

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33691.1.1 (B-4415) F.A. PROJ. BRSTP-0032(5)
 COUNTY BEAUFORT
 PROJECT DESCRIPTION BRIDGE NO. 21 ON NC 32 OVER PUNGO CREEK / ACRE SWAMP AT -L- STATION 16+22

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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) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE 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 (UN-PLACED) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE 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 THIS 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.

PROJECT: 33691.1.1 ID: B-4415

PERSONNEL
J.R. SWARTLEY

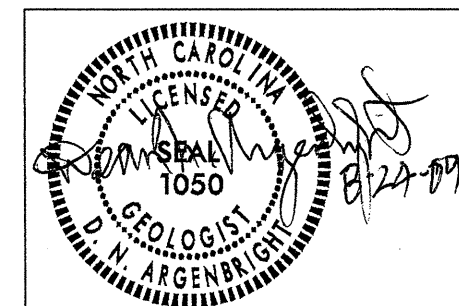
F&R, INC

INVESTIGATED BY **T.C. BOTTOMS**

CHECKED BY **D.N. ARGENBRIGHT**

SUBMITTED BY **D.N. ARGENBRIGHT**

DATE **AUGUST 2009**



DRAWN BY: **C.P. TURNER**


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

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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SUBSURFACE INVESTIGATION

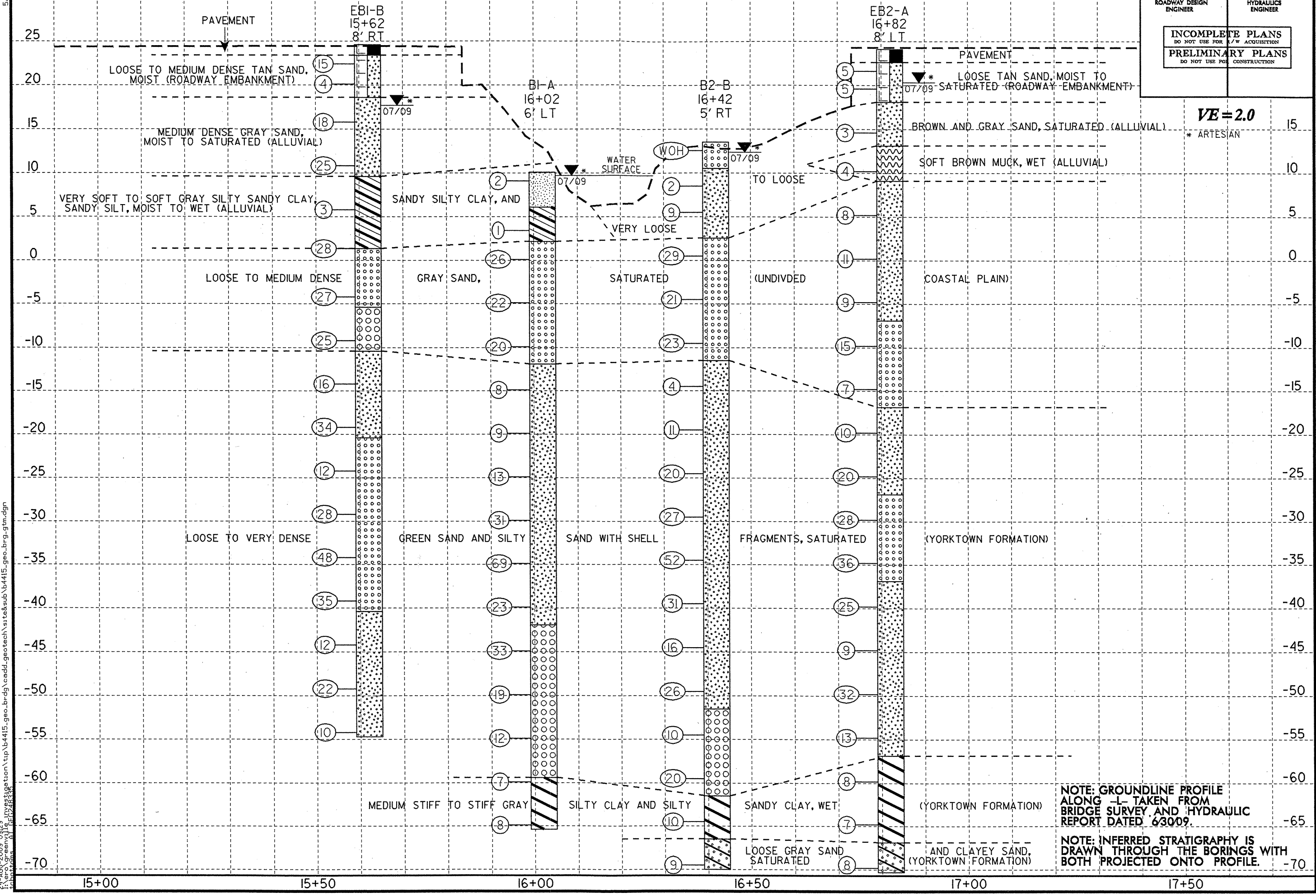
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																							
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T266, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAU-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <u>ANGULAR</u> , <u>SUBANGULAR</u> , <u>SUBROUNDED</u> , OR <u>ROUNDED</u> .										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 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, 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 SOILS RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																																							
SOIL LEGEND AND AASHTO CLASSIFICATION										MINERALOGICAL COMPOSITION										WEATHERING										ROCK HARDNESS																																							
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS										MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.										FRESH - ROCK FRESH, CRYSTALLINE BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SL.) - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SL.) - ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <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, YIELDS SPT N VALUES > 100 BPF</i> VERY SEVERE (V SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS 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.										LIQUID LIMIT PLASTIC INDEX GROUP INDEX USUAL TYPES OF MAJOR MATERIALS GEN. RATING AS A SUBGRADE PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30										SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 LIQUID LIMIT EQUAL TO 31-50 LIQUID LIMIT GREATER THAN 50										WEATHERING WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)										VERY HARD - CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD - CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY HARD - CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM HARD - CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT - CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY SOFT - CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.									
GROUP CLASS. A-1, A-3, A-2, A-4, A-5, A-6, A-7, A-1, A-2, A-4, A-5, A-6, A-7										ORGANIC MATERIAL TRACE OF ORGANIC MATTER LITTLE ORGANIC MATTER MODERATELY ORGANIC HIGHLY ORGANIC										FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																																							
PERCENTAGE OF MATERIAL GRANULAR SOILS SILT - CLAY SOILS OTHER MATERIAL										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										WEATHERING FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																																							
CONSISTENCY OR DENSENESS PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)										MISCELLANEOUS SYMBOLS ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD										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										WEATHERING FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																													
TEXTURE OR GRAIN SIZE U.S. STD. SIEVE SIZE OPENING (MM) BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F. SD.) SILT (SL.) CLAY (CL.)										ABBREVIATIONS AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE. - COARSE DNT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HL. - HIGHLY MED. - MEDIUM MICA. - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT v - VERY VST - VANE SHEAR TEST WEA. - WEATHERED w - UNIT WEIGHT w _d - DRY UNIT WEIGHT										WEATHERING FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																																							
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										WEATHERING FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																																							
PLASTICITY PLASTICITY INDEX (PI) DRY STRENGTH										EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: CORE SIZE: HAND TOOLS:										WEATHERING FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																																							
COLOR DESCRIPTORS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.										EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: CORE SIZE: HAND TOOLS:										WEATHERING FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																																							
FRACURE SPACING TERM SPACING										FRACURE SPACING TERM SPACING										WEATHERING FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																																							
INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.										INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.										WEATHERING FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																																							
BENCH MARK: BL-3 IS A 30' REBAR WITH ALUMINUM TRAVERSE CAP LOCATED AT -L- STA. 2+41.6 17' LT										BENCH MARK: BL-3 IS A 30' REBAR WITH ALUMINUM TRAVERSE CAP LOCATED AT -L- STA. 2+41.6 17' LT										WEATHERING FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																																							
NOTES:										NOTES:										WEATHERING FRESH VERY SLIGHT (V SL.) SLIGHT (SL.) MODERATE (MOD.) MODERATELY SEVERE (MOD. SEV.) SEVERE (SEV.) VERY SEVERE (V SEV.) COMPLETE										VERY HARD HARD MODERATELY HARD MEDIUM HARD SOFT VERY SOFT																																							

