3:43/1.0 4:42/1.0 5:07/1.0 5:06/1.0	(5.0) 100%	(4.7) 94%	(15.8) 100%	(14.1) 89%	CRYSTALLINE ROCK	Slightly weathered to fresh, hard to very hard, dark gray, (PIGEON SILTSTONE), with close fracture spacing.	
	1,404.6	9.7							1,408.4		
			5.0	4:18/1.0 4:24/1.0 4:03/1.0 3:43/1.0 3:38/1.0	(5.0) 100%	(3.5) 70%					
	1,399.6	14.7									
			5.0	3:33/1.0 3:03/1.0 3:12/1.0 3:41/1.0 3:25/1.0	(5.0) 100%	(5.0) 100%					
	1,394.6	19.7									
			2.0	3:41/1.0 3:28/1.0	(2.0) 100%	(2.0) 100%					
	1,392.6	21.7							1,392.6	Boring Terminated at Elevation 1,392.6 ft IN CRYSTALLINE ROCK (PIGEON SILTSTONE)	21.7
Began Coring at 0.7' after seating Casing in Colluvial Boulders											

NCDOT CORE SINGLE 63R-3026-0175 DIV. 14 BRIDGE 175.GPJ NC_DOT.GDT 6/22/16



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 14SP.20441.1	TIP N/A	COUNTY HAYWOOD	GEOLOGIST M. Brewer
SITE DESCRIPTION Bridge No. 175 on SR 1332 (Waterville Road) over Big Creek			GROUND WTR (ft)
BORING NO. EB2-A	STATION 13+96	OFFSET 11 ft LT	ALIGNMENT -L-
COLLAR ELEV. 1,431.1 ft	TOTAL DEPTH 21.5 ft	NORTHING 761,422	EASTING 783,810
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 86% 10/5/2012		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic
DRILLER J. Fowler	START DATE 10/03/13	COMP. DATE 10/04/13	SURFACE WATER DEPTH 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					
1435															
1430	1,430.3	0.8	15	18	20								1,431.1 GROUND SURFACE 0.0		
	1,427.6	3.5	11	6	9								1,430.3 Asphalt (0.3') and ABC Stone (0.5') 0.8		
1425	1,422.6	8.5	60/0.1										1,426.1 ROADWAY EMBANKMENT 5.0		
	1,417.6	13.5	28	42	58/0.1								Intermittent cobbles & boulders with brown and gray, fine to coarse sandy GRAVEL (A-1-a).		
1415	1,414.6	16.5	60/0.0										Boulder Fill		
													Advanced with NQ2 coring equipment.		
1410													1,414.6 CRYSTALLINE ROCK 16.5		
													Dark gray, (PIGEON SILTSTONE).		
													1,409.6 Boring Terminated at Elevation 1,409.6 ft IN 21.5		
													CRYSTALLINE ROCK (PIGEON SILTSTONE)		
													1) Driller indicated auger refusal at 5.0'		
													2) Driller indicated casing refusal at 14.6'		
													3) 0-hr. water level not measured due to coring method.		

NCDOT BORE SINGLE 63R-3025-0175 DIV. 14 BRIDGE 175.GPJ NC_DOT_GDT 6/22/16



NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS 14SP.20441.1		TIP N/A		COUNTY HAYWOOD		GEOLOGIST M. Brewer					
SITE DESCRIPTION Bridge No. 175 on SR 1332 (Waterville Road) over Big Creek							GROUND WTR (ft)				
BORING NO. EB2-A		STATION 13+96		OFFSET 11 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 1,431.1 ft		TOTAL DEPTH 21.5 ft		NORTHING 761,422		EASTING 783,810					
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 86% 10/5/2012		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic							
DRILLER J. Fowler		START DATE 10/03/13		COMP. DATE 10/04/13		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 6.9 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	ROD (ft) %	SAMP. NO.	REC. (ft) %			
1416.5										Begin Coring @ 14.6 ft	
1415	1,416.5	14.6	3.9	6:57/1.0 3:19/1.0 N=60/0.0 7:47/1.0 6:33/0.9	(3.9) 100%	(2.2) 56%				Boulder Fill	16.5
	1,412.6	18.5					(1.9) 100%	(1.0) 53%		CRYSTALLINE ROCK Slightly weathered to fresh, hard to very hard, dark gray, (PIGEON SILTSTONE), with close fracture spacing.	
			3.0		(3.0) 100%	(1.8) 60%	(5.0) 100%	(3.0) 60%			
1410	1,409.6	21.5		5:18/1.0 5:11/1.0 5:30/1.0						Boring Terminated at Elevation 1,409.6 ft IN CRYSTALLINE ROCK (PIGEON SILTSTONE)	21.5
<p style="text-align: center;">1) Driller indicated auger refusal at 5.0' 2) Driller indicated casing refusal at 14.6'. 3) 0-hr. water level not measured due to coring method.</p>											

