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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5768	1	5

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NOTES:

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- 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

D. Goodnight

E. Estep

INVESTIGATED BY RK&K, LLP

DRAWN BY A. Bozorgi

CHECKED BY M. Snyder

SUBMITTED BY RK&K, LLP

DATE October 2018

Prepared in the Office of:

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NC LICENSE NO. F-0112



DocuSigned by:

Matthew Snyder

10/24/2018

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SIGNATURE

DATE

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

**STRUCTURE
SUBSURFACE INVESTIGATION**

COUNTY STOKES

PROJECT DESCRIPTION US 311/NC 65 IN VICINITY OF
SR 1928 (STOKESBURG RD.) IN WALNUT COVE

SITE DESCRIPTION WALL NO. 1: RT. OF -Y2- STA 15+30
TO -Y1- STA 14+84

INVENTORY

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN AND WALL PROFILE
4-5	BORING LOGS

REFERENCE: R-5768

PROJECT: 44670

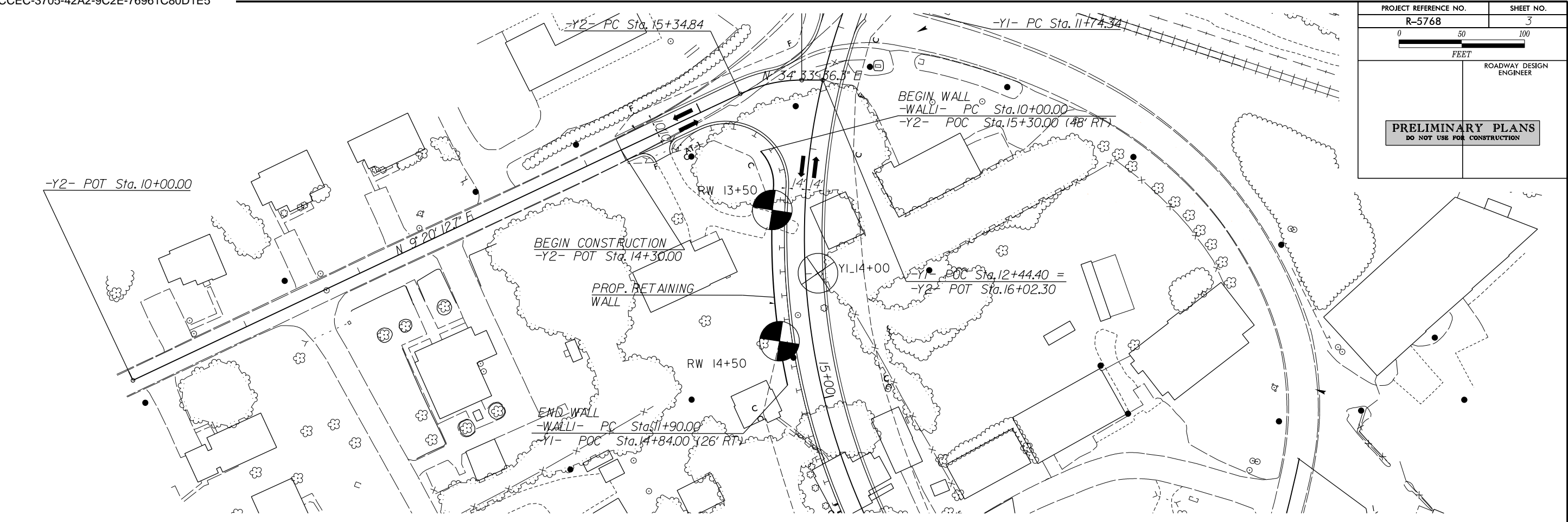
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

