

REFERENCE: B-5981

PROJECT: 47747

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY DUPLIN
PROJECT DESCRIPTION REPLACEMENT OF BRIDGE
NO. 16 ON US 117 (NBL) OVER CSX RR BETWEEN
SR 1320 AND US 117 ALT

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-9	BORE LOGS
10	SITE PHOTOGRAPH

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5981	1	10

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 1919 T07-6850. 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:
1. 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.
 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

- E. FERREIRA, EI
- CATLIN
- EJ. EDMONDSON
- A. CLISTER

INVESTIGATED BY E. FERREIRA, EI

DRAWN BY E. FERREIRA, EI

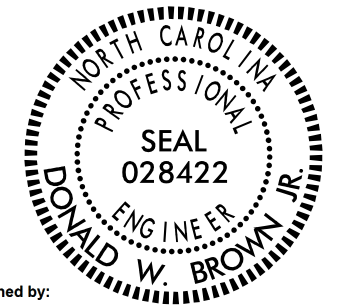
CHECKED BY D. BROWN, PE

SUBMITTED BY D. BROWN, PE

DATE APRIL 2021



STEWART



DocuSigned by:
Donald W. Brown Jr. 8/23/2021

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

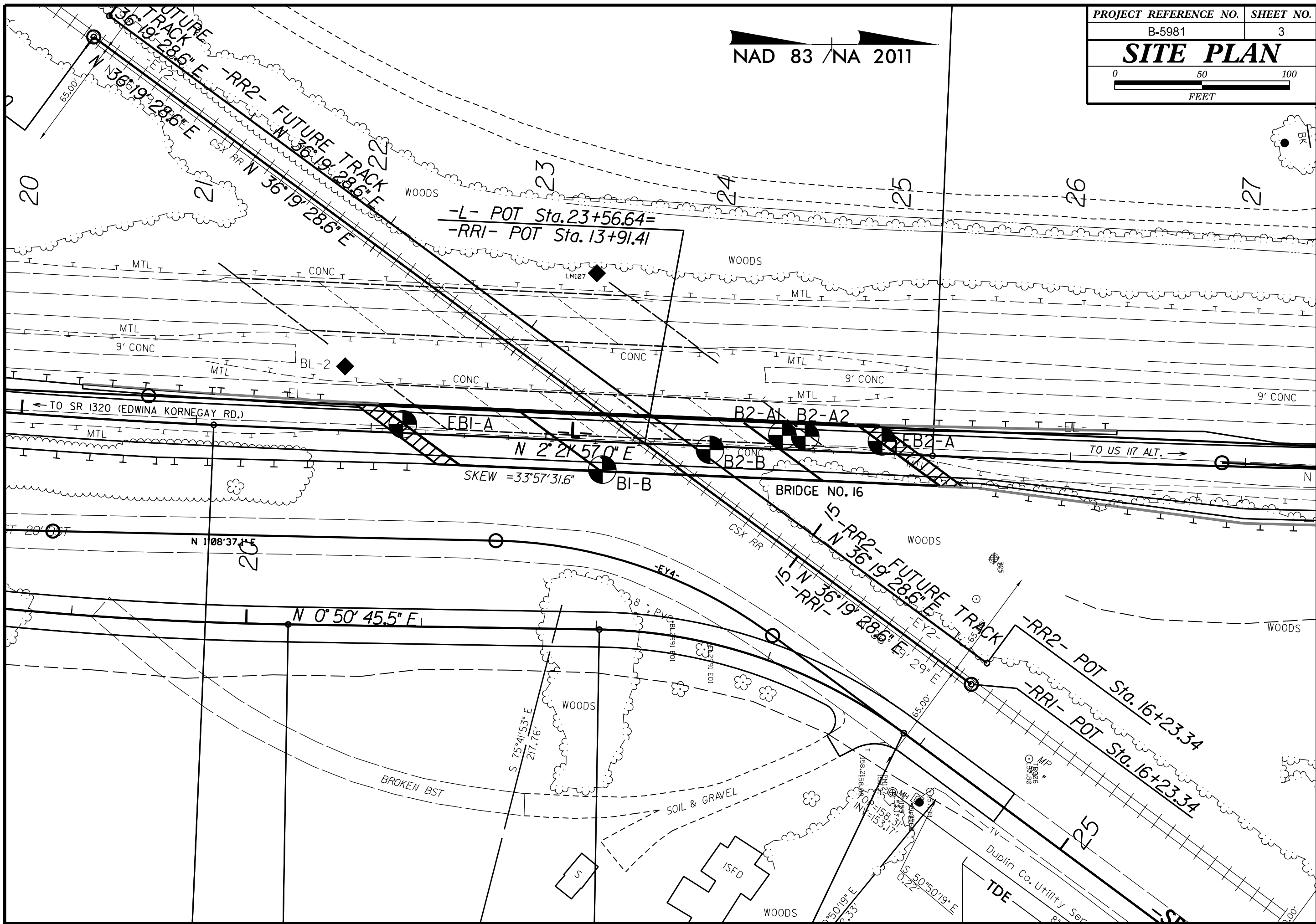
**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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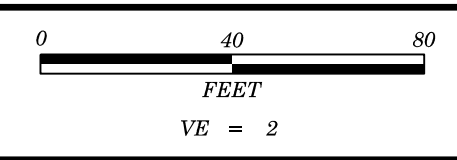
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																							
<p>SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>										<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.</p>										<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>										<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (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.</p>																																																																																																							
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<p>GENERAL CLASS.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th colspan="5"></th> </tr> <tr> <th>SYMBOL</th> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td colspan="5"></td> </tr> <tr> <th>% PASSING #10 #40 #200</th> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX 10 MX</td> <td>51 MN 35 MX 35 MX</td> <td>40 MX 41 MN 40 MX 41 MN 41 MN 41 MN</td> <td>40 MX 41 MN 40 MX 41 MN 40 MX 41 MN</td> <td>36 MN 36 MN 36 MN</td> <td>36 MN 36 MN 36 MN</td> <td>36 MN 36 MN 36 MN</td> <td>GRANULAR SOILS</td> <td>SILT-CLAY SOILS</td> <td>MUCK, PEAT</td> <td colspan="5"></td> </tr> </table>										GRANULAR MATERIALS (≤ 35% PASSING #200)					SILT-CLAY MATERIALS (> 35% PASSING #200)					ORGANIC MATERIALS					GROUP CLASS.	A-1	A-3	A-2	A-2	A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	A-6, A-7						SYMBOL																	% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX 10 MX	51 MN 35 MX 35 MX	40 MX 41 MN 40 MX 41 MN 41 MN 41 MN	40 MX 41 MN 40 MX 41 MN 40 MX 41 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT						<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p>FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (IV 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 (IV 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.</p>										<p>ROCK HARDNESS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td></td> <td></td> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table>										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
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<p>COLOR</p> <p>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.</p>										<p>INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>FRIABLE - RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>MODERATELY INDURATED - GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>INDURATED - GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>EXTREMELY INDURATED - SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>																																																																																																																											
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<p>NOTES:</p> <p>EXISTING GROUND SURFACE SHOWN WAS TAKEN FROM ELECTRONIC TIN FILE (DATED APRIL 2020).</p> <p>FIAD: FILLED IMMEDIATELY AFTER DRILLING</p>										<p>BENCH MARK: BM#2; RR SPIKE IN 30' OAK 93.9' LT OF -L- STA. 12+64.16 MH; MANHOLE LID 30.8' RT OF -SRI- STA. 24+03.48</p> <p style="text-align: right;">ELEVATION: 165.35, 158.31 FEET</p>																																																																																																																											