5/14/99

PROFILE THROUGH BORINGS PROJECTED ALONG -L-

PROJECT REFERENCE NO. B-4415	SHEET NO. 4 OF 13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



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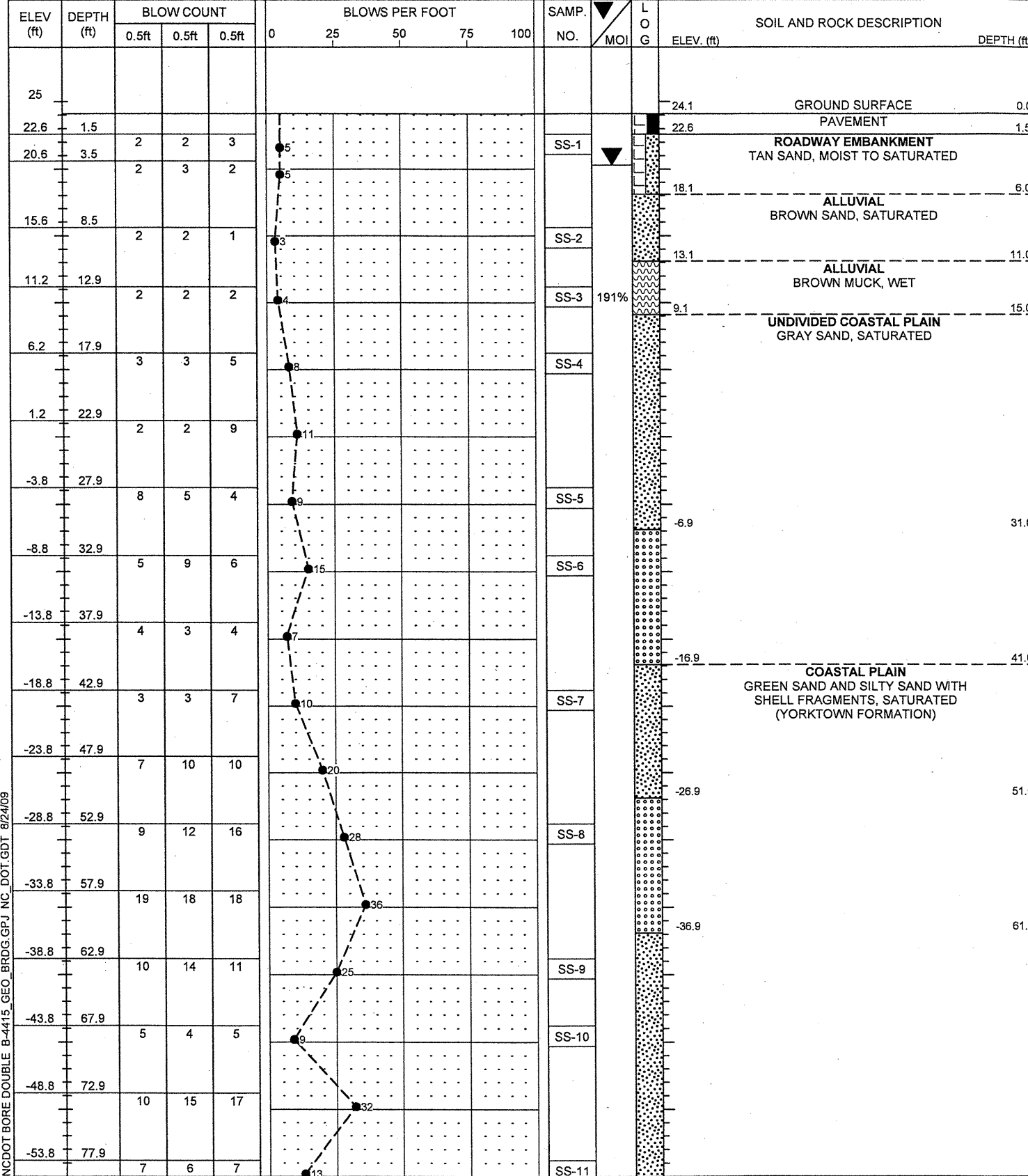


