

REFERENCE: 350172

PROJECT: 17BP.12.R.89

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.12.R.89	1	9

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

**STRUCTURE
SUBSURFACE INVESTIGATION**

COUNTY GASTON

PROJECT DESCRIPTION BRIDGE No.172 OVER HOYLE
CREEK ON SR 1819 (ALEXIS HIGH SHOALS RD.)

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2, 2A	LEGEND (SOIL & ROCK)
3	SITE PLAN
4-9	BORE LOGS, CORE REPORTS & CORE PHOTOGRAPHS

PERSONNEL

M. SNYDER

L. GONZALEZ

D. SUTTON

NCDOT PERSONNEL

INVESTIGATED BY M. SNYDER

DRAWN BY A. BOZORGI

CHECKED BY G. GOINS

SUBMITTED BY RK&K, LLP

DATE OCTOBER 2017

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:



RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F-0112



SIGNATURE

DATE

**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, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>										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 ANGLARITY 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;"> <thead> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> </thead> <tbody> <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> </tbody> </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	TRACE 1 - 10% LITTLE 10 - 20% SOME 20 - 35% HIGHLY 35% AND ABOVE																																								
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																																																																			
GROUND WATER										MISCELLANEOUS SYMBOLS																																																												
										<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td> ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td> 25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES</td> <td> SLOPE INDICATOR INSTALLATION</td> </tr> <tr> <td> SOIL SYMBOL</td> <td> SPT DPT DMT VST PNT TEST BORING</td> <td> CONE PENETROMETER TEST</td> </tr> <tr> <td> ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td> AUGER BORING</td> <td> SOUNDING ROD</td> </tr> <tr> <td> INFERRED SOIL BOUNDARY</td> <td> CORE BORING</td> <td> TEST BORING WITH CORE</td> </tr> <tr> <td> INFERRED ROCK LINE</td> <td> MONITORING WELL</td> <td> PIEZOMETER INSTALLATION</td> </tr> <tr> <td> ALLUVIAL SOIL BOUNDARY</td> <td> PIEZOMETER INSTALLATION</td> <td> SPT N-VALUE</td> </tr> </tbody> </table>										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION	25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES	SLOPE INDICATOR INSTALLATION	SOIL SYMBOL	SPT DPT DMT VST PNT TEST BORING	CONE PENETROMETER TEST	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT	AUGER BORING	SOUNDING ROD	INFERRED SOIL BOUNDARY	CORE BORING	TEST BORING WITH CORE	INFERRED ROCK LINE	MONITORING WELL	PIEZOMETER INSTALLATION	ALLUVIAL SOIL BOUNDARY	PIEZOMETER INSTALLATION	SPT N-VALUE																																	
ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION	25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES	SLOPE INDICATOR INSTALLATION																																																																				
SOIL SYMBOL	SPT DPT DMT VST PNT TEST BORING	CONE PENETROMETER TEST																																																																				
ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT	AUGER BORING	SOUNDING ROD																																																																				
INFERRED SOIL BOUNDARY	CORE BORING	TEST BORING WITH CORE																																																																				
INFERRED ROCK LINE	MONITORING WELL	PIEZOMETER INSTALLATION																																																																				
ALLUVIAL SOIL BOUNDARY	PIEZOMETER INSTALLATION	SPT N-VALUE																																																																				
CONSISTENCY OR DENSENESS										RECOMMENDATION SYMBOLS																																																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> </thead> <tbody> <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> </tbody> </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;"> <tbody> <tr> <td> UNDERCUT</td> <td> UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</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></td> <td></td> <td></td> </tr> </tbody> </table>										UNDERCUT	UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE	UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK	UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL	SHALLOW UNDERCUT																																		