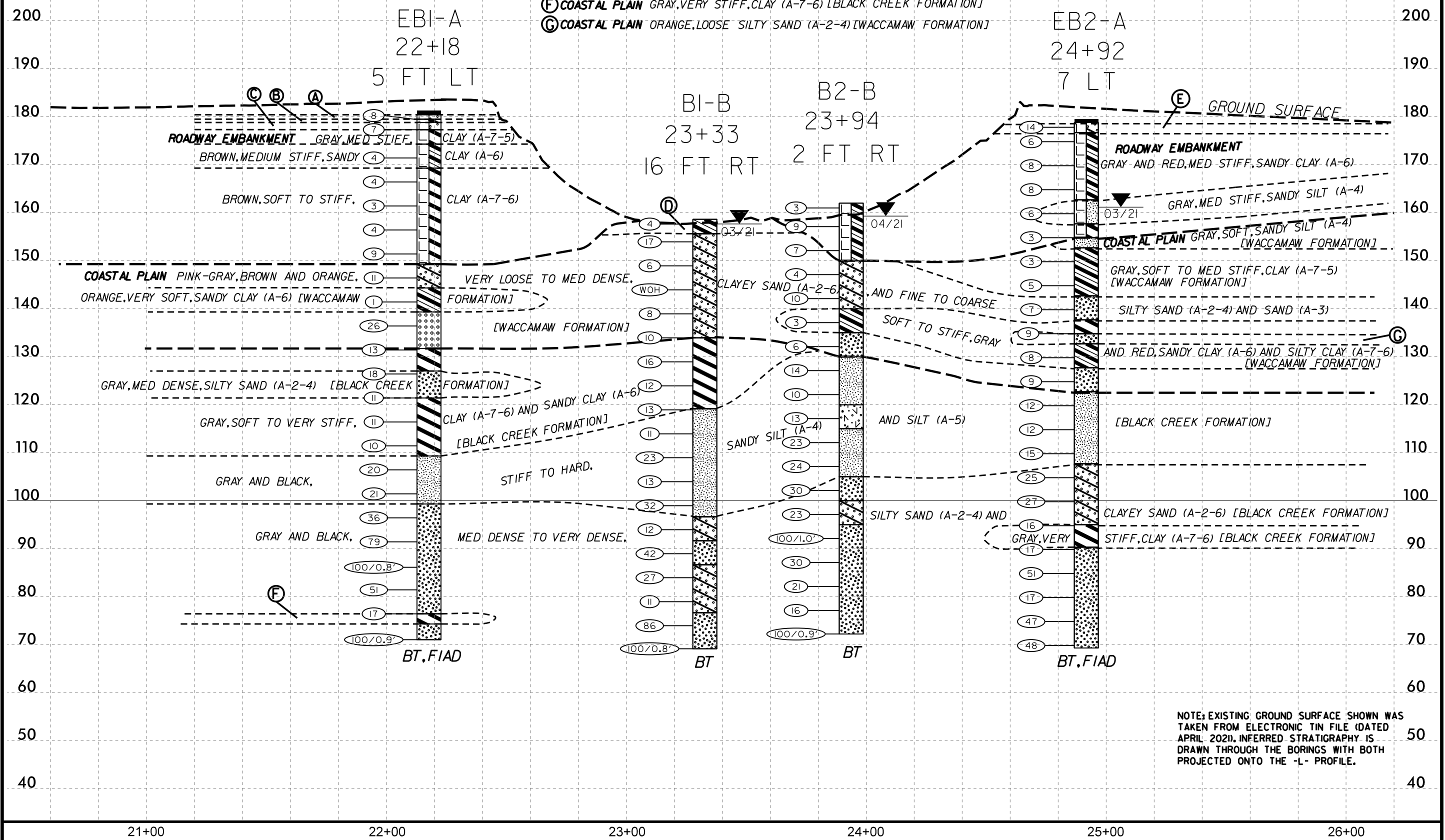
NAD 83 / NA 2011





PROJECT REFERENCE NO.	SHEET NO.
B-5981	4
PROFILE ALONG -L- CENTERLINE	

- (A) ROADWAY EMBANKMENT BROWN, LOOSE, CLAYEY SAND (A-2-6)
- (B) ROADWAY EMBANKMENT GRAY, MEDIUM STIFF, CLAY (A-7-5)
- (C) ROADWAY EMBANKMENT LOOSE, BROWN, CLAYEY SAND (A-2-6)
- (D) COASTAL PLAIN BROWN, MEDIUM STIFF, SANDY CLAY WITH TRACE MICA (A-6) [WACCAMAW FORMATION]
- (E) ROADWAY EMBANKMENT GRAY, MEDIUM DENSE, CLAYEY SAND (A-2-6)
- (F) COASTAL PLAIN GRAY, VERY STIFF, CLAY (A-7-6) [BLACK CREEK FORMATION]
- (G) COASTAL PLAIN ORANGE, LOOSE SILTY SAND (A-2-4) [WACCAMAW FORMATION]