NCDOT CORE SINGLE 63R-3026-0175 DIV. 14 BRIDGE 175.GPJ NC_DOT.GDT 6/22/16

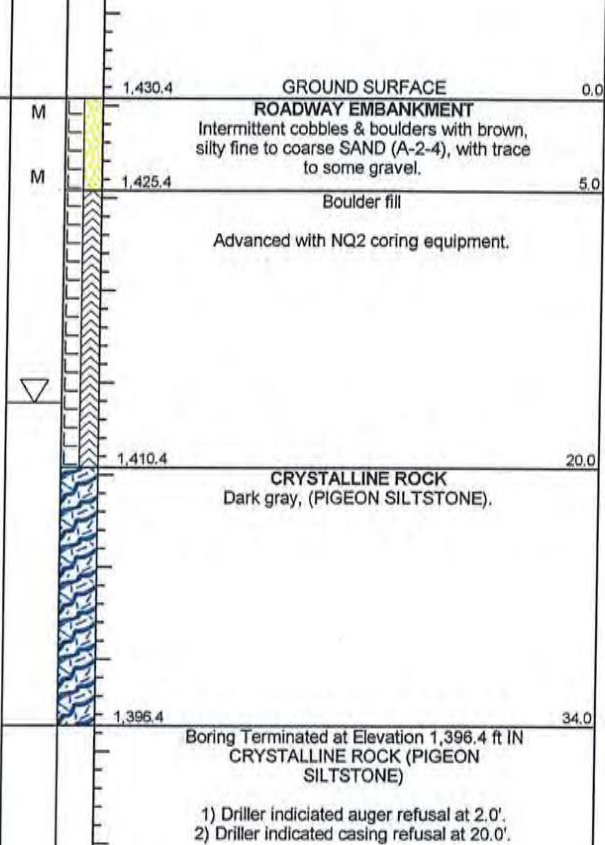


NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 14SP.20441.1		TIP N/A		COUNTY HAYWOOD		GEOLOGIST M. Brewer										
SITE DESCRIPTION Bridge No. 175 on SR 1332 (Waterville Road) over Big Creek							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 13+78		OFFSET 10 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 1,430.4 ft		TOTAL DEPTH 34.0 ft		NORTHING 761,398		EASTING 783,824										
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 86% 10/5/2012				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic										
DRILLER J. Fowler		START DATE 08/30/13		COMP. DATE 10/03/13		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						ELEV. (ft)
1435																
1430	1,430.4	0.0	3	3	4										1,430.4	0.0
1425	1,426.9	3.5	4	6	48										1,425.4	5.0
1420																
1415																
1410															1,410.4	20.0
1405																
1400															1,396.4	34.0

NCDOT BOIRE SINGLE 63R-3026-0175 DIV. 14 BRIDGE 175.GPJ NC_DOT.GDT 6/22/16





NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS 14SP.20441.1		TIP N/A		COUNTY HAYWOOD		GEOLOGIST M. Brewer					
SITE DESCRIPTION Bridge No. 175 on SR 1332 (Waterville Road) over Big Creek							GROUND WTR (ft)				
BORING NO. EB2-B		STATION 13+78		OFFSET 10 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 1,430.4 ft		TOTAL DEPTH 34.0 ft		NORTHING 761,398		EASTING 783,824					
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 86% 10/5/2012		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic		0 HR. 16.5					
DRILLER J. Fowler		START DATE 08/30/13		COMP. DATE 10/03/13		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 14.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	ROD (ft) %	REC. (ft) %	ROD (ft) %			
1410.4										Begin Coring @ 20.0 ft	
	1,410.4	20.0	4.0	4:01/1.0 6:11/1.0	(4.0) 100%	(2.1) 53%	(13.7) 98%	(9.2) 66%		1,410.4 CRYSTALLINE ROCK Slightly weathered to fresh, hard to very hard, dark gray, (PIGEON SILTSTONE), with close, very close, and moderately close fracture spacing.	20.0
	1,406.4	24.0		7:02/1.0 6:32/1.0							
1405			5.0	3:52/1.0 3:20/1.0	(4.7) 94%	(2.4) 48%					
	1,401.4	29.0		4:53/1.0 4:04/1.0 4:07/1.0							
1400			5.0	3:36/1.0 3:20/1.0	(5.0) 100%	(4.7) 94%					
	1,396.4	34.0		2:40/1.0 3:19/1.0 3:36/1.0						Boring Terminated at Elevation 1,396.4 ft IN CRYSTALLINE ROCK (PIGEON SILTSTONE)	34.0
1) Driller indicated auger refusal at 2.0'. 2) Driller indicated casing refusal at 20.0'.											