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																																																																			
UNDERCUT	UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE	UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK	UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL																																																																			
SHALLOW UNDERCUT																																																																						
TEXTURE OR GRAIN SIZE										ABBREVIATIONS																																																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>U.S. STD. SIEVE SIZE OPENING (MM)</th> <th>4</th> <th>10</th> <th>40</th> <th>60</th> <th>200</th> <th>270</th> </tr> </thead> <tbody> <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> </tbody> </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;"> <thead> <tr> <th>BOULDER (BLDR.)</th> <th>COBBLE (COB.)</th> <th>GRAVEL (GR.)</th> <th>COARSE SAND (CSE. SD.)</th> <th>FINE SAND (F. SD.)</th> <th>SILT (SL.)</th> <th>CLAY (CL.)</th> </tr> </thead> <tbody> <tr> <td>GRAIN SIZE MM</td> <td>305</td> <td>75</td> <td>2.0</td> <td>0.25</td> <td>0.05</td> <td>0.005</td> </tr> <tr> <td>GRAIN SIZE IN.</td> <td>12</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>										BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F. SD.)	SILT (SL.)	CLAY (CL.)	GRAIN SIZE MM	305	75	2.0	0.25	0.05	0.005	GRAIN SIZE IN.	12	3																				
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																																																																
BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F. SD.)	SILT (SL.)	CLAY (CL.)																																																																
GRAIN SIZE MM	305	75	2.0	0.25	0.05	0.005																																																																
GRAIN SIZE IN.	12	3																																																																				
SOIL MOISTURE - CORRELATION OF TERMS										EQUIPMENT USED ON SUBJECT PROJECT																																																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</th> <th>FIELD MOISTURE DESCRIPTION</th> <th>GUIDE FOR FIELD MOISTURE DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>LL - LIQUID LIMIT</td> <td>- SATURATED - (SAT.)</td> <td>USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</td> </tr> <tr> <td>PL - PLASTIC LIMIT</td> <td>- WET - (W)</td> <td>SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</td> </tr> <tr> <td>OM - OPTIMUM MOISTURE SHRINKAGE LIMIT</td> <td>- MOIST - (M)</td> <td>SOLID; AT OR NEAR OPTIMUM MOISTURE</td> </tr> <tr> <td>SL - SHRINKAGE LIMIT</td> <td>- DRY - (D)</td> <td>REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td> </tr> </tbody> </table>										SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION	LL - LIQUID LIMIT	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE	PL - PLASTIC LIMIT	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	OM - OPTIMUM MOISTURE SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE	SL - SHRINKAGE LIMIT	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	<table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td><input type="checkbox"/> CME-45C</td> <td><input type="checkbox"/> CLAY BITS</td> <td><input checked="" type="checkbox"/> AUTOMATIC</td> <td><input type="checkbox"/> MANUAL</td> </tr> <tr> <td><input type="checkbox"/> CME-55</td> <td><input checked="" type="checkbox"/> 6' CONTINUOUS FLIGHT AUGER</td> <td colspan="2">CORE SIZE:</td> </tr> <tr> <td><input type="checkbox"/> CME-550</td> <td><input type="checkbox"/> 8" HOLLOW AUGERS</td> <td><input type="checkbox"/> -B</td> <td><input type="checkbox"/> -H</td> </tr> <tr> <td><input type="checkbox"/> VANE SHEAR TEST</td> <td><input type="checkbox"/> HARD FACED FINGER BITS</td> <td colspan="2"><input checked="" type="checkbox"/> -N Q</td> </tr> <tr> <td><input type="checkbox"/> PORTABLE HOIST</td> <td><input type="checkbox"/> TUNG.-CARBIDE INSERTS</td> <td colspan="2">HAND TOOLS:</td> </tr> <tr> <td><input checked="" type="checkbox"/> CME-550X</td> <td><input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER</td> <td><input type="checkbox"/> POST HOLE DICGER</td> <td><input type="checkbox"/> HAND AUGER</td> </tr> <tr> <td></td> <td><input type="checkbox"/> TRICONE _____ * STEEL TEETH</td> <td><input type="checkbox"/> SOUNDING ROD</td> <td><input type="checkbox"/> VANE SHEAR TEST</td> </tr> <tr> <td></td> <td><input type="checkbox"/> TRICONE _____ * TUNG.