

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.3.R.61	1	13

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY SAMPSON
 PROJECT DESCRIPTION REPLACE BRIDGE NO. 810016
OVER BUCKHORN CREEK ON SR 1145 (BONEY
MILL ROAD)

REFERENCE: NO TIP

PROJECT: 17BP.3.R.61

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2, 2A	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5 - 12	BORE LOGS
13	LABORATORY TESTING SUMMARY

PERSONNEL
<u>BIGELOW, H. B.</u>
<u>SCHLEMM, T. S.</u>
<u>ECKLUND, M. A.</u>
<u>STUDNICKY, R. T.</u>

INVESTIGATED BY TERRACON CONSULTANTS
 DRAWN BY ALEXANDER, M. J.
 CHECKED BY NASH, A. A.
 SUBMITTED BY TERRACON CONSULTANTS
 DATE JANUARY 2018

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 MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE 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.

Prepared in the Office of:
Terracon
 Consulting Engineers and Scientists
 2401 BRENTWOOD ROAD, SUITE 107
 RALEIGH, NORTH CAROLINA 27604
 NC REGISTERED ENGINEERING FIRM: F-0869
 NC REGISTERED GEOLOGIC FIRM: C-367



DocuSigned by:
Andrew Nash 1/30/2018
 SIGNATURE DATE
 671DA68582E04FF

**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

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

SUBSURFACE INVESTIGATION




SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS (PAGE 1 OF 2)

