

REFERENCE: I-5987B

PROJECT: 47533

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY ROBESON
PROJECT DESCRIPTION I-95 IMPROVEMENTS FROM
US 301 (EXIT 22) IN ROBESON COUNTY TO NC 59
(EXIT 41) IN CUMBERLAND COUNTY
SITE DESCRIPTION BRIDGE NO. 162 ON -Y6-
(MCRAINEY RD.) OVER -L- (I-95) AT -L-
STA. 761 + 20.96

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5-6	CROSS SECTIONS
7-II	BORE LOGS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5987B	1	11

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:
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

F&R, INC.

INVESTIGATED BY F&R, INC.
DRAWN BY CROCKETT, S.C.
CHECKED BY HAMM, J. R.
SUBMITTED BY FALCON
DATE DECEMBER 2021

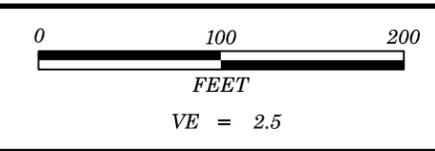


DocuSigned by:
Stephen C. Crockett Dec 16, 2021
C5CA5FED48E0435 SIGNATURE DATE

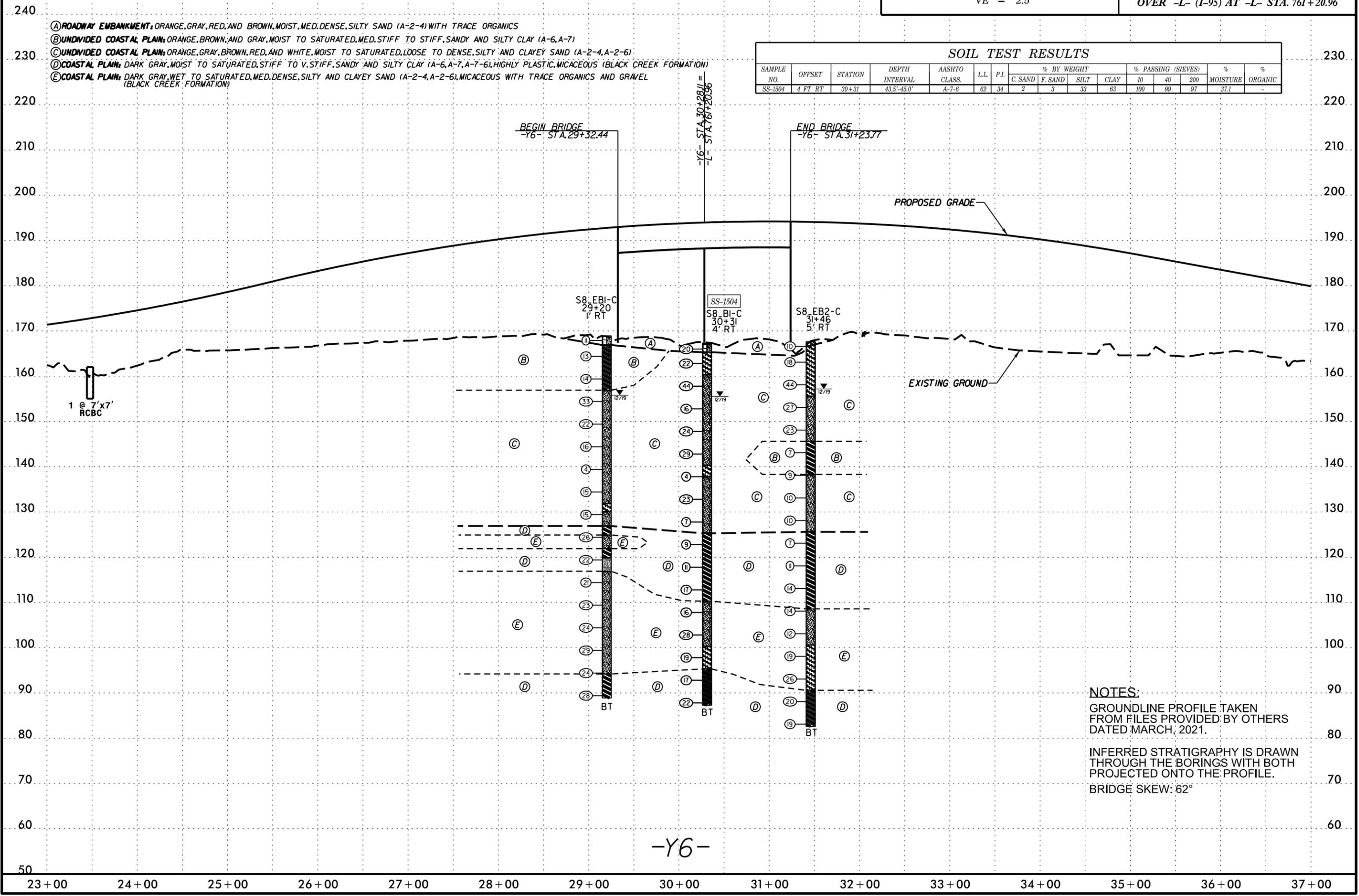
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

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																																																												
<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 (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.</p>																																																												
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										WEATHERED ROCK (WR)										CRYSTALLINE ROCK (CR)																																																												
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MINERALOGICAL COMPOSITION										COMPRESSION										NON-CRYSTALLINE ROCK (NCR)										COASTAL PLAIN SEDIMENTARY ROCK (CP)																																																												
<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p>SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50</p>										<p>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.</p>										<p>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>																																																												
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<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>																																																																																										



PROJECT REFERENCE NO.	SHEET NO.
I-5987B	4
BRIDGE NO. 162 ON -Y6- (MCRAINEY RD.) OVER -L- (I-95) AT -L- STA. 761+20.96	

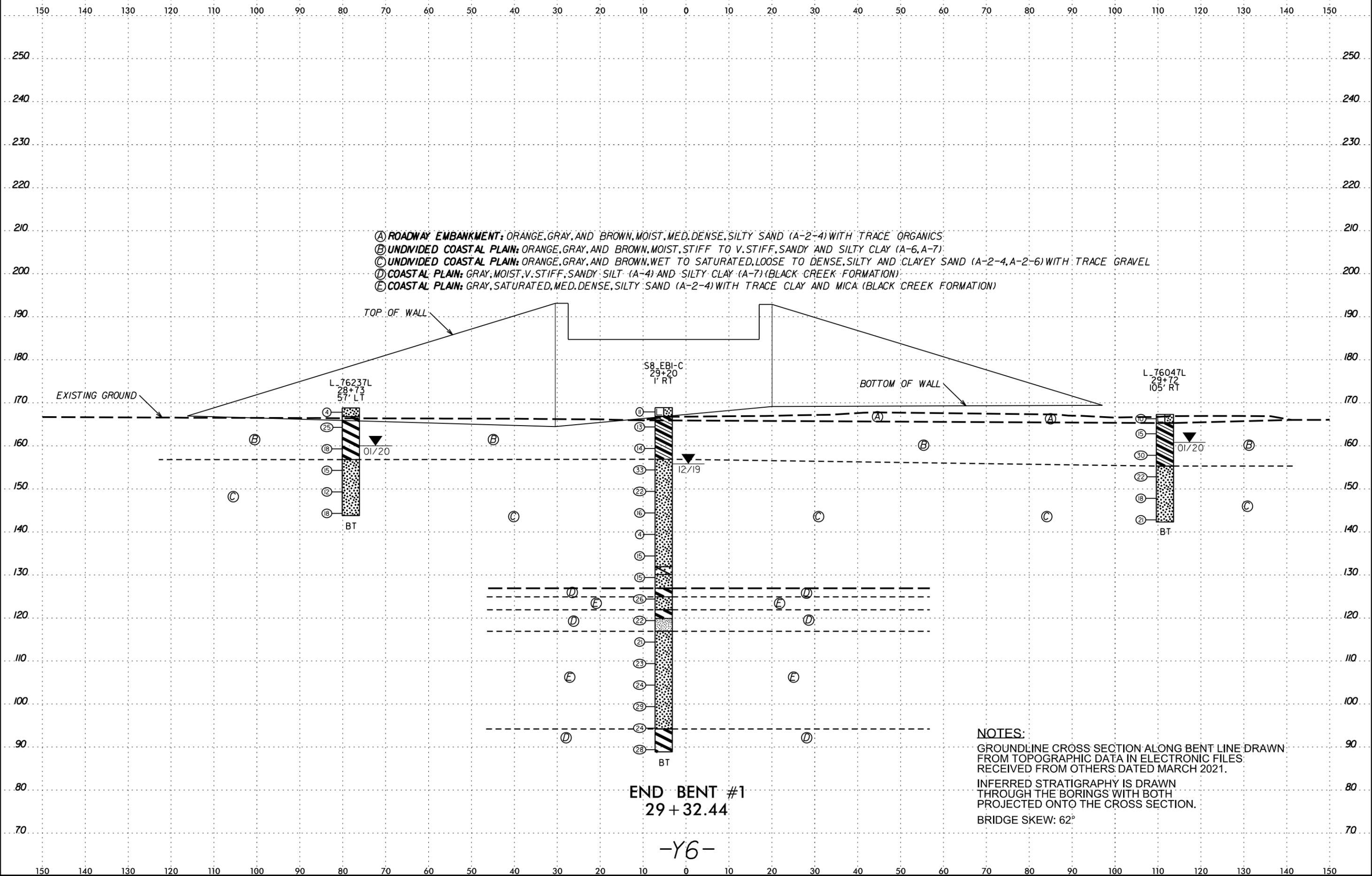


- Ⓐ ROADWAY EMBANKMENT: ORANGE, GRAY, RED, AND BROWN, MOIST, MED. DENSE, SILTY SAND (A-2-4) WITH TRACE ORGANICS
- Ⓑ UNDIVIDED COASTAL PLAIN: ORANGE, BROWN, AND GRAY, MOIST TO SATURATED, MED. STIFF TO STIFF, SANDY AND SILTY CLAY (A-6, A-7)
- Ⓒ UNDIVIDED COASTAL PLAIN: ORANGE, GRAY, BROWN, RED, AND WHITE, MOIST TO SATURATED, LOOSE TO DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6)
- Ⓓ COASTAL PLAIN: DARK GRAY, MOIST TO SATURATED, STIFF TO V. STIFF, SANDY AND SILTY CLAY (A-6, A-7, A-7-6), HIGHLY PLASTIC, MICACEOUS (BLACK CREEK FORMATION)
- Ⓔ COASTAL PLAIN: DARK GRAY, WET TO SATURATED, MED. DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6), MICACEOUS WITH TRACE ORGANICS AND GRAVEL (BLACK CREEK FORMATION)

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1504	4 FT RT	30+31	43.5'-45.0'	A-7-6	62	34	2	3	33	63	100	99	97	37.1	-

NOTES:
 GROUNDLINE PROFILE TAKEN FROM FILES PROVIDED BY OTHERS DATED MARCH, 2021.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.
 BRIDGE SKEW: 62°

-Y6-

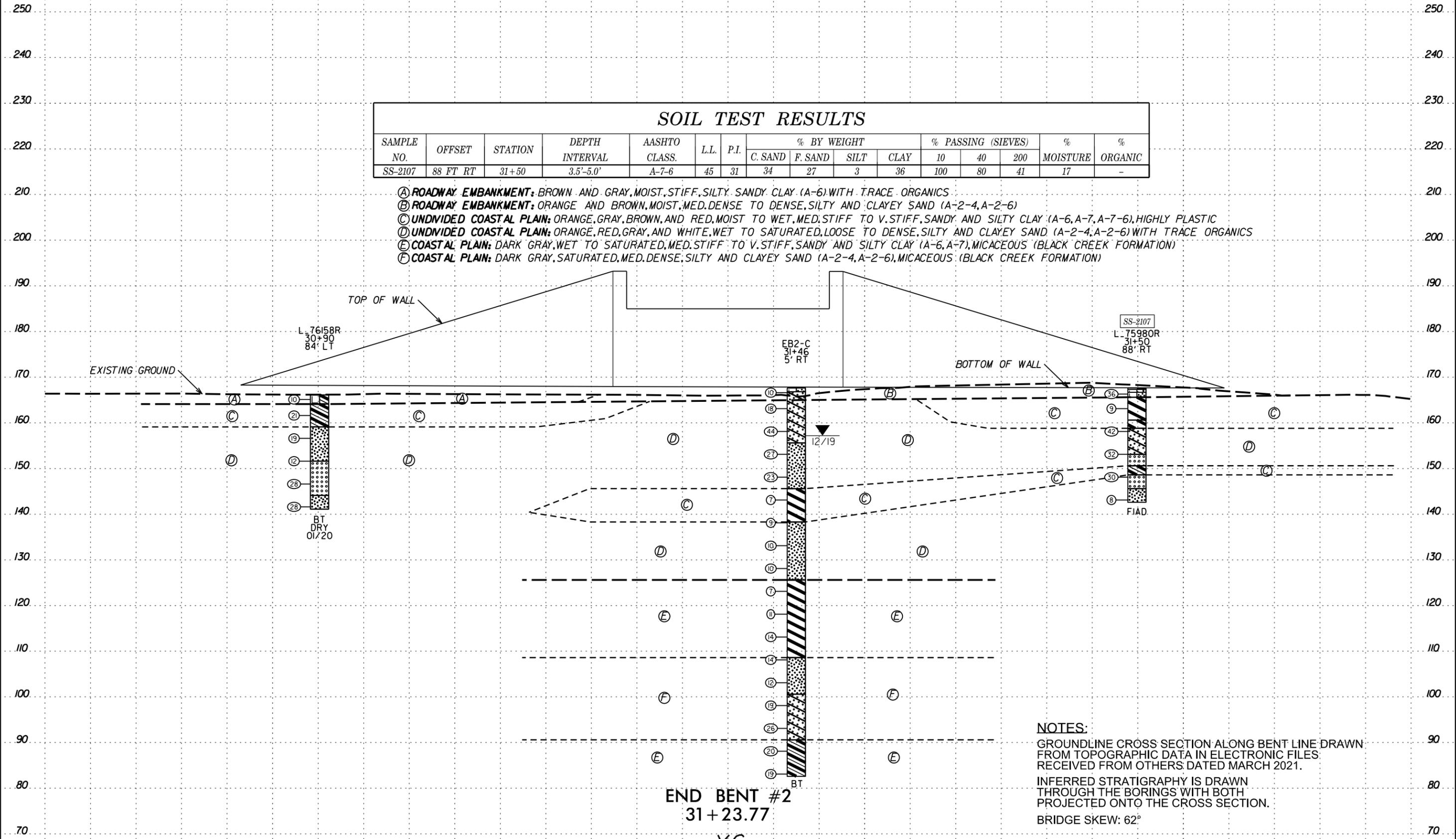


- (A) ROADWAY EMBANKMENT: ORANGE, GRAY, AND BROWN, MOIST, MED. DENSE, SILTY SAND (A-2-4) WITH TRACE ORGANICS
- (B) UNDIVIDED COASTAL PLAIN: ORANGE, GRAY, AND BROWN, MOIST, STIFF TO V. STIFF, SANDY AND SILTY CLAY (A-6, A-7)
- (C) UNDIVIDED COASTAL PLAIN: ORANGE, GRAY, AND BROWN, WET TO SATURATED, LOOSE TO DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6) WITH TRACE GRAVEL
- (D) COASTAL PLAIN: GRAY, MOIST, V. STIFF, SANDY SILT (A-4) AND SILTY CLAY (A-7) (BLACK CREEK FORMATION)
- (E) COASTAL PLAIN: GRAY, SATURATED, MED. DENSE, SILTY SAND (A-2-4) WITH TRACE CLAY AND MICA (BLACK CREEK FORMATION)

NOTES:
 GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA IN ELECTRONIC FILES RECEIVED FROM OTHERS DATED MARCH 2021.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.
 BRIDGE SKEW: 62°

END BENT #1
 29 + 32.44

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-2107	88 FT RT	31+50	3.5'-5.0'	A-7-6	45	31	34	27	3	36	100	80	41	17	-

- (A) ROADWAY EMBANKMENT: BROWN AND GRAY, MOIST, STIFF, SILTY SANDY CLAY (A-6) WITH TRACE ORGANICS
- (B) ROADWAY EMBANKMENT: ORANGE AND BROWN, MOIST, MED. DENSE TO DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6)
- (C) UNDIVIDED COASTAL PLAIN: ORANGE, GRAY, BROWN, AND RED, MOIST TO WET, MED. STIFF TO V. STIFF, SANDY AND SILTY CLAY (A-6, A-7, A-7-6), HIGHLY PLASTIC
- (D) UNDIVIDED COASTAL PLAIN: ORANGE, RED, GRAY, AND WHITE, WET TO SATURATED, LOOSE TO DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6) WITH TRACE ORGANICS
- (E) COASTAL PLAIN: DARK GRAY, WET TO SATURATED, MED. STIFF TO V. STIFF, SANDY AND SILTY CLAY (A-6, A-7), MICACEOUS (BLACK CREEK FORMATION)
- (F) COASTAL PLAIN: DARK GRAY, SATURATED, MED. DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6), MICACEOUS (BLACK CREEK FORMATION)

NOTES:
 GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA IN ELECTRONIC FILES RECEIVED FROM OTHERS DATED MARCH 2021.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.
 BRIDGE SKEW: 62°

END BENT #2
 31+23.77

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

GEOTECHNICAL BORING REPORT BORE LOG

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST B. Painter											
SITE DESCRIPTION Bridge No. 162 on -Y6- (McRainey Road) over -L- (I-95) at -L- Sta. 761+20.96							GROUND WTR (ft)										
BORING NO. L_76237L		STATION 28+73		OFFSET 57 ft LT		ALIGNMENT -Y6-											
COLLAR ELEV. 168.8 ft		TOTAL DEPTH 25.0 ft		NORTHING 399,657		EASTING 2,009,008											
DRILL RIG/HAMMER EFF./DATE F&R5785 CME-55 73% 03/01/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic													
DRILLER D. Tignor		START DATE 01/14/20		COMP. DATE 01/14/20		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							
170	168.8	0.0													168.8	GROUND SURFACE	0.0
			WOH	2	2										166.8	UNDIVIDED COASTAL PLAIN LIGHT BROWN-ORANGE, SILTY FINE SAND (A-2-4) WITH TRACE ORGANICS	2.0
165	165.3	3.5		5	11	14									166.8	GRAY-BROWN, FINE TO COARSE SANDY SILTY CLAY (A-7)	
160	160.3	8.5		4	8	10									156.8	ORANGE-BROWN AND WHITE, SILTY FINE TO COARSE SAND (A-2-4)	12.0
155	155.3	13.5		3	7	8									156.8		
150	150.3	18.5		5	5	7									143.8	Boring Terminated at Elevation 143.8 ft IN SILTY SAND (UNDIVIDED COASTAL PLAIN)	25.0
145	145.3	23.5		6	7	11											