PROJECT NO. 33691.1.1		ID. B-4415		COUNTY BEAUFORT		GEOLOGIST Swartley, J. R.							
SITE DESCRIPTION BRIDGE NO. 21 ON -L- (NC 32) OVER PUNGO CREEK/ ACRE SWAMP							GROUND WTR (ft)						
BORING NO. B2-B		STATION 16+42		OFFSET 5ft RT		ALIGNMENT -L-							
COLLAR ELEV. 13.5 ft		TOTAL DEPTH 83.5 ft		NORTHING 674,563		EASTING 2,642,456							
DRILL MACHINE CME-550		DRILL METHOD Mud Rotary			HAMMER TYPE Automatic								
START DATE 07/22/09		COMP. DATE 07/22/09		SURFACE WATER DEPTH N/A		DEPTH TO ROCK N/A							
ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG SOIL AND ROCK DESCRIPTION	DEPTH (ft)
		0.5ft	0.5ft	0.5ft	0	25	50	75	100				
15	0.0											GROUND SURFACE	0.0
13.5	0.0	WOH	WOH	WOH						SS-23		ALLUVIAL BROWN SAND, MOIST TO SATURATED	3.0
9.5	4.0	2	1	1						SS-24			
6.5	7.0	6	6	3									
1.5	12.0	8	12	17						SS-25		UNDIVIDED COASTAL PLAIN GRAY SAND, SATURATED	11.0
-3.5	17.0	8	10	11									
-8.5	22.0	9	13	10						SS-26			
-13.5	27.0	1	2	2						SS-27		COASTAL PLAIN GREEN SAND AND SILTY SAND WITH SHELL FRAGMENTS, SATURATED (YORKTOWN FORMATION)	25.0
-18.5	32.0	6	5	6									
-23.5	37.0	7	10	10						SS-28			
-28.5	42.0	9	11	16									
-33.5	47.0	12	24	28						SS-29			
-38.5	52.0	10	13	18									
-43.5	57.0	4	6	10						SS-30			
-48.5	62.0	7	10	16									
-53.5	67.0	5	5	5						SS-31			
-58.5	72.0	7	8	12									
-63.5	77.0	3	4	6						SS-32		COASTAL PLAIN GRAY SILTY CLAY, WET (YORKTOWN FORMATION)	75.0