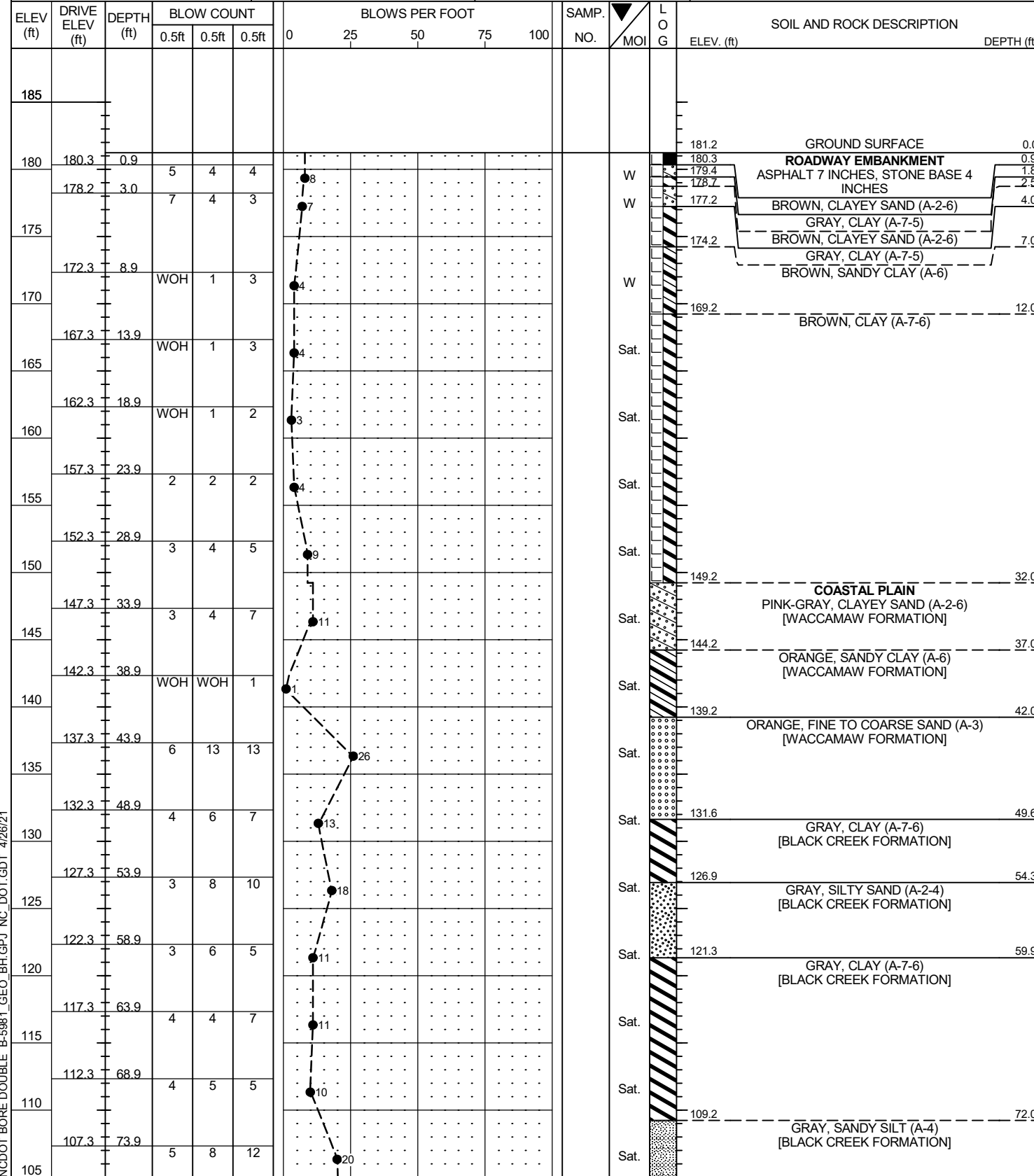


NOTE: EXISTING GROUND SURFACE SHOWN WAS TAKEN FROM ELECTRONIC TIN FILE (DATED APRIL 2021). INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE -L- PROFILE.

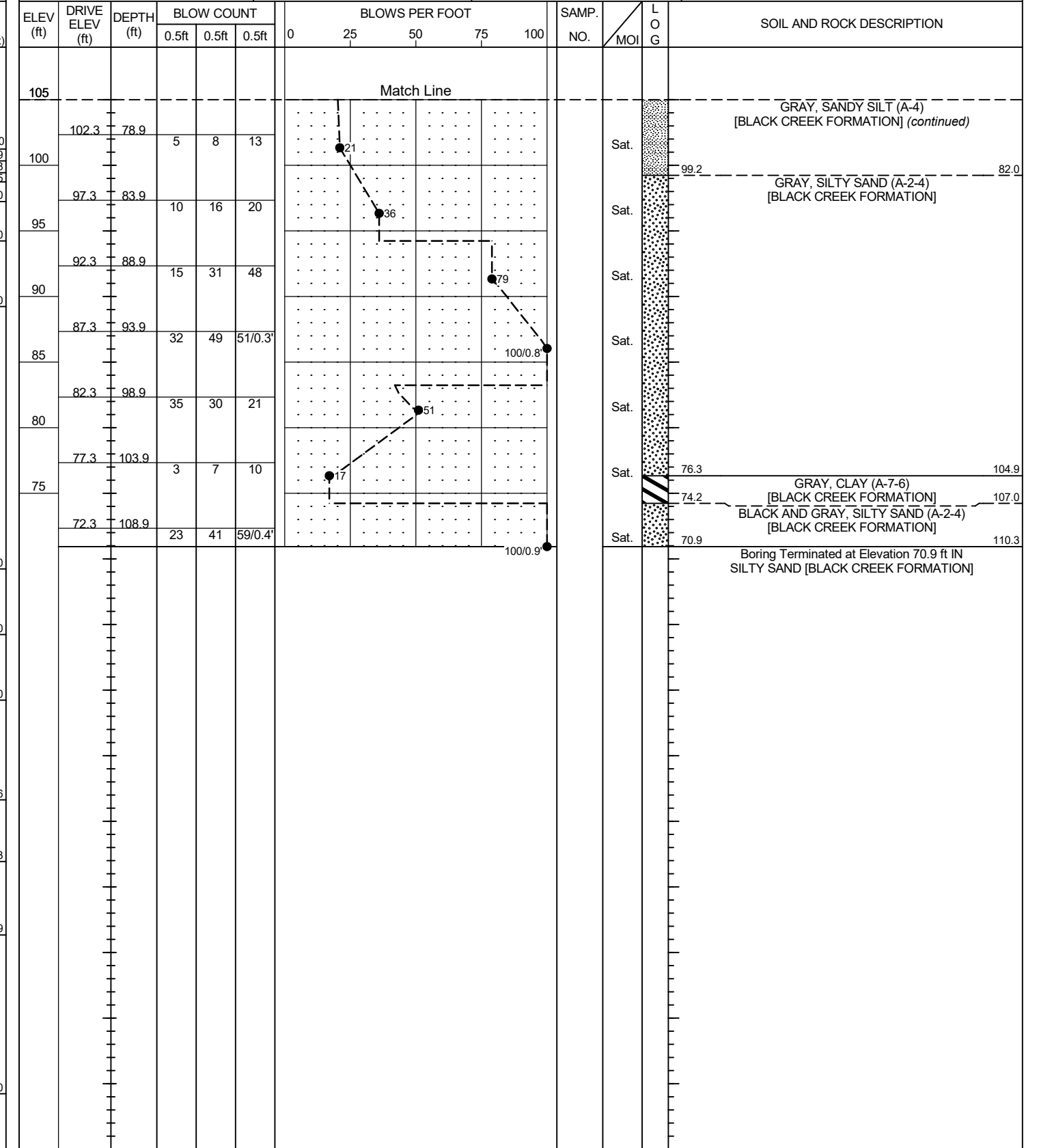
GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47747.1.1		TIP B-5981		COUNTY DUPLIN		GEOLOGIST FERREIRA, EMILY EI	
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 16 ON US 117 (NBL) OVER CSX RR BETWEEN SR 1320 AND US 117 AL							GROUND WTR (ft)
BORING NO. EB1-A		STATION 22+18		OFFSET 5 ft LT		ALIGNMENT L	
COLLAR ELEV. 181.2 ft		TOTAL DEPTH 110.3 ft		NORTHING 510,485		EASTING 2,266,365	
DRILL RIG/HAMMER EFF./DATE CAT4425 CME-55 87% 01/16/2019			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic	
DRILLER Edmondson, J. M.		START DATE 03/22/21		COMP. DATE 03/22/21		SURFACE WATER DEPTH N/A	