-CARB.</td> <td></td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> CORE BIT</td> <td></td> <td></td> </tr> </tbody> </table>										<input type="checkbox"/> CME-45C	<input type="checkbox"/> CLAY BITS	<input checked="" type="checkbox"/> AUTOMATIC	<input type="checkbox"/> MANUAL	<input type="checkbox"/> CME-55	<input checked="" type="checkbox"/> 6' CONTINUOUS FLIGHT AUGER	CORE SIZE:		<input type="checkbox"/> CME-550	<input type="checkbox"/> 8" HOLLOW AUGERS	<input type="checkbox"/> -B	<input type="checkbox"/> -H	<input type="checkbox"/> VANE SHEAR TEST	<input type="checkbox"/> HARD FACED FINGER BITS	<input checked="" type="checkbox"/> -N Q		<input type="checkbox"/> PORTABLE HOIST	<input type="checkbox"/> TUNG.-CARBIDE INSERTS	HAND TOOLS:		<input checked="" type="checkbox"/> CME-550X	<input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER	<input type="checkbox"/> POST HOLE DICGER	<input type="checkbox"/> HAND AUGER		<input type="checkbox"/> TRICONE _____ * STEEL TEETH	<input type="checkbox"/> SOUNDING ROD	<input type="checkbox"/> VANE SHEAR TEST		<input type="checkbox"/> TRICONE _____ * TUNG.-CARB.				<input type="checkbox"/> CORE BIT		
SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION																																																																				
LL - LIQUID LIMIT	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE																																																																				
PL - PLASTIC LIMIT	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE																																																																				
OM - OPTIMUM MOISTURE SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE																																																																				
SL - SHRINKAGE LIMIT	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE																																																																				
<input type="checkbox"/> CME-45C	<input type="checkbox"/> CLAY BITS	<input checked="" type="checkbox"/> AUTOMATIC	<input type="checkbox"/> MANUAL																																																																			
<input type="checkbox"/> CME-55	<input checked="" type="checkbox"/> 6' CONTINUOUS FLIGHT AUGER	CORE SIZE:																																																																				
<input type="checkbox"/> CME-550	<input type="checkbox"/> 8" HOLLOW AUGERS	<input type="checkbox"/> -B	<input type="checkbox"/> -H																																																																			
<input type="checkbox"/> VANE SHEAR TEST	<input type="checkbox"/> HARD FACED FINGER BITS	<input checked="" type="checkbox"/> -N Q																																																																				
<input type="checkbox"/> PORTABLE HOIST	<input type="checkbox"/> TUNG.-CARBIDE INSERTS	HAND TOOLS:																																																																				
<input checked="" type="checkbox"/> CME-550X	<input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER	<input type="checkbox"/> POST HOLE DICGER	<input type="checkbox"/> HAND AUGER																																																																			
	<input type="checkbox"/> TRICONE _____ * STEEL TEETH	<input type="checkbox"/> SOUNDING ROD	<input type="checkbox"/> VANE SHEAR TEST																																																																			
	<input type="checkbox"/> TRICONE _____ * TUNG.-CARB.																																																																					
	<input type="checkbox"/> CORE BIT																																																																					
PLASTICITY										COLOR																																																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NON PLASTIC</th> <th>PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> </thead> <tbody> <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> </tbody> </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	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.																																													
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																																																																				

