

REFERENCE: SF-090104

PROJECT: 17BP.3.R.80

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY BRUNSWICK
PROJECT DESCRIPTION BRIDGE NO. 104 ON -L- (NC 906)
OVER MIDDLE SWAMP AT -L- STA. 20+18

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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-090104	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 (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.

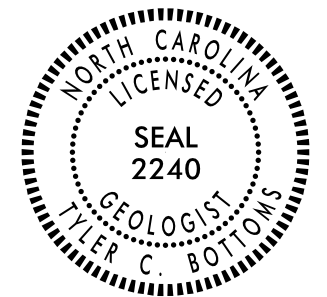
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT 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.

PERSONNEL

S.N. ZIMARINO
C.J. CORNETTE
R.E. SMITH
J.M. EDMONDSON

INVESTIGATED BY T.C. BOTTOMS
DRAWN BY S.N. ZIMARINO
CHECKED BY D.N. ARGENBRIGHT
SUBMITTED BY D.N. ARGENBRIGHT
DATE APRIL 2021



DocuSigned by:
Tyler C. Bottoms 5/3/2021
48A2D3BD086848A8 SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
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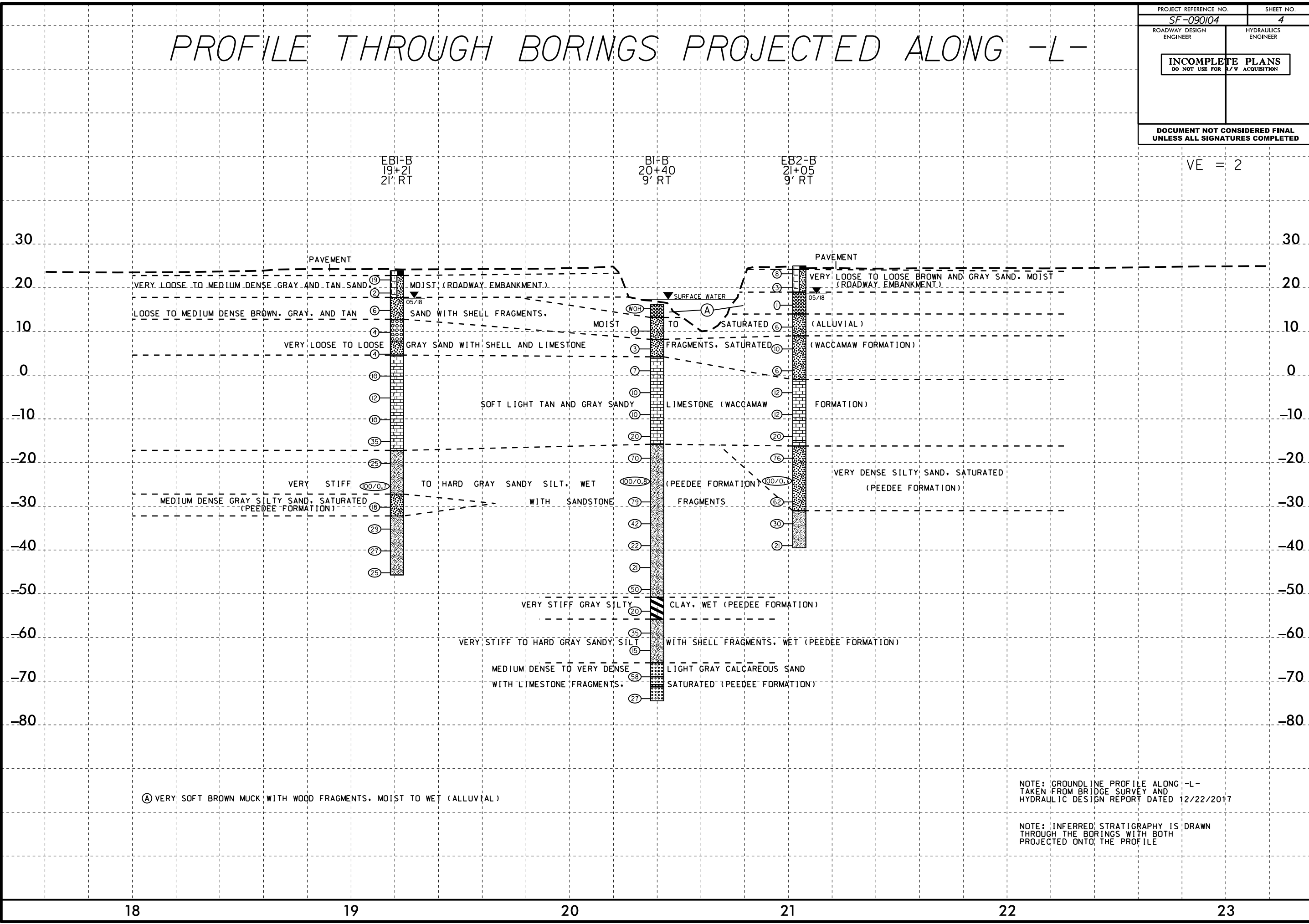
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
 SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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 (ASTM T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.										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 (CR) 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. 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 (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										ANGULARITY OF GRAINS										WEATHERING																													
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS										THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.										FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. 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 SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.																													
MINERALOGICAL COMPOSITION										COMPRESSION										PERCENTAGE OF MATERIAL										GROUND WATER																			
MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.										SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50										ORGANIC MATERIAL GRANULAR SOILS SILT - CLAY SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE										WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP																			
CONSISTENCY OR DENSENESS										MISCELLANEOUS SYMBOLS										ROCK HARDNESS										RECOMMENDATION SYMBOLS																			