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DRILLER Edmondson, J. M.		START DATE 03/22/21		COMP. DATE 03/22/21		SURFACE WATER DEPTH N/A	



NCDOT BORE DOUBLE B-5981_GEO_BH.GPJ_NC_DOT.GDT 4/28/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47747.1.1		TIP B-5981		COUNTY DUPLIN		GEOLOGIST FERREIRA, EMILY EI	
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 16 ON US 117 (NBL) OVER CSX RR BETWEEN SR 1320 AND US 117 AL							GROUND WTR (ft)
BORING NO. B1-B		STATION 23+33		OFFSET 16 ft RT		ALIGNMENT L	
COLLAR ELEV. 158.6 ft		TOTAL DEPTH 89.5 ft		NORTHING 510,599		EASTING 2,266,363	
DRILL RIG/HAMMER EFF./DATE CAT4425 CME-55 87% 01/16/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic		
DRILLER Edmondson, J. M.		START DATE 03/17/21		COMP. DATE 03/17/21		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION				
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)			
160	158.6	0.0	2	2	2											GROUND SURFACE	0.0	
155	154.9	3.7	4	6	11											COASTAL PLAIN - BROWN, SANDY CLAY WITH TRACE MICA (A-6) [WACCAMAW FORMATION]	3.0	
150	149.9	8.7	3	3	3											BROWN, RED, CLAYEY SAND (A-2-6) [WACCAMAW FORMATION]		
145	144.9	13.7	WOH	WOH	WOH													
140	139.9	18.7	2	3	5													
135	134.9	23.7	6	5	5													
130	129.9	28.7	4	6	10											GRAY, CLAY (A-7-6) [BLACK CREEK FORMATION]	24.7	
125	124.9	33.7	5	5	7													
120	119.9	38.7	4	6	7													
115	114.9	43.7	3	5	6											GRAY, SANDY SILT (A-4) [BLACK CREEK FORMATION]	39.5	
110	109.9	48.7	5	8	15													
105	104.9	53.7	3	4	9													
100	99.9	58.7	7	12	20													
95	94.9	63.7	4	5	7											DARK GRAY, FINE TO COARSE, CLAYEY SAND (A-2-6), WITH TRACE WOOD/LIGNITE [BLACK CREEK FORMATION]	62.0	
90	89.9	68.7	21	21	21											GRAY, FINE TO COARSE, SILTY SAND, (A-2-4) [BLACK CREEK FORMATION]	67.0	
85	84.9	73.7	14	14	13											GRAY, FINE TO COARSE, CLAYEY SAND (A-2-6) [BLACK CREEK FORMATION]	72.0	
80																	Boring Terminated at Elevation 69.1 ft IN SILTY SAND [BLACK CREEK FORMATION]	89.5

