

PROJECT: 17BP.2.R.77

REFERENCE: SF-510032

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY JONES  
PROJECT DESCRIPTION BRIDGE NO. 32 ON -L- (SR 1142)  
OVER TUCKAHOE CREEK

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-510032	1	12

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.

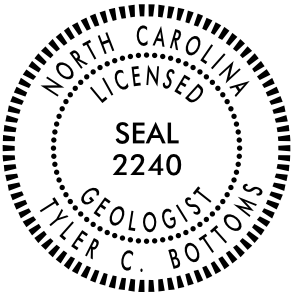
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND 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.

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SUBMITTED BY D.N. ARGENBRIGHT  
DATE NOVEMBER 2017



DocuSigned by:  
Tyler Bottoms 1/8/2018  
48A2D3BD08CF4A6...  
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

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
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.										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:  WEATHERED ROCK (WR)  CRYSTALLINE ROCK (ICR)  NON-CRYSTALLINE ROCK (NCR)  COASTAL PLAIN SEDIMENTARY ROCK (CP)										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. FLOOD - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOOGED 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 (ROD) - 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 (SROD) - 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.									
SOIL LEGEND AND AASHTO CLASSIFICATION										MINERALOGICAL COMPOSITION										WEATHERING																			
GENERAL CLASS.										MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.										FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE																			
GROUP CLASS.										COMPRESSIBILITY										ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. 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. 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. 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. 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> 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 &gt; 100 BPF</i> 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 &lt; 100 BPF</i> 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.																			
SYMBOL										PERCENTAGE OF MATERIAL										WEATHERING																			
Z PASSING #10 #20 #40										ORGANIC MATERIAL TRACE OF ORGANIC MATTER LITTLE ORGANIC MATTER MODERATELY ORGANIC HIGHLY ORGANIC										GROUND WATER																			
MATERIAL PASSING #40 LL PI										GROUND WATER										ROCK HARDNESS																			
GROUP INDEX										GROUND WATER										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
USUAL TYPES OF MAJOR MATERIALS										GROUND WATER										ROCK HARDNESS																			
GEN. RATING AS SUBGRADE										GROUND WATER										ROCK HARDNESS																			
PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30										GROUND WATER										ROCK HARDNESS																			
CONSISTENCY OR DENSENESS										RECOMMENDATION SYMBOLS										ROCK HARDNESS																			
PRIMARY SOIL TYPE										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
GENERAL COMPACTNESS OR CONSISTENCY										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
GENERAL PENETRATION RESISTANCE (N-VALUE)										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
GENERAL UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
TEXTURE OR GRAIN SIZE										RECOMMENDATION SYMBOLS										ROCK HARDNESS																			
U.S. STD. SIEVE SIZE OPENING (MM)										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
BOULDER (BLDR.)										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
COBBLE (COB.)										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
GRAVEL (GR.)										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
COARSE SAND (CSE. SD.)										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
FINE SAND (F SD.)										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
SILT (SL.)										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
CLAY (CL.)										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
GRAIN SIZE										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
SOIL MOISTURE - CORRELATION OF TERMS										RECOMMENDATION SYMBOLS										ROCK HARDNESS																			
SOIL MOISTURE SCALE (ATTERBERG LIMITS)										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
FIELD MOISTURE DESCRIPTION										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
GUIDE FOR FIELD MOISTURE DESCRIPTION										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
LL - LIQUID LIMIT										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
PL - PLASTIC LIMIT										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
OM - OPTIMUM MOISTURE SHRINKAGE LIMIT										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
SL - SHRINKAGE LIMIT										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
PLASTICITY										RECOMMENDATION SYMBOLS										ROCK HARDNESS																			
NON PLASTIC										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
SLIGHTLY PLASTIC										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
MODERATELY PLASTIC										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
HIGHLY PLASTIC										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			
COLOR										RECOMMENDATION SYMBOLS										ROCK HARDNESS																			
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.										RECOMMENDATION SYMBOLS										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																			