NCDOT BORE SINGLE B08_15987_GEO_BRDG_Y6.GPJ_NC_DOT.GDT 11/2/21

GEOTECHNICAL BORING REPORT BORE LOG

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST B. Painter											
SITE DESCRIPTION Bridge No. 162 on -Y6- (McRainey Road) over -L- (I-95) at -L- Sta. 761+20.96							GROUND WTR (ft)										
BORING NO. L_76047L		STATION 29+72		OFFSET 105 ft RT		ALIGNMENT -Y6-											
COLLAR ELEV. 167.3 ft		TOTAL DEPTH 25.0 ft		NORTHING 399,477		EASTING 2,008,947											
DRILL RIG/HAMMER EFF./DATE F&R5785 CME-55 73% 03/01/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic													
DRILLER D. Tignor		START DATE 01/14/20		COMP. DATE 01/14/20		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							
170															167.3	GROUND SURFACE	0.0
															165.3	ROADWAY EMBANKMENT BROWN, SILTY FINE SAND (A-2-4) WITH TRACE ORGANICS	2.0
165	163.8	3.5		3	6	9									165.3	UNDIVIDED COASTAL PLAIN ORANGE-BROWN TO GRAY, SILTY FINE SANDY CLAY (A-6)	
160	158.8	8.5		7	12	18									155.3	ORANGE-GRAY-RED, SILTY FINE TO COARSE SAND (A-2-4) WITH TRACE GRAVEL FROM 13.5'-15.0'	12.0
155	153.8	13.5		9	10	12									142.3	Boring Terminated at Elevation 142.3 ft IN SILTY SAND (UNDIVIDED COASTAL PLAIN)	25.0
150	148.8	18.5		9	8	10											
145	143.8	23.5		7	10	11											

NCDOT BORE SINGLE B08_15987_GEO_BRDG_Y6.GPJ_NC_DOT.GDT 11/2/21

GEOTECHNICAL BORING REPORT BORE LOG

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST B. Painter										
SITE DESCRIPTION Bridge No. 162 on -Y6- (McRainey Road) over -L- (I-95) at -L- Sta. 761+20.96							GROUND WTR (ft)									
BORING NO. L_76158R		STATION 30+90		OFFSET 84 ft LT		ALIGNMENT -Y6-										
COLLAR ELEV. 166.1 ft		TOTAL DEPTH 25.0 ft		NORTHING 399,508		EASTING 2,009,168										
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 82% 03/01/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER D. Tignor		START DATE 01/20/20		COMP. DATE 01/20/20		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						
170																
165	166.1	0.0	2	4	6										166.1	GROUND SURFACE
															164.1	ROADWAY EMBANKMENT BROWN-GRAY, SILTY FINE TO COARSE SANDY CLAY (A-6) WITH TRACE ORGANICS
	162.6	3.5	8	9	12										159.1	UNDIVIDED COASTAL PLAIN GRAY-RED, SILTY FINE TO COARSE SANDY CLAY (A-6) ORANGE-GRAY, SILTY FINE TO COARSE SAND (A-2-4)
160															151.6	ORANGE-GRAY-WHITE, FINE SAND (A-3)
	157.6	8.5	7	10	9										144.1	GRAY-WHITE, SILTY FINE TO COARSE SAND (A-2-4)
155															141.1	Boring Terminated at Elevation 141.1 ft IN SILTY SAND (UNDIVIDED COASTAL PLAIN)
	152.6	13.5	5	5	7											
150																
	147.6	18.5	11	14	14											
145																
	142.6	23.5	10	13	15											

Notes:
1. Boring caved-in at 3.5' after 24 hours

NCDOT BORE SINGLE B08_15987_GEO_BRDG_Y6.GPJ_NC_DOT.GDT 11/2/21

GEOTECHNICAL BORING REPORT BORE LOG

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST B. Painter										
SITE DESCRIPTION Bridge No. 162 on -Y6- (McRainey Road) over -L- (I-95) at -L- Sta. 761+20.96							GROUND WTR (ft)									
BORING NO. L_75980R		STATION 31+50		OFFSET 88 ft RT		ALIGNMENT -Y6-										
COLLAR ELEV. 167.6 ft		TOTAL DEPTH 25.0 ft		NORTHING 399,352		EASTING 2,009,075										
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 82% 03/01/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER D. Tignor		START DATE 01/22/20		COMP. DATE 01/22/20		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						
170																
	167.3	0.3	10	13	23										167.6	GROUND SURFACE
165															165.6	ROADWAY EMBANKMENT ASPHALT
	164.1	3.5	3	3	6										160.6	ORANGE-BROWN, SILTY CLAYEY FINE TO COARSE SAND (A-2-6) BROWN, CLAYEY SILTY FINE SAND (A-2-4)
160															158.8	UNDIVIDED COASTAL PLAIN ORANGE-BROWN-GRAY, FINE TO COARSE SANDY CLAY (A-7-6), HIGHLY PLASTIC
	159.1	8.5	7	20	22										153.1	GRAY, FINE SANDY SILTY CLAY (A-7) ORANGE-RED-GRAY, SILTY CLAYEY FINE TO COARSE SAND (A-2-6)
155															150.6	ORANGE-WHITE, FINE SAND (A-3)
	154.1	13.5	9	15	17										148.6	ORANGE-PINK, SILTY FINE SANDY CLAY (A-6)
150															145.6	WHITE, FINE SAND (A-3)
	149.1	18.5	4	13	17										142.6	GRAY, SILTY FINE TO COARSE SAND (A-2-4)
145																
	144.1	23.5	6	5	3											

Boring Terminated at Elevation 142.6 ft IN SILTY SAND (UNDIVIDED COASTAL PLAIN)

NCDOT BORE SINGLE B08_15987_GEO_BRDG_Y6.GPJ_NC_DOT.GDT 11/2/21

REFERENCE: I-5987B

PROJECT: 47533

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5987B	1	6

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5-6	BORE LOGS

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY ROBESON
PROJECT DESCRIPTION I-95 IMPROVEMENTS FROM
NORTH OF SR 1758 (McDUFFIE CROSSING RD.)
TO NORTH OF SR 1723 (PARKTON TOBEMORY RD.)
SITE DESCRIPTION CULVERT ON -L- (I-95) STATION
677+13.20 OVER MERCER BRANCH

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.

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PERSONNEL

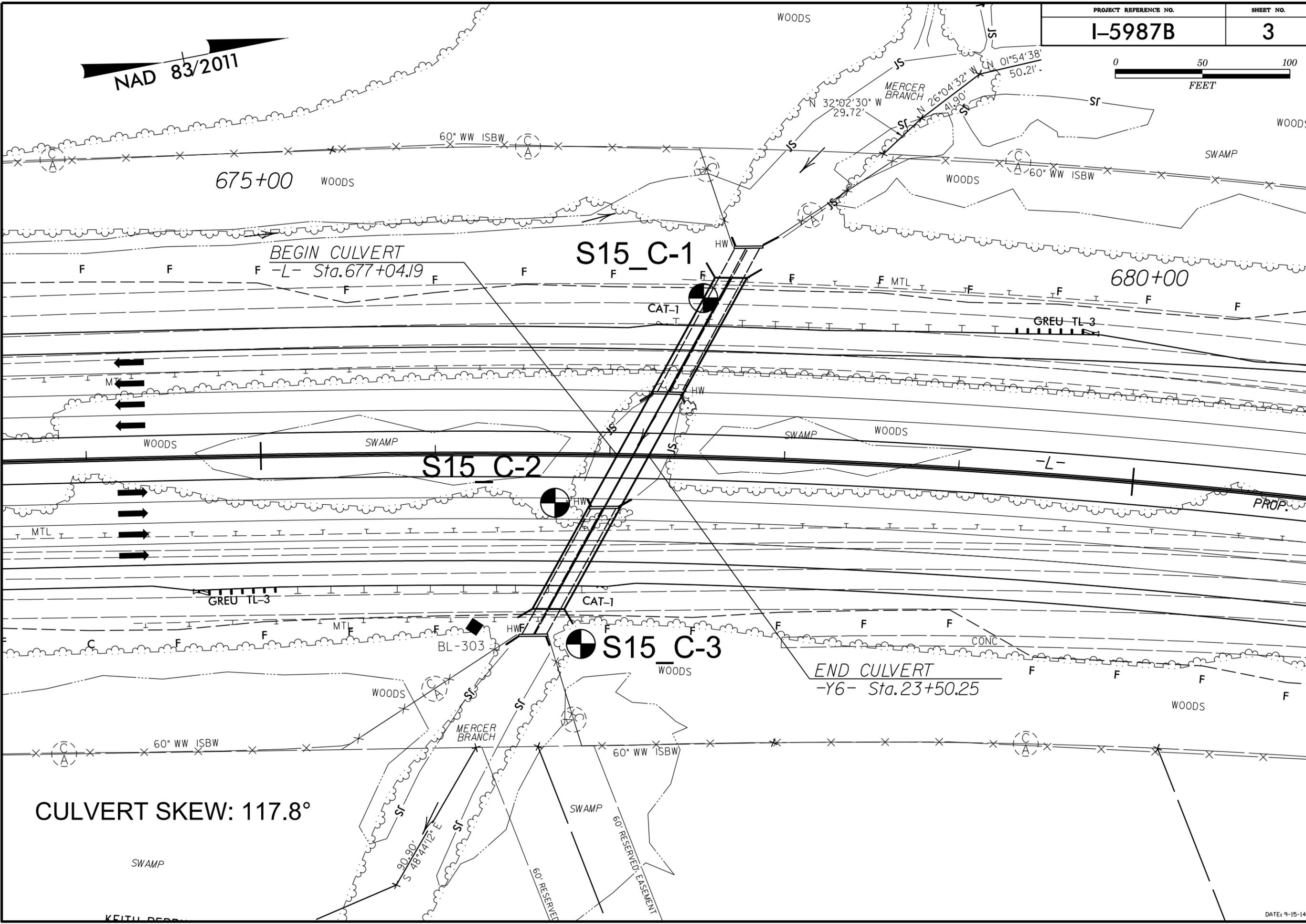
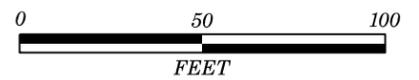
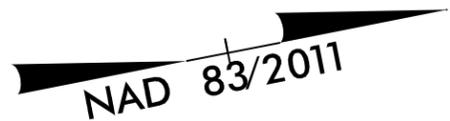
F&R, INC.

INVESTIGATED BY F&R, INC.
DRAWN BY HILL, M.J.
CHECKED BY CROCKETT, S.C.
SUBMITTED BY FALCON
DATE JANUARY 2022



DocuSigned by:
Stephen C Crockett 01/12/2022
CSCA5FED48E0435
SIGNATURE DATE

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675+00 WOODS

BEGIN CULVERT
-L- Sta. 677+04.19

S15_C-1

680+00

S15_C-2

S15_C-3

END CULVERT
-Y6- Sta. 23+50.25

CULVERT SKEW: 117.8°

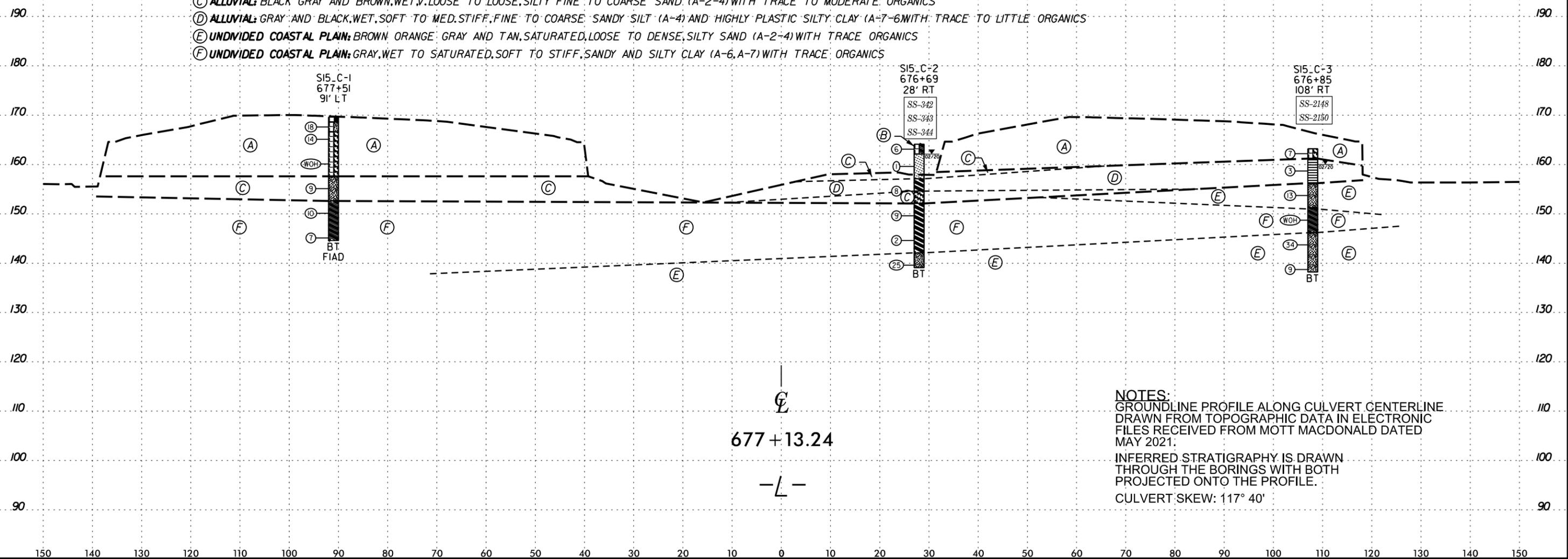
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

0 20 40
FEET

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-342	28 FT RT	676+69	0'-1.5'	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	3	
SS-343	28 FT RT	676+69	3.5'-5.0'	A-2-4	NP	NP	45	27	13	15	100	77	30	40	6
SS-344	28 FT RT	676+69	8.5'-10.0'	A-7-6	55	34	6	20	16	58	99	96	87	37	-
SS-2148	108 FT RT	676+85	3.5'-5.0'	A-4	NP	NP	40	24	16	20	99	74	39	21	6
SS-2150	108 FT RT	676+85	8.5'-10.0'	A-6	36	19	29	21	10	40	100	83	52	19	-

- (A) ROADWAY EMBANKMENT: GRAY BROWN ORANGE AND BLACK, MOIST TO SATURATED, V. LOOSE TO MED. DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6) WITH TRACE GRAVEL AND TRACE ORGANICS
- (B) ROADWAY EMBANKMENT: BLACK AND BROWN, MOIST, MED. STIFF, SANDY CLAY (A-6) WITH WITH TRACE ORGANICS
- (C) ALLUVIAL: BLACK GRAY AND BROWN, WET, V. LOOSE TO LOOSE, SILTY FINE TO COARSE SAND (A-2-4) WITH TRACE TO MODERATE ORGANICS
- (D) ALLUVIAL: GRAY AND BLACK, WET, SOFT TO MED. STIFF, FINE TO COARSE SANDY SILT (A-4) AND HIGHLY PLASTIC SILTY CLAY (A-7-6) WITH TRACE TO LITTLE ORGANICS
- (E) UNDIVIDED COASTAL PLAIN: BROWN ORANGE, GRAY AND TAN, SATURATED, LOOSE TO DENSE, SILTY SAND (A-2-4) WITH TRACE ORGANICS
- (F) UNDIVIDED COASTAL PLAIN: GRAY, WET TO SATURATED, SOFT TO STIFF, SANDY AND SILTY CLAY (A-6, A-7) WITH TRACE ORGANICS



NOTES:
 GROUNDLINE PROFILE ALONG CULVERT CENTERLINE
 DRAWN FROM TOPOGRAPHIC DATA IN ELECTRONIC
 FILES RECEIVED FROM MOTT MACDONALD DATED
 MAY 2021.
 INFERRED STRATIGRAPHY IS DRAWN
 THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE PROFILE.
 CULVERT SKEW: 117° 40'

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST B. Painter									
SITE DESCRIPTION Culvert on -L- (I-95) Sta. 677+13.20 Over Mercer Branch							GROUND WTR (ft)								
BORING NO. S15_C-1		STATION 677+51		OFFSET 91 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 169.6 ft		TOTAL DEPTH 25.0 ft		NORTHING 392,124		EASTING 2,005,162									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER E. Estep		START DATE 02/18/20		COMP. DATE 02/18/20		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
170	168.6	1.0	9	9	9									169.6 GROUND SURFACE 0.0	
	168.6													168.6 ROADWAY EMBANKMENT ASPHALT 1.0	
165	166.1	3.5	7	7	7									166.6 GRAY-BROWN, CLAYEY SILTY FINE TO COARSE SAND (A-2-4) 3.0	
	166.1													166.6 GRAY-ORANGE-BROWN, SILTY CLAYEY FINE TO COARSE SAND (A-2-6) WITH TRACE GRAVEL FROM 3.5'-5.0'	
160	161.1	8.5	WOH	WOH	WOH									157.6 ALLUVIAL GRAY-BROWN, SILTY FINE TO COARSE SAND (A-2-4) 12.0	
155	156.1	13.5	4	4	5									152.6 UNDIVIDED COASTAL PLAIN DARK GRAY, FINE SANDY CLAY (A-6) WITH TRACE ORGANICS FROM 23.5'-25.0'	
150	151.1	18.5	2	4	6										
145	146.1	23.5	1	3	4										
															Boring Terminated at Elevation 144.6 ft IN SANDY CLAY (UNDIVIDED COASTAL PLAIN)

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST W. Pesl									
SITE DESCRIPTION Culvert on -L- (I-95) Sta. 677+13.20 Over Mercer Branch							GROUND WTR (ft)								
BORING NO. S15_C-2		STATION 676+69		OFFSET 28 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 164.1 ft		TOTAL DEPTH 25.0 ft		NORTHING 392,018		EASTING 2,005,261									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER E. Estep		START DATE 02/14/20		COMP. DATE 02/14/20		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
165	164.1	0.0	2	3	3									164.1 GROUND SURFACE 0.0	
	164.1													162.1 ROADWAY EMBANKMENT BLACK-BROWN, SILTY FINE TO COARSE SANDY CLAY (A-6) WITH TRACE ORGANICS (ORGANIC CONTENT=3.0%) 2.0	
160	160.6	3.5	1	0	1									157.1 ALLUVIAL BLACK-GRAY, CLAYEY SILTY FINE TO COARSE SAND (A-2-4), MODERATELY ORGANIC (ORGANIC CONTENT=6.0%) 7.0	
155	155.6	8.5	1	2	6									154.6 GRAY, FINE SANDY SILTY CLAY (A-7-6) WITH TRACE COARSE SAND, WOOD FRAGMENTS AND ORGANICS, HIGHLY PLASTIC 9.5	
150	150.6	13.5	2	4	5									152.1 UNDIVIDED COASTAL PLAIN (GRAY, SILTY CLAYEY FINE SAND (A-2-6)) GRAY, SILTY CLAY (A-7) WITH TRACE COARSE SAND, WOOD FRAGMENTS, AND ORGANICS 12.0	
145	145.6	18.5	WOH	WOH	2									142.1 GRAY-TAN, CLAYEY SILTY FINE TO COARSE SAND (A-2-4) WITH TRACE ORGANICS 22.0	
140	140.6	23.5	10	13	12									139.1 Boring Terminated at Elevation 139.1 ft IN CLAYEY SILTY SAND (UNDIVIDED COASTAL PLAIN) 25.0	