NCDOT BORE DOUBLE B-5981_GEO_BH.GPJ NC_DOT.GDT 04/15/21

WBS 47747.1.1		TIP B-5981		COUNTY DUPLIN		GEOLOGIST FERREIRA, EMILY EI	
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 16 ON US 117 (NBL) OVER CSX RR BETWEEN SR 1320 AND US 117 AL							GROUND WTR (ft)
BORING NO. B1-B		STATION 23+33		OFFSET 16 ft RT		ALIGNMENT L	
COLLAR ELEV. 158.6 ft		TOTAL DEPTH 89.5 ft		NORTHING 510,599		EASTING 2,266,363	
DRILL RIG/HAMMER EFF./DATE CAT4425 CME-55 87% 01/16/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic		
DRILLER Edmondson, J. M.		START DATE 03/17/21		COMP. DATE 03/17/21		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION				
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)			
80	79.9	78.7	4	5	6													
75	74.9	83.7	21	41	45											GRAY, FINE TO COARSE, CLAYEY SAND (A-2-6) [BLACK CREEK FORMATION] (continued)	82.0	
70	69.9	88.7	55	45/0.3												GRAY AND BLACK, FINE TO COARSE, SILTY SAND (A-2-4) [BLACK CREEK FORMATION]		
																	Boring Terminated at Elevation 69.1 ft IN SILTY SAND [BLACK CREEK FORMATION]	89.5

GEOTECHNICAL BORING REPORT BORE LOG

WBS 47747.1.1		TIP B-5981		COUNTY DUPLIN		GEOLOGIST FERREIRA, EMILY EI										
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 16 ON US 117 (NBL) OVER CSX RR BETWEEN SR 1320 AND US 117 AL							GROUND WTR (ft)									
BORING NO. B2-A1		STATION 24+35		OFFSET 8 ft LT		ALIGNMENT L										
COLLAR ELEV. 171.3 ft		TOTAL DEPTH 20.9 ft		NORTHING 510,703		EASTING 2,266,342										
DRILL RIG/HAMMER EFF./DATE CAT4425 CME-55 87% 01/16/2019			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic										
DRILLER Edmondson, J. M.		START DATE 03/23/21		COMP. DATE 03/23/21		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						
175																
170	170.6	0.7	2	8	13											
165	166.4	4.9	4	2	2											
160	161.4	9.9	4	3	3											
155	157.4	13.9	WOH	1	2											
	151.4	19.9	WOH	WOH	60/0.0											

WBS 47747.1.1		TIP B-5981		COUNTY DUPLIN		GEOLOGIST FERREIRA, EMILY EI										
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 16 ON US 117 (NBL) OVER CSX RR BETWEEN SR 1320 AND US 117 AL							GROUND WTR (ft)									
BORING NO. B2-A2		STATION 24+48		OFFSET 8 ft LT		ALIGNMENT L										
COLLAR ELEV. 180.0 ft		TOTAL DEPTH 30.4 ft		NORTHING 510,716		EASTING 2,266,342										
DRILL RIG/HAMMER EFF./DATE CAT4425 CME-55 87% 01/16/2019			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic										
DRILLER Edmondson, J. M.		START DATE 03/23/21		COMP. DATE 03/23/21		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						
180																
	179.1	0.9	7	5	3											
	176.1	3.9														
175																
	171.1	8.9	WOH	WOH	1											
170																
	166.1	13.9	7	8	7											
165																
	161.1	18.9	9	10	10											
160																
	156.1	23.9	6	7	7											
155																
	151.1	28.9	4	4	5											
150																