SOIL DESCRIPTION										GRADATION																																																
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, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6										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.																																																
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS																																																
THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										MINERALOGICAL COMPOSITION																																																
MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.										COMPRESSIBILITY																																																
SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50										PERCENTAGE OF MATERIAL																																																
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 25%;">ORGANIC MATERIAL</th> <th style="width: 25%;">GRANULAR SOILS</th> <th style="width: 25%;">SILT - CLAY SOILS</th> <th style="width: 25%;">OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE 1 - 10%</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE 10 - 20%</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME 20 - 35%</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>> 10%</td> <td>> 20%</td> <td>HIGHLY 35% AND ABOVE</td> </tr> </table>										ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	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	GROUND WATER																												
ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL																																																							
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																																																							
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p> STATIC WATER LEVEL AFTER 24 HOURS</p> <p> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p> SPRING OR SEEP</p> </div> <div style="width: 50%; font-size: 10pt;"> <p>∇ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p>∇ STATIC WATER LEVEL AFTER 24 HOURS</p> <p>∇ PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p> SPRING OR SEEP</p> </div> </div>										MISCELLANEOUS SYMBOLS																																																
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 25%;">PRIMARY SOIL TYPE</th> <th style="width: 25%;">COMPACTNESS OR CONSISTENCY</th> <th style="width: 25%;">RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th style="width: 25%;">RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESIVE)</td> <td>VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE</td> <td>< 4 4 TO 10 10 TO 30 30 TO 50 > 50</td> <td>N/A</td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD</td> <td>< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30</td> <td>< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4</td> </tr> </table>										PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)	GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A	GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td> ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td> DIP & DIP DIRECTION OF ROCK STRUCTURES</td> <td> TEST BORING</td> <td> SLOPE INDICATOR INSTALLATION</td> </tr> <tr> <td> SOIL SYMBOL</td> <td> AUGER BORING</td> <td> CONE PENETROMETER TEST</td> <td> SOUNDING ROD</td> </tr> <tr> <td> ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td> CORE BORING</td> <td> MONITORING WELL</td> <td> TEST BORING WITH CORE</td> </tr> <tr> <td> INFERRED SOIL BOUNDARY</td> <td> PIEZOMETER INSTALLATION</td> <td> SPT N-VALUE</td> <td></td> </tr> <tr> <td> INFERRED ROCK LINE</td> <td></td> <td></td> <td></td> </tr> <tr> <td> ALLUVIAL SOIL BOUNDARY</td> <td></td> <td></td> <td></td> </tr> </table>										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION	DIP & DIP DIRECTION OF ROCK STRUCTURES	TEST BORING	SLOPE INDICATOR INSTALLATION	SOIL SYMBOL	AUGER BORING	CONE PENETROMETER TEST	SOUNDING ROD	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT	CORE BORING	MONITORING WELL	TEST BORING WITH CORE	INFERRED SOIL BOUNDARY	PIEZOMETER INSTALLATION	SPT N-VALUE		INFERRED ROCK LINE				ALLUVIAL SOIL BOUNDARY						
PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)																																																							
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A																																																							
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4																																																							
ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION	DIP & DIP DIRECTION OF ROCK STRUCTURES	TEST BORING	SLOPE INDICATOR INSTALLATION																																																							
SOIL SYMBOL	AUGER BORING	CONE PENETROMETER TEST	SOUNDING ROD																																																							
ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT	CORE BORING	MONITORING WELL	TEST BORING WITH CORE																																																							
INFERRED SOIL BOUNDARY	PIEZOMETER INSTALLATION	SPT N-VALUE																																																								
INFERRED ROCK LINE																																																										
ALLUVIAL SOIL BOUNDARY																																																										
TEXTURE OR GRAIN SIZE										RECOMMENDATION SYMBOLS																																																
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">U.S. STD. SIEVE SIZE OPENING (MM)</th> <th style="width: 10%;">4</th> <th style="width: 10%;">10</th> <th style="width: 10%;">40</th> <th style="width: 10%;">60</th> <th style="width: 10%;">200</th> <th style="width: 10%;">270</th> </tr> <tr> <td></td> <td>4.76</td> <td>2.00</td> <td>0.42</td> <td>0.25</td> <td>0.075</td> <td>0.053</td> </tr> </table>										U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270		4.76	2.00	0.42	0.25	0.075	0.053	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td> UNDERCUT</td> <td> UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td> UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</td> </tr> <tr> <td> SHALLOW UNDERCUT</td> <td> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</td> <td></td> </tr> </table>										UNDERCUT	UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE	UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL	SHALLOW UNDERCUT	UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK																				
U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270																																																				
	4.76	2.00	0.42	0.25	0.075	0.053																																																				
UNDERCUT	UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE	UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL																																																								
SHALLOW UNDERCUT	UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">GRAIN SIZE</th> <th style="width: 10%;">MM</th> <th style="width: 10%;">305</th> <th style="width: 10%;">75</th> <th style="width: 10%;">2.0</th> <th style="width: 10%;">0.25</th> <th style="width: 10%;">0.05</th> <th style="width: 10%;">0.005</th> </tr> <tr> <td></td> <td>IN.</td> <td>12</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>										GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005		IN.	12	3					ABBREVIATIONS																																
GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005																																																			
	IN.	12	3																																																							
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>AR - AUGER REFUSAL</td> <td>MED. - MEDIUM</td> <td>VST - VANE SHEAR TEST</td> </tr> <tr> <td>BT - BORING TERMINATED</td> <td>MICA - MICACEOUS</td> <td>WEA. - WEATHERED</td> </tr> <tr> <td>CL - CLAY</td> <td>MOD. - MODERATELY</td> <td>U - UNIT WEIGHT</td> </tr> <tr> <td>CPT - CONE PENETRATION TEST</td> <td>NP - NON PLASTIC</td> <td>U_g - DRY UNIT WEIGHT</td> </tr> <tr> <td>CSE. - COARSE</td> <td>ORG. - ORGANIC</td> <td></td> </tr> <tr> <td>DMT - DILATOMETER TEST</td> <td>PMT - PRESSUREMETER TEST</td> <td style="text-align: center;">SAMPLE ABBREVIATIONS</td> </tr> <tr> <td>DPT - DYNAMIC PENETRATION TEST</td> <td>SAP. - SAPROLITIC</td> <td>S - BULK</td> </tr> <tr> <td>e - VOID RATIO</td> <td>SD. - SAND, SANDY</td> <td>SS - SPLIT SPOON</td> </tr> <tr> <td>F - FINE</td> <td>SL. - SILT, SILTY</td> <td>ST - SHELBY TUBE</td> </tr> <tr> <td>FOSS. - FOSSILIFEROUS</td> <td>SLI. - SLIGHTLY</td> <td>RS - ROCK</td> </tr> <tr> <td>FRAC. - FRACTURED, FRACTURES</td> <td>TCR - TRICONE REFUSAL</td> <td>RT - RECOMPACTED TRIAXIAL</td> </tr> <tr> <td>FRAGS. - FRAGMENTS</td> <td>w - MOISTURE CONTENT</td> <td>CBR - CALIFORNIA BEARING RATIO</td> </tr> <tr> <td>HI. - HIGHLY</td> <td>v - VERY</td> <td></td> </tr> </table>										AR - AUGER REFUSAL	MED. - MEDIUM	VST - VANE SHEAR TEST	BT - BORING TERMINATED	MICA - MICACEOUS	WEA. - WEATHERED	CL - CLAY	MOD. - MODERATELY	U - UNIT WEIGHT	CPT - CONE PENETRATION TEST	NP - NON PLASTIC	U _g - DRY UNIT WEIGHT	CSE. - COARSE	ORG. - ORGANIC		DMT - DILATOMETER TEST	PMT - PRESSUREMETER TEST	SAMPLE ABBREVIATIONS	DPT - DYNAMIC PENETRATION TEST	SAP. - SAPROLITIC	S - BULK	e - VOID RATIO	SD. - SAND, SANDY	SS - SPLIT SPOON	F - FINE	SL. - SILT, SILTY	ST - SHELBY TUBE	FOSS. - FOSSILIFEROUS	SLI. - SLIGHTLY	RS - ROCK	FRAC. - FRACTURED, FRACTURES	TCR - TRICONE REFUSAL	RT - RECOMPACTED TRIAXIAL	FRAGS. - FRAGMENTS	w - MOISTURE CONTENT	CBR - CALIFORNIA BEARING RATIO	HI. - HIGHLY	v - VERY		EQUIPMENT USED ON SUBJECT PROJECT									
AR - AUGER REFUSAL	MED. - MEDIUM	VST - VANE SHEAR TEST																																																								
BT - BORING TERMINATED	MICA - MICACEOUS	WEA. - WEATHERED																																																								
CL - CLAY	MOD. - MODERATELY	U - UNIT WEIGHT																																																								
CPT - CONE PENETRATION TEST	NP - NON PLASTIC	U _g - DRY UNIT WEIGHT																																																								
CSE. - COARSE	ORG. - ORGANIC																																																									
DMT - DILATOMETER TEST	PMT - PRESSUREMETER TEST	SAMPLE ABBREVIATIONS																																																								
DPT - DYNAMIC PENETRATION TEST	SAP. - SAPROLITIC	S - BULK																																																								
e - VOID RATIO	SD. - SAND, SANDY	SS - SPLIT SPOON																																																								
F - FINE	SL. - SILT, SILTY	ST - SHELBY TUBE																																																								
FOSS. - FOSSILIFEROUS	SLI. - SLIGHTLY	RS - ROCK																																																								
FRAC. - FRACTURED, FRACTURES	TCR - TRICONE REFUSAL	RT - RECOMPACTED TRIAXIAL																																																								
FRAGS. - FRAGMENTS	w - MOISTURE CONTENT	CBR - CALIFORNIA BEARING RATIO																																																								
HI. - HIGHLY	v - VERY																																																									
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 33%;"> DRILL UNITS: <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"/> D-50 (TER346) </td> <td style="width: 33%;"> ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6' CONTINUOUS FLIGHT AUGER <input type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG-CARBIDE INSERTS <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input checked="" type="checkbox"/> TRICONE 2 1/8" STEEL TEETH <input type="checkbox"/> TRICONE " TUNG-CARB. <input type="checkbox"/> CORE BIT </td> <td style="width: 33%;"> HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL CORE SIZE: <input type="checkbox"/> -B _____ <input type="checkbox"/> -H _____ <input type="checkbox"/> -N _____ HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input checked="" type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST </td> </tr> </table>										DRILL UNITS: <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"/> D-50 (TER346)	ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6' CONTINUOUS FLIGHT AUGER <input type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG-CARBIDE INSERTS <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input checked="" type="checkbox"/> TRICONE 2 1/8" STEEL TEETH <input type="checkbox"/> TRICONE " TUNG-CARB. <input type="checkbox"/> CORE BIT	HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL CORE SIZE: <input type="checkbox"/> -B _____ <input type="checkbox"/> -H _____ <input type="checkbox"/> -N _____ HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input checked="" type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST																																														
DRILL UNITS: <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"/> D-50 (TER346)	ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6' CONTINUOUS FLIGHT AUGER <input type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG-CARBIDE INSERTS <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input checked="" type="checkbox"/> TRICONE 2 1/8" STEEL TEETH <input type="checkbox"/> TRICONE " TUNG-CARB. <input type="checkbox"/> CORE BIT	HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL CORE SIZE: <input type="checkbox"/> -B _____ <input type="checkbox"/> -H _____ <input type="checkbox"/> -N _____ HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input checked="" type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST																																																								
PLASTICITY																																																										
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">PLASTICITY INDEX (PI)</th> <th style="width: 50%;">DRY STRENGTH</th> </tr> <tr> <td>NON PLASTIC</td> <td>VERY LOW</td> </tr> <tr> <td>SLIGHTLY PLASTIC</td> <td>SLIGHT</td> </tr> <tr> <td>MODERATELY PLASTIC</td> <td>MEDIUM</td> </tr> <tr> <td>HIGHLY PLASTIC</td> <td>HIGH</td> </tr> </table>										PLASTICITY INDEX (PI)	DRY STRENGTH	NON PLASTIC	VERY LOW	SLIGHTLY PLASTIC	SLIGHT	MODERATELY PLASTIC	MEDIUM	HIGHLY PLASTIC	HIGH																																							
PLASTICITY INDEX (PI)	DRY STRENGTH																																																									
NON PLASTIC	VERY LOW																																																									
SLIGHTLY PLASTIC	SLIGHT																																																									
MODERATELY PLASTIC	MEDIUM																																																									
HIGHLY PLASTIC	HIGH																																																									
COLOR																																																										
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.																																																										