NCDOT CORE SINGLE 63R-3026-0175 DIV. 14 BRIDGE 175.GPJ NC_DOT.GDT 6/22/16



Bridge No. 430175 on SR 1332 (Waterville Road)

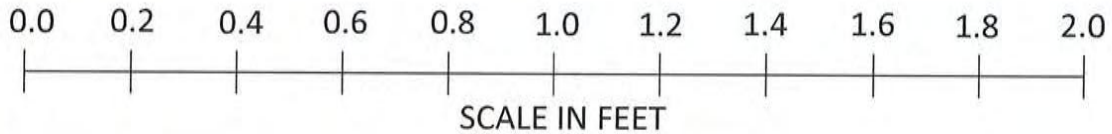
CORE PHOTOGRAPHS: EB1-A: Station 12+87, 14' LT

Begin Run 1
22.0 feet

Begin Run 2
27.0 feet



31.3 Feet



Begin Run 3
32.0 feet

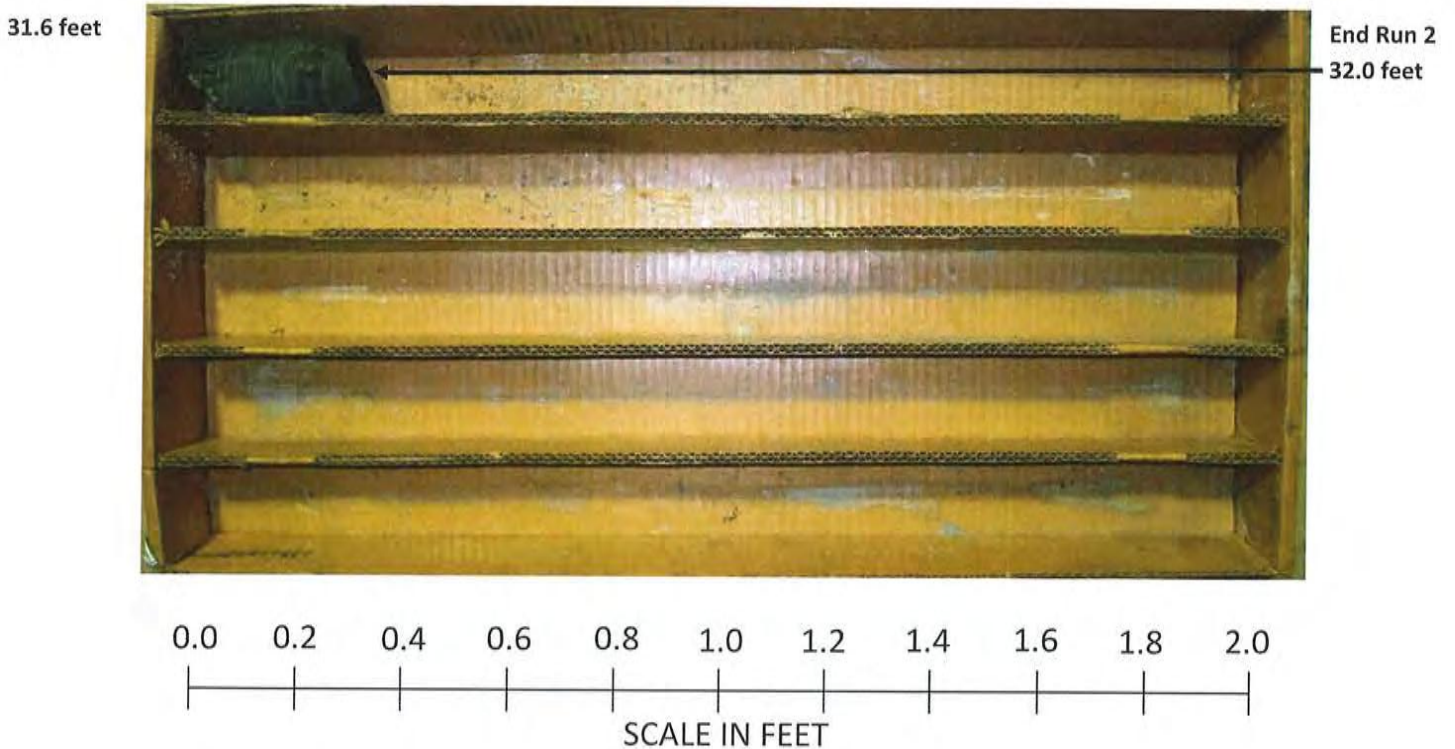
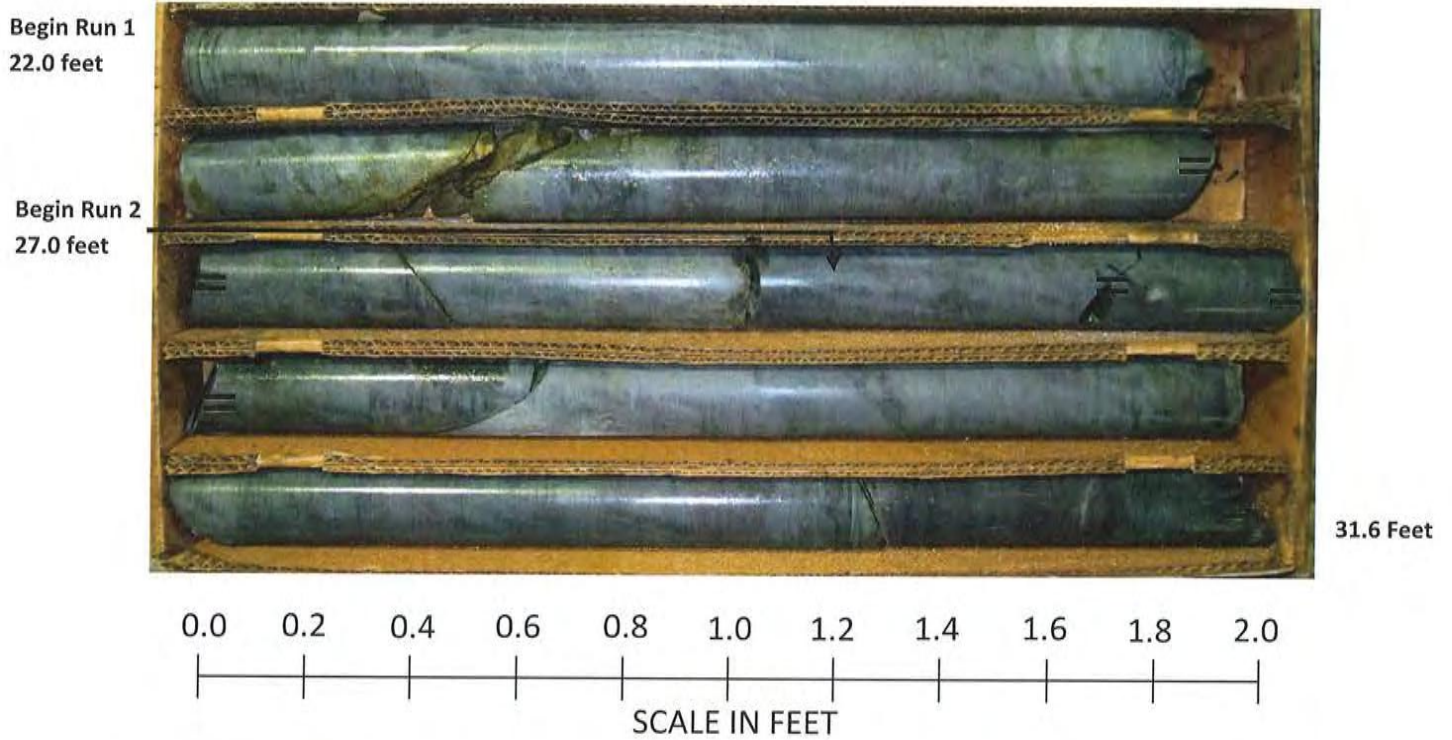