NCDOT BORE DOUBLE B-5981_GEO_BH.GPJ NC_DOT.GDT 7/13/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47747.1.1		TIP B-5981		COUNTY DUPLIN		GEOLOGIST FERREIRA, EMILY EI										
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 16 ON US 117 (NBL) OVER CSX RR BETWEEN SR 1320 AND US 117 AL						GROUND WTR (ft)										
BORING NO. B2-B		STATION 23+94		OFFSET 2 ft RT		ALIGNMENT L										
COLLAR ELEV. 161.9 ft		TOTAL DEPTH 89.8 ft		NORTHING 510,661		EASTING 2,266,351										
DRILL RIG/HAMMER EFF./DATE CAT4425 CME-55 87% 01/16/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Edmondson, J. M.		START DATE 03/25/21		COMP. DATE 03/25/21		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						
165																
161.9	161.9	0.0	2	1	2	3									161.9	GROUND SURFACE
160	158.0	3.9	3	3	6											ROADWAY EMBANKMENT BROWN, SANDY CLAY (A-6) [WACCAMAW FORMATION]
155	153.0	8.9	3	3	4											
150	148.0	13.9	WOH	2	2											COASTAL PLAIN ORANGE AND RED, CLAYEY SAND (A-2-6) [WACCAMAW FORMATION]
145	143.0	18.9	WOH	3	7											
140	138.0	23.9	1	2	1											GRAY AND RED, SANDY CLAY (A-6) [WACCAMAW FORMATION]
135	133.0	28.9	1	3	3											ORANGE, SILTY SAND (A-2-4) [WACCAMAW FORMATION]
130	128.0	33.9	4	6	8											GRAY, SANDY SILT (A-4) [BLACK CREEK FORMATION]
125	123.0	38.9	3	4	6											
120	118.0	43.9	3	5	8											GRAY, SILT (A-5) [BLACK CREEK FORMATION]
115	113.0	48.9	6	8	15											GRAY, SANDY SILT (A-4) [BLACK CREEK FORMATION]
110	108.0	53.9	8	8	16											
105	103.0	58.9	7	10	20											GRAY, SILTY SAND (A-2-4) [BLACK CREEK FORMATION]
100	98.0	63.9	4	10	13											GRAY, CLAYEY SAND (A-2-6) [BLACK CREEK FORMATION]
95	93.0	68.9	33	37	63											GRAY, SILTY SAND (A-2-4) [BLACK CREEK FORMATION]
90	88.0	73.9	10	11	19											
85																

NCDOT BORE DOUBLE B-5981_GEO_BH.GPJ NC_DOT.GDT 7/13/21

WBS 47747.1.1		TIP B-5981		COUNTY DUPLIN		GEOLOGIST FERREIRA, EMILY EI										
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 16 ON US 117 (NBL) OVER CSX RR BETWEEN SR 1320 AND US 117 AL						GROUND WTR (ft)										
BORING NO. B2-B		STATION 23+94		OFFSET 2 ft RT		ALIGNMENT L										
COLLAR ELEV. 161.9 ft		TOTAL DEPTH 89.8 ft		NORTHING 510,661		EASTING 2,266,351										
DRILL RIG/HAMMER EFF./DATE CAT4425 CME-55 87% 01/16/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Edmondson, J. M.		START DATE 03/25/21		COMP. DATE 03/25/21		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						
85																
80	83.0	78.9	9	9	12											GRAY, SILTY SAND (A-2-4) [BLACK CREEK FORMATION] (continued)
75	78.0	83.9	6	8	8											
	73.0	88.9	29	71	0.4											Boring Terminated at Elevation 72.1 ft IN SILTY SAND [BLACK CREEK FORMATION]

SITE PHOTOGRAPH

BRIDGE 16



VIEW LOOKING NORTH