**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)

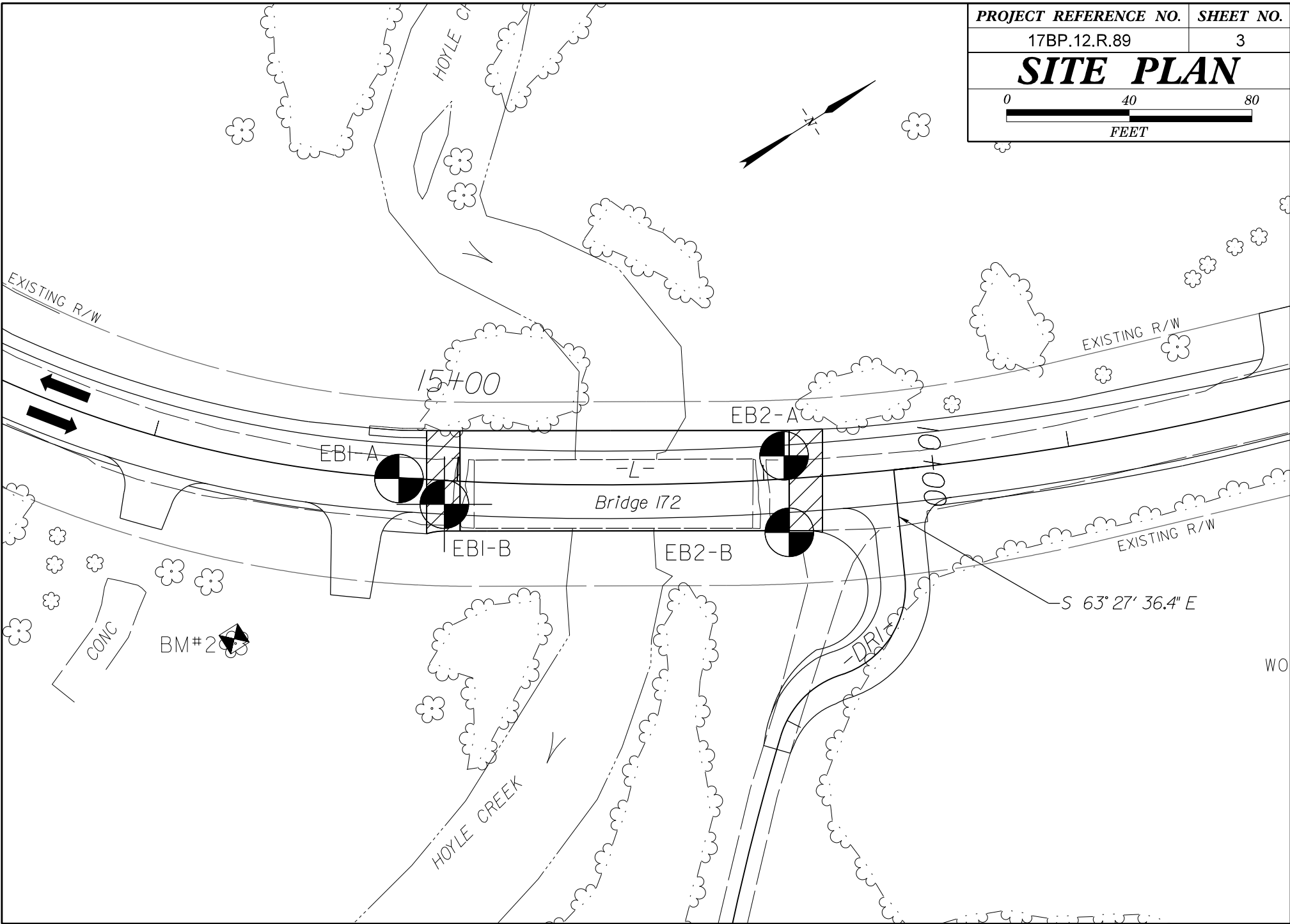
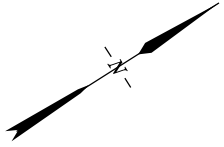
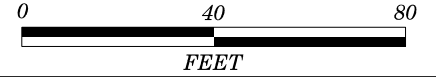
ROCK DESCRIPTION		TERMS AND DEFINITIONS	
<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 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. 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 (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. STRATA CORE RECOVERY (SREC.) - 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>	
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, WOULD YIELD SPT N VALUES > 100 BPF</i>		
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. <i>IF TESTED, WOULD YIELD 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. 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.		
MEDIUM HARD	CAN BE GROVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.		
SOFT	CAN BE GROVED 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.		
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 FINGERNAIL.		
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			
FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF 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.		
		BENCH MARK: BM2: N 606980.66, E 1352883.3	
		ELEVATION: 741.79 FEET	
		NOTES:	
		FIAD = FILLED IMMEDIATELY AFTER DRILLING	

PROJECT REFERENCE NO. SHEET NO.