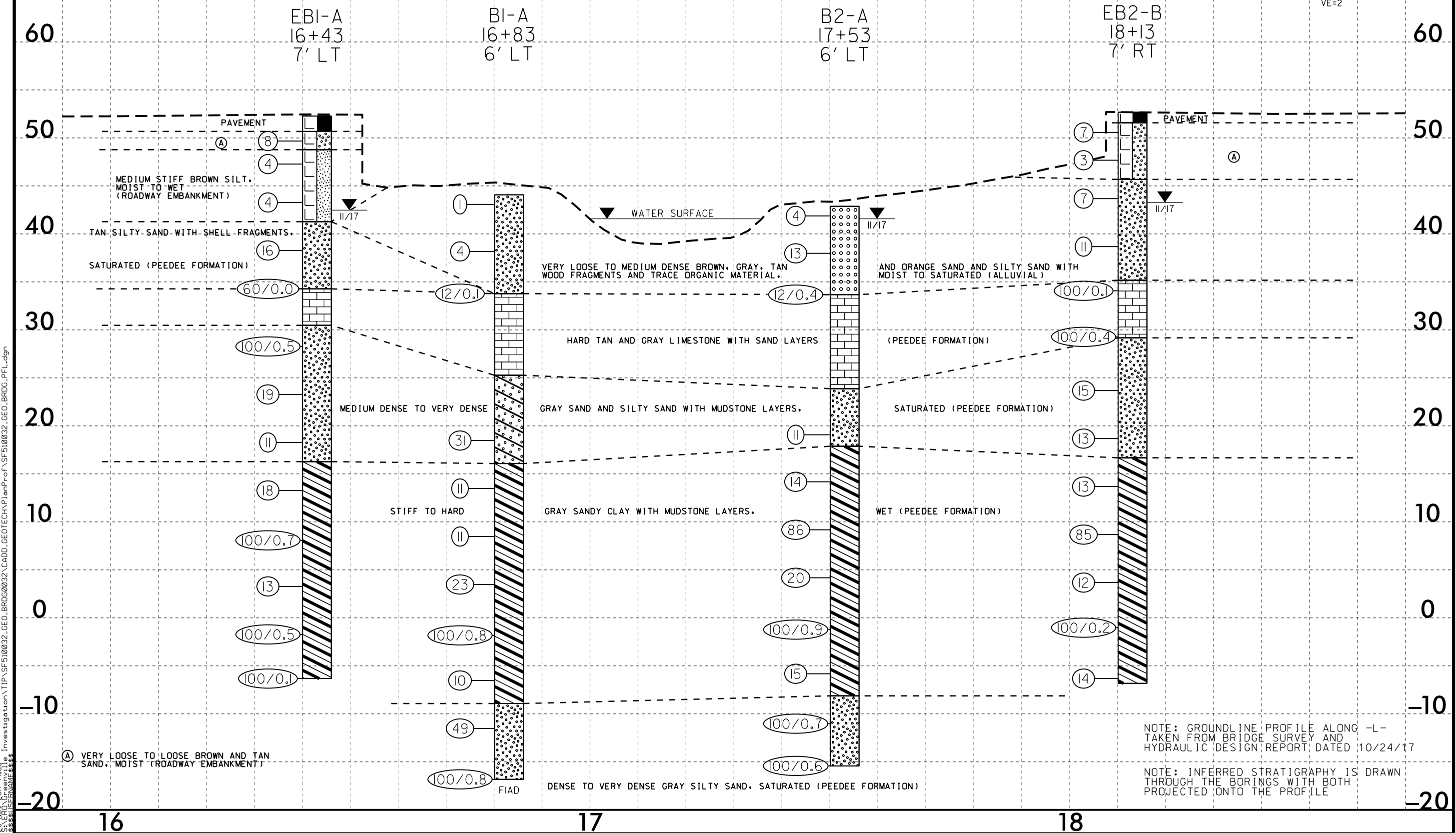


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PROFILE THROUGH BORINGS PROJECTED ALONG -L-

PROJECT REFERENCE NO. <b>SF-510032</b>		SHEET NO. <b>4</b>	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION			
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED			