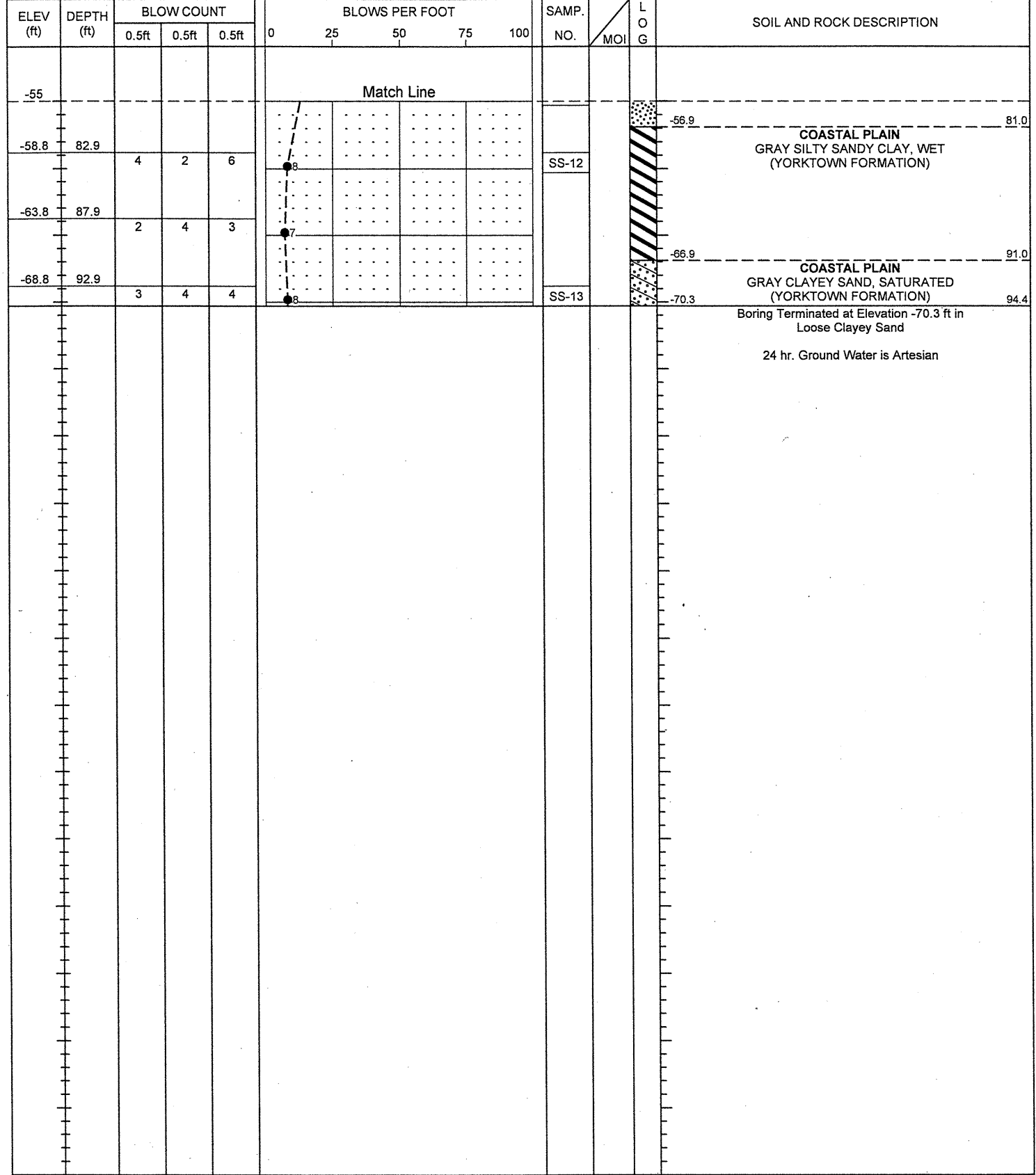
PROJECT NO. 33691.1.1		ID. B-4415		COUNTY BEAUFORT		GEOLOGIST Swartley, J. R.							
SITE DESCRIPTION BRIDGE NO. 21 ON -L- (NC 32) OVER PUNGO CREEK/ ACRE SWAMP							GROUND WTR (ft)						
BORING NO. B2-B		STATION 16+42		OFFSET 5ft RT		ALIGNMENT -L-							
COLLAR ELEV. 13.5 ft		TOTAL DEPTH 83.5 ft		NORTHING 674,563		EASTING 2,642,456							
DRILL MACHINE CME-550		DRILL METHOD Mud Rotary			HAMMER TYPE Automatic								
START DATE 07/22/09		COMP. DATE 07/22/09		SURFACE WATER DEPTH N/A		DEPTH TO ROCK N/A							
ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG SOIL AND ROCK DESCRIPTION	DEPTH (ft)
		0.5ft	0.5ft	0.5ft	0	25	50	75	100				
-65												Match Line	
-68.5	82.0	4	5	4						SS-33		COASTAL PLAIN GRAY SAND, SATURATED (YORKTOWN FORMATION)	83.5
												Boring Terminated at Elevation -70.0 ft in Loose Sand	
												24 hr. Ground Water is Artesian	

NCDOT BORE DOUBLE B-4415_GEO_BRDG.GPJ NC_DOT_GDT_8/24/09

PROJECT NO. 33691.1.1	ID. B-4415	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 21 ON -L- (NC 32) OVER PUNGO CREEK/ ACRE SWAMP			GROUND WTR (ft)
BORING NO. EB2-A	STATION 16+82	OFFSET 8ft LT	ALIGNMENT -L-
COLLAR ELEV. 24.1 ft	TOTAL DEPTH 94.4 ft	NORTHING 674,595	EASTING 2,642,483
DRILL MACHINE CME-550		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
START DATE 07/21/09	COMP. DATE 07/21/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