End Run 3
35.0 feet





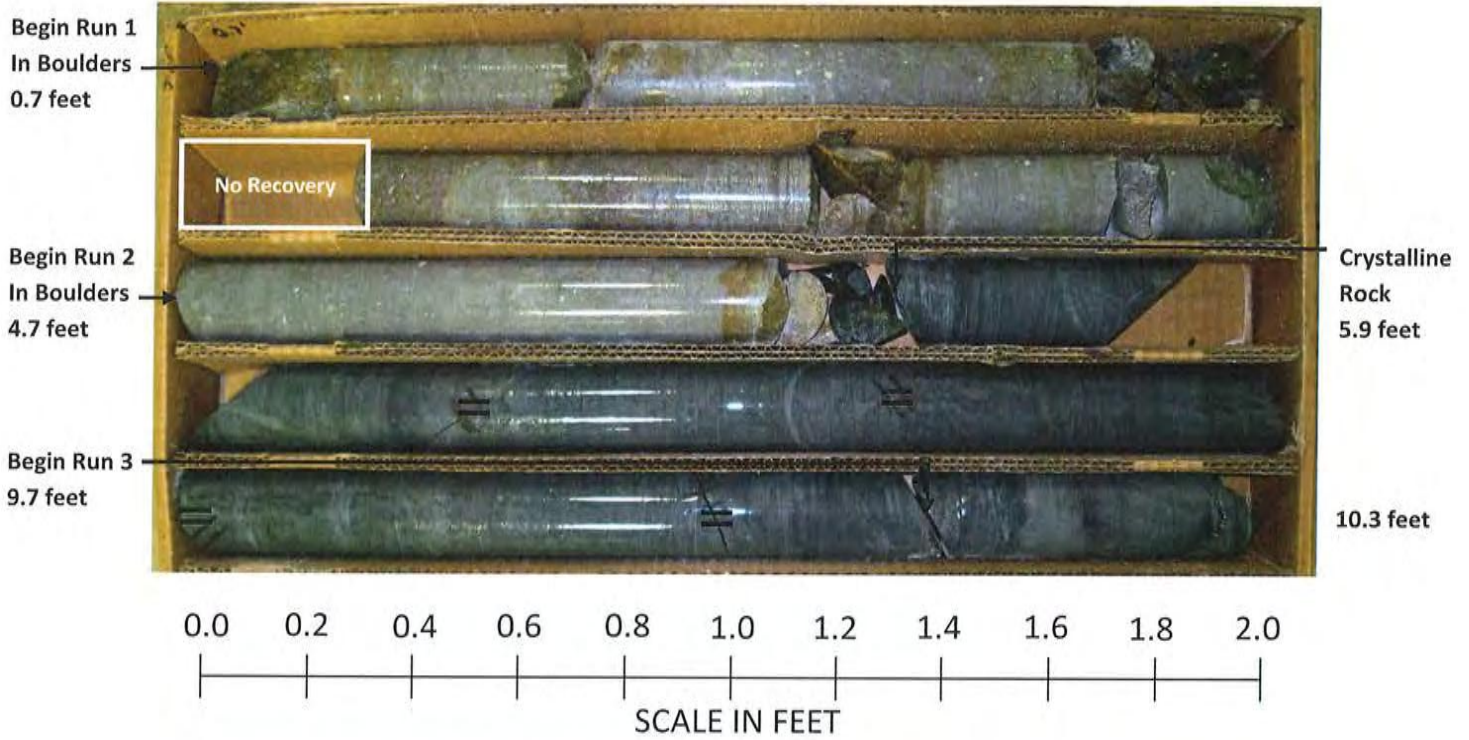
Bridge No. 430175 on SR 1332 (Waterville Road) CORE PHOTOGRAPHS: EB1-B: Station 12+84, 4' LT





Bridge No. 430175 on SR 1332 (Waterville Road)

CORE PHOTOGRAPHS: B1-A: Station 13+48, 12' LT





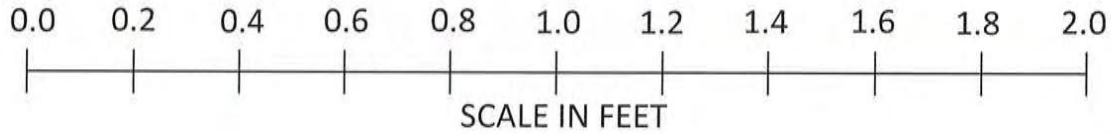
Bridge No. 430175 on SR 1332 (Waterville Road)