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY										DIP & DIP DIRECTION OF ROCK STRUCTURES SPT DMT VST PMT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD TEST BORING WITH CORE SPT N-VALUE										UNDERCUT SHALLOW 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																			
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										AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - COARSE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - 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 %g - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO																			
TEXTURE OR GRAIN SIZE										ABBREVIATIONS										FRACTURE SPACING										BEDDING																			
BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE, SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)										SOIL MOISTURE - CORRELATION OF TERMS										TERM SPACING VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FOOT VERY CLOSE LESS THAN 0.16 FEET										TERM THICKNESS VERY THICKLY BEDDED 4 FEET THICKLY BEDDED 1.5 - 4 FEET THINLY BEDDED 0.16 - 1.5 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET																			
GRAIN SIZE MM 305 75 2.0 0.25 0.05 0.005 IN. 12 3										SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.										INDURATION																			
LL LIQUID LIMIT PL PLASTIC LIMIT OM OPTIMUM MOISTURE SHRINKAGE LIMIT										- SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE										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: BMI N=III29.6175 E=2256442.5450 ELEVATION: 26.19 FEET																			
PLASTICITY										EQUIPMENT USED ON SUBJECT PROJECT										NOTES:																													
NON PLASTIC SLIGHTLY PLASTIC MODERATELY PLASTIC HIGHLY PLASTIC										PLASTICITY INDEX (PI) DRY STRENGTH 0-5 VERY LOW 6-15 SLIGHT 16-25 MEDIUM 26 OR MORE HIGH										DRILL UNITS: [X] CME-45C [X] CME-55 [] CME-550 [] VANE SHEAR TEST [] PORTABLE HOIST [] [] [] ADVANCING TOOLS: [] CLAY BITS [] 6" CONTINUOUS FLIGHT AUGER [] 8" HOLLOW AUGERS [] HARD FACED FINGER BITS [] TUNG-CARBIDE INSERTS [X] CASING [] W/ ADVANCER [X] TRICONE 2 1/8" STEEL TEETH [] TRICONE " TUNG-CARB. [X] CORE BIT [] HAMMER TYPE: [X] AUTOMATIC [] MANUAL CORE SIZE: [] -B [] -H [X] -N W HAND TOOLS: [] POST HOLE DIGGER [] HAND AUGER [] SOUNDING ROD [] VANE SHEAR TEST																													
COLOR																																																	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.																																																	