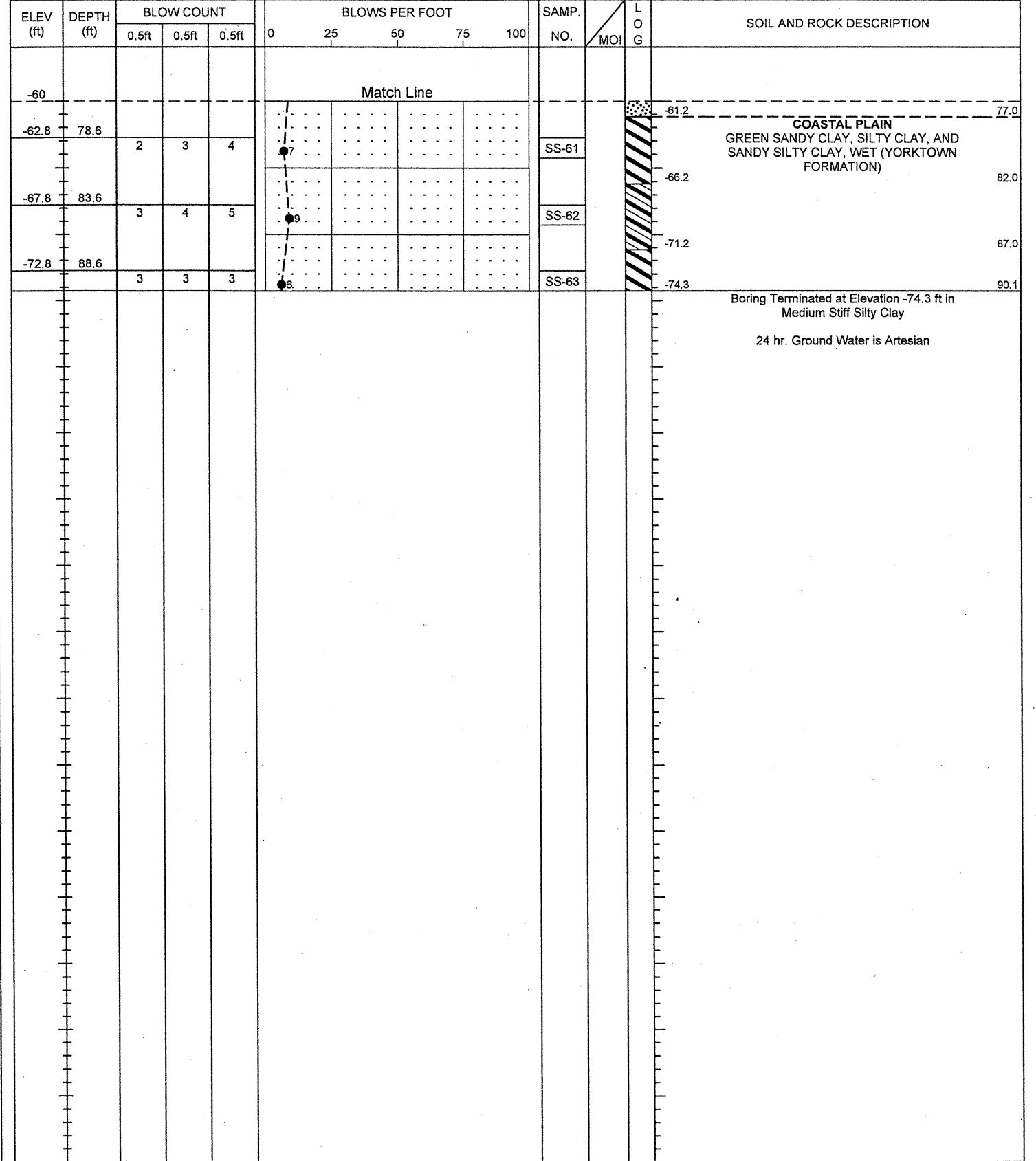
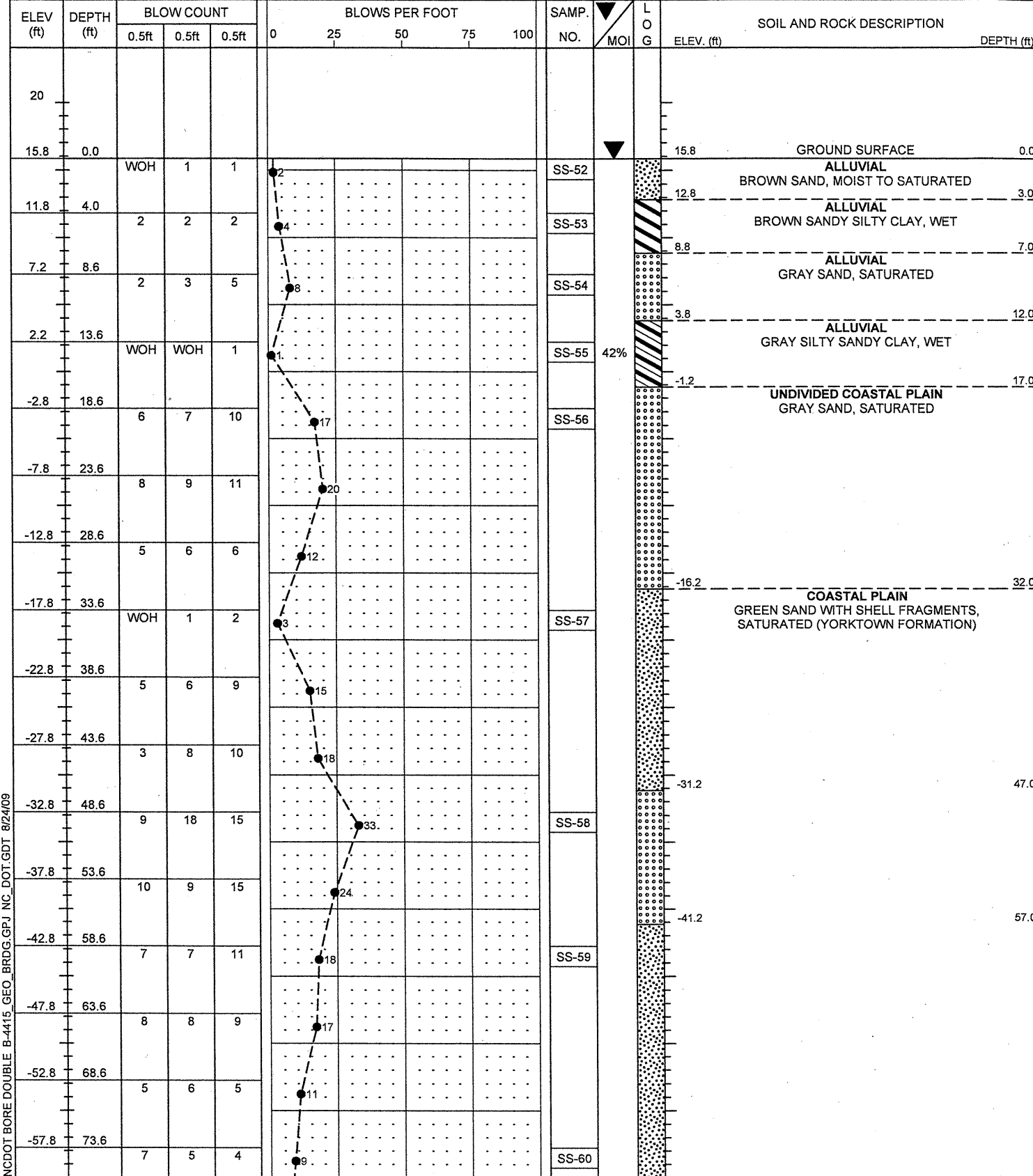
PROJECT NO. 33691.1.1	ID. B-4415	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION BRIDGE NO. 21 ON -L- (NC 32) OVER PUNGO CREEK/ ACRE SWAMP			GROUND WTR (ft)
BORING NO. EB2-A	STATION 16+82	OFFSET 8ft LT	ALIGNMENT -L-
COLLAR ELEV. 24.1 ft	TOTAL DEPTH 94.4 ft	NORTHING 674,595	EASTING 2,642,483
DRILL MACHINE CME-550		DRILL METHOD Mud Rotary	HAMMER TYPE Automatic
START DATE 07/21/09	COMP. DATE 07/21/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