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

SUBSURFACE INVESTIGATION

**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS
(PAGE 2 OF 2)**

ROCK DESCRIPTION		TERMS AND DEFINITIONS	
<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.</p> <p>AQUIFER - A WATER BEARING FORMATION OR STRATA.</p> <p>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p>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.</p> <p>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.</p> <p>CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p>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.</p> <p>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p>FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.</p> <p>FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p>FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p>JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p>LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p>MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p>RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p>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.</p> <p>SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p>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.</p> <p>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p>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 0.1 FOOT PER 60 BLOWS.</p> <p>STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p>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.</p> <p>TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>	
		<p>NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</p>	
WEATHERED ROCK (WR)		<p>FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p>	
CRYSTALLINE ROCK (CR)		<p>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>	
NON-CRYSTALLINE ROCK (NCR)		<p>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>	
COASTAL PLAIN SEDIMENTARY ROCK (CP)			
WEATHERING			
FRESH		<p>ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p>	
VERY SLIGHT (V SL.)		<p>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>	
SLIGHT (SL.)		<p>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>	
MODERATE (MOD.)		<p>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>	
MODERATELY SEVERE (MOD. SEV.)		<p>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. <u>IF TESTED, WOULD YIELD SPT REFUSAL</u></p>	
SEVERE (SEV.)		<p>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. <u>IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF</u></p>	
VERY SEVERE (V SEV.)		<p>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. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u></p>	
COMPLETE		<p>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>	
ROCK HARDNESS			
VERY HARD		<p>CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</p>	
HARD		<p>CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</p>	
MODERATELY HARD		<p>CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES 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.</p>	
MEDIUM HARD		<p>CAN BE GROOVED OR GOUGED 0.05 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.</p>	
SOFT		<p>CAN BE GROOVED OR GOUGED 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.</p>	
VERY SOFT		<p>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 FINGERNAIL.</p>	
FRACTURE SPACING		BEDDING	
TERM	SPACING	TERM	THICKNESS
VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	4 FEET
WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET
MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET
CLOSE	0.16 TO 1 FOOT	VERY THINLY BEDDED	0.03 - 0.16 FEET
VERY CLOSE	LESS THAN 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET
		THINLY LAMINATED	< 0.008 FEET
INDURATION			
FRIABLE		<p>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p>	
MODERATELY INDURATED		<p>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p>	
INDURATED		<p>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p>	
EXTREMELY INDURATED		<p>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>	
BENCH MARK: BM2 - 8" SPIKE SET IN 18" GUM TREE		N: 416726; E: 2208549	
		ELEVATION: 84.93 FEET	
NOTES:			
FIAD - FILLED IMMEDIATELY AFTER DRILLING			
DATE: 8-15-14			

PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.61	3
SITE PLAN	
FEET	

SKEW = 90°

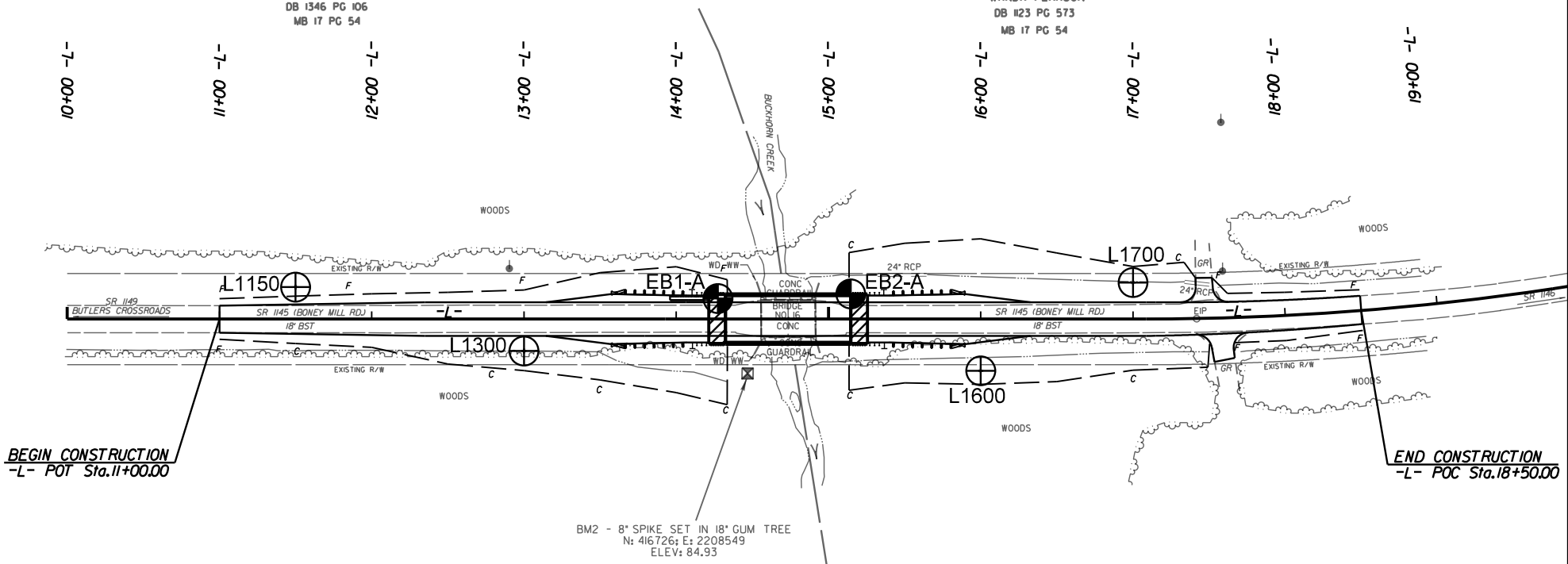


CAROL PEARSON HONEYCUTT &
HERVIE HONEYCUTT
DB 1346 PG 106
MB 17 PG 54

TERRY LEE PEARSON &
WANDA PEARSON
DB 1123 PG 573
MB 17 PG 54

FREDDIE L. THORNTON &
ANN THORNTON
DB 1136 PG 453
MB 17 PG 54

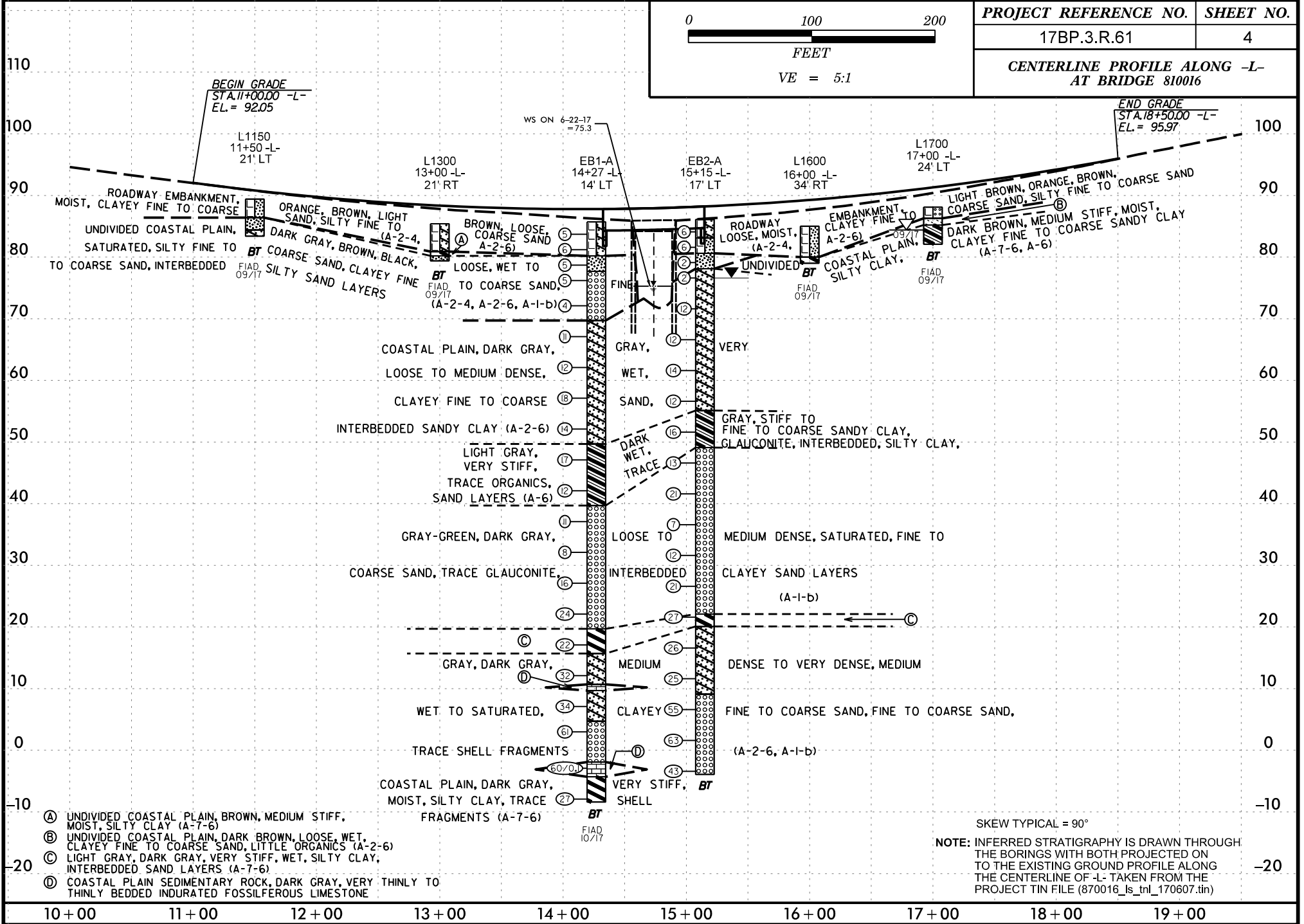
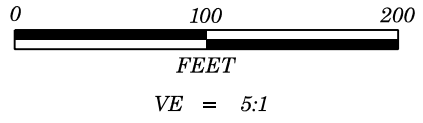
FREDDIE L. THORNTON &
ANN THORNTON
DB 1964 PG 842
MB 17 PG 54
MB 57 PG 78



BEGIN CONSTRUCTION
-L- POT Sta. 11+00.00

END CONSTRUCTION
-L- POC Sta. 18+50.00

PROJECT REFERENCE NO.	SHEET NO.
17BP.3.R.61	4
CENTERLINE PROFILE ALONG -L- AT BRIDGE 810016	



- Ⓐ UNDIVIDED COASTAL PLAIN, BROWN, MEDIUM STIFF, MOIST, SILTY CLAY (A-7-6)
- Ⓑ UNDIVIDED COASTAL PLAIN, DARK BROWN, LOOSE, WET, CLAYEY FINE TO COARSE SAND, LITTLE ORGANICS (A-2-6)
- Ⓒ LIGHT GRAY, DARK GRAY, VERY STIFF, WET, SILTY CLAY, INTERBEDDED SAND LAYERS (A-7-6)
- Ⓓ COASTAL PLAIN SEDIMENTARY ROCK, DARK GRAY, VERY THINLY TO THINLY BEDDED INDURATED FOSSILIFEROUS LIMESTONE

SKEW TYPICAL = 90°

NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ON TO THE EXISTING GROUND PROFILE ALONG THE CENTERLINE OF -L- TAKEN FROM THE PROJECT TIN FILE (870016_Is_tnl_170607.tin)