PROFILE THROUGH BORINGS PROJECTED ALONG -L-

PROJECT REFERENCE NO. <i>SF-090104</i>	SHEET NO. 4
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

VE = 2



(A) VERY SOFT BROWN MUCK WITH WOOD FRAGMENTS, MOIST TO WET (ALLUVIAL)

NOTE: GROUNDLINE PROFILE ALONG -L- TAKEN FROM BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT DATED 12/22/2017

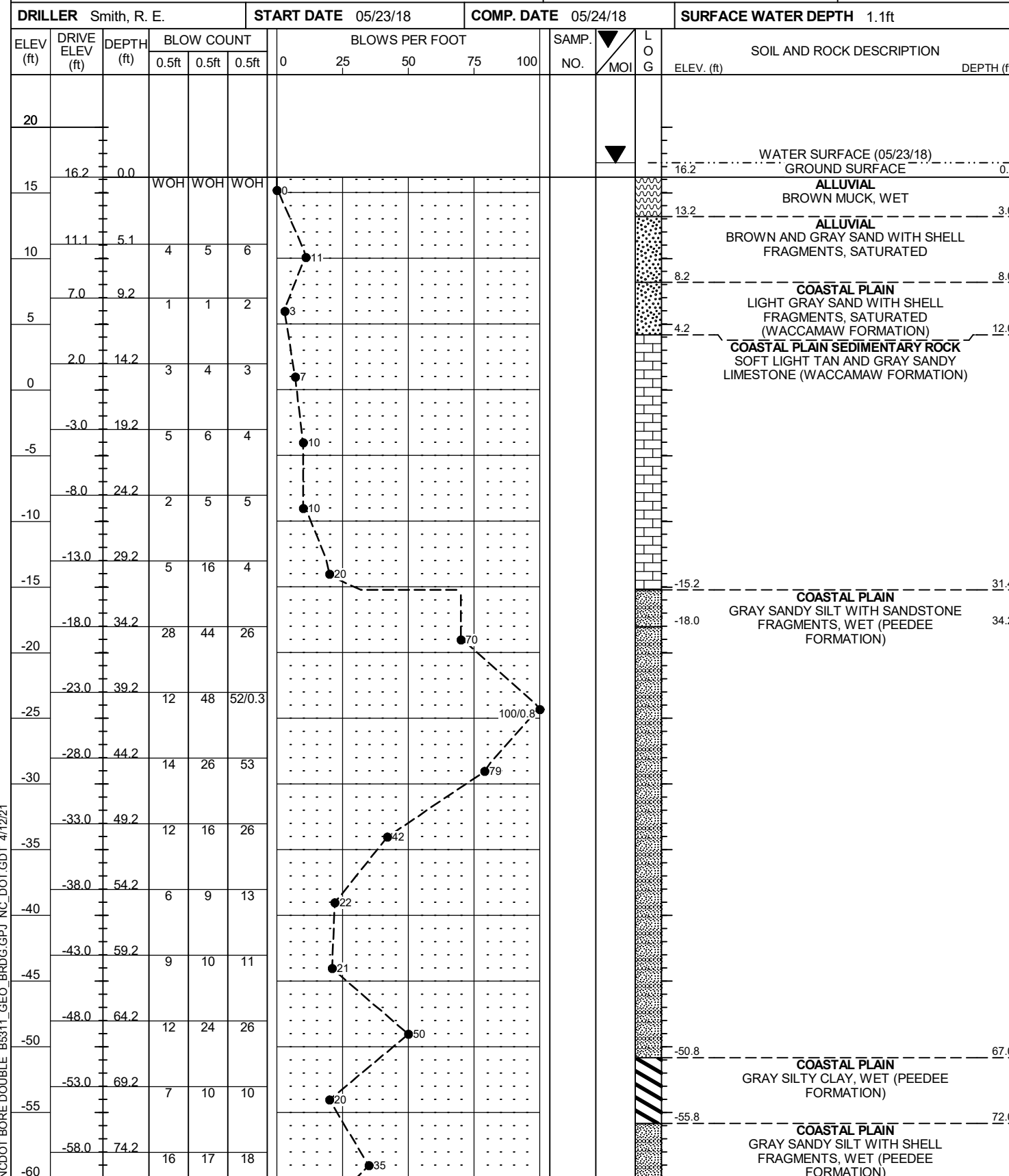
NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE