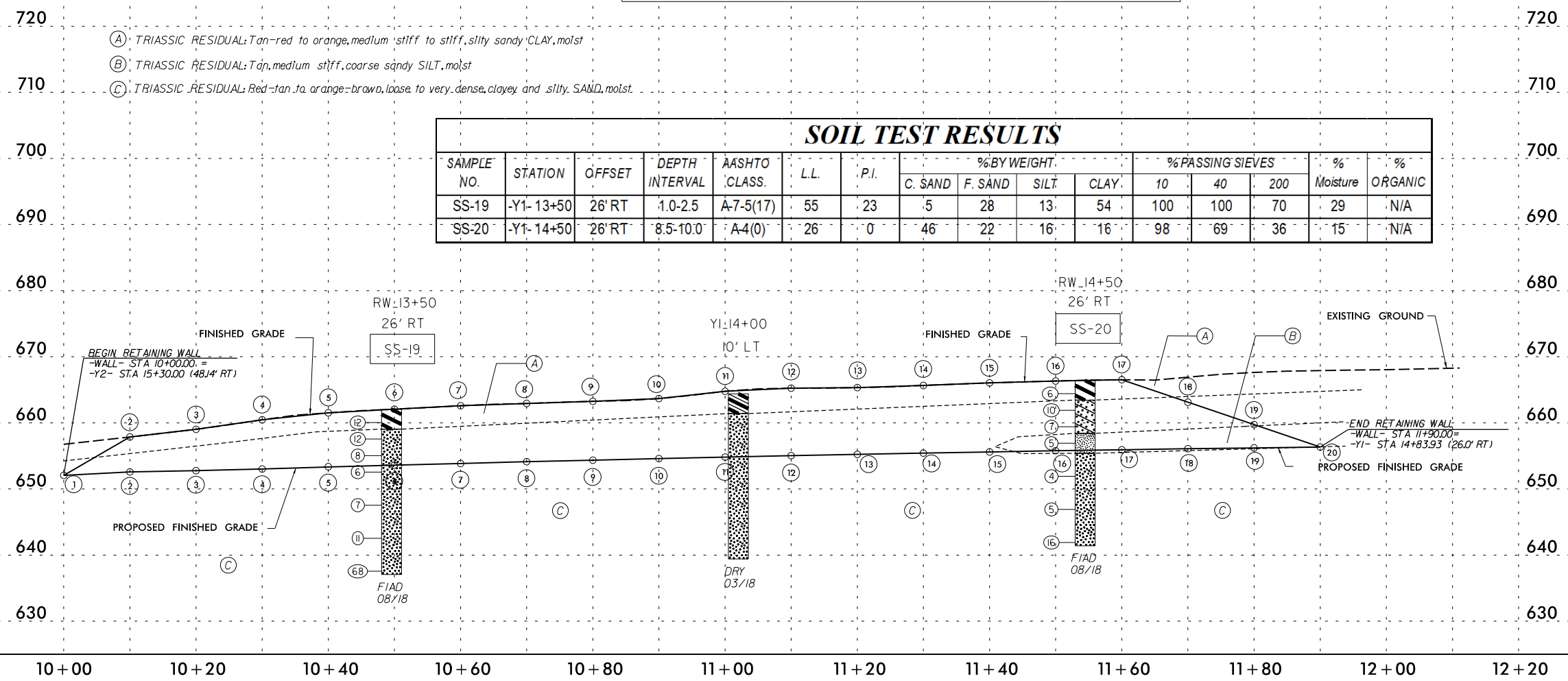
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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 206, 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>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - 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>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - 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, SUCH 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 DISLOGGED 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 IN 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. 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.</p>																																																																																																																																																																																	
<p>SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1"> <tr> <th>GENERAL CLASS.</th> <th colspan="5">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> </tr> <tr> <th>SYMBOL</th> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> <td>[Symbol]</td> </tr> <tr> <th>% PASSING</th> <td>50 MX</td> <td>30 MX</td> <td>10 MX</td> <td>5 MN</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> </tr> <tr> <th>MATERIAL PASSING #40</th> <td>LL</td> <td>PI</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>GROUP INDEX</th> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td>STONE FRAGS. 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RATING AS SUBGRADE	EXCELLENT TO GOOD					FAIR TO POOR					FAIR TO POOR	POOR	UNSATURABLE	<p>ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>		<p>MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>		<p>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.</p>		<p>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.</p>		<p>COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>		<p>WEATHERING</p> <p>FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>VERY SLIGHT (V SLI.) 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.</p> <p>SLIGHT (SLI.) 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.</p> <p>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.</p> <p>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. IF TESTED, WOULD YIELD SPT REFUSAL.</p> <p>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. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF.</p> <p>VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF.</p> <p>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.</p>	
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<p>COMPRESSIBILITY</p> <p>SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50</p>		<p>PERCENTAGE OF MATERIAL</p> <table border="1"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>> 10%</td> <td>> 20%</td> <td>HIGHLY</td> </tr> <tr> <td></td> <td></td> <td></td> <td>35% AND ABOVE</td> </tr> </table>		ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	> 10%	> 20%	HIGHLY				35% AND ABOVE	<p>GROUND WATER</p> <p>▽ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING ▽ STATIC WATER LEVEL AFTER 24 HOURS ▽ PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA ○ SPRING OR SEEP</p>		<p>WEATHERING</p> <p>FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>VERY SLIGHT (V SLI.) 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.</p> <p>SLIGHT (SLI.) 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.</p> <p>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.</p> <p>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. IF TESTED, WOULD YIELD SPT REFUSAL.</p> <p>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. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF.</p> <p>VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF.</p> <p>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.</p>																																																																																																																																																									
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OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT	- MOIST - (M) - DRY - (D)	SOLID; AT OR NEAR OPTIMUM MOISTURE REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE																																																																																																																																																																																					