CORE PHOTOGRAPHS: B1-A: Station 13+48, 12' LT

20.3 feet

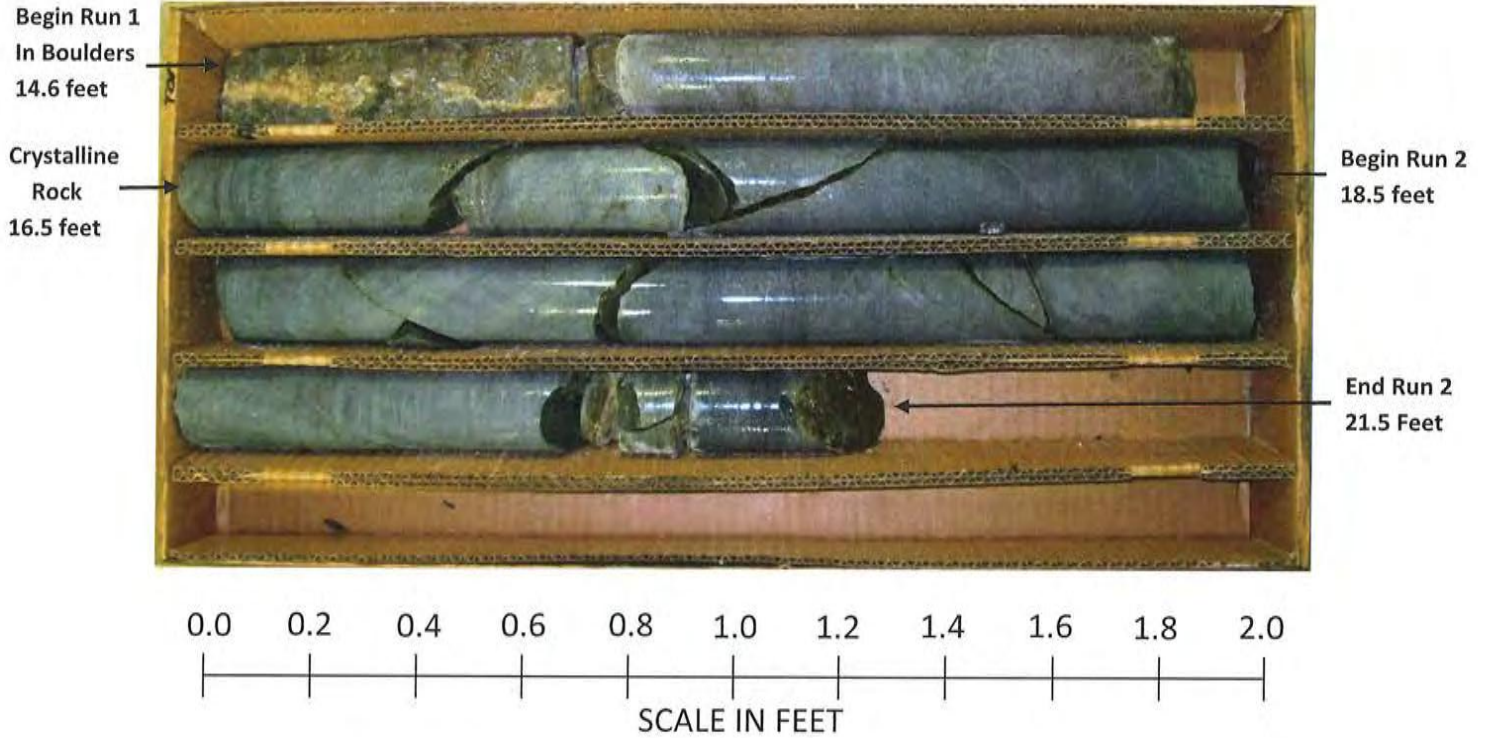