GEOTECHNICAL BORING REPORT  
BORE LOG

WBS 17BP.2.R.77			TIP SF-510032			COUNTY JONES			GEOLOGIST Zimarino, S. N.					
SITE DESCRIPTION BRIDGE NUMBER 32 ON -L- (SR 1142) OVER TUCKAHOE CREEK									GROUND WTR (ft)					
BORING NO. EB1-A			STATION 16+43			OFFSET 7 ft LT			ALIGNMENT -L-			0 HR. N/A		
COLLAR ELEV. 52.3 ft			TOTAL DEPTH 58.6 ft			NORTHING 469,591			EASTING 2,425,238			24 HR. 9.8		
DRILL RIG/HAMMER EFF./DATE GFO0075 CME-45C 84% 08/21/2017						DRILL METHOD Mud Rotary			HAMMER TYPE Automatic					
DRILLER Edmondson, J. M.			START DATE 11/13/17			COMP. DATE 11/13/17			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)
55														
													52.3	GROUND SURFACE 0.0
	50.7	1.6	1	3	5								50.7	1.6
50													48.8	ROADWAY EMBANKMENT 3.5
	48.3	4.0	1	2	2									ROADWAY EMBANKMENT BROWN SAND, MOIST
														ROADWAY EMBANKMENT BROWN SILT, MOIST TO WET
45													41.3	11.0
	44.3	8.0	1	1	3									COASTAL PLAIN
40														TAN SILTY SAND WITH SHELL FRAGMENTS, SATURATED (PEEDEE FORMATION)
	39.3	13.0	10	10	6									
35													34.3	18.0
	34.3	18.0	60/0.0											COASTAL PLAIN SEDIMENTARY ROCK
30														HARD GRAY LIMESTONE (PEEDEE FORMATION)
	29.3	23.0	16	100/0.5									30.5	21.8
25														COASTAL PLAIN
	24.3	28.0	10	9	10									GRAY SILTY SAND WITH MUDSTONE LAYERS, SATURATED (PEEDEE FORMATION)
20														
	19.3	33.0	3	5	6									
15													16.3	36.0
	14.3	38.0	5	8	10									COASTAL PLAIN
10														GRAY SANDY CLAY WITH MUDSTONE LAYERS, WET (PEEDEE FORMATION)
	9.3	43.0	8	37	63/0.2									
5														
	4.3	48.0	8	7	6									
0														
	-0.7	53.0	50	100/0.5										
-5														
	-5.7	58.0	52	100/0.1										
													-6.3	58.6
														Boring Terminated at Elevation -6.3 ft in Very Hard Sandy Clay

NCDOT BORE DOUBLE SF510032.GPJ NC\_DOT.GDT 11/28/17

GEOTECHNICAL BORING REPORT  
BORE LOG

WBS 17BP.2.R.77			TIP SF-510032			COUNTY JONES			GEOLOGIST Kintner, A. N.					
SITE DESCRIPTION BRIDGE NUMBER 32 ON -L- (SR 1142) OVER TUCKAHOE CREEK									GROUND WTR (ft)					
BORING NO. B1-A			STATION 16+83			OFFSET 6 ft LT			ALIGNMENT -L-			0 HR. N/A		
COLLAR ELEV. 44.1 ft			TOTAL DEPTH 60.9 ft			NORTHING 469,629			EASTING 2,425,226			24 HR. FIAD		
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 90% 07/12/2016						DRILL METHOD Mud Rotary			HAMMER TYPE Automatic					
DRILLER Pinter, D. G.			START DATE 11/20/17			COMP. DATE 11/20/17			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		MOI		ELEV. (ft) DEPTH (ft)
45														
	44.1	0.0												44.1 GROUND SURFACE 0.0
			WOH	WOH	1									ALLUVIAL
														BROWN SILTY SAND WITH WOOD FRAGMENTS, MOIST TO SATURATED
40	39.2	4.9												
			2	2	2									
35	33.9	10.2												
			12/0.1											33.8 10.3
														33.6 10.5
														COASTAL PLAIN SEDIMENTARY ROCK
														HARD TAN AND GRAY LIMESTONE WITH SAND LAYERS (PEEDEE FORMATION)
30														
25														25.3 18.8
														COASTAL PLAIN
														GRAY CLAYEY SAND, SATURATED (PEEDEE FORMATION)
20	19.5	24.6												
			9	14	17									
15	14.5	29.6												16.1 28.0
			3	5	6									COASTAL PLAIN
														GRAY SANDY CLAY, WET (PEEDEE FORMATION)
10	9.5	34.6												
			3	5	6									
5	4.5	39.6												
			6	13	10									
0	-0.5	44.6												
			5	6	94/0.3									
-5	-5.5	49.6												
			4	4	6									
-10	-10.5	54.6												-8.9 53.0
			6	21	28									COASTAL PLAIN
														GRAY SILTY SAND, SATURATED (PEEDEE FORMATION)
-15	-15.5	59.6												
			14	45	55/0.3									-16.8 60.9
														Boring Terminated at Elevation -16.8 ft in Very Dense Sand