NCDOT BORE DOUBLE B-4415_GEO_BRDG.GPJ NC_DOT.GDT 8/24/09

PROJECT NO. 33691.1.1	ID. B-4415	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION DETOUR BRIDGE ON -DET- (NC 32) OVER PUNGO CREEK/ ACRE SWAMP			GROUND WTR (ft)
BORING NO. EB2-B	STATION 16+89	OFFSET 27ft RT	ALIGNMENT -DET-
COLLAR ELEV. 15.8 ft	TOTAL DEPTH 90.1 ft	NORTHING 674,621	EASTING 2,642,469
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 07/27/09	COMP. DATE 07/27/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

PROJECT NO. 33691.1.1	ID. B-4415	COUNTY BEAUFORT	GEOLOGIST Swartley, J. R.
SITE DESCRIPTION DETOUR BRIDGE ON -DET- (NC 32) OVER PUNGO CREEK/ ACRE SWAMP			GROUND WTR (ft)
BORING NO. EB2-B	STATION 16+89	OFFSET 27ft RT	ALIGNMENT -DET-
COLLAR ELEV. 15.8 ft	TOTAL DEPTH 90.1 ft	NORTHING 674,621	EASTING 2,642,469
DRILL MACHINE CME-550	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 07/27/09	COMP. DATE 07/27/09	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



NCDOT BORE DOUBLE B-4415 GEO_BRDG.GPJ NC_DOT.GDT 8/24/09

33691.1.1

B-4415

BRIDGE NO. 21 ON NC 32 OVER PUNGO CREEK/ACRE SWAMP AT -L- STATION 16+22

-L-

-DET-

EB1-B

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-14	8 RT	15+62	1.2-2.7	A-2-4(0)	18	NP	30.2	52.6	5.0	12.1	100	89	19	-	-
SS-15	8 RT	15+62	7.8-9.3	A-2-4(0)	21	NP	1.4	86.1	4.4	8.1	100	100	18	-	-
SS-16	8 RT	15+62	17.8-19.3	A-6(11)	35	18	0.2	38.5	3.1	28.2	100	100	72	49.2	-
SS-17	8 RT	15+62	23.3-24.3	A-3(0)	20	NP	45.8	49.0	3.2	2.0	100	90	6	-	-
SS-18	8 RT	15+62	32.8-34.3	A-1-b(0)	18	NP	73.6	21.0	3.4	2.0	96	50	7	-	-
SS-19	8 RT	15+62	37.8-39.3	A-2-4(0)	30	4	54.2	22.0	11.7	12.1	93	71	24	-	-
SS-20	8 RT	15+62	47.8-49.3	A-3(0)	19	NP	39.5	54.2	4.2	2.0	100	98	8	-	-
SS-21	8 RT	15+62	57.8-59.3	A-3(0)	18	NP	64.5	27.8	5.6	2.0	93	63	9	-	-
SS-22	8 RT	15+62	67.8-69.3	A-2-4(0)	25	5	51.0	24.8	14.1	10.1	91	59	24	-	-