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.3.R.61			TIP N/A			COUNTY SAMPSON			GEOLOGIST SCHLEMM, T. S.							
SITE DESCRIPTION BRIDGE NO. 810016 OVER BUCKHORN CREEK ON SR 1145 (BONEY MILL ROAD)									GROUND WTR (ft)							
BORING NO. EB1-A			STATION 14+27			OFFSET 14 ft LT			ALIGNMENT -L-							
COLLAR ELEV. 85.7 ft			TOTAL DEPTH 94.1 ft			NORTHING 416,777			EASTING 2,208,535							
DRILL RIG/HAMMER EFF./DATE TER346 DIEDRICH D-50 90% 03/10/2017						DRILL METHOD Mud Rotary			HAMMER TYPE Automatic							
DRILLER EKLUND, M. A.			START DATE 10/20/17			COMP. DATE 10/20/17			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						
90																
85	84.7	1.0	3	3	2									85.7	GROUND SURFACE	0.0
	82.2	3.5	3	3	3											
80	79.7	6.0	1	2	3									80.2	ROADWAY EMBANKMENT ORANGE-BROWN AND LIGHT BROWN, CLAYEY FINE TO COARSE SAND	5.5
	77.2	8.5	3	3	2									77.7	UNDIVIDED COASTAL PLAIN BLACK, SILTY FINE TO COARSE SAND	8.0
75	73.1	12.6	2	2	2											
	68.1	17.6	4	4	7									69.7	COASTAL PLAIN DARK GRAY, CLAYEY FINE TO COARSE SAND, INTERBEDDED SANDY CLAY LAYERS	16.0
65	63.1	22.6	5	5	7											
	58.1	27.6	6	7	11											
55	53.1	32.6	4	6	8											
	48.1	37.6	6	7	10											
45	43.1	42.6	5	5	7									49.7	LIGHT TO DARK GRAY, FINE TO COARSE SANDY CLAY, TRACE ORGANICS, TRACE GLAUCONITE, INTERBEDDED SILTY CLAY AND SAND LAYERS	36.0
	38.1	47.6	5	5	6											
35	33.1	52.6	2	3	5									39.7	GRAY-GREEN, FINE TO COARSE SAND, TRACE GLAUCONITE, INTERBEDDED CLAYEY SAND LAYERS	46.0
	28.1	57.6	7	8	8											
25	23.1	62.6	8	9	15											
	18.1	67.6	7	10	12									19.7	LIGHT GRAY AND DARK GRAY, SILTY CLAY, INTERBEDDED SAND LAYERS	66.0
15	13.1	72.6	6	12	20									15.7	DARK GRAY, CLAYEY FINE TO COARSE SAND, TRACE SHELL FRAGMENTS	70.0
10														10.7		75.0

NCDOT BORE SINGLE BORELOG.GPJ NC_DOT.GDT 1/30/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.3.R.61		TIP N/A		COUNTY SAMPSON		GEOLOGIST SCHLEMM, T. S.											
SITE DESCRIPTION BRIDGE NO. 810016 OVER BUCKHORN CREEK ON SR 1145 (BONEY MILL ROAD)							GROUND WTR (ft)										
BORING NO. EB1-A		STATION 14+27		OFFSET 14 ft LT		ALIGNMENT -L-	0 HR. N/A										
COLLAR ELEV. 85.7 ft		TOTAL DEPTH 94.1 ft		NORTHING 416,777		EASTING 2,208,535	24 HR. FIAD										
DRILL RIG/HAMMER EFF./DATE TER346 DIEDRICH D-50 90% 03/10/2017				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER EKLUND, M. A.		START DATE 10/20/17		COMP. DATE 10/20/17		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)			
10																	
	8.1	77.6	10	11	23									9.7	76.0	COASTAL PLAIN SEDIMENTARY ROCK DARK GRAY, VERY THINLY BEDDED, INDURATED, FOSSILIFEROUS LIMESTONE (continued)	
5														4.7	81.0	COASTAL PLAIN DARK GRAY, CLAYEY FINE TO COARSE SAND, TRACE SHELL FRAGMENTS	
	3.1	82.6	20	26	35											GRAY, FINE TO COARSE SAND, TRACE SHELL FRAGMENTS	
0																	
	-1.9	87.6	60/0.1														COASTAL PLAIN SEDIMENTARY ROCK DARK GRAY, VERY THINLY TO THINLY BEDDED, INDURATED, FOSSILIFEROUS LIMESTONE
-5																	
	-6.9	92.6	10	12	15												COASTAL PLAIN DARK GRAY, SILTY CLAY, TRACE SHELL FRAGMENTS
																	Boring Terminated at Elevation -8.4 ft IN COASTAL PLAIN SILTY CLAY