NCDOT BORE DOUBLE SF510032.GPJ NC\_DOT.GDT 11/28/17

GEOTECHNICAL BORING REPORT  
CORE LOG

WBS 17BP.2.R.77				TIP SF-510032				COUNTY JONES				GEOLOGIST Kintner, A. N.							
SITE DESCRIPTION BRIDGE NUMBER 32 ON -L- (SR 1142) OVER TUCKAHOE CREEK												GROUND WTR (ft)							
BORING NO. B1-A				STATION 16+83				OFFSET 6 ft LT				ALIGNMENT -L-				0 HR. N/A			
COLLAR ELEV. 44.1 ft				TOTAL DEPTH 60.9 ft				NORTHING 469,629				EASTING 2,425,226				24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 90% 07/12/2016								DRILL METHOD Mud Rotary				HAMMER TYPE Automatic							
DRILLER Pinter, D. G.				START DATE 11/20/17				COMP. DATE 11/20/17				SURFACE WATER DEPTH N/A							
CORE SIZE NX				TOTAL RUN 11.5 ft															
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS								
					REC. (ft) %	ROD (ft) %		REC. (ft) %	ROD (ft) %				ELEV. (ft)	DEPTH (ft)					
33.58												Begin Coring @ 10.5 ft							
	33.6 32.1	10.5 12.0	1.5	0:27/0.5 0:52/1.0	(1.4) 93%	(1.4) 93%		(3.1) 37%	(1.8) 22%		33.6	HARD TAN AND GRAY LIMESTONE WITH SAND LAYERS (PEEDEE FORMATION)	10.5						
30			5.0	0:18/1.0 0:06/1.0 0:15/1.0 0:24/1.0 0:07/1.0	(1.7) 34%	(0.4) 8%													
25		27.1	17.0								25.3	COASTAL PLAIN GRAY CLAYEY SAND, SATURATED (PEEDEE FORMATION)	18.8						
			5.0	0:10/1.0 3:12/1.0 0:03/1.0 0:04/1.0 0:02/1.0	(0.1) 2%	(0.0) 0%													
20		22.1	22.0																
				N=31															
15											16.1	COASTAL PLAIN GRAY SANDY CLAY, WET (PEEDEE FORMATION)	28.0						
				N=11															
10																			
				N=11															
5																			
				N=23															
0																			
				N=100/0.8															
-5																			
				N=10															
-10											-8.9	COASTAL PLAIN GRAY SILTY SAND, SATURATED (PEEDEE FORMATION)	53.0						
				N=49															
-15																			
				N=100/0.8							-16.8	Boring Terminated at Elevation -16.8 ft in Very Dense Sand	60.9						

NCDOT CORE DOUBLE SF510032.GPJ NC\_DOT.GDT 11/28/17


# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 17BP.2.R.77				TIP SF-510032				COUNTY JONES				GEOLOGIST Kintner, A. N.					
SITE DESCRIPTION BRIDGE NUMBER 32 ON -L- (SR 1142) OVER TUCKAHOE CREEK												GROUND WTR (ft)					
BORING NO. B2-A				STATION 17+53				OFFSET 6 ft LT				ALIGNMENT -L-				0 HR. N/A	
COLLAR ELEV. 42.9 ft				TOTAL DEPTH 58.3 ft				NORTHING 469,696				EASTING 2,425,203				24 HR. 1.3	
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 90% 07/12/2016								DRILL METHOD Mud Rotary				HAMMER TYPE Automatic					
DRILLER Pinter, D. G.				START DATE 11/16/17				COMP. DATE 11/16/17				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)
45																	
	42.9	0.0	1	2	2										42.9		GROUND SURFACE 0.0
40																	ALLUVIAL
	39.0	3.9	6	7	6												GRAY AND TAN SAND WITH TRACE ORGANICS, MOIST TO SATURATED
35																	
	34.1	8.8	12/0.4												33.7		9.2
30															33.4		COASTAL PLAIN SEDIMENTARY ROCK
																	HARD TAN AND GRAY LIMESTONE WITH SAND LAYERS (PEEDEE FORMATION)
25																	
20	20.1	22.8	7	6	5										23.9		19.0
																	COASTAL PLAIN
15	15.2	27.7	4	6	8												GRAY SILTY SAND WITH SHELL FRAGMENTS, SATURATED (PEEDEE FORMATION)
10	10.2	32.7	3	12	74												
	5.2	37.7	13	10	10												
5																	
	0.2	42.7	5	6	94/0.4												
0																	
	-4.8	47.7	3	6	9												
-5																	
	-9.8	52.7	32	61	39/0.2												
-10																	
	-14.8	57.7	65	35/0.1													
-15																	
													</				

