

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	WBS NO. 17BP.14.R.46	1	8

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. WBS NO. 17BP.14.R.46 F.A. PROJ. _____

COUNTY JACKSON

PROJECT DESCRIPTION DIVISION 14

LOW IMPACT BRIDGE REPLACEMENT

SITE DESCRIPTION BRIDGE NO. 55 ON SR 1552

(LITTLE SAVANNAH ROAD) OVER LONG BRANCH

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PERSONNEL

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INVESTIGATED BY F&H

CHECKED BY S. PROVANCE

SUBMITTED BY F&H

DATE 10/21/2011

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. 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) 250-4088. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE. INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA, AND BOREHOLE INFORMATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS. THE LABORATORY SAMPLE DATA AND THE IN SITU (ON-PLACED) 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 DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION 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.

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - 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.

DRAWN BY: T. RIDEOUT



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

SOIL DESCRIPTION										GRADATION									
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LENSES, HIGHLY PLASTIC, A-7-6</i>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.									
										ANGULARITY OF GRAINS									
										THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS <u>ANGULAR</u> , <u>SUBANGULAR</u> , <u>SUBROUNDED</u> , OR <u>ROUNDED</u> .									
SOIL LEGEND AND AASHTO CLASSIFICATION										MINERALOGICAL COMPOSITION									
MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.										COMPRESSIBILITY									
SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE										LIQUID LIMIT LESS THAN 31 LIQUID LIMIT EQUAL TO 31-50 LIQUID LIMIT GREATER THAN 50									
PERCENTAGE OF MATERIAL										PERCENTAGE OF MATERIAL									
ORGANIC MATERIAL										OTHER MATERIAL									
TRACE OF ORGANIC MATTER										TRACE 1 - 10%									
LITTLE ORGANIC MATTER										LITTLE 10 - 20%									
MODERATELY ORGANIC										SOME 20 - 35%									
HIGHLY ORGANIC										HIGHLY 35% AND ABOVE									
GROUND WATER										GROUND WATER									
WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING										WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING									
STATIC WATER LEVEL AFTER 24 HOURS										STATIC WATER LEVEL AFTER 24 HOURS									
PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA										PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA									
SPRING OR SEEP										SPRING OR SEEP									
CONSISTENCY OR DENSENESS										MISCELLANEOUS SYMBOLS									
PRIMARY SOIL TYPE										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION									
COMPACTNESS OR CONSISTENCY										SOIL SYMBOL									
RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)										ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT									
RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TENS/FT ²)										INFERRED SOIL BOUNDARY									
VERY LOOSE										INFERRED ROCK LINE									
LOOSE										ALLUVIAL SOIL BOUNDARY									
MEDIUM DENSE										DIP & DIP DIRECTION OF ROCK STRUCTURES									
DENSE										TEST BORING									
VERY DENSE										AUGER BORING									
VERY SOFT										CORE BORING									
SOFT										MONITORING WELL									
MEDIUM STIFF										PIEZOMETER INSTALLATION									
STIFF										SLOPE INDICATOR INSTALLATION									
VERY STIFF										CONE PENETROMETER TEST									
HARD										SOUNDING ROD									
TEXTURE OR GRAIN SIZE										ABBREVIATIONS									
U.S. STD. SIEVE SIZE										AR - AUGER REFUSAL									
OPENING (MM)										BT - BORING TERMINATED									
4										CL - CLAY									
4.75										CPT - CONE PENETRATION TEST									
10										CSE - COARSE									
2.00										DMT - DILATOMETER TEST									
40										DPT - DYNAMIC PENETRATION TEST									
0.42										e - VOID RATIO									
0.25										F - FINE									
0.075										FOSS - FOSSILIFEROUS									
0.05										FRAC - FRACTURED, FRACTURES									
0.005										FRAGS - FRAGMENTS									
										HL - HIGHLY									
										MED. - MEDIUM									
										MICA - MICACEOUS									
										MOD. - MODERATELY									
										NP - NON PLASTIC									
										ORG. - ORGANIC									
										PMT - PRESSUREMETER TEST									
										SAP. - SAPROLITIC									
										SD. - SAND, SANDY									
										SL. - SILT, SILTY									
										SLI. - SLIGHTLY									
										TCR - TRICONE REFUSAL									
										w - MOISTURE CONTENT									
										V - VERY									
										VST - VANE SHEAR TEST									
										WEA. - WEATHERED									
										UNIT WEIGHT									
										DRY UNIT WEIGHT									
										SAMPLE ABBREVIATIONS									
										S - BULK									
										SS - SPLIT SPOON									
										ST - SHELBY TUBE									
										RS - ROCK									
										RT - RECOMPACTED TRIAXIAL									
										CBR - CALIFORNIA BEARING RATIO									
SOIL MOISTURE - CORRELATION OF TERMS										EQUIPMENT USED ON SUBJECT PROJECT									
SOIL MOISTURE SCALE (ATTERBERG LIMITS)										DRILL UNITS:									
FIELD MOISTURE DESCRIPTION										ADVANCING TOOLS:									
GUIDE FOR FIELD MOISTURE DESCRIPTION										HAMMER TYPE:									
- SATURATED - (SAT.)										☒ AUTOMATIC ☐ MANUAL									
USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE										CORE SIZE:									
- WET - (W)										☐ -B									
SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE										☐ -N									
- MOIST - (M)										☐ -H									
SOLID; AT OR NEAR OPTIMUM MOISTURE										HAND TOOLS:									
- DRY - (D)										☐ POST HOLE DIGGER									
REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE										☐ HAND AUGER									
										☐ SOUNDING ROD									
										☐ VANE SHEAR TEST									
PLASTICITY																			
PLASTICITY INDEX (PI)																			
DRY STRENGTH																			
NONPLASTIC																			
LOW PLASTICITY																			
MED. PLASTICITY																			
HIGH PLASTICITY																			
COLOR																			
DESCRIPTORS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.																			