17BP.12.R.89

3

SITE PLAN



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.12.R.89	TIP LIB-350172	COUNTY GASTON	GEOLOGIST M. Snyder
SITE DESCRIPTION Bridge 350172 over Hoyle Creek on SR 1819 (Alexis High Shoals Rd.)			GROUND WTR (ft)
BORING NO. EB1-A	STATION 14+81	OFFSET CL	ALIGNMENT -L-
COLLAR ELEV. 742.0 ft	TOTAL DEPTH 10.7 ft	NORTHING 607,054	EASTING 1,352,868
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 88% 11/09/2016		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER L. Gonzalez	START DATE 10/05/17	COMP. DATE 10/05/17	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
745																
740	738.4	3.6	1	2	2											
735	733.4	8.6	4	6	29											
	731.4	10.6	60/0.1			60/0.1										

GROUND SURFACE 0.0

0.5' Asphalt Pavement 0.9

ROADWAY EMBANKMENT

Brown, orange, soft, moderately plastic silty CLAY (A-6) 6.0

RESIDUAL

Brown, white, dense, silty fine to coarse SAND (A-2-4), little rock fragments, saprolitic 10.6

CRYSTALLINE ROCK

GRANITE 10.7

Boring Terminated at Elevation 731.3 ft in Crystalline Rock: GRANITE

- Offset due to overhead lines
- Auger slow at 6.0'
- Auger refusal at 10.6'

NCDOT BORE SINGLE 172_GEO_EXDB_BRDG980172.GPJ NC_DOT.GDT 10/17/17

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.12.R.89	TIP LIB-350172	COUNTY GASTON	GEOLOGIST M. Snyder
SITE DESCRIPTION Bridge 350172 over Hoyle Creek on SR 1819 (Alexis High Shoals Rd.)			GROUND WTR (ft)
BORING NO. EB1-B	STATION 14+96	OFFSET 8 ft RT	ALIGNMENT -L-
COLLAR ELEV. 742.2 ft	TOTAL DEPTH 19.2 ft	NORTHING 607,062	EASTING 1,352,883
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 88% 11/09/2016		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER L. Gonzalez	START DATE 10/05/17	COMP. DATE 10/05/17	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)	
745																
740	738.5	3.7	2	1	2											
735	733.5	8.7	1	2	2											
730	730.0	12.2	60/0.0													
725																

742.2	GROUND SURFACE	0.0
742.6	0.4' Asphalt Pavement	0.4
	ROADWAY EMBANKMENT	
	Brown, very loose, silty fine SAND (A-2-4)	
736.2	Red, soft, fine sandy moderately plastic CLAY (A-6)	6.0
731.2	WEATHERED ROCK	11.0
730.0	GRANITE	12.2
	CRYSTALLINE ROCK	
	GRANITE	
723.0	Boring Terminated at Elevation 723.0 ft in Crystalline Rock: GRANITE	19.2
	- Auger slow at 11.0', - Auger refusal at 12.2'.	

NCDOT BORE SINGLE 172_GEO_EXDB_BRDG980172.GPJ NC_DOT_GDT 10/18/17

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 17BP.12.R.89				TIP LIB-350172				COUNTY GASTON				GEOLOGIST M. Snyder			
SITE DESCRIPTION Bridge 350172 over Hoyle Creek on SR 1819 (Alexis High Shoals Rd.)											GROUND WTR (ft)				
BORING NO. EB1-B				STATION 14+96				OFFSET 8 ft RT				ALIGNMENT -L-		0 HR. N/A	
COLLAR ELEV. 742.2 ft				TOTAL DEPTH 19.2 ft				NORTHING 607,062				EASTING 1,352,883		24 HR. N/A	
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 88% 11/09/2016							DRILL METHOD H.S. Augers				HAMMER TYPE Automatic				
DRILLER L. Gonzalez				START DATE 10/05/17				COMP. DATE 10/05/17				SURFACE WATER DEPTH N/A			
CORE SIZE NQ				TOTAL RUN 7.0 ft											
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS				
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %		ELEV. (ft)	DEPTH (ft)			
730											Begin Coring @ 12.2 ft				
	730.0	12.2	2.0	N=60/0.0 1:12/1.0	(1.3)	(0.0)		(4.7)	(2.2)		730.0	12.2			
	728.0	14.2		1:03/1.0	65%	0%		67%	31%						
725			5.0	1:26/1.0	(3.4)	(2.2)									
				1:10/1.0	68%	44%									
	723.0	19.2		1:47/1.0 1:45/1.0 2:02/1.0							723.0	19.2			
											Boring Terminated at Elevation 723.0 ft in Crystalline Rock: GRANITE				
											- Auger slow at 11.0', - Auger refusal at 12.2'.				