EB1-A

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-44	12 LT	15+84	1.0-1.5	A-2-4(0)	26	NP	11.6	76.8	3.5	8.1	100	99	15	-	-
SS-45	12 LT	15+84	13.5-15.0	A-6(13)	38	20	0.4	35.9	25.5	38.3	99	99	73	-	-
SS-46	12 LT	15+84	23.5-25.0	A-3(0)	20	NP	51.4	39.8	1.8	7.0	98	66	10	-	-
SS-47	12 LT	15+84	33.5-35.0	A-3(0)	20	NP	79.5	15.1	2.4	3.0	98	65	6	-	-
SS-48	12 LT	15+84	43.5-45.0	A-2-4(0)	20	NP	37.1	53.4	3.5	6.0	99	96	11	-	-
SS-49	12 LT	15+84	53.5-55.0	A-3(0)	17	NP	49.7	42.4	1.8	6.0	94	66	9	-	-
SS-50	12 LT	15+84	63.5-65.0	A-2-4(0)	28	8	54.6	21.2	11.1	13.1	82	51	22	-	-
SS-51	12 LT	15+84	78.5-80.0	A-7-6(26)	47	26	1.6	13.3	40.8	44.3	100	99	93	-	-

B1-A

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-34	6 LT	16+02	1.0-1.5	A-4(2)	28	10	14.5	48.4	19.0	18.1	100	95	46	39.5	-
SS-35	6 LT	16+02	5.7-7.2	A-6(8)	33	13	0.8	38.1	42.9	18.1	100	100	75	-	-
SS-36	6 LT	16+02	9.0-10.5	A-3(0)	22	NP	39.3	56.9	1.8	2.0	100	91	5	-	-
SS-37	6 LT	16+02	19.0-20.5	A-3(0)	23	NP	66.3	27.8	1.8	4.0	99	57	7	-	-
SS-38	6 LT	16+02	24.0-25.5	A-2-4(0)	26	8	49.2	24.2	16.5	10.1	97	79	28	-	-
SS-39	6 LT	16+02	29.0-30.5	A-2-4(0)	24	NP	45.0	42.9	6.0	6.0	96	84	13	-	-
SS-40	6 LT	16+02	44.0-45.5	A-2-4(0)	19	NP	65.9	21.2	8.9	4.0	93	60	13	-	-
SS-41	6 LT	16+02	54.0-55.5	A-1-b(0)	27	NP	75.4	13.7	6.9	4.0	93	43	11	-	-
SS-42	6 LT	16+02	59.0-60.5	A-1-b(0)	33	NP	60.9	16.7	12.3	10.1	82	49	20	-	-
SS-43	6 LT	16+02	69.5-70.5	A-7-6(35)	55	34	1.4	9.9	50.4	38.3	100	99	94	-	-

EB2-B

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-52	27 RT	16+89	1.0-1.5	A-2-4(0)	24	NP	19.1	57.2	7.6	16.1	100	94	27	-	-
SS-53	27 RT	16+89	4.0-5.5	A-7-5(25)	64	28	2.2	24.0	27.5	46.3	100	99	78	-	-
SS-54	27 RT	16+89	8.6-10.1	A-3(0)	22	NP	26.4	66.4	2.2	5.0	99	93	9	-	-
SS-55	27 RT	16+89	13.6-15.1	A-6(4)	28	12	13.3	39.7	26.9	20.1	100	98	56	41.8	-
SS-56	27 RT	16+89	18.6-20.1	A-3(0)	19	NP	37.8	53.7	3.5	5.0	100	83	10	-	-
SS-57	27 RT	16+89	33.6-35.1	A-2-4(0)	27	NP	48.9	30.4	7.6	13.1	97	81	21	-	-
SS-58	27 RT	16+89	48.6-50.1	A-3(0)	18	NP	59.6	32.0	3.3	5.0	94	59	9	-	-
SS-59	27 RT	16+89	58.6-60.1	A-2-4(0)	30	NP	57.0	26.6	9.4	7.0	90	54	17	-	-
SS-60	27 RT	16+89	73.6-75.1	A-2-4(0)	29	8	30.2	40.9	11.8	17.1	90	71	29	-	-
SS-61	27 RT	16+89	78.6-80.1	A-7-6(25)	47	29	5.6	15.3	30.7	48.3	100	97	86	-	-
SS-62	27 RT	16+89	83.6-85.1	A-6(3)	38	23	40.3	21.0	9.5	29.2	91	71	37	-	-
SS-63	27 RT	16+89	88.6-90.1	A-7-6(45)	66	44	2.4	9.9	35.3	52.4	99	97	92	-	-

B2-B

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-23	5 RT	16+42	1.0-1.5	A-3(0)	26	NP	2.6	91.5	3.8	2.0	99	99	10	-	-
SS-24	5 RT	16+42	4.0-5.5	A-2-4(0)	24	NP	4.2	84.7	5.0	6.0	100	100	15	-	-
SS-25	5 RT	16+42	12.0-13.5	A-3(0)	21	NP	42.5	53.8	1.6	2.0	100	90	4	-	-
SS-26	5 RT	16+42	22.0-23.5	A-3(0)	20	NP	72.2	21.8	6.0	0.0	95	52	7	-	-
SS-27	5 RT	16+42	27.0-28.5	A-2-4(0)	28	8	47.4	17.9	22.6	12.1	92	73	33	-	-
SS-28	5 RT	16+42	37.0-38.5	A-2-4(0)	19	NP	40.1	50.6	5.2	4.0	100	98	11	-	-
SS-29	5 RT	16+42	47.0-48.5	A-2-4(0)	17	NP	54.0	36.1	3.8	6.0	95	70	11	-	-
SS-30	5 RT	16+42	57.0-58.5	A-2-4(0)	26	5	51.4	23.0	15.5	10.1	89	58	25	-	-
SS-31	5 RT	16+42	67.0-68.5	A-1-b(0)	28	5	58.9	24.8	8.3	8.1	78	48	15	-	-
SS-32	5 RT	16+42	77.0-78.5	A-7-6(25)	47	30	6.7	15.9	31.0	46.4	100	96	84	-	-
SS-33	5 RT	16+42	82.0-83.5	A-2-6(0)	32	14	50.6	20.6	12.7	16.1	86	60	26	-	-