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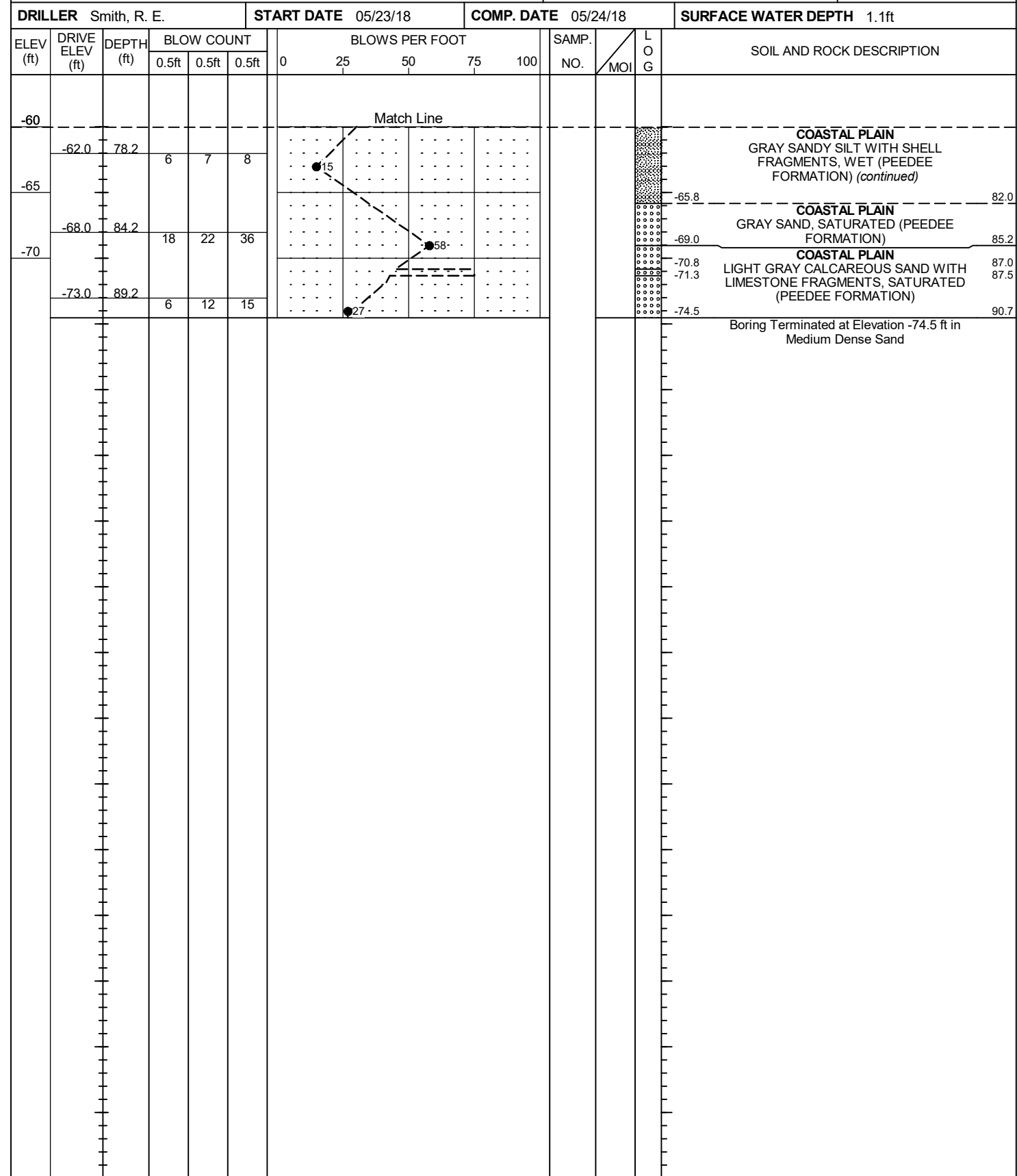
GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.3.R.80	TIP SF-090104	COUNTY BRUNSWICK	GEOLOGIST Zimarino, S. N.
SITE DESCRIPTION BRIDGE NO. 104 ON -L- (NC 906) OVER MIDDLE SWAMP			GROUND WTR (ft)
BORING NO. B1-B	STATION 20+40	OFFSET 9 ft RT	ALIGNMENT -L-
COLLAR ELEV. 16.2 ft	TOTAL DEPTH 90.7 ft	NORTHING 111,016	EASTING 2,256,546
DRILL RIGHAMMER EFF./DATE GFC0075 CME-45C 84% 08/21/2017		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Smith, R. E.	START DATE 05/23/18	COMP. DATE 05/24/18	SURFACE WATER DEPTH 1.1ft