End Run 5
21.7 feet



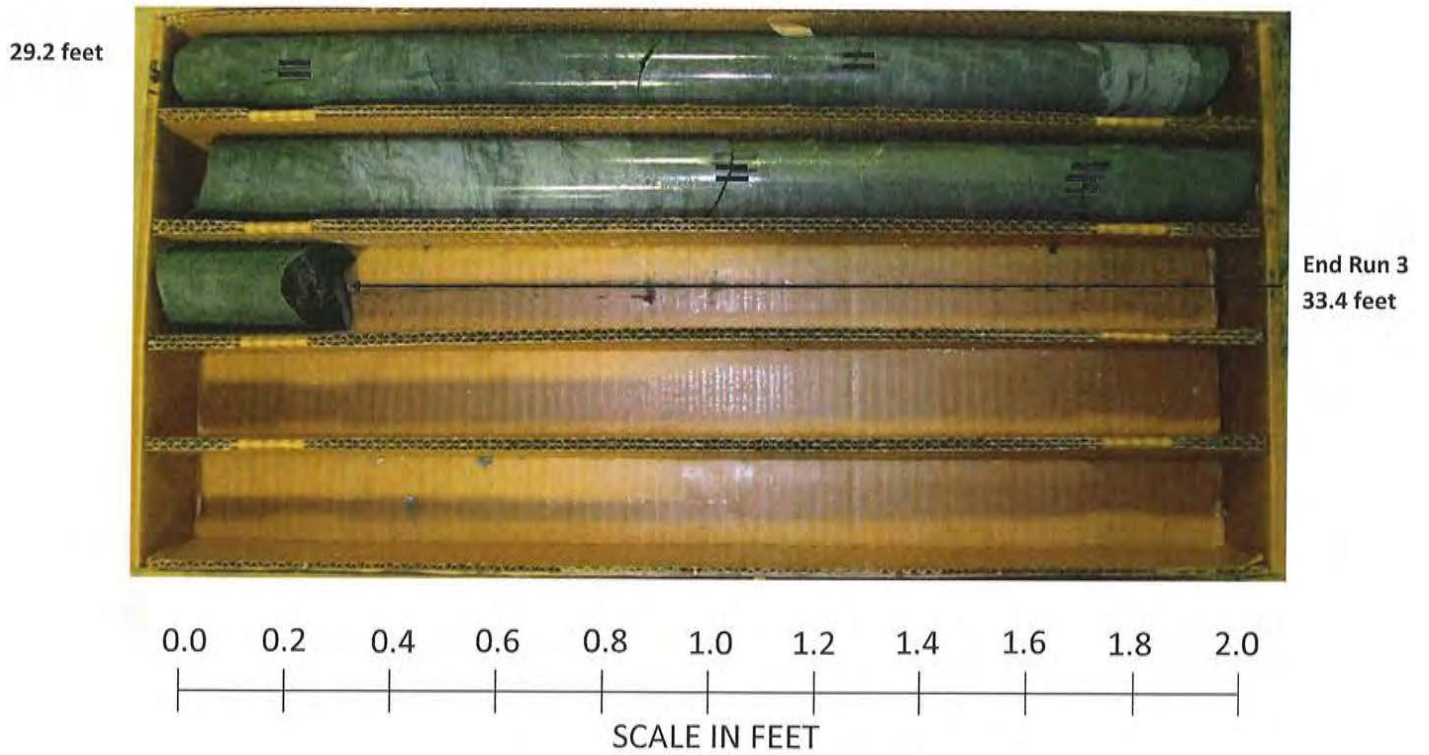
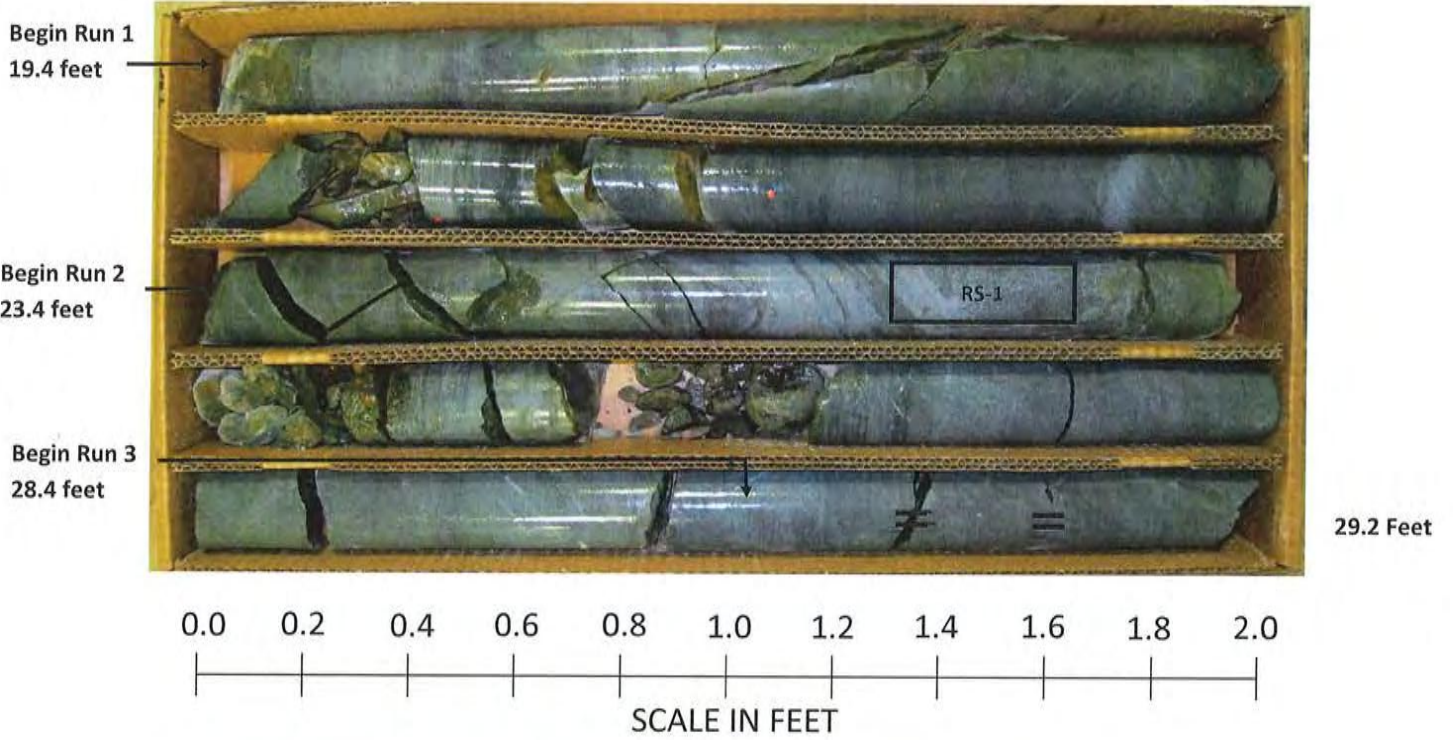