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SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

ROCK DESCRIPTION		TERMS AND DEFINITIONS	
HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 60 BLOWS PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:			
WEATHERED ROCK (WR)		NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.	
CRYSTALLINE ROCK (CR)		FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	
NON-CRYSTALLINE ROCK (NCR)		FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	
COASTAL PLAIN SEDIMENTARY ROCK (CP)		COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.	
WEATHERING			
FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.		
VERY SLIGHT (V SL.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.		
SLIGHT (SL.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH, OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.		
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.		
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <u>IF TESTED, WOULD YIELD SPT REFUSAL</u>		
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. <u>IF TESTED, YIELDS SPT N VALUES > 100 BPF</u>		
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, YIELDS SPT N VALUES < 100 BPF</u>		
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 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.		
SOFT	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.		
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 FEET	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 THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.			
FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.		
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.		
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.		
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.		
ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.		ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.	
AQUIFER - A WATER BEARING FORMATION OR STRATA.		ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.	
ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.		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.	
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.	
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.	
FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.		FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.	
FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.		FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.	
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.	
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.	
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.	
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.	
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.	
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.	
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.	
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.	
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.	
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.	
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.	
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 60 BLOWS PER 60 BLOWS.	
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 60 BLOWS 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 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.	
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.	
BENCH MARK: ORANGE PAINT CIRCLE LABELED G SE CORNER OF BRIDGE DECK (NEAREST EB1-B)			
ELEVATION: 100 FT.			
NOTES:			

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N.C.	WBS NO. 17BP.14.R.46	3	8



DRAWN BY: T. RIDEOUT



WBS 17BP.14.R.46			TIP 17BP.14.R.46			COUNTY JACKSON			GEOLOGIST Smith, B. C.						
SITE DESCRIPTION Bridge No. 55 on -L- (SR 1552, Little Savannah Road) over Long Branch									GROUND WTR (ft)						
BORING NO. EB1-A			STATION 11+48			OFFSET 18 ft LT			ALIGNMENT -L-						
COLLAR ELEV. 100.7 ft			TOTAL DEPTH 75.0 ft			NORTHING 593,094			EASTING 749,819						
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 82% 10/5/2010						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER Whichard, W.			START DATE 10/14/11			COMP. DATE 10/14/11			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					
105															
100	100.7	0.0	3	2	2									GROUND SURFACE	0.0
														ALLUVIAL	
	97.2	3.5	1	3	12									Brown, loose, silty, fine grain sand & gravel (A-1-b).	2.5
95														ALLUVIAL	
	92.2	8.5	3	3	2									Brown, stiff, clayey sand w/trace gravel (A-2-7).	6.0
90														RESIDUAL	
	87.2	13.5	2	2	4									Brown, med. stiff to v. stiff, saprolitic, f. sandy, micaceous silt (A-4).	
85															
	82.2	18.5	3	4	6										
80															
	77.2	23.5	3	5	7										
75															
	72.2	28.5	3	6	7										
70															
	67.2	33.5	3	5	8										
65															
	62.2	38.5	3	6	8										
60															
	57.2	43.5	5	8	11										
55															
	52.2	48.5	9	12	18									RESIDUAL	46.0
50														Brown, dense, saprolitic, silty, fine grain, micaceous sand (A-3).	
	47.2	53.5	13	20	26										
45															
	42.2	58.5	47	53/0.5										WEATHERED ROCK	56.0
40														Weathered rock (Biotite Gneiss).	
	37.2	63.5	17	24	32										
35														RESIDUAL	61.0
	32.2	68.5	29	71/0.5										Brown, v. dense, saprolitic, silty, fine grain, micaceous sand (A-3).	
30														WEATHERED ROCK	66.0
	27.2	73.5	36	46	50/0.5									Weathered rock (Biotite Gneiss).	
													</		