DRILL UNITS:	ADVANCING TOOLS:	HAMMER TYPE:																																																																																																																																																																																					
<input type="checkbox"/> CME-45C <input type="checkbox"/> CME-55 <input type="checkbox"/> CME-550 <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> PORTABLE HOIST <input checked="" type="checkbox"/> MOBILE B-57	<input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input checked="" type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG-CARBIDE INSERTS <input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE <input type="checkbox"/> TRICONE <input type="checkbox"/> CORE BIT	<input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL <input type="checkbox"/> B <input type="checkbox"/> H <input type="checkbox"/> N <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST																																																																																																																																																																																					
TERM	SPACING																																																																																																																																																																																						
VERY WIDE	MORE THAN 10 FEET																																																																																																																																																																																						
WIDE	3 TO 10 FEET																																																																																																																																																																																						
MODERATELY CLOSE	1 TO 3 FEET																																																																																																																																																																																						
CLOSE	0.16 TO 1 FOOT																																																																																																																																																																																						
VERY CLOSE	LESS THAN 0.16 FEET																																																																																																																																																																																						
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	0.008 - 0.03 FEET																																																																																																																																																																																						
THINLY LAMINATED	< 0.008 FEET																																																																																																																																																																																						
<p>PLASTICITY</p> <table border="1"> <tr> <th>NON PLASTIC</th> <th>PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> <tr> <td>SLIGHTLY PLASTIC</td> <td>0-5</td> <td>VERY LOW</td> </tr> <tr> <td>MODERATELY PLASTIC</td> <td>6-15</td> <td>SLIGHT</td> </tr> <tr> <td>HIGHLY PLASTIC</td> <td>16-25</td> <td>MEDIUM</td> </tr> <tr> <td></td> <td>26 OR MORE</td> <td>HIGH</td> </tr> </table>		NON PLASTIC	PLASTICITY INDEX (PI)	DRY STRENGTH	SLIGHTLY PLASTIC	0-5	VERY LOW	MODERATELY PLASTIC	6-15	SLIGHT	HIGHLY PLASTIC	16-25	MEDIUM		26 OR MORE	HIGH	<p>INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>		<p>BENCH MARK:</p> <table border="1"> <tr> <th>ELEVATION:</th> <th>FEET</th> </tr> </table> <p>NOTES: BOREHOLE ELEVATIONS DETERMINED FROM PROVIDED .TIN FILE AND GPS ABBREVIATIONS: F.I.A.D. - FILLED IMMEDIATELY AFTER DRILLING</p>		ELEVATION:	FEET																																																																																																																																																																	
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PROJECT REFERENCE NO.	SHEET NO.
R-5768	3
ROADWAY DESIGN ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