Bridge No. 430175 on SR 1332 (Waterville Road) CORE PHOTOGRAPHS: EB2-A: Station 13+96, 11' LT





Bridge No. 430175 on SR 1332 (Waterville Road) CORE PHOTOGRAPHS: EB2-B: Station 13+78, 10' RT





NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 14SP.20441.1		TIP N/A		COUNTY HAYWOOD		GEOLOGIST P. Fahey										
SITE DESCRIPTION Bridge No. 175 on SR 1332 (Waterville Road) over Big Creek							GROUND WTR (ft)									
BORING NO. RW1-A		STATION 12+43		OFFSET 7 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 1,434.4 ft		TOTAL DEPTH 2.0 ft		NORTHING 761,275		EASTING 783,784										
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 85.5% 11/20/2015				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER C. Boyce		START DATE 10/24/16		COMP. DATE 10/24/16		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
1435	1432.4	2.0														



NCDOT BORE SINGLE 63R-3025-0175 DIV. 14 BRIDGE 175.GPJ NC_DOT.GDT 10/31/16



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 14SP.20441.1		TIP N/A		COUNTY HAYWOOD		GEOLOGIST P. Fahey										
SITE DESCRIPTION Bridge No. 175 on SR 1332 (Waterville Road) over Big Creek							GROUND WTR (ft)									
BORING NO. RW1-B		STATION 12+29		OFFSET 9 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 1,435.0 ft		TOTAL DEPTH 12.5 ft		NORTHING 761,252		EASTING 783,786										
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 85.5% 11/20/2015				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER C. Boyce		START DATE 10/24/16		COMP. DATE 10/24/16		SURFACE WATER DEPTH 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						
1435														1,435.0	GROUND SURFACE	0.0
														1,434.8	Asphalt Pavement	0.2
														1,434.0	Aggregate Base Stone	1.0
1430															ARTIFICIAL FILL	
															Boulder Fill	
1425	1,425.0	10.0												1,425.0		10.0
	1,422.5	12.5	22	18	12									1,423.5	ALLUVIAL	11.5
														1,422.5	Brown, Silty, Fine SAND with rock fragments	12.5
															WEATHERED ROCK	
															Brown Rock Fragments	
															Boring Terminated at Elevation 1,422.5 ft ON	
															CRYSTALLINE ROCK (PIGEON SILTSTONE)	

NCDOT BORE SINGLE 63R-3028-0175 DIV. 14 BRIDGE 175.GPJ NC_DOT.GDT 10/31/16