NC DOT BORE DOUBLE SF510032.GPJ NC\_DOT.GDT 11/28/17

GEOTECHNICAL BORING REPORT  
CORE LOG

WBS 17BP.2.R.77				TIP SF-510032				COUNTY JONES				GEOLOGIST Kintner, A. N.							
SITE DESCRIPTION BRIDGE NUMBER 32 ON -L- (SR 1142) OVER TUCKAHOE CREEK												GROUND WTR (ft)							
BORING NO. B2-A				STATION 17+53				OFFSET 6 ft LT				ALIGNMENT -L-				0 HR. N/A			
COLLAR ELEV. 42.9 ft				TOTAL DEPTH 58.3 ft				NORTHING 469,696				EASTING 2,425,203				24 HR. 1.3			
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 90% 07/12/2016								DRILL METHOD Mud Rotary				HAMMER TYPE Automatic							
DRILLER Pinter, D. G.				START DATE 11/16/17				COMP. DATE 11/16/17				SURFACE WATER DEPTH N/A							
CORE SIZE NX				TOTAL RUN 11.0 ft															
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %RQD (ft) %		SAMP. NO.	STRATA REC. (ft) %RQD (ft) %		L O G	DESCRIPTION AND REMARKS ELEV. (ft) DEPTH (ft)								
33.37											Begin Coring @ 9.5 ft								
30	33.4	9.5	1.0	1:36/1.0	(1.0)	(1.0)		(3.0)	(2.1)		33.4 HARD TAN AND GRAY LIMESTONE WITH SAND LAYERS (PEEDEE FORMATION) 9.5								
	32.4	10.5	5.0	0:49/1.0 0:25/1.0 0:14/1.0 0:10/1.0 0:20/1.0	100% (1.5) 30%	100% (1.1) 22%													
	27.4	15.5	5.0	0:41/1.0 0:27/1.0 0:14/1.0 0:23/1.0 0:22/1.0	(0.5) 10%	(0.0) 0%													
25	22.4	20.5		N=11				23.9 COASTAL PLAIN 19.0											
GRAY SILTY SAND WITH SHELL FRAGMENTS, SATURATED (PEEDEE FORMATION)																			
20							15	10	5	0	-5	-10	-15	17.9 COASTAL PLAIN 25.0					
														GRAY SANDY CLAY WITH MUDSTONE LAYERS, WET (PEEDEE FORMATION)					
					-8.1 COASTAL PLAIN 51.0														
					GRAY AND TAN SILTY SAND, SATURATED (PEEDEE FORMATION)														
					-15.4 Boring Terminated at Elevation -15.4 ft in Very Dense Sand 58.3														

NCDOT CORE DOUBLE SF510032.GPJ NC\_DOT.GDT 11/28/17

GEOTECHNICAL BORING REPORT  
BORE LOG

WBS 17BP.2.R.77			TIP SF-510032			COUNTY JONES			GEOLOGIST Zimarino, S. N.					
SITE DESCRIPTION BRIDGE NUMBER 32 ON -L- (SR 1142) OVER TUCKAHOE CREEK									GROUND WTR (ft)					
BORING NO. EB2-B			STATION 18+13			OFFSET 7 ft RT			ALIGNMENT -L-			0 HR.	N/A	
COLLAR ELEV. 52.7 ft			TOTAL DEPTH 59.5 ft			NORTHING 469,757			EASTING 2,425,196			24 HR.	9.4	
DRILL RIG/HAMMER EFF./DATE GFO0075 CME-45C 84% 08/21/2017						DRILL METHOD Mud Rotary			HAMMER TYPE Automatic					
DRILLER Smith, R. E.			START DATE 11/14/17			COMP. DATE 11/14/17			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)
55														
	51.6	1.1	3	3	4								GROUND SURFACE 0.0	
50	48.7	4.0	2	1	2								ROADWAY EMBANKMENT 1.1	
													BROWN AND TAN SAND, MOIST	
45	44.7	8.0	2	3	4								ALLUVIAL 7.0	
													ORANGE AND TAN SAND, MOIST TO SATURATED	
40	39.7	13.0	2	5	6									
			32	100/0.1									COASTAL PLAIN SEDIMENTARY ROCK 17.5	
35	34.7	18.0											HARD TAN LIMESTONE (PEEDEE FORMATION)	
30	29.7	23.0	100/0.4										COASTAL PLAIN 23.5	
													GRAY SAND, SATURATED (PEEDEE FORMATION)	
25	24.7	28.0	7	7	8									
20	19.7	33.0	6	6	7									
													COASTAL PLAIN 36.0	
15	14.7	38.0	4	5	8								GRAY SANDY CLAY, WET (PEEDEE FORMATION)	
10	9.7	43.0	20	48	37									
5	4.7	48.0	5	6	6									
0	-0.3	53.0	11	100/0.2										
-5	-5.3	58.0	12	8	6									
													Boring Terminated at Elevation -6.8 ft in Stiff Sandy Clay	

NCDOT BORE DOUBLE SF510032.GPJ NC\_DOT.GDT 11/28/17



CORE PHOTOGRAPH  
B1-A  
10.5' TO 22.0'





CORE PHOTOGRAPH  
B2-A  
9.5' TO 20.5'