NCDOT CORE SINGLE 172_GEO_EXDB_BRDG980172.GPJ NC_DOT_GDT 10/18/17

CORE PHOTOGRAPHS

Gatson County
Bridge No. 172 over Hoyle Creek on SR 1819 (Alexis High Shoals Road)

EB1-B
BOX 1: 12.2 TO 19.2 FEET



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.12.R.89		TIP LIB-350172		COUNTY GASTON		GEOLOGIST M. Snyder	
SITE DESCRIPTION Bridge 350172 over Hoyle Creek on SR 1819 (Alexis High Shoals Rd.)							GROUND WTR (ft)
BORING NO. EB2-A		STATION 16+07		OFFSET 8 ft LT		ALIGNMENT -L-	0 HR. Dry
COLLAR ELEV. 742.0 ft		TOTAL DEPTH 26.0 ft		NORTHING 607,164		EASTING 1,352,929	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 88% 11/09/2016				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER L. Gonzalez		START DATE 10/05/17		COMP. DATE 10/05/17		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)		
745																	
740	738.4	3.6	2	1	2										742.0	GROUND SURFACE	
															741.6	0.4 Asphalt Pavement	
																	ROADWAY EMBANKMENT
																	Red-brown, soft, fine sandy moderately plastic silty CLAY (A-6)
735	733.4	8.6	2	3	3										735.0	Red-brown, gray, medium stiff, fine sandy SILT (A-4)	
															732.0	RESIDUAL	
																	Orange, brown, gray, loose, silty fine SAND (A-2-4), saprolitic
730	728.4	13.6	2	4	5												
725	723.4	18.6	14	100/0.5											723.0	WEATHERED ROCK	
																	GRANITE
720	718.4	23.6	100/0.3														
	716.1	25.9	60/0.1												716.1	CRYSTALLINE ROCK	
															716.0	GRANITE	
																	Boring Terminated at Elevation 716.0 ft in Crystalline Rock: GRANITE
																	- Auger slow at 19.0', - Auger refusal at 25.9'.

NCDOT BORE SINGLE 172_GEO_EXDB_BRDG980172.GPJ NC_DOT.GDT 10/17/17

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.12.R.89	TIP LIB-350172	COUNTY GASTON	GEOLOGIST M. Snyder
SITE DESCRIPTION Bridge 350172 over Hoyle Creek on SR 1819 (Alexis High Shoals Rd.)			GROUND WTR (ft)
BORING NO. EB2-B	STATION 16+07	OFFSET 17 ft RT	ALIGNMENT -L-
COLLAR ELEV. 742.3 ft	TOTAL DEPTH 32.7 ft	NORTHING 607,152	EASTING 1,352,951
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 88% 11/09/2016		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER L. Gonzalez	START DATE 10/05/17	COMP. DATE 10/05/17	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					
745															
740	738.8	3.5	1	1	1									GROUND SURFACE 0.0 0.4' Asphalt Pavement 0.4	
735	733.8	8.5	2	4	3									ROADWAY EMBANKMENT Brown, soft, fine sandy slightly plastic silty CLAY (A-6)	
730	728.8	13.5	3	8	11									Brown, loose, silty fine to coarse SAND (A-2-4)	
725	723.8	18.5	20	15	36									RESIDUAL Brown, white, medium dense to very dense, silty fine to coarse SAND (A-2-4), trace to little rock fragments, saprolitic	
720	718.8	23.5	100/0.3											WEATHERED ROCK GRANITE	
715	713.8	28.5	100/0.2												
710	709.6	32.7	60/0.0											CRYSTALLINE ROCK GRANITE Boring Terminated at Elevation 709.6 ft on Crystalline Rock: GRANITE - Auger slow at 22.0', - Auger refusal at 32.7'.	

NCDOT BORE SINGLE 172_GEO_EXDB_BRDG980172.GPJ NC_DOT.GDT 10/17/17