RETAINING WALL NO. 1 ENVELOPE



- (A) TRIASSIC RESIDUAL: Tan-red to orange, medium stiff to stiff, silty sandy CLAY, moist
- (B) TRIASSIC RESIDUAL: Tan, medium stiff, coarse sandy SILT, moist
- (C) TRIASSIC RESIDUAL: Red-tan to orange-brown, loose to very dense, clayey and silty SAND, moist

SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING SIEVES			% Moisture	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-19	-Y1- 13+50	26' RT	1.0-2.5	A-7-5(17)	55	23	5	28	13	54	100	100	70	29	N/A
SS-20	-Y1- 14+50	26' RT	8.5-10.0	A-4(0)	26	0	46	22	16	16	98	69	36	15	N/A

POINT NO.	-WALL- STATION	PROPOSED FINISHED GRADE (TOP)	PROPOSED FINISHED GRADE (BENCH)
1	10+00.00	652.06	652.06
2	10+10.00	657.86	652.59
3	10+20.00	659.03	652.78
4	10+30.00	660.48	653.03
5	10+40.00	661.53	653.34
6	10+50.00	662.08	653.60
7	10+60.00	662.60	653.86
8	10+70.00	662.94	654.12
9	10+80.00	663.26	654.36
10	10+90.00	663.67	654.60
11	11+00.00	664.77	654.82
12	11+10.00	665.25	655.04
13	11+20.00	665.34	655.24
14	11+30.00	665.65	655.43
15	11+40.00	666.04	655.61
16	11+50.00	666.33	655.78
17	11+60.00	666.52	655.94
18	11+70.00	663.13	656.09
19	11+80.00	659.74	656.22
20	11+90.00	656.35	656.35

PLANS PREPARED BY :

RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NO. F-0112 • (919) 878-9560

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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 8/17/08

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 44670.1.1		TIP R-5768		COUNTY STOKES		GEOLOGIST D Goodnight									
SITE DESCRIPTION N/A							GROUND WTR (ft)								
BORING NO. RW_13+50		STATION 13+50		OFFSET 26 ft RT		ALIGNMENT -Y1-									
COLLAR ELEV. 662.1 ft		TOTAL DEPTH 25.0 ft		NORTHING 925,828		EASTING 1,663,723									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 95% 03/19/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER E Estep		START DATE 08/10/18		COMP. DATE 08/10/18		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					
665															
660	661.1	1.0	3	5	7									662.1	0.0
	658.6	3.5	4	6	6									659.1	3.0
655	656.1	6.0	4	4	4										
	653.6	8.5	3	3	3										
650	648.6	13.5	3	3	4										
645	643.6	18.5	4	5	6										
640	638.6	23.5	14	24	44									637.1	25.0
Boring Terminated at Elevation 637.1 ft in Triassic Residual: silty SAND (A-2-4)															

WBS 44670.1.1		TIP R-5768		COUNTY STOKES		GEOLOGIST D Goodnight									
SITE DESCRIPTION N/A							GROUND WTR (ft)								
BORING NO. RW_14+50		STATION 14+50		OFFSET 26 ft RT		ALIGNMENT -Y1-									
COLLAR ELEV. 666.5 ft		TOTAL DEPTH 25.0 ft		NORTHING 925,773		EASTING 1,663,813									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 95% 03/19/2018			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER E Estep		START DATE 08/10/18		COMP. DATE 08/10/18		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					
670															
665	665.5	1.0	1	2	4									666.5	0.0
	663.0	3.5	4	4	6									663.5	3.0
660	660.5	6.0	3	3	4										
	658.0	8.5	3	2	3									658.5	8.0
655														655.5	11.0
	653.0	13.5	2	2	2										
650															
	648.0	18.5	2	2	3										
645															
	643.0	23.5	3	7	9									641.5	25.0
Boring Terminated at Elevation 641.5 ft in Triassic Residual: silty SAND (A-2-4)															

NCDOT BORE DOUBLE R-5768_GEO_RDY.GPJ NC_DOT.GDT 10/23/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 44670.1.1		TIP R-5768		COUNTY STOKES		GEOLOGIST R Lane										
SITE DESCRIPTION N/A							GROUND WTR (ft)									
BORING NO. Y1_14+00		STATION 14+00		OFFSET 10 ft LT		ALIGNMENT -Y1-	0 HR. Dry									
COLLAR ELEV. 664.3 ft		TOTAL DEPTH 25.0 ft		NORTHING 925,829		EASTING 1,663,786	24 HR. Dry									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 95% 03/19/2018				DRILL METHOD H.S. Augers		HAMMER TYPE N/A										
DRILLER E Estep		START DATE 03/09/18		COMP. DATE 03/09/18		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			ELEV. (ft)	DEPTH (ft)		
665														664.3	0.0	GROUND SURFACE
660														661.3	3.0	TRIASSIC RESIDUAL Orange, sandy CLAY (A-6) Orange-brown, silty SAND (A-2-4)
655																
650																
645																
640														639.3	25.0	Boring Terminated at Elevation 639.3 ft in Triassic Residual silty SAND (A-2-4)

NCDOT BORE DOUBLE R-5768_GEO_RDY.GPJ NC_DOT.GDT 10/23/18