NCDOT BORE DOUBLE C15_I5987_GEO_CULV_L67713.GPJ NC_DOT.GDT 1/10/22

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST B. Painter										
SITE DESCRIPTION Culvert on -L- (I-95) Sta. 677+13.20 Over Mercer Branch							GROUND WTR (ft)									
BORING NO. S15_C-3		STATION 676+85		OFFSET 108 ft RT		ALIGNMENT -L-	0 HR. N/A									
COLLAR ELEV. 163.2 ft		TOTAL DEPTH 25.0 ft		NORTHING 392,017		EASTING 2,005,343	24 HR. 3.2									
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 82% 03/01/2019				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER R. Clarke		START DATE 02/03/20		COMP. DATE 02/03/20		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)		
165														163.2	0.0	GROUND SURFACE
	163.2	0.0	1	2	5									161.2	2.0	ROADWAY EMBANKMENT BROWN-BLACK-ORANGE, SILTY CLAYEY FINE TO COARSE SAND (A-2-6) WITH TRACE ORGANICS
160	159.7	3.5	1	1	2						SS-2148	21%				ALLUVIAL BLACK, CLAYEY FINE TO COARSE SANDY SILT (A-4) WITH LITTLE ORGANICS (ORGANIC CONTENT=6.3%)
	154.7	8.5	5	7	6									156.2	7.0	UNDIVIDED COASTAL PLAIN GRAY, SILTY FINE TO COARSE SAND (A-2-4), MICACEOUS
155	154.7	8.5	5	7	6									151.2	12.0	UNDIVIDED COASTAL PLAIN GRAY, SILTY FINE TO COARSE SANDY CLAY (A-6) WITH TRACE ORGANICS
150	149.7	13.5	WOH	WOH	WOH						SS-2150	19%		146.2	17.0	BROWN-ORANGE-GRAY, SILTY FINE TO COARSE SAND (A-2-4)
145	144.7	18.5	2	13	21									138.2	25.0	Boring Terminated at Elevation 138.2 ft IN SILTY SAND (UNDIVIDED COASTAL PLAIN)
140	139.7	23.5	9	5	4											

NCDOT BORE DOUBLE C15_I5987_GEO_CULV_L67713.GPJ NC_DOT.GDT 1/10/22

REFERENCE: I-5987B

PROJECT: 47533

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY ROBESON
PROJECT DESCRIPTION I-95 IMPROVEMENTS FROM
NORTH OF SR 1758 (McDUFFIE CROSSING RD.)
TO NORTH OF SR 1723 (PARKTON TOBEMORY RD.)
SITE DESCRIPTION CULVERT ON -L- STA. 708+48.43
OVER BRISSON BRANCH

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4,5	PROFILE
6-9	BORE LOGS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5987B	1	9

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PERSONNEL

M.A.D.
F&R, INC.
GOODNIGHT, D.J.
WEIS, J.M.

INVESTIGATED BY GOODNIGHT, D.J.
DRAWN BY HILL, M.J.
CHECKED BY CROCKETT, S.C.
SUBMITTED BY FALCON
DATE JANUARY 2022



DocuSigned by:
Stephen C. Crockett 01/12/2022
SIGNATURE DATE

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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																																																										
<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 DISLOADED 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.</p>																																																										
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS										WEATHERED ROCK (WR)										CRYSTALLINE ROCK (CR)																																																										
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<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p>SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50</p>										<p>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.</p>										<p>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>																																																										
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<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>FRAC. MARK: ELEVATIONS TAKEN FROM I5987_LS_TIN2_TIN DATED 05/21 ELEVATION: FEET</p>										<p>NOTES: FIAD - FILLED IMMEDIATELY AFTER DRILLING</p>										<p>DATE: 8-15-14</p>																																																										

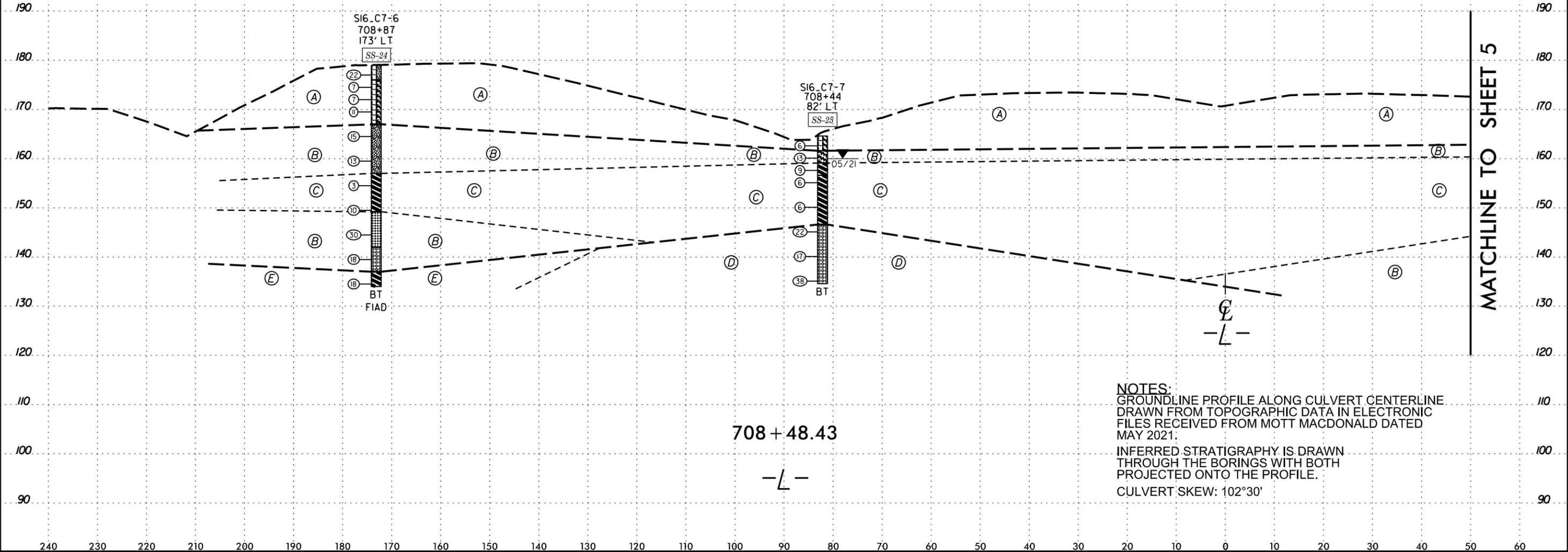
240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60

0 20 40
FEET

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-25	82 FT LT	708+44	8.5'-10.0'	A-7-5	80	31	5	3	18	74	100	96	93	38	-
SS-24	173 FT LT	708+87	23.5'-25.0'	A-7-6	87	73	4	2	23	71	100	97	95	45	-

- (A) ROADWAY EMBANKMENT: TAN GRAY AND BLACK, MOIST, LOOSE TO MED. DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6) WITH TRACE GRAVEL
- (B) UNDIVIDED COASTAL PLAIN: RED TAN AND BROWN, MOIST, MED. DENSE, SILTY AND CLAYEY SAND (A-2-5, A-2-6) AND CLEAN F. TO CSE. SAND (A-1-a, A-3.)
- (C) UNDIVIDED COASTAL PLAIN: TAN AND GRAY, SOFT TO STIFF, SANDY AND HIGHLY PLASTIC SILTY CLAY (A-7, A-7-5, A-7-6)
- (D) COASTAL PLAIN: TAN, SATURATED, MED. DENSE TO DENSE, COARSE SAND (A-1-b) (BLACK CREEK FORMATION)
- (E) COASTAL PLAIN: GRAY, WET, V. STIFF, SILTY CLAY (A-7) (BLACK CREEK FORMATION)



NOTES:
 GROUNDLINE PROFILE ALONG CULVERT CENTERLINE.
 DRAWN FROM TOPOGRAPHIC DATA IN ELECTRONIC
 FILES RECEIVED FROM MOTT MACDONALD DATED
 MAY 2021.
 INFERRED STRATIGRAPHY IS DRAWN
 THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE PROFILE.
 CULVERT SKEW: 102°30'

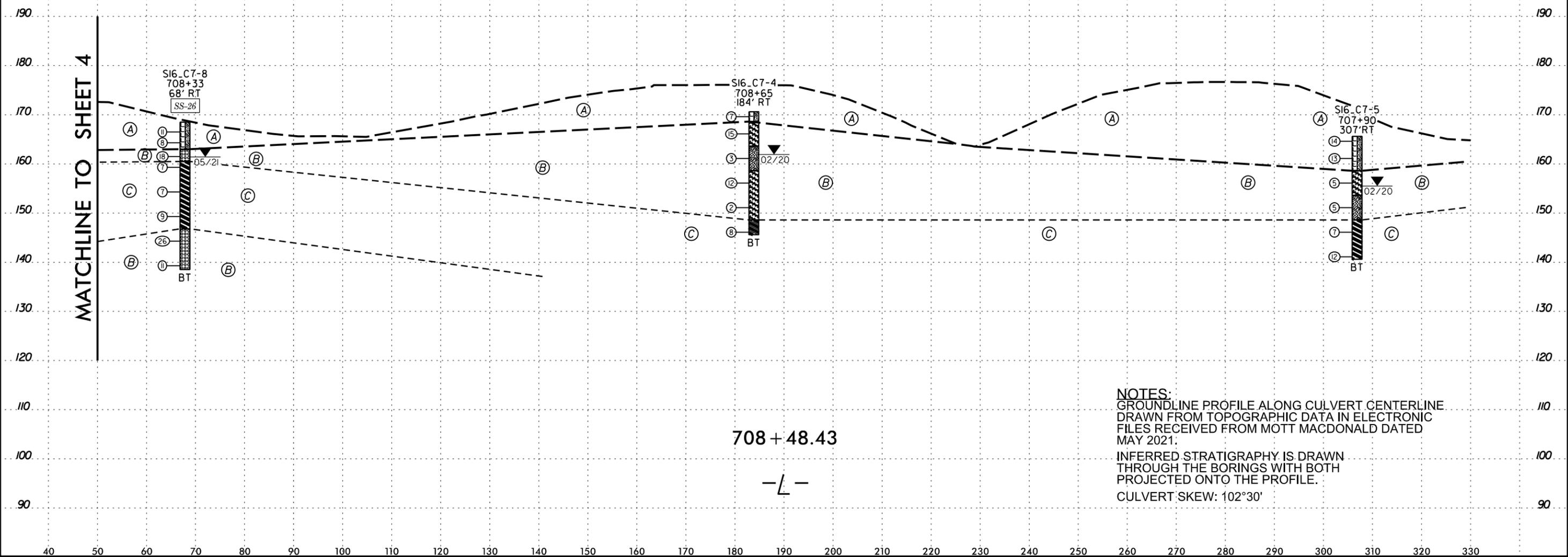
8/23/99

40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330

0 20 40
FEET

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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-26	68 FT RT	708+33	8.2'-9.7'	A-7-6	49	31	38	21	3	38	100	75	42	20	-

- (A) ROADWAY EMBANKMENT: ORANGE BROWN AND TAN, MOIST TO SAT., LOOSE TO MED. DENSE, SILTY SAND (A-2-4)
- (B) UNDIVIDED COASTAL PLAIN: TAN ORANGE BROWN AND GRAY, MOIST TO SAT., V. LOOSE TO MED. DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-5, A-2-6) AND CLEAN F. TO CSE. SAND (A-1-b, A-3) WITH TRACE ORGANICS AND ROOTS
- (C) UNDIVIDED COASTAL PLAIN: RED TAN AND GRAY, MED. STIFF TO STIFF, SANDY AND HIGHLY PLASTIC SILTY CLAY (A-6, A-7, A-7-6)



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8/23/99

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST Goodnight, D.										
SITE DESCRIPTION CULVERT ON -L- (I-95) STATION 708+48.43 OVER BRISSON BRANCH							GROUND WTR (ft)									
BORING NO. S16_C7-6		STATION 708+87		OFFSET 173 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 179.0 ft		TOTAL DEPTH 45.0 ft		NORTHING 394,933		EASTING 2,006,600										
DRILL RIG/HAMMER EFF./DATE MID3964 CME-45C 91% 02/21/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Powell, B.		START DATE 05/20/21		COMP. DATE 05/20/21		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						
180														179.0	5 INCHES ASPHALT ROADWAY EMBANKMENT	0.0
	178.0	1.0	9	10	12								M	176.0	BLACK AND TAN, SILTY SAND (A-2-4) WITH TRACE GRAVEL	3.0
175	175.5	3.5	5	4	3								M		GRAY-TAN, CLAYEY SAND (A-2-6)	
	173.0	6.0	3	3	4								M			
170	170.5	8.5	4	5	6								M			
	167.0	12.0											M	167.0	UNDIVIDED COASTAL PLAIN	12.0
165	165.5	13.5	4	6	9								M		RED-TAN AND GRAY, CLAYEY SILTY SAND (A-2-5)	
	160.5	18.5	10	8	5								M			
160	160.5	18.5	10	8	5								M			
	155.5	23.5	WOH	1	2								SS-24	157.0	LIGHT-GRAY, HIGHLY PLASTIC SILTY CLAY (A-7-6)	22.0
155	155.5	23.5	WOH	1	2								SS-24	149.2	TAN, SAND (A-3)	29.8
	150.5	28.5	2	2	8								W			
150	150.5	28.5	2	2	8								W			
	145.5	33.5	5	12	18								Sat.	142.0	TAN, FINE TO COARSE SAND (A-1-a)	37.0
145	145.5	33.5	5	12	18								Sat.			
	140.5	38.5	1	6	12								Sat.			
140	140.5	38.5	1	6	12								Sat.			
	135.5	43.5	4	7	11								W	137.0	COASTAL PLAIN	42.0
135	135.5	43.5	4	7	11								W	134.0	GRAY, SILTY CLAY (A-7) (BLACK CREEK FORMATION)	45.0
															Boring Terminated at Elevation 134.0 ft IN CLAY (COASTAL PLAIN)	

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST Weis, J. M.										
SITE DESCRIPTION CULVERT ON -L- (I-95) STATION 708+48.43 OVER BRISSON BRANCH							GROUND WTR (ft)									
BORING NO. S16_C7-7		STATION 708+44		OFFSET 82 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 164.6 ft		TOTAL DEPTH 30.0 ft		NORTHING 394,846		EASTING 2,006,650										
DRILL RIG/HAMMER EFF./DATE MID3964 CME-45C 91% 02/21/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Powell, B.		START DATE 05/18/21		COMP. DATE 05/18/21		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						
165														164.6	GROUND SURFACE	0.0
	163.6	1.0	3	3	3								M	161.6	ROADWAY EMBANKMENT	3.0
	161.1	3.5	6	8	5								M	159.1	UNDIVIDED COASTAL PLAIN	5.5
160	161.1	3.5	6	8	5								M		BROWN TO TAN, CLAYEY SAND (A-2-6)	
	158.6	6.0	4	4	5								M	156.6	TAN, CLAY (A-7)	8.0
155	156.1	8.5	2	2	4								SS-25	38%	TAN, HIGHLY PLASTIC SILTY CLAY (A-7-5)	
	151.1	13.5	2	3	3								Sat.			
150	151.1	13.5	2	3	3								Sat.			
	146.1	18.5	6	10	12								Sat.	146.6	COASTAL PLAIN	18.0
145	146.1	18.5	6	10	12								Sat.		TAN, COARSE SAND (A-1-b)	
	141.1	23.5	7	7	10								Sat.			
140	141.1	23.5	7	7	10								Sat.			
	136.1	28.5	8	16	22								Sat.	134.6		30.0
135	136.1	28.5	8	16	22								Sat.		Boring Terminated at Elevation 134.6 ft IN SAND (COASTAL PLAIN)	

NCDOT BORE DOUBLE C16_I5987_GEO_CULV_L70848.GPJ_NC_DOT.GDT 1/10/22

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST W. Pestl										
SITE DESCRIPTION CULVERT ON -L- (I-95) STATION 708+48.43 OVER BRISSON BRANCH							GROUND WTR (ft)									
BORING NO. S16_C7-5		STATION 707+90		OFFSET 307 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 165.6 ft		TOTAL DEPTH 25.0 ft		NORTHING 394,580		EASTING 2,006,940										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER E. Estep		START DATE 02/17/20		COMP. DATE 02/17/20		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						
170																
165	165.6	0.0	4	6	8										165.6	GROUND SURFACE
160	162.1	3.5	6	6	7										158.6	ROADWAY EMBANKMENT ORANGE-BROWN-TAN, SILTY FINE TO COARSE SAND (A-2-4)
155	157.1	8.5	2	2	3										153.6	UNDIVIDED COASTAL PLAIN TAN-GRAY, SILTY CLAYEY FINE TO COARSE SAND (A-2-6)
150	152.1	13.5	1	2	3										148.6	DARK BROWN-GRAY, CLAYEY SILTY FINE TO COARSE SAND (A-2-4) WITH TRACE ORGANICS AND WOOD FRAGMENTS
145	147.1	18.5	2	3	4										140.6	RED-TAN-GRAY, FINE TO COARSE SANDY SILTY CLAY (A-7)
	142.1	23.5	5	5	7										140.6	Boring Terminated at Elevation 140.6 ft IN CLAY (UNDIVIDED COASTAL PLAIN)