EB2-A

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-1	8 LT	16+82	1.5-3.0	A-2-4(0)	17	NP	46.6	39.5	5.8	8.1	100	83	15	-	-
SS-2	8 LT	16+82	8.5-11.0	A-2-4(0)	24	NP	12.5	72.6	6.9	8.1	98	93	19	-	-
SS-3	8 LT	16+82	12.9-14.4	A-4(0)	-	-	-	-	-	-	-	-	-	191.4	33.0
SS-4	8 LT	16+82	17.9-19.4	A-2-4(0)	23	NP	13.5	76.6	3.8	6.0	100	98	15	-	-
SS-5	8 LT	16+82	27.9-29.4	A-2-4(0)	20	7	27.2	44.2	12.5	16.1	100	92	31	-	-
SS-6	8 LT	16+82	32.9-34.4	A-3(0)	21	NP	63.3	31.7	3.0	2.0	99	72	6	-	-
SS-7	8 LT	16+82	42.9-44.4	A-2-4(0)	20	NP	42.7	44.4	4.8	8.1	97	85	14	-	-
SS-8	8 LT	16+82	52.9-54.4	A-3(0)	22	NP	50.2	40.5	3.2	6.0	98	68	10	-	-
SS-9	8 LT	16+82	62.9-64.4	A-2-4(0)	23	NP	37.5	49.2	7.3	6.0	90	64	16	-	-
SS-10	8 LT	16+82	67.9-69.4	A-2-4(0)	24	6	44.6	25.0	20.4	10.1	83	60	27	-	-
SS-11	8 LT	16+82	77.9-79.4	A-2-4(0)	29	NP	53.0	31.3	7.7	8.1	83	54	16	-	-
SS-12	8 LT	16+82	82.9-84.4	A-7-6(14)	41	24	15.5	22.0	32.3	30.2	97	88	68	-	-
SS-13	8 LT	16+82	92.9-94.4	A-2-6(1)	33	17	38.3	25.4	14.1	22.2	80	65	31	-	-



FIELD
 SCOUR REPORT

WBS: 33691.1.1 TIP: B-4415 COUNTY: BEAUFORT

DESCRIPTION(1): BRIDGE NO. 21 ON NC 32 OVER PUNGO CREEK/ ACRE SWAMP

EXISTING BRIDGE

Information from: Field Inspection Microfilm _____ (reel _____ pos: _____)
 Other (explain) _____

Bridge No.: 21 Length: 90' Total Bents: 5 Bents in Channel: 3 Bents in Floodplain: 2
 Foundation Type: TIMBER AND STEEL PILES

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: NONE NOTED

Interior Bents: NONE NOTED

Channel Bed: NONE NOTED

Channel Bank: NONE NOTED

EXISTING SCOUR PROTECTION

Type(3): CONCRETE WING WALLS

Extent(4): 6' OUTSIDE EDGE OF BRIDGE

Effectiveness(5): EFFECTIVE

Obstructions(6): NONE NOTED

INSTRUCTIONS

- 1 Describe the specific site's location, including route number and body of water crossed.
- 2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- 3 Note existing scour protection (e.g. rip rap).
- 4 Describe extent of existing scour protection.
- 5 Describe whether or not the scour protection appears to be working.
- 6 Note obstructions such as dams, fallen trees, debris at bents, etc.
- 7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- 8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- 9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- 10 Determine the approximate floodplain width from field observation or a topographic map.
- 11 Describe the material covering the floodplain (e.g. grass, trees, crops).
- 12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- 14 Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This

elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoretical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

DESIGN INFORMATION

Channel Bed Material(7): SAND AND SANDY SILT

Channel Bank Material(8): SAND

Channel Bank Cover(9): TREES AND SHRUBS

Floodplain Width(10): APPROX. 500'

Floodplain Cover(11): TREES AND SHRUBS

Stream is(12): Aggrading _____ Degrading Static _____

Channel Migration Tendency(13): SOUTHWEST TOWARD EB1

Observations and Other Comments: _____

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

BENTS

B1	B2													
2.1	3.5													

Comparison of DSE to Hydraulics Unit theoretical scour:
 Design Scour Elevations agree with the Hydraulic Unit's theoretical 100 year scour

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Bed or Bank														
Sample No.														
Retained #4														
Passed #10														
Passed #40														
Passed #200														
Coarse Sand														
Fine Sand														
Silt														
Clay														
LL														
PI														
AASHTO														
Station														
Offset														
Depth														

See Sheet 12,
 "Soil Test Results",
 for samples:
 Channel Bed: SS-23, SS-34
 Channel Bank: SS-15, SS-44

Reported by: *Tyler Bottoms*
 Tyler Bottoms

Date: 8/24/2009