NCDOT BORE SINGLE BORELOG.GPJ NC_DOT.GDT 1/30/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.3.R.61	TIP N/A	COUNTY SAMPSON	GEOLOGIST SCHLEMM, T. S.
SITE DESCRIPTION BRIDGE NO. 810016 OVER BUCKHORN CREEK ON SR 1145 (BONEY MILL ROAD)			GROUND WTR (ft)
BORING NO. EB2-A	STATION 15+15	OFFSET 17 ft LT	ALIGNMENT -L-
COLLAR ELEV. 86.1 ft	TOTAL DEPTH 90.0 ft	NORTHING 416,771	EASTING 2,208,622
DRILL RIG/HAMMER EFF./DATE TER346 DIEDRICH D-50 90% 03/10/2017		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER EKLUND, M. A.	START DATE 10/19/17	COMP. DATE 10/19/17	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	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)
90													GROUND SURFACE	0.0
85	85.1	1.0	2	3	3	6						M	ROADWAY EMBANKMENT	
	82.6	3.5	3	3	3	6						M	ORANGE-BROWN, CLAYEY FINE TO COARSE SAND	3.0
80	80.1	6.0	2	1	1	2						W	ORANGE-BROWN, SILTY FINE TO COARSE SAND	5.5
	77.6	8.5	1	1	1	2						W	UNDIVIDED COASTAL PLAIN	
75												W	BLACK, SILTY FINE TO COARSE SAND	8.0
	72.6	13.5	3	5	7	12						W	COASTAL PLAIN	
70												W	GRAY TO DARK GRAY, CLAYEY FINE TO COARSE SAND, INTERBEDDED SANDY CLAY	
	67.6	18.5	5	4	8	12						W		
65												W		
	62.6	23.5	5	6	8	14						W		
60												W		
	57.6	28.5	5	6	6	12						W		
55												W		
	52.6	33.5	4	7	9	16						W	DARK GRAY, FINE TO COARSE SANDY CLAY	31.0
50												W		
	47.6	38.5	5	5	8	13						Sat.	DARK GRAY, FINE TO COARSE SAND, INTERBEDDED CLAYEY SAND	37.0
45												Sat.		
	42.6	43.5	7	8	13	21						Sat.		
40												Sat.		
	37.6	48.5	3	4	3	7						Sat.		
35												Sat.		
	32.6	53.5	5	5	7	12						Sat.		
30												Sat.		
	27.6	58.5	7	8	13	21						Sat.		
25												Sat.		
	22.6	63.5	9	12	15	27						M	DARK GRAY, SILTY CLAY	64.0
20												M	DARK GRAY, CLAYEY FINE TO COARSE SAND	66.0
	17.6	68.5	10	10	16	26						M		
15												M		
	12.6	73.5	9	9	16	25						M		

NCDOT BORE SINGLE BORELOG.GPJ NC_DOT.GDT 1/30/18

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 17BP.3.R.61		TIP N/A		COUNTY SAMPSON		GEOLOGIST SCHLEMM, T. S.										
SITE DESCRIPTION BRIDGE NO. 810016 OVER BUCKHORN CREEK ON SR 1145 (BONEY MILL ROAD)							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 15+15		OFFSET 17 ft LT		ALIGNMENT -L-		0 HR. N/A								
COLLAR ELEV. 86.1 ft		TOTAL DEPTH 90.0 ft		NORTHING 416,771		EASTING 2,208,622		24 HR. 9.5								
DRILL RIG/HAMMER EFF./DATE TER346 DIEDRICH D-50 90% 03/10/2017				DRILL METHOD Mud Rotary			HAMMER TYPE Automatic									
DRILLER EKLUND, M. A.		START DATE 10/19/17		COMP. DATE 10/19/17		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		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
10																
	7.6	78.5	13	19	36								Sat.		9.1	77.0
5																
	2.6	83.5	17	27	36								Sat.			
0																
	-2.4	88.5	14	16	27								Sat.		-3.9	90.0

Match Line

DARK GRAY, FINE TO COARSE SAND,
TRACE SHELL FRAGMENTS

Boring Terminated at Elevation -3.9 ft IN
COASTAL PLAIN FINE TO COARSE
SAND

NCDOT BORE SINGLE BORELOG.GPJ NC_DOT.GDT 1/30/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.3.R.61			TIP N/A			COUNTY SAMPSON			GEOLOGIST BIGELOW, H. B.								
SITE DESCRIPTION BRIDGE NO. 810016 OVER BUCKHORN CREEK ON SR 1145 (BONEY MILL ROAD)									GROUND WTR (ft)								
BORING NO. L1150			STATION 11+50			OFFSET 21 ft LT			ALIGNMENT -L-								
COLLAR ELEV. 89.4 ft			TOTAL DEPTH 6.0 ft			NORTHING 416,812			EASTING 2,208,259								
DRILL RIG/HAMMER EFF./DATE N/A						DRILL METHOD Hand Auger			HAMMER TYPE N/A								
DRILLER N/A			START DATE 09/29/17			COMP. DATE 09/29/17			SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
90															89.4	GROUND SURFACE	0.0
											S-1				86.4	ROADWAY EMBANKMENT ORANGE AND BROWN, FINE TO COARSE SAND	3.0
85											S-2				84.4	UNDIVIDED COASTAL PLAIN DARK GRAY AND BROWN, SILTY FINE TO COARSE SAND	5.0
															83.4	BROWN, CLAYEY FINE TO COARSE SAND	6.0
																Boring Terminated at Elevation 83.4 ft IN UNDIVIDED COASTAL PLAIN CLAYEY FINE TO COARSE SAND	

NCDOT BORE SINGLE BORELOG.GPJ NC_DOT.GDT 1/30/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.3.R.61			TIP N/A			COUNTY SAMPSON			GEOLOGIST BIGELOW, H. B.							
SITE DESCRIPTION BRIDGE NO. 810016 OVER BUCKHORN CREEK ON SR 1145 (BONEY MILL ROAD)									GROUND WTR (ft)							
BORING NO. L1300			STATION 13+00			OFFSET 21 ft RT			ALIGNMENT -L-							
COLLAR ELEV. 85.4 ft			TOTAL DEPTH 6.0 ft			NORTHING 416,755			EASTING 2,208,404							
DRILL RIG/HAMMER EFF./DATE N/A						DRILL METHOD Hand Auger			HAMMER TYPE N/A							
DRILLER N/A			START DATE 09/29/17			COMP. DATE 09/29/17			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)
90																
85														85.4	GROUND SURFACE	0.0
										S-3					ROADWAY EMBANKMENT BROWN AND ORANGE, CLAYEY FINE TO COARSE SAND	
80										S-4				80.9	UNDIVIDED COASTAL PLAIN BROWN, SILTY CLAY	4.5
														80.2	BROWN AND DARK BROWN, SILTY SAND, TRACE ORGANICS	5.2
														79.4	Boring Terminated at Elevation 79.4 ft IN UNDIVIDED COASTAL PLAIN SILTY FINE TO COARSE SAND	6.0