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST W. Pestl										
SITE DESCRIPTION CULVERT ON -L- (I-95) STATION 708+48.43 OVER BRISSON BRANCH							GROUND WTR (ft)									
BORING NO. S16_C7-1		STATION 710+66		OFFSET 129 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 169.6 ft		TOTAL DEPTH 30.0 ft		NORTHING 395,056		EASTING 2,006,738										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER E. Estep		START DATE 02/17/20		COMP. DATE 02/17/20		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						
170																
165	169.6	0.0	3	7	6										169.6	GROUND SURFACE
160	166.1	3.5	3	5	6										167.6	ROADWAY EMBANKMENT BROWN-GRAY, SILTY FINE TO COARSE SAND (A-2-4) WITH TRACE GRAVEL AND ORGANICS
155	161.1	8.5	WOH	WOH	2										158.6	UNDIVIDED COASTAL PLAIN ORANGE-BROWN-GRAY, SILTY CLAYEY FINE TO COARSE SAND (A-2-6) WITH TRACE WOOD FRAGMENTS FROM 13.5'-15.0'
150	156.1	13.5	3	4	3										153.6	DARK BROWN-GRAY, CLAYEY SILTY FINE TO COARSE SAND (A-2-4) WITH TRACE ORGANICS AND WOOD FRAGMENTS
145	151.1	18.5	WOH	1	1										148.6	RED-TAN-GRAY, SILTY CLAY (A-7) WITH TRACE FINE SAND
140	146.1	23.5	1	2	1										147.6	BROWN-TAN-GRAY, CLAYEY FINE TO COARSE SAND (A-2-6)
	141.1	28.5	16	16	20										142.6	TAN-GRAY, FINE SANDY SILTY CLAY (A-7)
															139.6	TAN-WHITE, CLAYEY SILTY FINE SAND (A-2-4)
															139.6	Boring Terminated at Elevation 139.6 ft IN SAND (UNDIVIDED COASTAL PLAIN)

NCDOT BORE DOUBLE C16_I5987_GEO_CULV_L70848.GPJ NC_DOT.GDT 1/10/22

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST B. Painter										
SITE DESCRIPTION CULVERT ON -L- (I-95) STATION 708+48.43 OVER BRISSON BRANCH							GROUND WTR (ft)									
BORING NO. S16_C7-2		STATION 710+19		OFFSET 1 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 170.8 ft		TOTAL DEPTH 25.0 ft		NORTHING 394,944		EASTING 2,006,816										
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 82% 03/01/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER D.Tignor		START DATE 01/21/20		COMP. DATE 12/06/19		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						
175																
170	170.8	0.0	1	3	5									170.8	GROUND SURFACE	0.0
														168.8	ROADWAY EMBANKMENT BROWN, SILTY FINE TO COARSE SAND (A-2-4) WITH TRACE ORGANICS	2.0
	167.3	3.5	6	5	5									163.8	GRAY-BROWN, SILTY CLAYEY FINE TO COARSE SAND (A-2-6)	7.0
														158.8	UNDIVIDED COASTAL PLAIN GRAY-BROWN, SILTY CLAYEY FINE TO COARSE SAND (A-2-6) WITH TRACE GRAVEL	12.0
	162.3	8.5	5	12	10									153.8	GRAY-BROWN, FINE SANDY SILTY CLAY (A-7)	17.0
														151.3	ORANGE-GRAY-BROWN, SILTY FINE SAND (A-2-4)	19.5
	157.3	13.5	3	3	4									148.8	GRAY-PINK-RED, FINE SANDY SILTY CLAY (A-7)	22.0
														145.8	WHITE, FINE TO COARSE SAND (A-3)	25.0
	152.3	18.5	6	5	3											
	147.3	23.5	2	6	11											

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST B. Painter										
SITE DESCRIPTION CULVERT ON -L- (I-95) STATION 708+48.43 OVER BRISSON BRANCH							GROUND WTR (ft)									
BORING NO. S16_C7-3		STATION 709+18		OFFSET 88 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 167.0 ft		TOTAL DEPTH 25.0 ft		NORTHING 394,810		EASTING 2,006,832										
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 82% 03/01/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER D.Tignor		START DATE 02/03/20		COMP. DATE 02/03/20		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						
170																
	167.0	0.0	2	3	2									167.0	GROUND SURFACE	0.0
														165.0	ROADWAY EMBANKMENT BROWN, SILTY FINE TO COARSE SAND (A-2-6) WITH TRACE ORGANICS	2.0
	163.5	3.5	2	3	3									160.0	ALLUVIAL BROWN, SILTY FINE TO COARSE SAND (A-2-4)	7.0
														158.5	UNDIVIDED COASTAL PLAIN GRAY-ORANGE-RED TO BROWN-GRAY, SILTY FINE TO COARSE SANDY CLAY (A-7-6), HIGHLY PLASTIC	12.0
	158.5	8.5	3	3	4									153.5	GRAY, SILTY FINE SAND (A-2-4)	17.0
														148.5	GRAY, SILTY FINE SAND (A-2-4)	17.0
	153.5	13.5	4	7	9									145.0	YELLOW-BROWN, FINE TO COARSE SAND (A-3)	22.0
														143.5	YELLOW-BROWN, FINE TO COARSE SAND (A-3)	25.0
	148.5	18.5	2	2	2											
	143.5	23.5	4	6	16											

NCDOT BORE DOUBLE C16_I5987_GEO_CULV_L70848.GPJ NC_DOT_GDT 1/10/22

REFERENCE: I-5987B

PROJECT: 47533

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5987B	1	6

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5,6	BORE LOGS

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY ROBESON
PROJECT DESCRIPTION I-95 IMPROVEMENTS FROM
NORTH OF SR 1758 (McDUFFIE CROSSING RD.)
TO NORTH OF SR 1723 (PARKTON TOBEMORY RD.)
SITE DESCRIPTION CULVERT ON -L- (I-95)
STA. 902+33.45 OVER BUCKHORN SWAMP

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:
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

TRIGON
F&R, INC.

INVESTIGATED BY F&R, INC.
DRAWN BY HILL, M.J.
CHECKED BY CROCKETT, S.C.
SUBMITTED BY FALCON
DATE JANUARY 2022



DocuSigned by:
Stephen C Crockett 01/12/2022
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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
<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 (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.</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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SD.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>FINE SAND (F SD.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SILT (SL.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>CLAY (CL.)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>GRAIN SIZE</td> <td>MM 305</td> <td>75</td> <td>2.0</td> <td>0.25</td> <td>0.05</td> <td>0.005</td> </tr> <tr> <td></td> <td>IN. 12</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> </td> <td colspan="10"> <p style="text-align: center;">RECOMMENDATION SYMBOLS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td></td> <td>UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</td> </tr> <tr> <td></td> <td>SHALLOW UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</td> <td></td> <td></td> </tr> </tbody> </table> </td> <td colspan="10"> <p style="text-align: center;">ABBREVIATIONS</p> <table border="1" style="width: 100%; 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MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p> </td> <td colspan="10"> <p style="text-align: center;">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </tbody> </table> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;">FRAC. 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<p style="text-align: center;">FRAC. MARK: ELEVATIONS TAKEN FROM I5987_LS_TIN2_TIN DATED 05/21</p> <p style="text-align: right;">ELEVATION: FEET</p>										<p style="text-align: center;">NOTES:</p> <p>FIAD - FILLED IMMEDIATELY AFTER DRILLING</p>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

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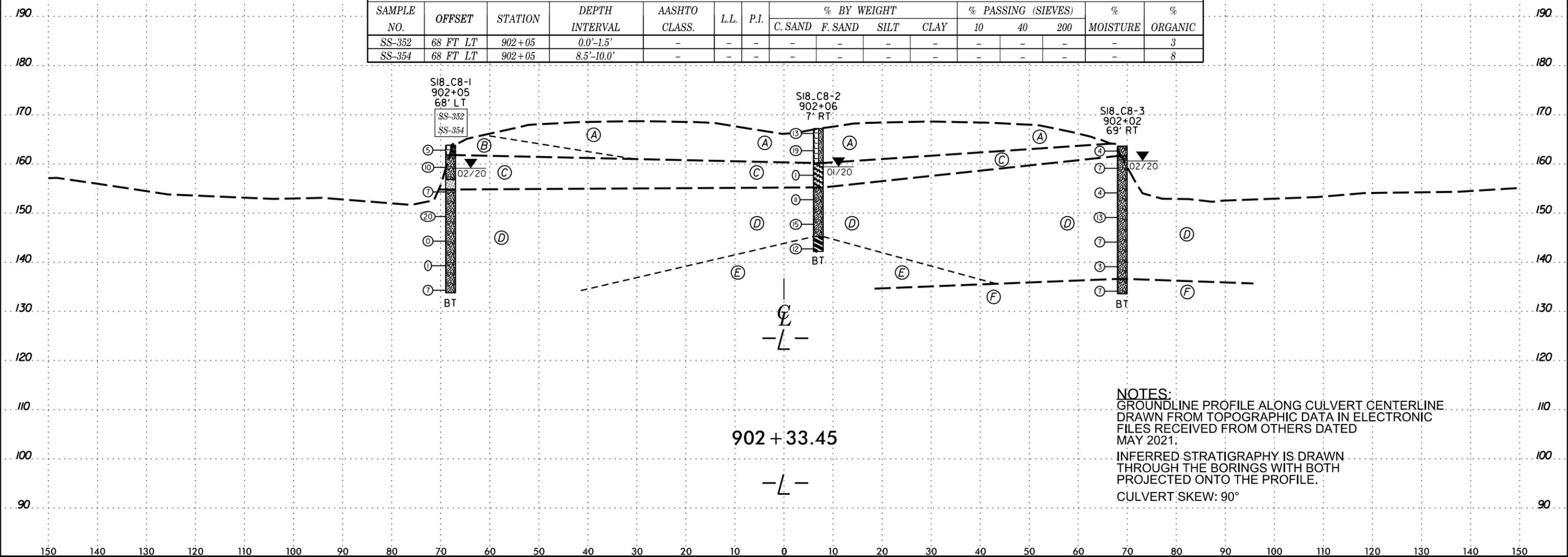
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



V.E. = 1

- (A) ROADWAY EMBANKMENT: ORANGE AND BROWN, MOIST, MED. DENSE, SILTY FINE SAND (A-2-4) WITH TRACE GRAVEL
- (B) ROADWAY EMBANKMENT: BROWN AND GRAY, MOIST, MED. STIFF, FINE TO COARSE SANDY CLAY (A-6) WITH TRACE ORGANICS
- (C) ALLUVIAL: BROWN ORANGE TAN AND GRAY, MOIST TO SATURATED, V. LOOSE TO LOOSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6) WITH TRACE TO MODERATE ORGANICS AND TRACE GRAVEL
- (D) UNDIVIDED COASTAL PLAIN: TAN BROWN WHITE AND GRAY, MOIST TO SATURATED, V. LOOSE TO MED. DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6) WITH TRACE MICA CLAY AND ORGANICS
- (E) UNDIVIDED COASTAL PLAIN: GRAY, MOIST, STIFF, SILTY CLAY (A-7)
- (F) COASTAL PLAIN: GRAY, WET, LOOSE, SILTY FINE TO COARSE SAND (A-2-4) WITH TRACE MICA (BLACK CREEK FORMATION)

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-352	68 FT LT	902+05	0.0'-1.5'	-	-	-	-	-	-	-	-	-	-	-	3
SS-354	68 FT LT	902+05	8.5'-10.0'	-	-	-	-	-	-	-	-	-	-	-	8



NOTES:
 GROUNDLINE PROFILE ALONG CULVERT CENTERLINE
 DRAWN FROM TOPOGRAPHIC DATA IN ELECTRONIC
 FILES RECEIVED FROM OTHERS DATED
 MAY 2021.
 INFERRED STRATIGRAPHY IS DRAWN
 THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE PROFILE.
 CULVERT SKEW: 90°

SCALE\$

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1	TIP I-5987B	COUNTY ROBESON	GEOLOGIST B. Painter
SITE DESCRIPTION CULVERT AT BUCKHORN SWAMP AT -L- STA. 902+33.45			GROUND WTR (ft)
BORING NO. C18-3	STATION 902+02	OFFSET 69 ft RT	ALIGNMENT -L-
COLLAR ELEV. 162.6 ft	TOTAL DEPTH 30.0 ft	NORTHING 413,263	EASTING 2,011,796
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 82% 03/01/2019		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
DRILLER D. Tignor	START DATE 02/04/20	COMP. DATE 02/04/20	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
165																
	162.6	0.0												162.6	GROUND SURFACE	0.0
160	159.1	3.5	1	2	2							M		160.6	ALLUVIAL ORANGE-GRAY, SILTY FINE SAND (A-2-4) WITH TRACE ORGANICS	2.0
	154.1	8.5	3	3	4							M			UNDIVIDED COASTAL PLAIN GRAY-WHITE, CLAYEY SILTY FINE TO COARSE SAND (A-2-4) WITH TRACE MICA	
155												Sat.				
150	149.1	13.5	2	1	3							Sat.				
145	144.1	18.5	4	8	5							Sat.				
140	139.1	23.5	2	4	3							Sat.				
135	134.1	28.5	1	1	2							Sat.		135.6	COASTAL PLAIN DARK GRAY, SILTY FINE TO COARSE SAND (A-2-4) WITH TRACE MICA (BLACK CREEK FORMATION)	27.0
			2	3	4							W		132.6	DARK GRAY, SILTY FINE TO COARSE SAND (A-2-4) WITH TRACE MICA (BLACK CREEK FORMATION)	30.0
															Boring Terminated at Elevation 132.6 ft IN SAND (COASTAL PLAIN) (BLACK CREEK FORMATION)	

NCDOT BORE SINGLE C18 I5987 GEO_CULV_I90233.GPJ NC_DOT_GDT 12/15/21

REFERENCE: I-5987B

PROJECT: 47533

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY ROBESON
 PROJECT DESCRIPTION I-95 IMPROVEMENTS FROM
NORTH OF SR 1758 (McDUFFIE CROSSING RD.)
TO NORTH OF SR 1723 (PARKTON TOBEMORY RD.)
 SITE DESCRIPTION CULVERT ON -Y6- (W. MCRAINEY
RD.) STATION 23+47.75 OVER UNNAMED
TRIBUTARY TO LITTLE MARSH SWAMP

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5	BORE LOGS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5987B	1	5

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:
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

M.A.D.
GOODNIGHT, D.J.

INVESTIGATED BY GOODNIGHT, D.J.
 DRAWN BY CROCKETT, S.C.
 CHECKED BY HAMM, J. R.
 SUBMITTED BY FALCON
 DATE NOVEMBER 2021

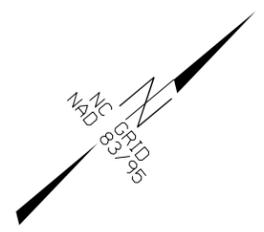
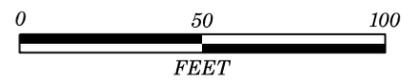


DocuSigned by:
Stephen C Crockett 01/12/2022
 SIGNATURE DATE

**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:										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										WEATHERED ROCK (WR)										NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.																			
MINERALOGICAL COMPOSITION										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.									
COMPRESSION										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																			
PERCENTAGE OF MATERIAL										FRESH										ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.										VERY SLIGHT (IV SLI.)										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.									
GROUND WATER										SLIGHT (SLI.)										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.									
MISCELLANEOUS SYMBOLS										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. IF TESTED, WOULD YIELD SPT REFUSAL										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. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF									
RECOMMENDATION SYMBOLS										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. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF										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.									
TEXTURE OR GRAIN SIZE										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.																			
CONSISTENCY OR DENSENESS										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.									
SOIL MOISTURE - CORRELATION OF TERMS										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.									
PLASTICITY										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 FINGER NAIL.										FRACTURE SPACING										BEDDING									
COLOR										FRAGILE										MORE THAN 10 FEET										VERY THICKLY BEDDED										4 FEET									
EQUIPMENT USED ON SUBJECT PROJECT										MODERATELY INDRURATED										3 TO 10 FEET										THICKLY BEDDED										1.5 - 4 FEET									
INDURATION										INDURATED										1 TO 3 FEET										THINLY BEDDED										0.16 - 1.5 FEET									
DRILL UNITS:										EXTREMELY INDRURATED										0.16 TO 1 FOOT										VERY THINLY BEDDED										0.03 - 0.16 FEET									
ADVANCING TOOLS:										SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.										LESS THAN 0.16 FEET										THICKLY LAMINATED										0.008 - 0.03 FEET									
HAND TOOLS:										NOTES:										FIAD - FILLED IMMEDIATELY AFTER DRILLING										THINLY LAMINATED										< 0.008 FEET									
CLAY BITS										DATE: 8-15-14																																							



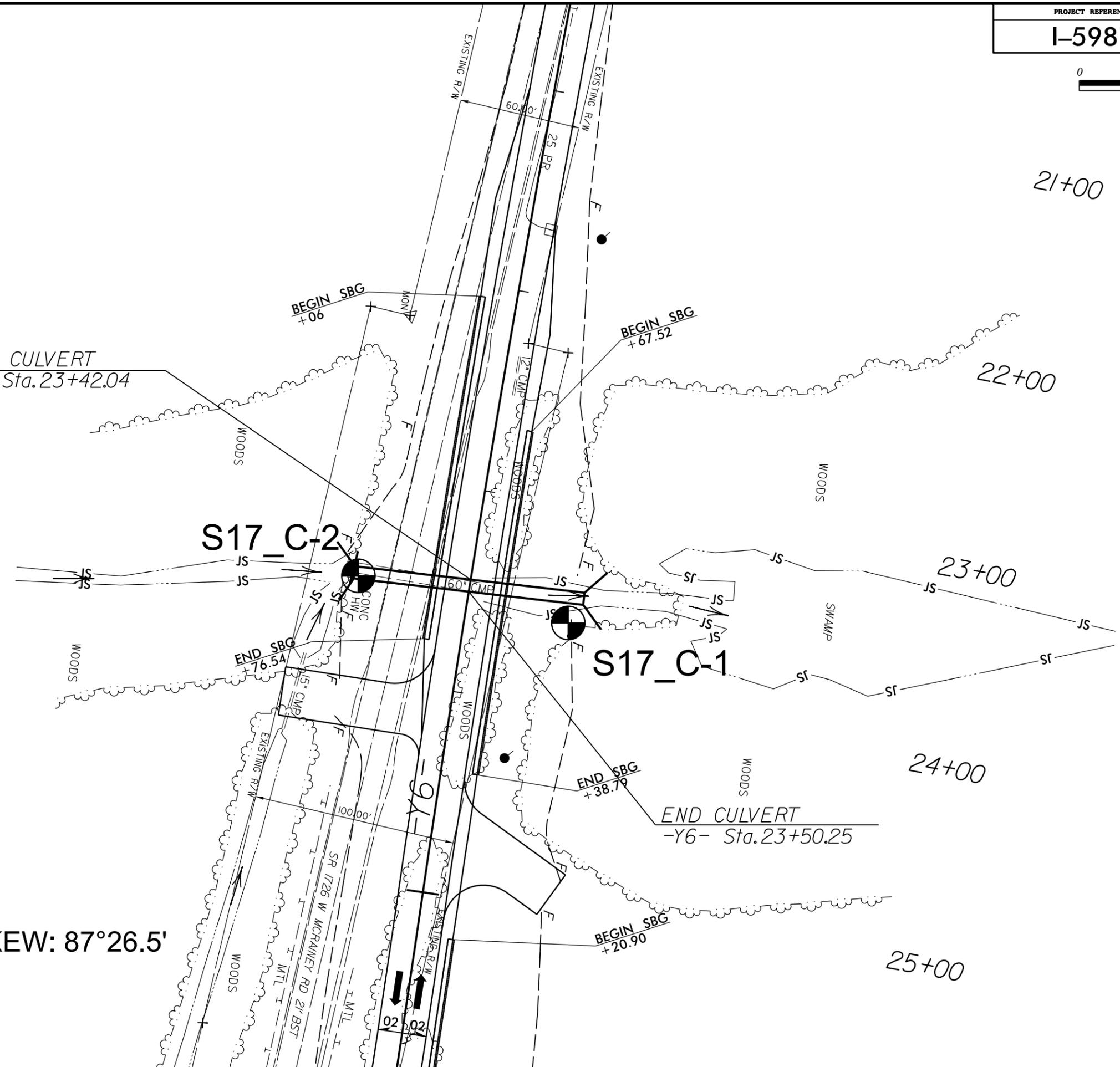
BEGIN CULVERT
-Y6- Sta.23+42.04

S17_C-2

S17_C-1

END CULVERT
-Y6- Sta.23+50.25

CULVERT SKEW: 87°26.5'