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

SHEET 4 OF 7

WBS 17BP.14.R.46		TIP 17BP.14.R.46		COUNTY JACKSON		GEOLOGIST Smith, B. C.							
SITE DESCRIPTION Bridge No. 55 on -L- (SR 1552, Little Savannah Road) over Long Branch							GROUND WTR (ft)						
BORING NO. EB1-A		STATION 11+48		OFFSET 18 ft LT		ALIGNMENT -L-							
COLLAR ELEV. 100.7 ft		TOTAL DEPTH 75.0 ft		NORTHING 593,094		EASTING 749,819							
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 82% 10/5/2010				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic							
DRILLER Whichard, W.		START DATE 10/14/11		COMP. DATE 10/14/11		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			
25						Match Line							
												Boring Terminated at Elevation 25.7 ft in Weathered Rock (Biotite Gneiss). Bearing capacity reached around 58'.	



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 5 OF 7

WBS 17BP.14.R.46	TIP 17BP.14.R.46	COUNTY JACKSON	GEOLOGIST Smith, B. C.
SITE DESCRIPTION Bridge No. 55 on -L- (SR 1552, Little Savannah Road) over Long Branch			
BORING NO. EB1-B	STATION 11+08	OFFSET 25 ft RT	ALIGNMENT -L-
COLLAR ELEV. 103.0 ft	TOTAL DEPTH 58.6 ft	NORTHING 593,038	EASTING 749,842
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 82% 10/5/2010		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Whichard, W.	START DATE 10/13/11	COMP. DATE 10/13/11	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
105														
	103.0	0.0	8	17	11								GROUND SURFACE	0.0
100	99.5	3.5	19	22	15							M	ALLUVIAL	
													Brown, med. dense to dense, silty, fine grain sand & gravel (A-1-b).	
95	94.5	8.5	3	2	2							M		
													RESIDUAL	6.0
90	89.5	13.5	2	3	4							M	Brown, black & white, soft to hard, saprolitic, f. sandy, micaceous silt (A-4).	
85	84.5	18.5	3	3	6							M		
80	79.5	23.5	3	3	6							M		
75	74.5	28.5	3	5	6							W		
70	69.5	33.5	4	4	6							W		
65	64.5	38.5	5	6	7							W		
60	59.5	43.5	10	16	32							W		
55	54.5	48.5	20	29	61								RESIDUAL	46.0
													Brown & white, v. dense, saprolitic, silty, fine grain, micaceous sand (A-3).	
50	49.5	53.5	42	58/0.4									WEATHERED ROCK	51.0
													Weathered rock (Biotite Gneiss).	
45	44.5	58.5	60/0.1											
													Boring Terminated with Standard Penetration Test Refusal at Elevation 44.4 ft on Crystalline Rock (Biotite Gneiss).	58.5