WBS 17BP.3.R.80	TIP SF-090104	COUNTY BRUNSWICK	GEOLOGIST Zimarino, S. N.
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DRILLER Smith, R. E.	START DATE 05/23/18	COMP. DATE 05/24/18	SURFACE WATER DEPTH 1.1ft



NCDOT BORE DOUBLE B6311_GEO_BRDG.GPJ NC_DOT.GDT 4/12/21

GEOTECHNICAL BORING REPORT BORE LOG

WBS 17BP.3.R.80		TIP SF-090104		COUNTY BRUNSWICK		GEOLOGIST Bottoms, T. C.										
SITE DESCRIPTION BRIDGE NO. 104 ON -L- (NC 906) OVER MIDDLE SWAMP							GROUND WTR (ft)									
BORING NO. B1-X		STATION 20+55		OFFSET 9 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 9.4 ft		TOTAL DEPTH 28.6 ft		NORTHING 111,003		EASTING 2,256,553										
DRILL RIGHAMMER EFF./DATE RFC0074 CME-55 86% 11/17/2017				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Pinter, D. G.		START DATE 06/04/18		COMP. DATE 06/04/18		SURFACE WATER DEPTH 7.3ft										
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)		
20																
15																
10														9.4	GROUND SURFACE	0.0
5	6.8	2.6	5	5	5										COASTAL PLAIN GRAY SAND WITH SHELL FRAGMENTS, SATURATED (WACCAMAW FORMATION)	
0	1.8	7.6	3	2	7									3.4	COASTAL PLAIN SEDIMENTARY ROCK SOFT LIGHT TAN AND GRAY LIMESTONE (WACCAMAW FORMATION)	6.0
-5														-0.2		9.6
-10																
-15																
														-18.6	COASTAL PLAIN GRAY SANDY SILT, WET (WACCAMAW FORMATION)	28.0
														-19.2		28.6
															Boring Terminated at Elevation -19.2 ft in Hard Sandy Silt	