8/23/99

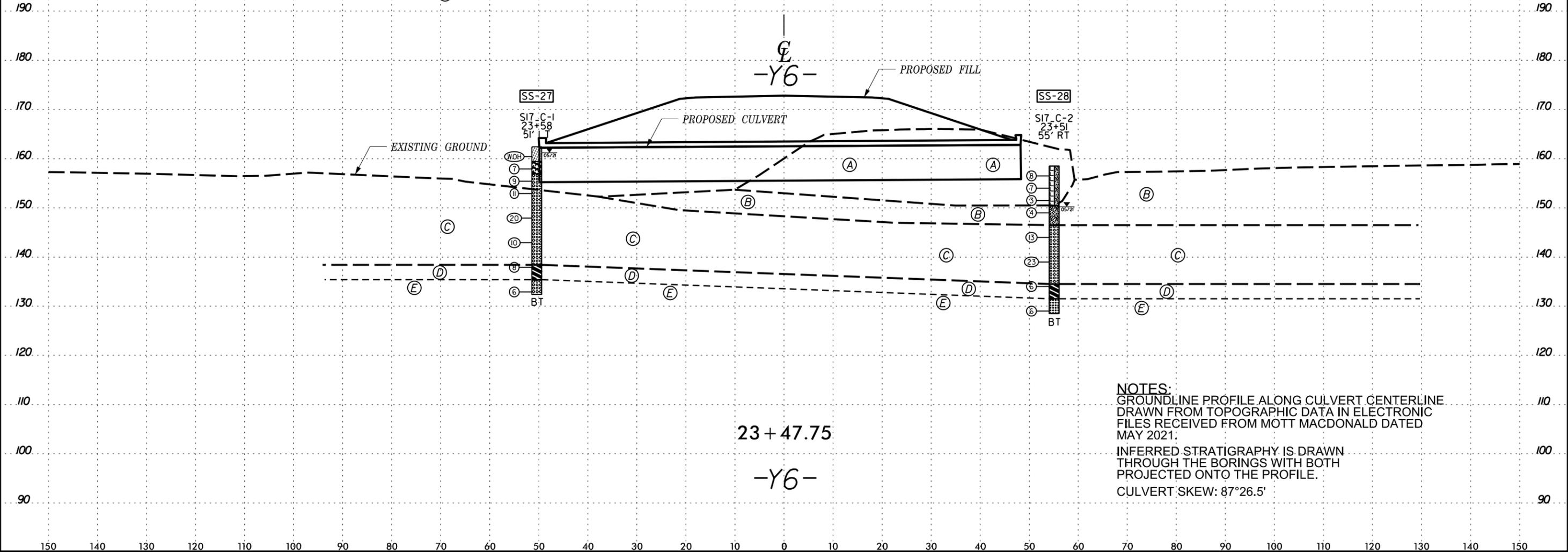
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

0 20 40
FEET

V.E. = 1

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-28	55 FT RT	23+51	24.0'-25.0'	A-7-6	45	21	9	14	18	59	100	94	80	25	-
SS-27	51 FT LT	23+58	24.0'-25.0'	A-7-6	44	18	5	10	32	53	100	97	90	31	-

- (A) ROADWAY EMBANKMENT: GRAY AND TAN, MOIST, V. LOOSE TO LOOSE, SILTY CLAYEY SAND (A-2-5)
- (B) ALLUVIAL: GRAY, WET, LOOSE, SILTY F. TO CSE. SAND (A-2-4) WITH TRACE TO LITTLE ORGANICS
- (C) UNDIVIDED COASTAL PLAIN: TAN AND GRAY, LOOSE TO MED. DENSE, SLIGHTLY SILTY F. TO CSE. SAND (A-1-b)
- (D) COASTAL PLAIN: TAN AND GRAY, MOIST TO WET, MED. STIFF TO STIFF, SANDY SILTY CLAY (A-7-6)
- (E) COASTAL PLAIN: TAN, SATURATED, LOOSE, SLIGHTLY SILTY F. TO CSE. SAND (A-1-b, A-3) (BLACK CREEK FORMATION)



NOTES:
 GROUNDLINE PROFILE ALONG CULVERT CENTERLINE
 DRAWN FROM TOPOGRAPHIC DATA IN ELECTRONIC
 FILES RECEIVED FROM MOTT MACDONALD DATED
 MAY 2021.
 INFERRED STRATIGRAPHY IS DRAWN
 THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE PROFILE.
 CULVERT SKEW: 87°26.5'

SCALE\$

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST Goodnight, D.										
SITE DESCRIPTION CULVERT ON -Y6- STATION 23+47.75 OVER UNNAMED TRIBUTARY TO LITTLE MARSH SWAMP							GROUND WTR (ft)									
BORING NO. S17_C-1		STATION 23+58		OFFSET 51 ft LT		ALIGNMENT -Y6-										
COLLAR ELEV. 162.4 ft		TOTAL DEPTH 30.0 ft		NORTHING 400,042		EASTING 2,008,663										
DRILL RIG/HAMMER EFF./DATE MID3964 CME-45C 91% 02/21/2019			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic										
DRILLER Powell, B.		START DATE 05/21/21		COMP. DATE 05/21/21		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						
165																
160	161.4	1.0	WOH	WOH	WOH								W	162.4	0.0	
	158.9	3.5	WOH	3	4								Sat.	159.4	3.0	ALLUVIAL TAN-GRAY, SILTY SAND (A-2-4) WITH LITTLE ORGANICS
	156.4	6.0											Sat.	156.9	5.5	GRAY, CLAYEY SAND (A-2-6) WITH TRACE ORGANICS
155	153.9	8.5	4	4	5								Sat.			UNDIVIDED COASTAL PLAIN TAN, F. TO CSE. SAND (A-1-b)
	148.9	13.5	3	5	6								Sat.			
150	143.9	18.5	4	9	11								Sat.			
145	138.9	23.5	5	6	4								Sat.			
140	133.9	28.5	4	5	3								Sat.	138.4	24.0	COASTAL PLAIN TAN AND LIGHT GRAY, SANDY SILTY CLAY (A-7-6) (BLACK CREEK FORMATION)
135													SS-27 31%	135.4	27.0	TAN, F. TO CSE. SAND (A-1-b) (BLACK CREEK FORMATION)
													Sat.	132.4	30.0	Boring Terminated at Elevation 132.4 ft IN CP: A-1-b

WBS 47533.1.1		TIP I-5987B		COUNTY ROBESON		GEOLOGIST Goodnight, D.										
SITE DESCRIPTION CULVERT ON -Y6- STATION 23+47.75 OVER UNNAMED TRIBUTARY TO LITTLE MARSH SWAMP							GROUND WTR (ft)									
BORING NO. S17_C-2		STATION 23+51		OFFSET 55 ft RT		ALIGNMENT -Y6-										
COLLAR ELEV. 158.5 ft		TOTAL DEPTH 30.0 ft		NORTHING 399,977		EASTING 2,008,579										
DRILL RIG/HAMMER EFF./DATE MID3964 CME-45C 91% 02/21/2019			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic										
DRILLER Powell, B.		START DATE 05/20/21		COMP. DATE 05/20/21		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						
160																
	157.5	1.0														
155	155.0	3.5	2	5	3								M	158.5	0.0	ROADWAY EMBANKMENT GRAY AND TAN, SILTY CLAYEY SAND (A-2-5)
	152.5	6.0	3	4	3								M			
150	150.0	8.5	3	2	1								M	150.5	8.0	ALLUVIAL GRAY, SILTY F. TO CSE. SAND (A-2-4) WITH TRACE ORGANICS
	145.0	13.5	2	1	3								W			UNDIVIDED COASTAL PLAIN TAN AND GRAY, SLIGHTLY SILTY F. TO CSE. SAND (A-1-b)
145	145.0	13.5	7	6	7								Sat.	146.5	12.0	
140	140.0	18.5	9	10	13								Sat.			
135	135.0	23.5	2	2	4								Sat.	134.5	24.0	COASTAL PLAIN GRAY, SANDY SILTY CLAY (A-7-6) (BLACK CREEK FORMATION)
130	130.0	28.5	2	2	4								SS-28 25%	131.5	27.0	TAN, SLIGHTLY SILTY SAND (A-3) (BLACK CREEK FORMATION)
			WOH	3	3								Sat.	128.5	30.0	Boring Terminated at Elevation 128.5 ft IN CP: A-3

NCDOT BORE DOUBLE C17_15987_GEO_CULV_Y6_2348.GPJ NC_DOT.GDT 1/4/22

REFERENCE: I-5987B

PROJECT: 47533

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5987B	1	17

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3,4	SITE PLAN
5,6	PROFILE
7-16	BORE LOGS
17	SOIL TEST RESULTS

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY ROBESON

PROJECT DESCRIPTION I-95 IMPROVEMENTS FROM
NORTH OF SR 1758 (McDUFFIE CROSSING RD.)
TO NORTH OF SR 1723 (PARKTON TOBEMORY RD.)

SITE DESCRIPTION RETAINING WALL W5A ON -L-
(I-95) BETWEEN STA. 609+75.00 AND STA. 616+54.12 &
RETAINING WALL W5B ON -L- (I-95) BETWEEN
STA. 617+92.40 AND STA. 626+20.00

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:
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

TRIGON

F&R, INC.

INVESTIGATED BY GOODNIGHT, D.J.

DRAWN BY HILL, M.J.

CHECKED BY HAMM, J. R.

SUBMITTED BY FALCON

DATE APRIL 2022



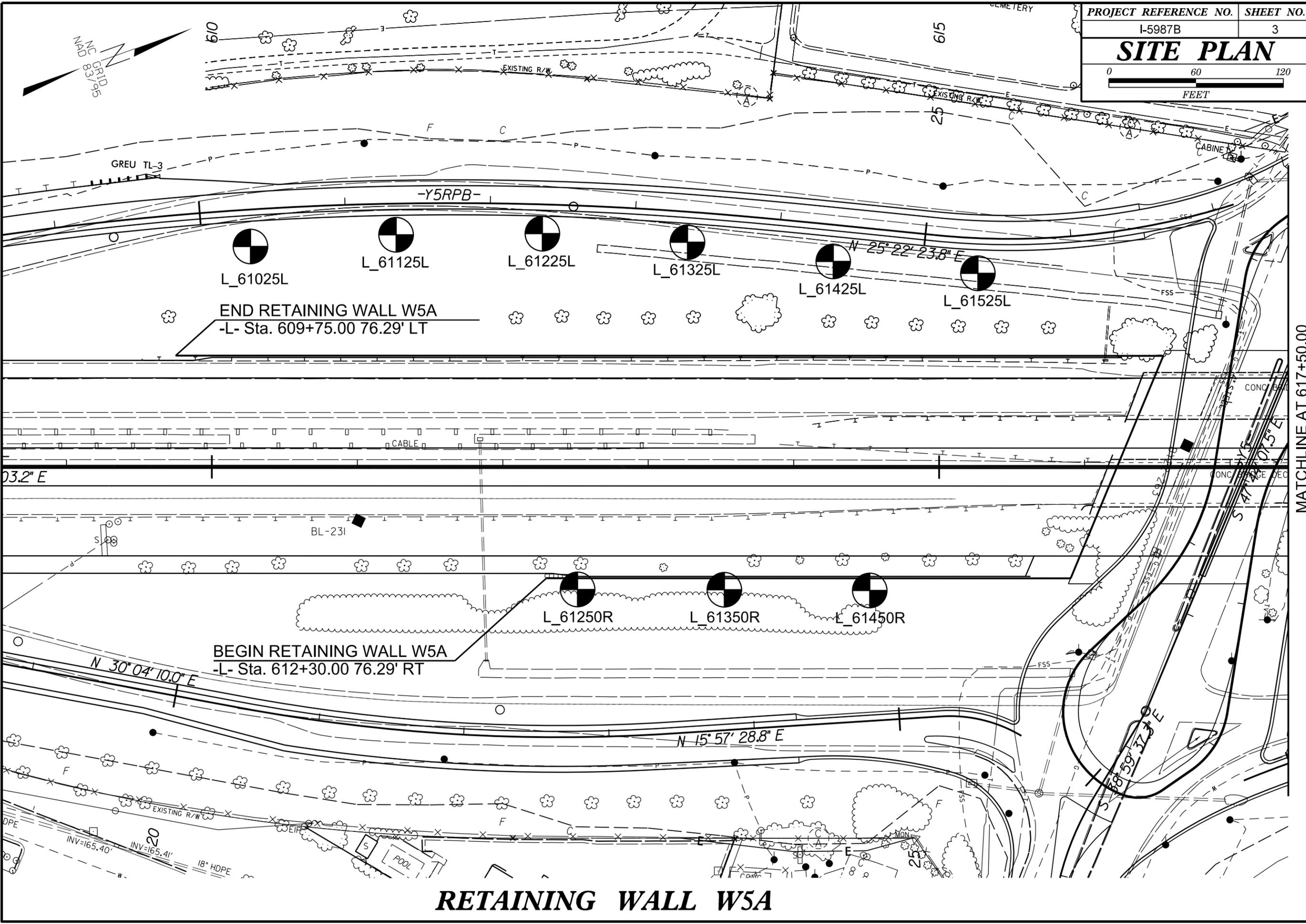
DocuSigned by:
Stephen C Crockett 04/12/2022

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SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

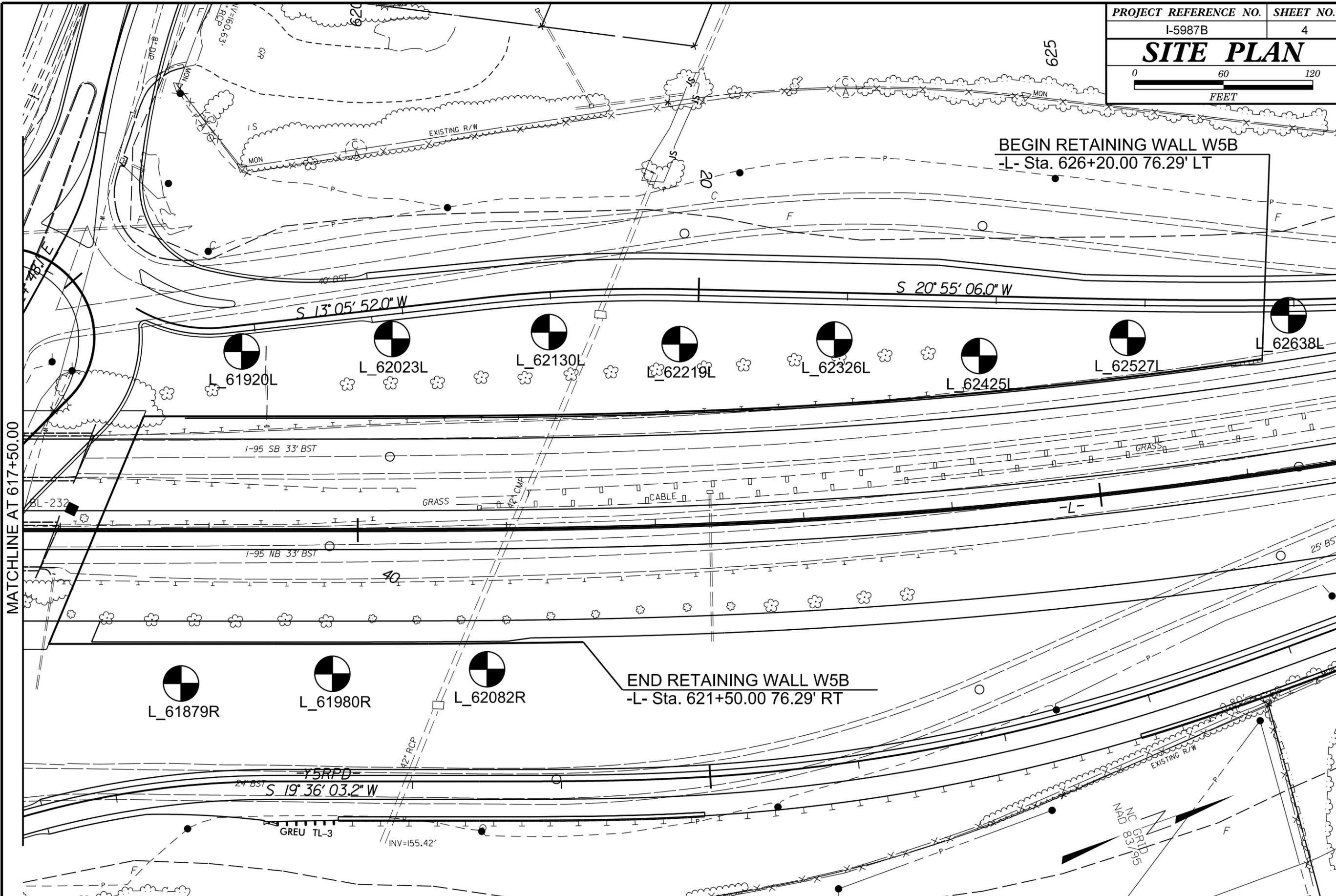
**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