NCDOT BORE SINGLE GEO BRDG0055.GPJ NC_DOT.GDT 10/20/11

WBS 17BP.14.R.46			TIP 17BP.14.R.46			COUNTY JACKSON			GEOLOGIST Smith, B. C.							
SITE DESCRIPTION Bridge No. 55 on -L- (SR 1552, Little Savannah Road) over Long Branch									GROUND WTR (ft)							
BORING NO. EB2-A			STATION 12+20			OFFSET 5 ft LT			ALIGNMENT -L-							
COLLAR ELEV. 99.5 ft			TOTAL DEPTH 75.0 ft			NORTHING 593,159			EASTING 749,862							
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 82% 10/5/2010						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic							
DRILLER Whichard, W.			START DATE 10/13/11			COMP. DATE 10/13/11			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)		
100																
	99.5	0.0	1	2	2	4								99.5	GROUND SURFACE	0.0
	96.0	3.5	2	1	2	3								97.0	ALLUVIAL Brown, loose, silty, fine grain sand (A-3).	2.5
95															ALLUVIAL Brown, soft, silty clay (A-6).	
														93.5		6.0
	91.0	8.5	2	2	3	5									RESIDUAL Brown, med. stiff to stiff, saprolitic, f. sandy, micaceous silt (A-4).	
90																
	86.0	13.5	2	4	4	8										
85																
	81.0	18.5	3	4	8	12										
80																
	76.0	23.5	6	7	7	14										
75																
	71.0	28.5	3	6	9	15										
70																
	66.0	33.5	4	6	9	15										
65																
	61.0	38.5	4	5	10	15										
60																
	56.0	43.5	5	9	11	20								58.5	RESIDUAL Brown & white, med. dense to dense, saprolitic, silty, fine grain, micaceous sand (A-3).	41.0
55																
	51.0	48.5	8	10	15	25										
50																
	46.0	53.5	8	13	22	35										
45																
	41.0	58.5	12	18	18	36										
40																
	36.0	63.5	9	13	22	35										
35																
	31.0	68.5	10	13	21	34										
30																
	26.0	73.5	11	16	30	46										
25																
														24.5	Boring Terminated at Elevation 24.5 ft in Residual Saprolitic, Silty, Fine Grain Sand. Bearing capacity reached around 58'.	75.0



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

SHEET 7 OF 7

WBS 17BP.14.R.46		TIP 17BP.14.R.46		COUNTY JACKSON		GEOLOGIST Smith, B. C.						
SITE DESCRIPTION Bridge No. 55 on -L- (SR 1552, Little Savannah Road) over Long Branch						GROUND WTR (ft)						
BORING NO. EB2-B		STATION 12+58		OFFSET 2 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 99.5 ft		TOTAL DEPTH 65.5 ft		NORTHING 593,169		EASTING 749,902						
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 82% 10/5/2010						DRILL METHOD H.S. Augers						
DRILLER Whichard, W.						HAMMER TYPE Automatic						
START DATE 10/18/11		COMP. DATE 10/18/11		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)
100												
	99.5	0.0	3	4	4							GROUND SURFACE 0.0
											M	ALLUVIAL
	96.0	3.5	14	18	19						M	97.5 Brown, loose, fine grain sand w/trace gravel (A-3). 2.0
95												ALLUVIAL
												93.5 Brown, dense, f. grain sand w/gravel (A-1-b). 6.0
	91.0	8.5	20	7	8						M	ALLUVIAL
90												Brown, med. dense, silty, f. grain sand w/trace gravel (A-3).
	86.0	13.5	4	4	6						W	88.5 ALLUVIAL 11.0
85												Brown, stiff, f. sandy, silty clay and gravel (A-2-6).
	81.0	18.5	6	6	10						W	83.5 RESIDUAL 16.0
80												Brown, orange brown & white, stiff to v. stiff, saprolitic, f. sandy, micaceous silt (A-4).
	76.0	23.5	3	4	7						W	
75												
	71.0	28.5	3	5	8						W	
70												
	66.0	33.5	4	7	10						W	
65												
	61.0	38.5	5	9	13						W	
60												
	56.0	43.5	6	11	15						W	
55												
	51.0	48.5	6	8	14						M	
50												53.5 RESIDUAL 46.0
	46.0	53.5	6	11	15						M	Brown w/some red & white, med. dense to dense, saprolitic, silty, f. grain micaceous sand (A-3).
45												
	41.0	58.5	9	12	20						M	
40												
	36.0	63.5	10	13	57						M	
35												
	34.0	65.5	60/0.0								M	34.0 Boring Terminated with Auger & Standard Penetration Test Refusal at Elevation 34.0 ft on Crystalline Rock (Biotite Gneiss). 65.5

NCDOT BORE SINGLE GEO_BRDG0055.GPJ NC_DOT_GDT 10/25/11