NCDOT BORE DOUBLE B5311_GEO_BRDG.GPJ NC_DOT.GDT 4/12/21

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 17BP.3.R.80		TIP SF-090104		COUNTY BRUNSWICK		GEOLOGIST Bottoms, T. C.					
SITE DESCRIPTION BRIDGE NO. 104 ON -L- (NC 906) OVER MIDDLE SWAMP							GROUND WTR (ft)				
BORING NO. B1-X		STATION 20+55		OFFSET 9 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 9.4 ft		TOTAL DEPTH 28.6 ft		NORTHING 111,003		EASTING 2,256,553					
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 86% 11/17/2017				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic					
DRILLER Pinter, D. G.		START DATE 06/04/18		COMP. DATE 06/04/18		SURFACE WATER DEPTH 7.3ft					
CORE SIZE NW		TOTAL RUN 19.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
-0.23	-0.2	9.6	4.0	00:12/1.0 00:10/1.0 00:08/1.0 00:07/1.0	(0.3) 8%	(0.0) 0%	(3.2) 17%	(0.0) 0%		Begin Coring @ 9.6 ft	9.6
-5	-4.2	13.6	5.0	00:08/1.0 00:04/1.0 00:01/1.0 00:01/1.0	(0.5) 10%	(0.0) 0%				SOFT LIGHT TAN AND GRAY LIMESTONE (WACCAMAW FORMATION)	
-10	-9.2	18.6	5.0	00:04/1.0 00:04/1.0 00:02/1.0 00:06/1.0	(1.1) 22%	(0.0) 0%					
-15	-14.2	23.6	5.0	00:04/1.0 00:08/1.0 00:03/1.0 00:09/1.0	(1.3) 26%	(0.0) 0%					
	-19.2	28.6		00:05/1.0						COASTAL PLAIN GRAY SANDY SILT, WET (WACCAMAW FORMATION) Boring Terminated at Elevation -19.2 ft in Hard Sandy Silt	28.0 28.6

NCDOT CORE DOUBLE B6311_GEO_BRDG.GPJ NC_DOT.GDT 6/11/18

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.3.R.80	TIP SF-090104	COUNTY BRUNSWICK	GEOLOGIST Zimarino, S. N.
SITE DESCRIPTION BRIDGE NO. 104 ON -L- (NC 906) OVER MIDDLE SWAMP			GROUND WTR (ft)
BORING NO. EB2-B	STATION 21+05	OFFSET 9 ft RT	ALIGNMENT -L-
COLLAR ELEV. 25.0 ft	TOTAL DEPTH 64.5 ft	NORTHING 110,959	EASTING 2,256,577
DRILL RIGHAMMER EFF./DATE GFO075 CME-45C 84% 08/21/2017		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER Smith, R. E.	START DATE 05/21/18	COMP. DATE 05/22/18	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				
25	24.2	0.8	4	4	4								GROUND SURFACE	0.0
	21.0	4.0	3	2	1								ROADWAY EMBANKMENT PAVEMENT	0.8
20	17.0	8.0	1	1	0								ROADWAY EMBANKMENT BROWN AND GRAY SAND, MOIST	6.0
15	12.0	13.0	2	3	3								ALLUVIAL BROWN MUCK WITH WOOD FRAGMENTS, MOIST TO WET	11.0
10	7.0	18.0	3	5	5								ALLUVIAL GRAY AND BROWN SAND, SATURATED	16.0
5	2.0	23.0	3	3	3								COASTAL PLAIN GRAY SAND WITH LIMESTONE AND SHELL FRAGMENTS, SATURATED (WACCAMAW FORMATION)	26.0
0	-3.0	28.0	2	5	7								COASTAL PLAIN SEDIMENTARY ROCK SOFT LIGHT GRAY SANDY LIMESTONE (WACCAMAW FORMATION)	41.2
-5	-8.0	33.0	7	6	6									
-10	-13.0	38.0	6	10	10									
-15	-18.0	43.0	6	21	55								COASTAL PLAIN GRAY SILTY SAND, SATURATED (PEEDEE FORMATION)	56.0
-20	-23.0	48.0	10	20	80/0.2									
-25	-28.0	53.0	28	43	19									
-30	-33.0	58.0	8	14	16								COASTAL PLAIN GRAY SANDY SILT, WET (PEEDEE FORMATION)	64.5
-35	-38.0	63.0	5	10	11									
														Boring Terminated at Elevation -39.5 ft in Very Stiff Sandy Silt

NCDOT BORE DOUBLE B6311_GEO_BRDG.GPJ NC_DOT.GDT 4/12/21

CORE PHOTOGRAPH
B1-X
9.6' TO 28.6'