NCDOT BORE SINGLE BORELOG.GPJ NC_DOT.GDT 1/30/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.3.R.61			TIP N/A			COUNTY SAMPSON			GEOLOGIST BIGELOW, H. B.								
SITE DESCRIPTION BRIDGE NO. 810016 OVER BUCKHORN CREEK ON SR 1145 (BONEY MILL ROAD)									GROUND WTR (ft)								
BORING NO. L1600			STATION 16+00			OFFSET 34 ft RT			ALIGNMENT -L-								
COLLAR ELEV. 85.0 ft			TOTAL DEPTH 6.0 ft			NORTHING 416,712			EASTING 2,208,701								
DRILL RIG/HAMMER EFF./DATE N/A						DRILL METHOD Hand Auger			HAMMER TYPE N/A								
DRILLER N/A			START DATE 09/29/17			COMP. DATE 09/29/17			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			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
85															85.0	GROUND SURFACE	0.0
80											S-5				80.0	ROADWAY EMBANKMENT BROWN AND ORANGE, SILTY FINE TO COARSE SAND	5.0
															79.0	DARK BROWN, SILTY CLAY	6.0
																Boring Terminated at Elevation 79.0 ft IN UNDIVIDED COASTAL PLAIN SILTY CLAY	

NCDOT BORE SINGLE BORELOG.GPJ NC_DOT.GDT 1/30/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.3.R.61			TIP N/A			COUNTY SAMPSON			GEOLOGIST BIGELOW, H. B.								
SITE DESCRIPTION BRIDGE NO. 810016 OVER BUCKHORN CREEK ON SR 1145 (BONEY MILL ROAD)									GROUND WTR (ft)								
BORING NO. L1700			STATION 17+00			OFFSET 24 ft LT			ALIGNMENT -L-								
COLLAR ELEV. 88.1 ft			TOTAL DEPTH 6.0 ft			NORTHING 416,759			EASTING 2,208,807								
DRILL RIG/HAMMER EFF./DATE N/A						DRILL METHOD Hand Auger			HAMMER TYPE N/A								
DRILLER N/A			START DATE 09/29/17			COMP. DATE 09/29/17			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			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
90															88.1	GROUND SURFACE	0.0
85															86.3	ROADWAY EMBANKMENT	1.8
															85.2	LIGHT BROWN AND BROWN, FINE TO COARSE SAND	2.9
															82.1	UNDIVIDED COASTAL PLAIN DARK BROWN, CLAYEY FINE TO COARSE SAND, LITTLE ORGANICS GRAY AND BROWN, FINE TO COARSE SANDY CLAY	6.0
															Boring Terminated at Elevation 82.1 ft IN UNDIVIDED COASTAL PLAIN CLAYEY FINE TO COARSE SAND		

NCDOT BORE SINGLE BORELOG.GPJ NC_DOT.GDT 1/30/18

LABORATORY TESTING SUMMARY

PROJECT NUMBER: 17BP.3.R.61

TIP: NO TIP

COUNTY: SAMPSON

DESCRIPTION: REPLACE BRIDGE NO. 810016 OVER BUCKHORN CREEK ON SR 1145 (BONEY MILL ROAD)

Sample No.	Alignment	Station	Offset (feet)	Depth Interval (feet)	AASHTO Class.	L.L.	P.I.	% by Weight				% Retained #4 Sieve	% Passing (sieves)			% Moisture	% Organic
								Coarse Sand	Fine Sand	Silt	Clay		#10	#40	#200		
S-1	-L-	11+50	21 LT	0 - 3.0	A-2-4 (0)	26	10	36.9	42.0	0.7	20.4	0	99	81	22	9.2	--
S-2	-L-	11+50	21 LT	5.0 - 6.0	A-2-7 (3)	46	30	45.0	23.3	0.2	31.5	0	99	71	32	24.7	--
S-3	-L-	13+00	21 RT	0 - 4.5	A-2-6 (0)	28	13	52.2	27.3	0.1	20.4	2	94	51	21	9.5	--
S-4	-L-	13+00	21 RT	4.5 - 5.2	A-7-6 (6)	42	26	20.6	39.5	2.5	37.4	0	99	90	42	20.1	--
S-5	-L-	16+00	34 RT	0 - 5.0	A-2-4 (0)	18	2	50.9	32.7	0.7	15.7	1	98	70	17	10.2	--
S-6	-L-	17+00	24 LT	1.8 - 2.9	A-2-6 (0)	31	11	56.5	18.1	10.2	15.2	0	99	70	26	43.4	4.0

Stephanie H. Huffman

 Certified Lab Technician Signature
 114-01-1203

 Certification Number