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 208, 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:										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 DISLOADED 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 (IN 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										WEATHERED ROCK (WR)										NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.																																							
MINERALOGICAL COMPOSITION										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.																													
COMPRESSION										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.																																																	
PERCENTAGE OF MATERIAL										WEATHERING										FRESH										ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.																																							
GROUND WATER										VERY SLIGHT (IV SLI.)										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 (SLI.)										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.																													
MISCELLANEOUS SYMBOLS										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, IF TESTED, WOULD YIELD SPT REFUSAL																													
RECOMMENDATION SYMBOLS										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, IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF										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, IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF																													
ABBREVIATIONS										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.																			
TEXTURE OR GRAIN SIZE										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.																													
SOIL MOISTURE - CORRELATION OF TERMS										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.																													
PLASTICITY										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 FINGER NAIL.										FRACTURE SPACING										BEDDING																													
EQUIPMENT USED ON SUBJECT PROJECT										VERY CLOSE										MORE THAN 10 FEET										VERY THICKLY BEDDED										4 FEET																													
INDURATION										MODERATELY CLOSE										3 TO 10 FEET										THICKLY BEDDED										1.5 - 4 FEET																													
DRILL UNITS:										CLOSE										1 TO 3 FEET										THINLY BEDDED										0.16 - 1.5 FEET																													
ADVANCING TOOLS:										VERY CLOSE										LESS THAN 0.16 FEET										VERY THINLY BEDDED										0.03 - 0.16 FEET																													
HAMMER TYPE:										EXTREMELY CLOSE										SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.										THICKLY LAMINATED										< 0.008 FEET																													
CORE SIZE:										INDURATED										GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.										THINLY LAMINATED										< 0.008 FEET																													
HAND TOOLS:										EXTREMELY INDURATED										SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.																																																	
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.																																																																					



RETAINING WALL W5A

MATCHLINE AT 617+50.00



BEGIN RETAINING WALL W5B
 -L- Sta. 626+20.00 76.29' LT

END RETAINING WALL W5B
 -L- Sta. 621+50.00 76.29' RT

MATCHLINE AT 617+50.00

RETAINING WALL W5B

- L_61920L
- L_62023L
- L_62130L
- L_62219L
- L_62326L
- L_62425L
- L_62527L
- L_62638L
- L_61879R
- L_61980R
- L_62082R

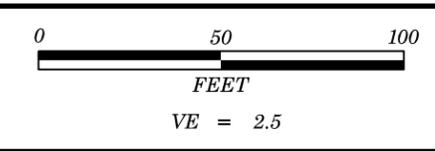
S 19° 36' 03.2" W

GREU TL-3

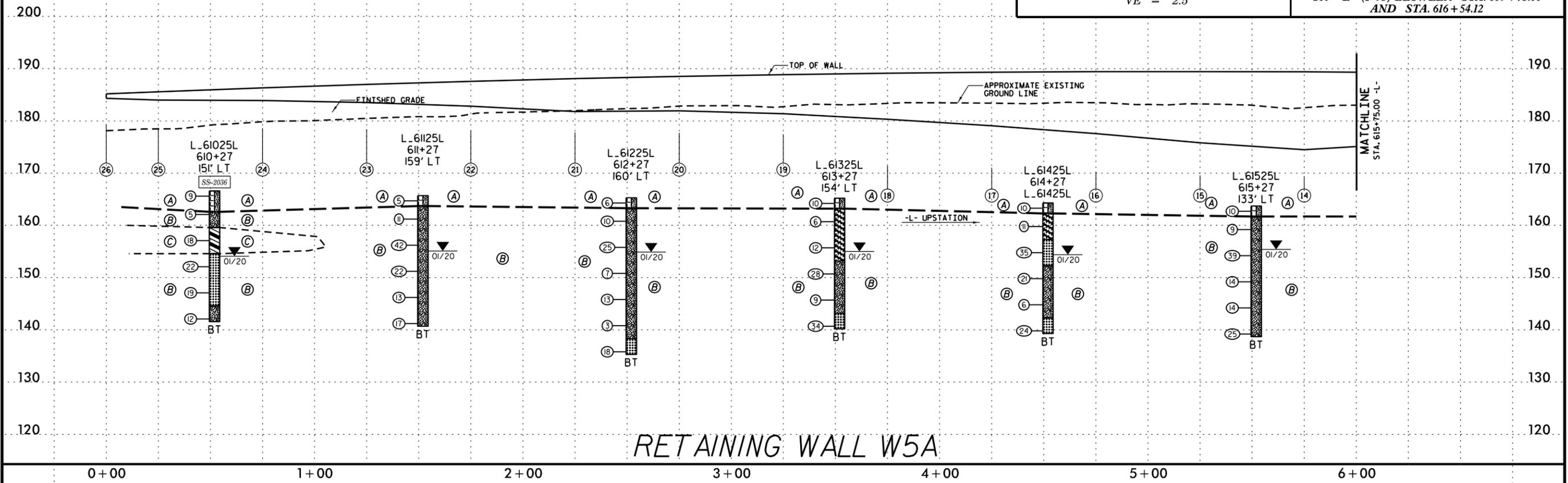
INV=155.42'

M&C Grids

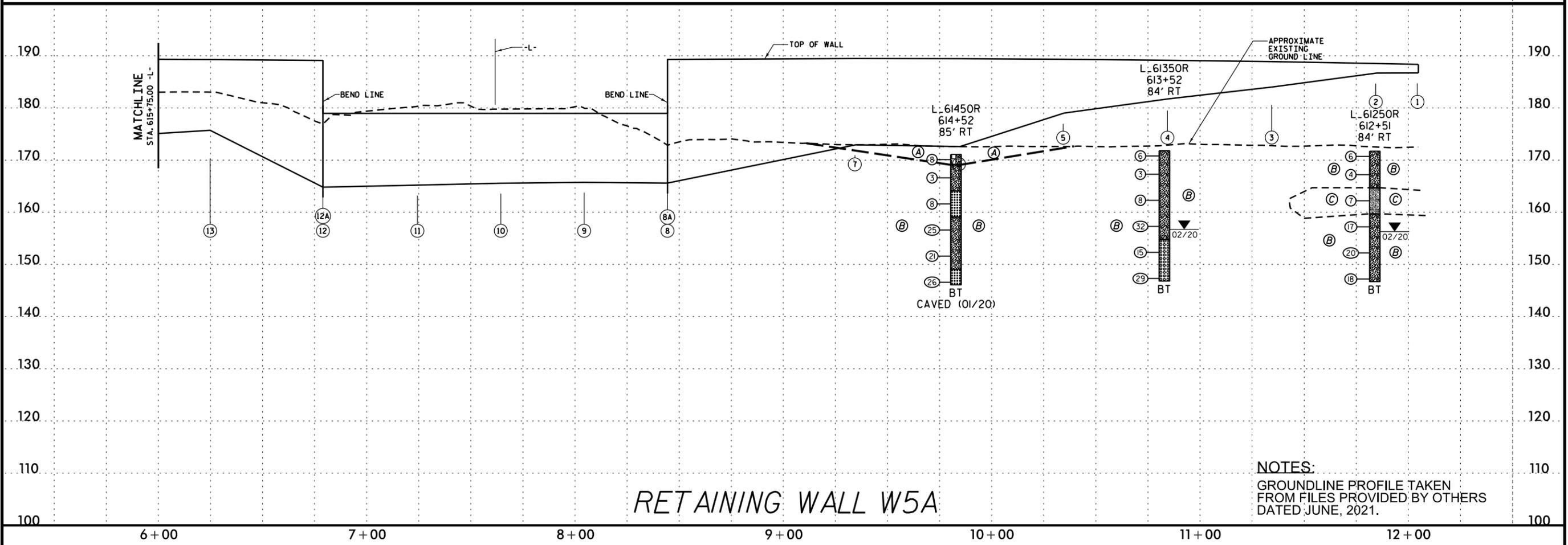
- Ⓐ ROADWAY EMBANKMENT: BROWN, GRAY, YELLOW AND ORANGE, MOIST, LOOSE TO MED. DENSE, SILTY SAND (A-2-4) WITH TRACE ORGANICS AND TRACE GRAVEL
- Ⓑ COASTAL PLAIN: BROWN-TAN, GRAY, PINK, YELLOW, WHITE AND ORANGE, MOIST TO SAT. V. LOOSE TO DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6) AND F. AND CSE. SAND (A-3, A-1-b) WITH TRACE ORGANICS (CAPE FEAR FORMATION)
- Ⓒ COASTAL PLAIN: RED, YELLOW AND GRAY, MOIST, MED. STIFF TO V. STIFF, SILTY SANDY CLAY AND SANDY SILT (A-6, A-4)



PROJECT REFERENCE NO.	SHEET NO.
I-5987B	5
RETAINING WALL W5A ON -L- (I-95) BETWEEN STA. 609+75.00 AND STA. 616+54.12	

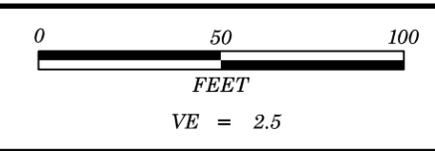


RETAINING WALL W5A

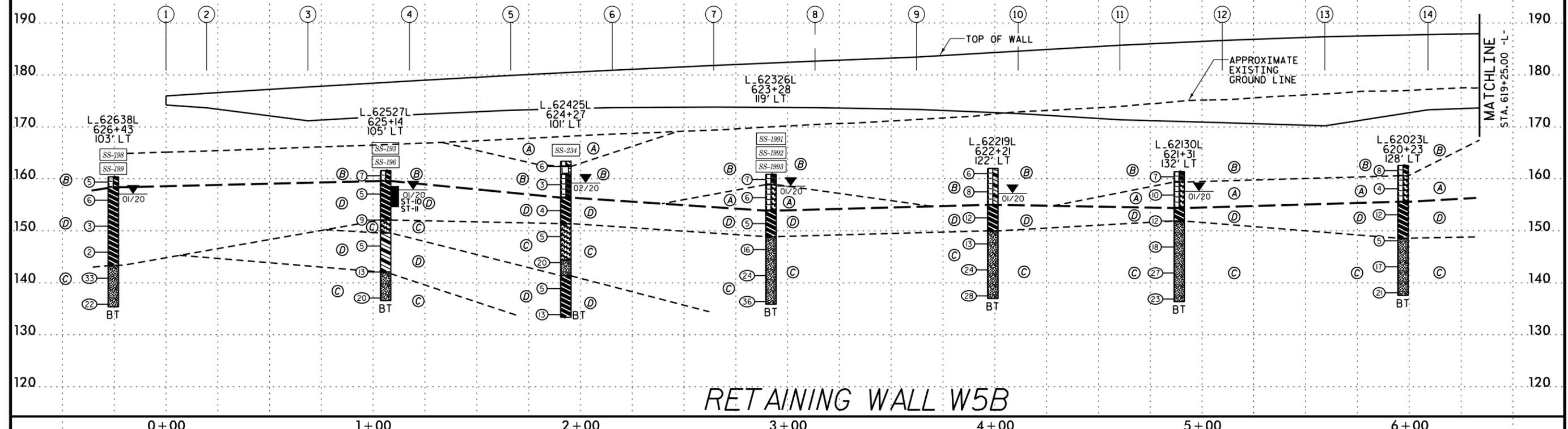


RETAINING WALL W5A

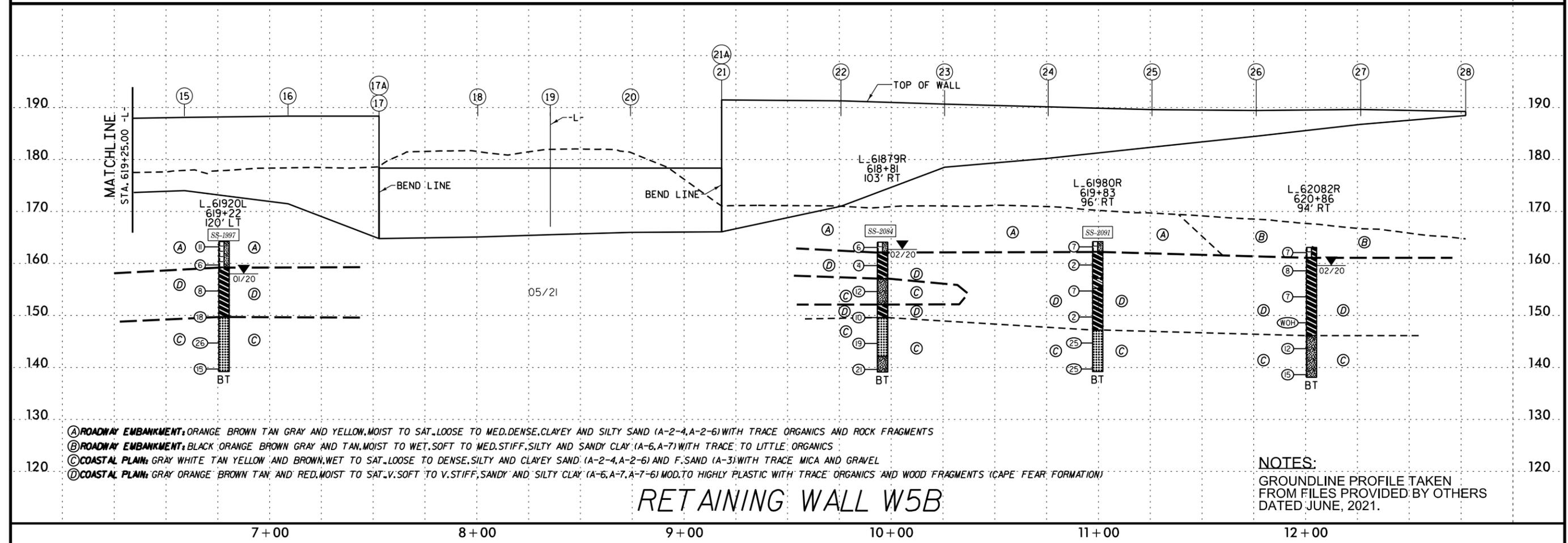
NOTES:
GROUNDLINE PROFILE TAKEN
FROM FILES PROVIDED BY OTHERS
DATED JUNE, 2021.



PROJECT REFERENCE NO.	SHEET NO.
I-5987B	6
RETAINING WALL W5B	
ON -L- (I-95) BETWEEN STA. 617+92.40 AND STA. 626+20.00	



RETAINING WALL W5B



RETAINING WALL W5B

- (A) ROADWAY EMBANKMENT: ORANGE BROWN TAN GRAY AND YELLOW, MOIST TO SAT., LOOSE TO MED. DENSE, CLAYEY AND SILTY SAND (A-2-4, A-2-6) WITH TRACE ORGANICS AND ROCK FRAGMENTS
- (B) ROADWAY EMBANKMENT: BLACK ORANGE BROWN GRAY AND TAN, MOIST TO WET, SOFT TO MED. STIFF, SILTY AND SANDY CLAY (A-6, A-7) WITH TRACE TO LITTLE ORGANICS
- (C) COASTAL PLAIN: GRAY WHITE TAN YELLOW AND BROWN, WET TO SAT., LOOSE TO DENSE, SILTY AND CLAYEY SAND (A-2-4, A-2-6) AND F. SAND (A-3) WITH TRACE MICA AND GRAVEL
- (D) COASTAL PLAIN: GRAY ORANGE BROWN TAN AND RED, MOIST TO SAT., V. SOFT TO V. STIFF, SANDY AND SILTY CLAY (A-6, A-7, A-7-6) MOD. TO HIGHLY PLASTIC WITH TRACE ORGANICS AND WOOD FRAGMENTS (CAPE FEAR FORMATION)

NOTES:
GROUNDLINE PROFILE TAKEN FROM FILES PROVIDED BY OTHERS DATED JUNE, 2021.

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST P. Fahey									
SITE DESCRIPTION RETAINING WALL W5A ON -L- (I-95) BETWEEN STA. 609+75.00 AND STA. 616+54.12							GROUND WTR (ft)								
BORING NO. L_61025L		STATION 610+27		OFFSET 151 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 166.6 ft		TOTAL DEPTH 25.0 ft		NORTHING 385,582		EASTING 2,003,766									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER E. Estep		START DATE 01/29/20		COMP. DATE 01/29/20		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					
170															
165	166.6	0.0	1	3	6								M	166.6 GROUND SURFACE	0.0
	163.1	3.5	3	3	2								M	ROADWAY EMBANKMENT BROWN-GRAY, SILTY FINE SAND (A-2-4) WITH TRACE ORGANICS	4.0
160	158.1	8.5	5	8	10								M	COASTAL PLAIN ORANGE, SILTY FINE SAND (A-2-4) (CAPE FEAR FORMATION)	7.0
155	153.1	13.5	8	10	12								SS-2036 16%	RED-YELLOW-LIGHT GRAY, SILTY FINE TO COARSE SANDY CLAY (A-6)	12.0
150	148.1	18.5	5	9	10								Sat.	ORANGE-YELLOW, FINE SAND (A-3)	15.0
145	143.1	23.5	5	6	6								Sat.	ORANGE-YELLOW, SILTY FINE SAND (A-2-4)	22.0
													Sat.	Boring Terminated at Elevation 141.6 ft in SAND (COASTAL PLAIN) (CAPE FEAR FORMATION)	25.0

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST P. Fahey									
SITE DESCRIPTION RETAINING WALL W5A ON -L- (I-95) BETWEEN STA. 609+75.00 AND STA. 616+54.12							GROUND WTR (ft)								
BORING NO. L_61125L		STATION 611+27		OFFSET 159 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 165.7 ft		TOTAL DEPTH 25.0 ft		NORTHING 385,679		EASTING 2,003,792									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER E. Estep		START DATE 01/29/20		COMP. DATE 01/29/20		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					
170															
165	165.7	0.0	1	2	3								M	165.7 GROUND SURFACE	0.0
	162.2	3.5	3	5	6								M	ROADWAY EMBANKMENT LIGHT BROWN, SILTY FINE SAND (A-2-4) WITH TRACE ORGANICS	2.0
160	157.2	8.5	14	20	22								M	COASTAL PLAIN ORANGE-BROWN TO YELLOW-GRAY-BROWN, SILTY FINE TO COARSE SAND (A-2-4) (CAPE FEAR FORMATION)	7.0
155	152.2	13.5	8	11	11								Sat.		12.0
150	147.2	18.5	7	7	6								Sat.		15.0
145	142.2	23.5	7	8	9								Sat.		22.0
													Sat.	Boring Terminated at Elevation 140.7 ft in SAND (COASTAL PLAIN) (CAPE FEAR FORMATION)	25.0

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST P. Fahey										
SITE DESCRIPTION RETAINING WALL W5A ON -L- (I-95) BETWEEN STA. 609+75.00 AND STA. 616+54.12							GROUND WTR (ft)									
BORING NO. L_61225L		STATION 612+27		OFFSET 160 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 165.3 ft		TOTAL DEPTH 30.0 ft		NORTHING 385,774		EASTING 2,003,825										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER E. Estep		START DATE 01/29/20		COMP. DATE 01/29/20		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
170																
165	165.3	0.0	2	2	4									165.3	GROUND SURFACE	0.0
160	161.8	3.5	4	4	6									163.3	ROADWAY EMBANKMENT LIGHT BROWN, SILTY FINE SAND (A-2-4) WITH TRACE ORGANICS	2.9
155	156.8	8.5	9	12	13										COASTAL PLAIN ORANGE-YELLOW TO GRAY-WHITE-BROWN, SILTY FINE TO COARSE SAND (A-2-4) (CAPE FEAR FORMATION)	
150	151.8	13.5	4	4	3											
145	146.8	18.5	3	6	7											
140	141.8	23.5	3	2	1											
	136.8	28.5	6	8	10									138.3	YELLOW-LIGHT GRAY, FINE SAND (A-3)	27.9
														135.3	Boring Terminated at Elevation 135.3 ft in SAND (COASTAL PLAIN) (CAPE FEAR FORMATION)	30.0

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST P. Fahey										
SITE DESCRIPTION RETAINING WALL W5A ON -L- (I-95) BETWEEN STA. 609+75.00 AND STA. 616+54.12							GROUND WTR (ft)									
BORING NO. L_61250R		STATION 612+51		OFFSET 84 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 171.7 ft		TOTAL DEPTH 25.0 ft		NORTHING 385,715		EASTING 2,004,063										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER E. Estep		START DATE 01/31/20		COMP. DATE 01/31/20		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
175																
170	171.7	0.0	2	3	3									171.7	GROUND SURFACE	0.0
165	168.2	3.5	2	2	2										COASTAL PLAIN BROWN-LIGHT BROWN-ORANGE, SILTY FINE SAND (A-2-4) WITH TRACE ORGANICS (CAPE FEAR FORMATION)	
160	163.2	8.5	3	4	3									164.7	ORANGE-BROWN, FINE SANDY CLAYEY SILT (A-4)	7.0
155	158.2	13.5	7	7	10									159.7	BROWN-GRAY-PINK, SILTY FINE TO COARSE SAND (A-2-4)	12.0
150	153.2	18.5	7	10	10											
	148.2	23.5	8	9	9									146.7	Boring Terminated at Elevation 146.7 ft in SAND (COASTAL PLAIN) (CAPE FEAR FORMATION)	25.0

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST P. Fahey									
SITE DESCRIPTION RETAINING WALL W5A ON -L- (I-95) BETWEEN STA. 609+75.00 AND STA. 616+54.12							GROUND WTR (ft)								
BORING NO. L_61325L		STATION 613+27		OFFSET 154 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 165.2 ft		TOTAL DEPTH 25.0 ft		NORTHING 385,866		EASTING 2,003,864									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER E. Estep		START DATE 01/28/20		COMP. DATE 01/28/20		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					
170															
165	165.2	0.0	2	4	6									165.2	GROUND SURFACE
160	161.7	3.5	4	2	4									163.2	ROADWAY EMBANKMENT ORANGE-YELLOW-BROWN, SILTY FINE SAND (A-2-4)
155	156.7	8.5	4	4	8									153.2	COASTAL PLAIN ORANGE-BROWN, CLAYEY FINE SAND (A-2-6) (CAPE FEAR FORMATION)
150	151.7	13.5	15	13	15									143.2	ORANGE-BROWN TO LIGHT GRAY, SILTY FINE SAND (A-2-4)
145	146.7	18.5	5	4	5									143.2	LIGHT GRAY-BROWN, FINE SAND (A-3)
	141.7	23.5	13	16	18									140.2	Boring Terminated at Elevation 140.2 ft in SAND (COASTAL PLAIN) (CAPE FEAR FORMATION)

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST P. Fahey									
SITE DESCRIPTION RETAINING WALL W5A ON -L- (I-95) BETWEEN STA. 609+75.00 AND STA. 616+54.12							GROUND WTR (ft)								
BORING NO. L_61350R		STATION 613+52		OFFSET 84 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 171.8 ft		TOTAL DEPTH 25.0 ft		NORTHING 385,810		EASTING 2,004,097									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER E. Estep		START DATE 01/31/20		COMP. DATE 01/31/20		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					
175															
170	171.8	0.0	2	2	4									171.8	GROUND SURFACE
165	168.3	3.5	2	1	2									163.2	COASTAL PLAIN YELLOW-BROWN TO ORANGE-WHITE, SILTY FINE TO COARSE SAND (A-2-4) WITH TRACE ORGANICS FROM 0.0-1.5' (CAPE FEAR FORMATION)
160	163.3	8.5	2	4	4									153.2	ORANGE-BROWN TO LIGHT GRAY, SILTY FINE SAND (A-2-4)
155	158.3	13.5	7	12	20									153.2	ORANGE-BROWN TO LIGHT GRAY, SILTY FINE SAND (A-2-4)
150	153.3	18.5	6	6	9									154.8	GRAY-BROWN TO YELLOW, FINE TO COARSE SAND (A-1-B)
	148.3	23.5	7	12	17									146.8	Boring Terminated at Elevation 146.8 ft in SAND (COASTAL PLAIN) (CAPE FEAR FORMATION)

NCDOT BORE DOUBLE RWALL5 EXPORT.GPJ NC_DOT.GDT 4/7/22

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST P. Fahey										
SITE DESCRIPTION RETAINING WALL W5A ON -L- (I-95) BETWEEN STA. 609+75.00 AND STA. 616+54.12							GROUND WTR (ft)									
BORING NO. L_61425L		STATION 614+27		OFFSET 141 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 164.3 ft		TOTAL DEPTH 25.0 ft		NORTHING 385,956		EASTING 2,003,910										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER E. Estep		START DATE 01/28/20		COMP. DATE 01/28/20		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
165	164.3	0.0												164.3	0.0	GROUND SURFACE
			2	4	6									162.3	2.0	ROADWAY EMBANKMENT ORANGE-BROWN, SILTY FINE TO COARSE SAND (A-2-4)
160	160.8	3.5	4	4	7									157.3	7.0	COASTAL PLAIN ORANGE, CLAYEY FINE SAND (A-2-6) (CAPE FEAR FORMATION)
			7	17	18									152.3	12.0	LIGHT GRAY TO ORANGE, FINE SAND (A-3)
155	155.8	8.5												142.3	22.0	YELLOW-WHITE, SILTY FINE TO COARSE SAND (A-2-4)
150	150.8	13.5	5	9	12									142.3	22.0	GRAY-YELLOW-WHITE, FINE SAND (A-3)
145	145.8	18.5	4	3	3									139.3	25.0	Boring Terminated at Elevation 139.3 ft in SAND (COASTAL PLAIN) (CAPE FEAR FORMATION)
140	140.8	23.5	9	11	13											

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST P. Fahey										
SITE DESCRIPTION RETAINING WALL W5A ON -L- (I-95) BETWEEN STA. 609+75.00 AND STA. 616+54.12							GROUND WTR (ft)									
BORING NO. L_61450R		STATION 614+52		OFFSET 85 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 171.1 ft		TOTAL DEPTH 25.0 ft		NORTHING 385,904		EASTING 2,004,131										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER E. Estep		START DATE 01/31/20		COMP. DATE 01/31/20		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
175														171.1	0.0	GROUND SURFACE
			2	3	5									169.1	2.0	ROADWAY EMBANKMENT DARK BROWN, SILTY FINE SAND (A-2-4)
170	171.1	0.0												164.1	7.0	COASTAL PLAIN ORANGE, SILTY FINE SAND (A-2-4) WITH TRACE ORGANICS (CAPE FEAR FORMATION)
			1	2	1									159.1	12.0	LIGHT BROWN, FINE TO COARSE SAND (A-3)
165	167.6	3.5												152.3	12.0	GRAY-BROWN TO YELLOW, SILTY FINE TO COARSE SAND (A-2-4)
			2	4	4									149.1	22.0	ORANGE-YELLOW, FINE SAND (A-3)
160	162.6	8.5												146.1	25.0	Boring Terminated at Elevation 146.1 ft in SAND (COASTAL PLAIN) (CAPE FEAR FORMATION)
			10	11	14											
155	157.6	13.5	6	9	12											
			8	11	15											
150	152.6	18.5														
145	147.6	23.5														

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST P. Fahey									
SITE DESCRIPTION RETAINING WALL W5B ON -L- (I-95) BETWEEN STA. 617+92.40 AND STA. 626+20.00							GROUND WTR (ft)								
BORING NO. L_61920L		STATION 619+22		OFFSET 120 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 164.2 ft		TOTAL DEPTH 25.0 ft		NORTHING 386,415		EASTING 2,004,096									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER E. Estep		START DATE 01/28/20		COMP. DATE 01/28/20		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					
165	164.2	0.0	1	5	6								M	164.2 GROUND SURFACE	0.0
160	160.7	3.5	2	2	4								M	ROADWAY EMBANKMENT ORANGE-GRAY-BROWN, SILTY FINE TO COARSE SAND (A-2-4) WITH TRACE ORGANICS	5.0
155	155.7	8.5	4	3	5							SS-1997	29%	COASTAL PLAIN LIGHT GRAY, FINE TO COARSE SANDY SILTY CLAY (A-7-6), HIGHLY PLASTIC (CAPE FEAR FORMATION)	
150	150.7	13.5	2	5	13								W		14.5
145	145.7	18.5	6	12	14								Sat.	LIGHT GRAY, FINE SAND (A-3)	
140	140.7	23.5	6	6	9								Sat.		25.0
Boring Terminated at Elevation 139.2 ft in SAND (COASTAL PLAIN) (CAPE FEAR FORMATION)															

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST P. Fahey									
SITE DESCRIPTION RETAINING WALL W5B ON -L- (I-95) BETWEEN STA. 617+92.40 AND STA. 626+20.00							GROUND WTR (ft)								
BORING NO. L_61980R		STATION 619+83		OFFSET 96 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 164.2 ft		TOTAL DEPTH 25.0 ft		NORTHING 386,400		EASTING 2,004,320									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER E. Estep		START DATE 02/03/20		COMP. DATE 02/03/20		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					
165	164.2	0.0	2	3	4								M	164.2 GROUND SURFACE	0.0
160	160.7	3.5	1	1	1								M	ROADWAY EMBANKMENT LIGHT YELLOW, SILTY FINE SAND (A-2-4) WITH TRACE ORGANICS	2.0
155	155.7	8.5	2	3	4							SS-2091	20%	COASTAL PLAIN GRAY, FINE TO COARSE SANDY CLAY (A-7-6), HIGHLY PLASTIC (CAPE FEAR FORMATION)	7.0
150	150.7	13.5	WOH	1	1								W	GRAY, SILTY FINE SANDY CLAY (A-6)	9.0
145	145.7	18.5	9	11	14								Sat.	GRAY, FINE SANDY SILTY CLAY (A-7)	
140	140.7	23.5	9	13	12								Sat.		25.0
Boring Terminated at Elevation 139.2 ft in SAND (COASTAL PLAIN) (CAPE FEAR FORMATION)															

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST R. French										
SITE DESCRIPTION RETAINING WALL W5B ON -L- (I-95) BETWEEN STA. 617+92.40 AND STA. 626+20.00							GROUND WTR (ft)									
BORING NO. L_62326L		STATION 623+28		OFFSET 119 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 160.9 ft		TOTAL DEPTH 25.0 ft		NORTHING 386,793		EASTING 2,004,222										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER E. Estep		START DATE 01/24/20		COMP. DATE 01/24/20		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																
160	160.9	0.0	2	3	4										160.9	GROUND SURFACE
	157.4	3.5	2	2	4										158.9	ROADWAY EMBANKMENT Tan-Gray-Dark Gray, Fine to Coarse Sandy CLAY (A-6) with Trace Organics
155	152.4	8.5	1	2	3										153.9	ROADWAY EMBANKMENT Tan-Gray, Clayey Fine to Coarse SAND (A-2-6) with Trace Rock Fragments
150	147.4	13.5	WOH	7	9										148.9	COASTAL PLAIN Tan-Gray, Fine Sandy Silty CLAY (A-7-6), Highly Plastic (CAPE FEAR FORMATION)
145	142.4	18.5													148.9	Tan-Gray-White, Silty Fine to Coarse SAND (A-2-4) with Trace Gravel from 13.5'-15.0'
140	137.4	23.5													135.9	Boring Terminated at Elevation 135.9 ft in SAND (COASTAL PLAIN) (CAPE FEAR FORMATION)

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST W. Pesl										
SITE DESCRIPTION RETAINING WALL W5B ON -L- (I-95) BETWEEN STA. 617+92.40 AND STA. 626+20.00							GROUND WTR (ft)									
BORING NO. L_62425L		STATION 624+27		OFFSET 101 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 163.4 ft		TOTAL DEPTH 30.0 ft		NORTHING 386,881		EASTING 2,004,265										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 84% 03/01/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic												
DRILLER S. Davis		START DATE 01/31/20		COMP. DATE 01/31/20		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																
	163.4	0.0	1	3	3										163.4	GROUND SURFACE
160	159.9	3.5	1	1	2										162.4	ROADWAY EMBANKMENT Orange-Brown, Silty Clayey Fine to Coarse SAND (A-2-6) with Trace Organics
155	154.9	8.5	1	2	2										160.9	Black-Gray, Silty Fine to Coarse Sandy CLAY (A-6) with Little Organics (Organic Content=5.9%)
150	149.9	13.5	2	3	2										156.4	Black-Gray, Silty Fine to Coarse Sandy CLAY (A-6) with Trace Organics
145	144.9	18.5	5	9	11										151.4	COASTAL PLAIN Gray, Fine to Coarse Sandy Silty CLAY (A-7) (CAPE FEAR FORMATION)
140	139.9	23.5	4	2	3										144.4	Gray, Silty Clayey Fine SAND (A-2-6)
135	134.9	28.5	3	5	8										141.4	Gray, Clayey Silty Fine SAND (A-2-4)
															133.4	Dark Brown-Gray, Fine Sandy Silty CLAY (A-7) with Trace Wood Fragments from 23.5'-25.0'
																Boring Terminated at Elevation 133.4 ft in CLAY (COASTAL PLAIN) (CAPE FEAR FORMATION)

NCDOT BORE DOUBLE RWALL5 EXPORT.GPJ NC_DOT.GDT 4/7/22

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST W. Pesl										
SITE DESCRIPTION RETAINING WALL W5B ON -L- (I-95) BETWEEN STA. 617+92.40 AND STA. 626+20.00							GROUND WTR (ft)									
BORING NO. L_62527L		STATION 625+14		OFFSET 105 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 161.6 ft		TOTAL DEPTH 25.0 ft		NORTHING 386,979		EASTING 2,004,287										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 84% 03/01/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER S. Davis		START DATE 01/27/20		COMP. DATE 01/27/20		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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
165																
	161.6	0.0													161.6	GROUND SURFACE
160			2	3	4										159.6	ROADWAY EMBANKMENT Black to Orange-Brown, Fine to Coarse Sandy Silty CLAY (A-7) with Trace Organics
	158.1	3.5	2	2	3										SS-193	18%
155															152.1	COASTAL PLAIN Orange-Brown-Gray, Silty Fine to Coarse Sandy CLAY (A-7-6), Highly Plastic (CAPE FEAR FORMATION)
	153.1	8.5	2	3	6											9.5
150															149.6	Gray, Silty Clayey Fine to Coarse SAND (A-2-6)
	148.1	13.5	1	2	3										SS-196	17%
145															142.1	Tan-Light Gray, Silty Fine SAND (A-2-4) with Trace Clay
	143.1	18.5	WOH	2	11											Sat.
140															136.6	Boring Terminated at Elevation 136.6 ft in SAND (COASTAL PLAIN) (CAPE FEAR FORMATION)
	138.1	23.5	5	8	12											Sat.
																Other Samples: ST-11 (5.0 - 7.0)

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST W. Pesl										
SITE DESCRIPTION RETAINING WALL W5B ON -L- (I-95) BETWEEN STA. 617+92.40 AND STA. 626+20.00							GROUND WTR (ft)									
BORING NO. L_62638L		STATION 626+43		OFFSET 103 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 160.4 ft		TOTAL DEPTH 25.0 ft		NORTHING 387,086		EASTING 2,004,309										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 84% 03/01/2019			DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER S. Davis		START DATE 01/27/20		COMP. DATE 01/27/20		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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
165																
	160.4	0.0													160.4	GROUND SURFACE
160			2	3	2										158.4	ROADWAY EMBANKMENT Black to Orange-Brown, Fine to Coarse Sandy Silty CLAY (A-7) with Trace Organics
	156.9	3.5	2	2	4										SS-198	20%
155															152.1	COASTAL PLAIN Gray, Fine to Coarse Sandy Silty CLAY (A-7-6), Highly Plastic, with Trace Organics from 3.5'-5.0' (Organic Content=2.7%) (CAPE FEAR FORMATION)
	151.9	8.5	1	1	2											21%
150															146.9	
	146.9	13.5	1	1	1											Sat.
145															143.4	Light Gray-White, Silty Fine SAND (A-2-4)
	141.9	18.5	7	13	20											Sat.
140															135.4	Boring Terminated at Elevation 135.4 ft in SAND (COASTAL PLAIN) (CAPE FEAR FORMATION)
	136.9	23.5	10	13	9											Sat.

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-2036	151 FT LT	610+27	8.5'-10.0'	A-6	35	18	28	28	11	33	100	83	49	16	-
SS-2084	103 FT RT	618+81	3.5'-5.0'	A-7-6	56	35	31	14	9	47	99	79	57	24	-
SS-1997	120 FT LT	619+22	8.5'-10.0'	A-7-6	56	35	11	12	23	54	100	94	82	29	-
SS-2091	96 FT RT	619+83	3.5'-5.0'	A-7-6	44	27	37	14	8	41	99	75	51	20	-
SS-1991	119 FT LT	623+28	0.1'-1.5'	A-6	36	21	32	18	10	40	100	82	51	15	-
SS-1992	119 FT LT	623+28	3.5'-5.0'	A-2-6	34	19	56	17	1	27	100	66	28	16	-
SS-1993	119 FT LT	623+28	8.5'-10.0'	A-7-6	57	38	0	12	41	47	100	100	97	26	-
SS-234	101 FT LT	624+27	1.0'-1.5'	A-6	29	13	36	17	13	35	100	77	50	19	-
SS-193	105 FT LT	625+14	3.5'-5.0'	A-7-6	54	34	31	13	11	45	100	81	58	18	-
SS-196	105 FT LT	625+14	13.5'-15.0'	A-6	26	11	2	45	18	34	100	99	60	17	-
ST-10	105 FT LT	625+14	3.0'-5.0'	A-7-6	50	31	27	12	14	47	100	83	63	25	-
ST-11	105 FT LT	625+14	5.0'-7.0'	A-7-6	43	24	44	18	2	37	100	76	41	18	-
SS-198	103 FT LT	626+43	3.5'-5.0'	A-7-6	44	28	36	22	6	37	100	79	44	20	-
SS-199	103 FT LT	626+43	8.5'-10.0'	A-7-6	44	26	1	23	34	43	100	100	88	17	-

REFERENCE: I-5987B

PROJECT: 47533

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5987B	1	7

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN AND PROFILE
4-7	BORE LOGS

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY ROBESON

PROJECT DESCRIPTION I-95 IMPROVEMENTS FROM
NORTH OF SR 1758 (McDUFFIE CROSSING RD.)
TO NORTH OF SR 1723 (PARKTON TOBEMORY RD.)

SITE DESCRIPTION NOISEWALL NW19 ON -L-
(I-95) BETWEEN -L- STA. 884+25.27 76.5' RT
(-NW19- STA. 10+30.00) AND -L- STA. 897+45.27 76.5' RT
(-NW19- STA. 23+50.00)

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:
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
MID ATLANTIC
LANE, R.W.

INVESTIGATED BY GOODNIGHT, D.J.
DRAWN BY HILL, M.J.
CHECKED BY HAMM, J. R.
SUBMITTED BY FALCON
DATE APRIL 2022



DocuSigned by:
Stephen C. Crockett 04/12/2022
C5CA5FED48E0435
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

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 208, 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*

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS			
	A-1	A-3	A-2	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7
GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	
SYMBOL															
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 35 MX	40 MX 35 MX	41 MN 35 MX	41 MN 35 MX	40 MX 36 MN	41 MN 36 MN	40 MX 36 MN	41 MN 36 MN					
MATERIAL PASSING #40 LL PI	-	-	40 MX 10 MN	41 MN 10 MN	41 MN 11 MN	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN	40 MX 11 MN					
GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX							
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILTY SOILS	CLAYEY SOILS										
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD			FAIR TO POOR			FAIR TO POOR	POOR	UNSATURABLE						
	PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30														

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270
	4.75	2.00	0.42	0.25	0.075	0.053
BOULDER (BLDR.)						
COBBLE (COB.)						
GRAVEL (GR.)						
COARSE SAND (CS, SD.)						
FINE SAND (F SD.)						
SILT (SL.)						
CLAY (CL.)						
GRAIN SIZE	305	75	2.0	0.25	0.05	0.005
	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
LL - LIQUID LIMIT	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
PL - PLASTIC LIMIT	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
OM - OPTIMUM MOISTURE SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL - SHRINKAGE LIMIT	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

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.

ANGULARITY OF GRAINS
THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: **ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.**

MINERALOGICAL COMPOSITION
MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY
SLIGHTLY COMPRESSIBLE LL < 31
MODERATELY COMPRESSIBLE LL = 31 - 50
HIGHLY COMPRESSIBLE LL > 50

PERCENTAGE OF MATERIAL

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

	ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION		DIP & DIP DIRECTION OF ROCK STRUCTURES
	SOIL SYMBOL		SPT TEST BORING
	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT		AUGER BORING
	INFERRED SOIL BOUNDARY		CORE BORING
	INFERRED ROCK LINE		MONITORING WELL
	ALLUVIAL SOIL BOUNDARY		PIEZOMETER INSTALLATION
	SLOPE INDICATOR INSTALLATION		CONE PENETROMETER TEST
	SOUNDING ROD		TEST BORING WITH CORE
	SPT N-VALUE		

RECOMMENDATION SYMBOLS

	UNDERCUT		UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE		UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL
	SHALLOW UNDERCUT		UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK		

ABBREVIATIONS

AR - AUGER REFUSAL	BT - BORING TERMINATED	CL - CLAY	CPT - CONE 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	DRY UNIT WEIGHT			

EQUIPMENT USED ON SUBJECT PROJECT

<input checked="" type="checkbox"/> CME-45C	<input type="checkbox"/> ADVANCING TOOLS:	<input checked="" type="checkbox"/> AUTOMATIC	<input type="checkbox"/> MANUAL
<input checked="" type="checkbox"/> CME-55	<input type="checkbox"/> CLAY BITS	CORE SIZE:	
<input type="checkbox"/> CME-550	<input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER	<input type="checkbox"/> -B	<input type="checkbox"/> -H
<input type="checkbox"/> VANE SHEAR TEST	<input type="checkbox"/> 8" HOLLOW AUGERS	<input type="checkbox"/> -N	
<input type="checkbox"/> PORTABLE HOIST	<input type="checkbox"/> HARD FACED FINGER BITS	HAND TOOLS:	
	<input type="checkbox"/> TUNG-CARBIDE INSERTS	<input type="checkbox"/> POST HOLE DIGGER	
	<input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER	<input type="checkbox"/> HAND AUGER	
	<input checked="" type="checkbox"/> TRICONE 2 1/8" STEEL TEETH	<input type="checkbox"/> SOUNDING ROD	
	<input type="checkbox"/> TRICONE " TUNG-CARB.	<input type="checkbox"/> VANE SHEAR TEST	
	<input type="checkbox"/> CORE BIT		

ROCK DESCRIPTION

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 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)		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 (IV SLI.)	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 (SLI.)	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.

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 GROUDED 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 GROUDED 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 FINGER NAIL.

FRACTURE SPACING

TERM	SPACING	TERM	THICKNESS
VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	4 FEET
WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET
MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET
CLOSE	0.16 TO 1 FOOT	VERY THINLY BEDDED	0.03 - 0.16 FEET
VERY CLOSE	LESS THAN 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET
		THINLY LAMINATED	< 0.008 FEET

INDURATION

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.

TERMS AND DEFINITIONS

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 DISLOADED 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.

BENCH MARK: ELEVATIONS TAKEN FROM I5987_LS_TIN2_TIN DATED 05/21

ELEVATION: FEET

NOTES:

FIAD - FILLED IMMEDIATELY AFTER DRILLING

GEOTECHNICAL BORING REPORT BORE LOG

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST B. PAINTER									
SITE DESCRIPTION NOISEWALL NW19 ON -L- BETWEEN STA. 883+95.27, 76.5' RT AND -L- STA. 897+45.27, 76.5' RT							GROUND WTR (ft)								
BORING NO. L_88414R		STATION 10+28		OFFSET 1 ft RT		ALIGNMENT -NW19-									
COLLAR ELEV. 171.0 ft		TOTAL DEPTH 25.0 ft		NORTHING 411,502		EASTING 2,011,546									
DRILL RIG/HAMMER EFF./DATE F&R3495 CME-55 82% 03/01/2019				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic									
DRILLER R. Clarke		START DATE 02/04/20		COMP. DATE 02/04/20		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					
175															
170	171.0	0.0	1	1	3								M	171.0 GROUND SURFACE	0.0
165	167.5	3.5	1	3	6									UNDIVIDED COASTAL PLAIN BROWN-ORANGE, CLAYEY SILTY FINE TO COARSE SAND (A-2-4)	
160	162.5	8.5	15	19	22								M	164.0 COASTAL PLAIN ORANGE, CLAYEY FINE TO COARSE SAND (A-2-6) (MIDDENDORF FORMATION)	7.0
155	157.5	13.5	12	15	15								W	154.0 ORANGE-WHITE, SILTY FINE TO COARSE SAND (A-2-4) WITH TRACE GRAVEL (MIDDENDORF FORMATION)	17.0
150	152.5	18.5	11	16	16								W	146.0 Boring Terminated at Elevation 146.0 ft in SILTY SAND (COASTAL PLAIN) (MIDDENDORF FORMATION)	25.0
	147.5	23.5	7	15	17								W		

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST R. LANE									
SITE DESCRIPTION NOISEWALL NW19 ON -L- BETWEEN STA. 883+95.27, 76.5' RT AND -L- STA. 897+45.27, 76.5' RT							GROUND WTR (ft)								
BORING NO. NW19_1		STATION 11+96		OFFSET 4 ft RT		ALIGNMENT -NW19-									
COLLAR ELEV. 170.6 ft		TOTAL DEPTH 20.0 ft		NORTHING 411,667		EASTING 2,011,572									
DRILL RIG/HAMMER EFF./DATE MID606214 CME-45C 91% 02/28/2019				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic									
DRILLER Contract Driller		START DATE 11/11/21		COMP. DATE 11/11/21		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					
175															
170	170.6	0.0												170.6 GROUND SURFACE	0.0
165	169.6	1.0	3	4	3								D	UNDIVIDED COASTAL PLAIN TAN, F. SAND (A-3)	
160	167.1	3.5	7	7	9								M	167.6 COASTAL PLAIN ORANGE AND GRAY, CLAYEY SAND (A-2-6) (MIDDENDORF FORMATION)	3.0
155	165.1	5.5	7	9	15								Sat.	162.6 TAN GRAY AND RED, F. SAND (A-3) (MIDDENDORF FORMATION)	8.0
150	162.1	8.5	8	18	18								Sat.		
	157.1	13.5	9	8	11								Sat.		
	152.1	18.5	7	10	13								Sat.	150.6 Boring Terminated at Elevation 150.6 ft in SAND (COASTAL PLAIN) (MIDDENDORF FORMATION)	20.0

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST R. LANE										
SITE DESCRIPTION NOISEWALL NW19 ON -L- BETWEEN STA. 883+95.27, 76.5' RT AND -L- STA. 897+45.27, 76.5' RT							GROUND WTR (ft)									
BORING NO. NW19_2		STATION 14+00		OFFSET 1 ft RT		ALIGNMENT -NW19-										
COLLAR ELEV. 168.3 ft		TOTAL DEPTH 20.0 ft		NORTHING 411,870		EASTING 2,011,599										
DRILL RIG/HAMMER EFF./DATE MID606214 CME-45C 91% 02/28/2019				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Contract Driller		START DATE 11/11/21		COMP. DATE 11/11/21		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						
170																
	167.3	1.0	6	6	6								M	GROUND SURFACE	0.0	
165	164.8	3.5	5	5	6									COASTAL PLAIN BROWN AND ORANGE, SANDY CLAY (A-6) (MIDDENDORF FORMATION)		
	162.8	5.5	8	8	7								W	TAN GRAY AND RED, CLAYEY SAND (A-2-6) (MIDDENDORF FORMATION)	5.5	
160	159.8	8.5	4	4	4								M	GRAY, CLAYEY SAND (A-2-7) (MIDDENDORF FORMATION)	8.0	
	156.3	12.0											M	GRAY AND PINK, SANDY CLAY (A-7) (MIDDENDORF FORMATION)	12.0	
155	154.8	13.5	3	2	6								M	RED AND TAN, F. SAND (A-3) (MIDDENDORF FORMATION)	16.0	
150	149.8	18.5	12	16	18								Sat.	Boring Terminated at Elevation 148.3 ft in SAND (COASTAL PLAIN) (MIDDENDORF FORMATION)	20.0	

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST R. LANE										
SITE DESCRIPTION NOISEWALL NW19 ON -L- BETWEEN STA. 883+95.27, 76.5' RT AND -L- STA. 897+45.27, 76.5' RT							GROUND WTR (ft)									
BORING NO. NW19_3		STATION 15+96		OFFSET 2 ft LT		ALIGNMENT -NW19-										
COLLAR ELEV. 167.3 ft		TOTAL DEPTH 20.0 ft		NORTHING 412,064		EASTING 2,011,625										
DRILL RIG/HAMMER EFF./DATE MID606214 CME-45C 91% 02/28/2019				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Contract Driller		START DATE 11/11/21		COMP. DATE 11/11/21		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						
170																
	167.3	1.0	7	8	16								D	GROUND SURFACE	0.0	
165	166.3	1.0	6	8	11									COASTAL PLAIN TAN AND GRAY, SANDY CLAY (A-6) (MIDDENDORF FORMATION)		
	163.8	3.5	4	7	9								M	GRAY AND TAN, CLAYEY SAND (A-2-7) (MIDDENDORF FORMATION)	8.0	
160	161.8	5.5	3	5	11								M	GRAY AND TAN, CLAYEY SAND (A-2-7) (MIDDENDORF FORMATION)	12.0	
	159.3	8.0											Sat.	ORANGE AND TAN, F. SAND (A-3) (MIDDENDORF FORMATION)	16.0	
155	153.8	13.5	8	9	12								Sat.	Boring Terminated at Elevation 147.3 ft in SAND (COASTAL PLAIN) (MIDDENDORF FORMATION)	20.0	
150	148.8	18.5	5	7	10								Sat.			

NCDOT BORE DOUBLE NW19.GPJ NC_DOT.GDT 1/11/22

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST R. LANE									
SITE DESCRIPTION NOISEWALL NW19 ON -L- BETWEEN STA. 883+95.27, 76.5' RT AND -L- STA. 897+45.27, 76.5' RT							GROUND WTR (ft)								
BORING NO. NW19_4		STATION 17+94		OFFSET CL		ALIGNMENT -NW19-									
COLLAR ELEV. 167.1 ft		TOTAL DEPTH 20.0 ft		NORTHING 412,260		EASTING 2,011,656									
DRILL RIG/HAMMER EFF./DATE MID606214 CME-45C 91% 02/28/2019			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic									
DRILLER Contract Driller		START DATE 11/11/21		COMP. DATE 11/11/21		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					
170															
165	166.1	1.0	4	6	7								D	167.1 GROUND SURFACE 0.0	
	163.6	3.5	6	10	15									164.1 ROADWAY EMBANKMENT TAN AND GRAY, CANDY CLAY (A-6) (MIDDENDORF FORMATION) 3.0	
	161.6	5.5	10	14	17									162.1 COASTAL PLAIN TAN AND GRAY, SANDY CLAY (A-6) (MIDDENDORF FORMATION) 5.0	
160	158.6	8.5	25	26	31								M	159.1 GRAY AND TAN, CLAYEY SAND (A-2-7) (MIDDENDORF FORMATION) 8.0	
	153.6	13.5	12	14	16								Sat.	TAN AND ORANGE, F. SAND (A-3) (MIDDENDORF FORMATION)	
155															
	148.6	18.5	5	7	22									149.1 GRAY AND PINK, SILTY SAND (A-2-4) (MIDDENDORF FORMATION) 18.0	
150														147.1 Boring Terminated at Elevation 147.1 ft in SAND (COASTAL PLAIN) (MIDDENDORF FORMATION) 20.0	

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST R. LANE										
SITE DESCRIPTION NOISEWALL NW19 ON -L- BETWEEN STA. 883+95.27, 76.5' RT AND -L- STA. 897+45.27, 76.5' RT							GROUND WTR (ft)									
BORING NO. NW19_5		STATION 19+95		OFFSET CL		ALIGNMENT -NW19-										
COLLAR ELEV. 165.1 ft		TOTAL DEPTH 20.0 ft		NORTHING 412,459		EASTING 2,011,685										
DRILL RIG/HAMMER EFF./DATE MID606214 CME-45C 91% 02/28/2019			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic										
DRILLER Contract Driller		START DATE 11/11/21		COMP. DATE 11/11/21		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						
170																
165	164.1	1.0	11	12	9								M	165.1 GROUND SURFACE 0.0		
	161.6	3.5	4	5	6									162.1 COASTAL PLAIN BROWN, CLAYEY SAND (A-2-6) (MIDDENDORF FORMATION) 3.0		
160	159.6	5.5	7	8	10								M	160.1 GRAY AND BROWN, SANDY CLAY (A-6) (MIDDENDORF FORMATION) 5.0		
	156.6	8.5	6	18	22									157.1 GRAY AND ORANGE, CLAY (A-7) (MIDDENDORF FORMATION) 8.0		
155														Sat.	PINK RED GRAY AND TAN, F. SAND (A-3) (MIDDENDORF FORMATION)	
	151.6	13.5	8	11	12									Sat.		
150	146.6	18.5	17	11	10									Sat.	145.1 Boring Terminated at Elevation 145.1 ft in SAND (COASTAL PLAIN) (MIDDENDORF FORMATION) 20.0	

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST R. LANE										
SITE DESCRIPTION NOISEWALL NW19 ON -L- BETWEEN STA. 883+95.27, 76.5' RT AND -L- STA. 897+45.27, 76.5' RT							GROUND WTR (ft)									
BORING NO. NW19_6		STATION 21+84		OFFSET 3 ft LT		ALIGNMENT -NW19-										
COLLAR ELEV. 164.3 ft		TOTAL DEPTH 20.0 ft		NORTHING 412,646		EASTING 2,011,709										
DRILL RIG/HAMMER EFF./DATE MID606214 CME-45C 91% 02/28/2019				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Contract Driller		START DATE 11/11/21		COMP. DATE 11/11/21		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						
165														164.3	GROUND SURFACE	0.0
	163.3	1.0	2	8	11										COASTAL PLAIN	
	160.8	3.5												161.3	GRAY, F. SAND (A-3) (MIDDENDORF FORMATION)	3.0
160			4	7	9										TAN AND GRAY, CLAYEY SAND (A-2-7) (MIDDENDORF FORMATION)	
	158.8	5.5	14	18	20											
	155.8	8.5												156.3	TAN ORANGE AND RED, F. SAND (A-3) (MIDDENDORF FORMATION)	8.0
155			11	18	23											
	150.8	13.5	9	12	14											
150														147.3	GRAY, SANDY SILT (A-4) (MIDDENDORF FORMATION)	17.0
	145.8	18.5	4	1	6									144.3	Boring Terminated at Elevation 144.3 ft in SILT (COASTAL PLAIN) (MIDDENDORF FORMATION)	20.0

WBS 47533.1.1		TIP I-5987		COUNTY ROBESON		GEOLOGIST R. LANE										
SITE DESCRIPTION NOISEWALL NW19 ON -L- BETWEEN STA. 883+95.27, 76.5' RT AND -L- STA. 897+45.27, 76.5' RT							GROUND WTR (ft)									
BORING NO. NW19_7		STATION 23+37		OFFSET 7 ft LT		ALIGNMENT -NW19-										
COLLAR ELEV. 163.5 ft		TOTAL DEPTH 20.0 ft		NORTHING 412,798		EASTING 2,011,728										
DRILL RIG/HAMMER EFF./DATE MID606214 CME-45C 91% 02/28/2019				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Contract Driller		START DATE 11/11/21		COMP. DATE 11/11/21		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						
165														163.5	GROUND SURFACE	0.0
	162.5	1.0	5	8	8										COASTAL PLAIN	
	160.0	3.5												160.5	TAN, F. SAND (A-3) (MIDDENDORF FORMATION)	3.0
160			5	10	26										GRAY AND TAN, CLAYEY SAND (A-2-7) (MIDDENDORF FORMATION)	
	158.0	5.5	18	20	21									158.5	ORANGE, F. SAND (A-3) (MIDDENDORF FORMATION)	5.0
	155.0	8.5	6	8	11											
155																
	150.0	13.5	6	5	6									151.5	GRAY, SILTY SAND (A-2-4) (MIDDENDORF FORMATION)	12.0
150																
	145.0	18.5	8	9	9									143.5	Boring Terminated at Elevation 143.5 ft in SAND (COASTAL PLAIN) (MIDDENDORF FORMATION)	20.0