

CONTRACT: ID: 33612.1.1

# STATE OF NORTH CAROLINA

## DEPARTMENT OF TRANSPORTATION

### DIVISION OF HIGHWAYS

### GEOTECHNICAL UNIT

# STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT 33612.1.1 I.D. NO. B-4271  
F.A. PROJECT BRZ-1246(2)  
COUNTY SAMPSON  
PROJECT DESCRIPTION BRIDGE NO. 98 ON  
SR 1246 (BUTLER ISLAND RD.) OVER  
BIG SWAMP AT -L- STATION 17+15  
**INVENTORY**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33612.1.1(B-4271)	1	12
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
		P.E.	
		CONST.	

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INVESTIGATED BY O.B. OTI PERSONNEL D.S. CANADY  
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8/29/05

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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.





DRAWN BY: T.T. WALKER

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL UNIT

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
B-4271	33612.1.1	2	12

## 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 WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLES: <i>VERY STIFF, GRW SFT CLM, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH 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) POORLY GRADED GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.  THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN 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:  WEATHERED ROCK (WR)  NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER FOOT.  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.	ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER. ADUIFIER - 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 IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS WHICH 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 DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (F.P.) - 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 - A 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (R.Q.D.) - 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 WHICH 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, WHICH 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 B.P.F.) 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 LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>	<b>MINERALOGICAL COMPOSITION</b>	<b>WEATHERING</b>	
GENERAL CLASS. GRANULAR MATERIALS (< 85% PASSING #200) SILT-CLAY MATERIALS (< 85% 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, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V. 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 ROCKS 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 &gt; 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 &lt; 100 BPF</i> COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. FABRIC MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>	<b>COMPRESSION</b>	<b>GROUND WATER</b>	
GROUP CLASS. A-1, A-1-b, A-2, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-7-5, A-7-6, A-1, A-2, A-3, A-4, A-5, A-6, A-7	SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30 MODERATELY COMPRESSIBLE LIQUID LIMIT 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	▽ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING. ▽ STATIC WATER LEVEL AFTER 24 HOURS. ▽ PW PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA ○ SPRING OR SEEPAGE	
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>	<b>PERCENTAGE OF MATERIAL</b>	<b>MISCELLANEOUS SYMBOLS</b>	
SYMBOL	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	ROADWAY EMBANKMENT WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS INFERRED SOIL BOUNDARIES INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP/DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD	SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>	<b>TEXTURE OR GRAIN SIZE</b>	<b>ABBREVIATIONS</b>	
GENERAL CLASS. GRANULAR MATERIALS (< 85% PASSING #200) SILT-CLAY MATERIALS (< 85% PASSING #200) ORGANIC MATERIALS	U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.0 0.42 0.25 0.075 0.053	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 FRAGS - FRAGMENTS MED - MEDIUM PMT - PRESSUREMETER TEST SD - SAND, SANDY SL - SILT, SILTY SLI - SLIGHTLY TCR - TRICONE REFUSAL γ - UNIT WEIGHT γ <sub>d</sub> - DRY UNIT WEIGHT w - MOISTURE CONTENT v - VERY VST - VANE SHEAR TEST	
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>	<b>TEXTURE OR GRAIN SIZE</b>	<b>EQUIPMENT USED ON SUBJECT PROJECT</b>	
GENERAL CLASS. GRANULAR MATERIALS (< 85% PASSING #200) SILT-CLAY MATERIALS (< 85% PASSING #200) ORGANIC MATERIALS	BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE, SD.) FINE SAND (F, SD.) SILT (SL.) CLAY (CL.) GRAIN SIZE MM 305 75 2.0 0.25 0.05 0.005 IN. 12" 3" 2.0 0.25 0.05 0.005	DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST OTHER OTHER ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING w/ ADVANCER TRICONE 2 5/8" STEEL TEETH TRICONE TUNG-CARB. CORE BIT OTHER HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B N H HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST OTHER	
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>	<b>TEXTURE OR GRAIN SIZE</b>	<b>FRAC</b>	
GENERAL CLASS. GRANULAR MATERIALS (< 85% PASSING #200) SILT-CLAY MATERIALS (< 85% PASSING #200) ORGANIC MATERIALS	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 - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE SL - SHRINKAGE LIMIT - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	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 FINGER NAIL.	
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>	<b>PLASTICITY</b>	<b>INDURATION</b>	
GENERAL CLASS. GRANULAR MATERIALS (< 85% PASSING #200) SILT-CLAY MATERIALS (< 85% PASSING #200) ORGANIC MATERIALS	PLASTICITY INDEX (PI) DRY STRENGTH NONPLASTIC 0-5 VERY LOW LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH	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.	
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>	<b>COLOR</b>	<b>FRAC</b>	
GENERAL CLASS. GRANULAR MATERIALS (< 85% PASSING #200) SILT-CLAY MATERIALS (< 85% PASSING #200) ORGANIC MATERIALS	DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FEET VERY CLOSE LESS THAN 0.16 FEET	
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>	<b>COLOR</b>	<b>INDURATION</b>	
GENERAL CLASS. GRANULAR MATERIALS (< 85% PASSING #200) SILT-CLAY MATERIALS (< 85% PASSING #200) ORGANIC MATERIALS			BENCH MARK: TBM NO. 1 NAIL IN BACK OF 18" MAPLE AT STA. 17+51, 45' LT ELEVATION: 81.14'
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>	<b>COLOR</b>	<b>INDURATION</b>	NOTES:
GENERAL CLASS. GRANULAR MATERIALS (< 85% PASSING #200) SILT-CLAY MATERIALS (< 85% PASSING #200) ORGANIC MATERIALS			



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

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Lyndo Tippet  
SECRETARY

August 29, 2005

STATE PROJECT: 33612.1.1 (B-4271)  
FEDERAL PROJECT: BRZ-1246 (2)  
COUNTY: Sampson  
  
DESCRIPTION: Bridge No. 98 on -L- (SR 1246) over Big Swamp  
  
SUBJECT: Geotechnical Report – Structure Inventory Report

**Project Description**

The project is located in west central Sampson County, west of the town of Clinton. Structure No. 98 on SR 1246 is scheduled to be replaced along the existing alignment. The proposed structure is 120 feet long with three spans at a skew angle of 90 degrees. A subsurface investigation was conducted during June of 1998. Two standard penetration test borings were performed at each end bent location and one SPT boring was performed at each interior bent. Soil samples were obtained for classification in the field and for laboratory analysis by the Materials and Tests Unit.

**Physiography and Geology**

The topography of the project area is typical of the coastal plain and is relatively flat resulting in a wide flood plain. The flood plain at the structure site is approximately 600 feet wide. Big Swamp flows toward the south into South River. Geologically, the project is located in the Coastal Plain Physiographic Province. Coastal Plain sediments are of the Black Creek Formation. These sediments typically consist of gray to black clay interlayered with gray to green sand. These sediments were deposited in a deltaic environment.

**Soil Properties**

Roadway embankment soils are present at the proposed End Bent locations. The embankment material consists of moist to wet, very loose to loose, fine to coarse sand (AASHTO classification A-2-4). Roadway embankment is underlain by alluvial soils

Alluvial soils are present throughout the site and range in thickness from 8.9 to 13.9 feet. Very soft to soft fine-grained sandy silt (A-4) and silty clay (A-7-5) overlie loose to medium dense fine to coarse sand (A-2-4, A-3, and A-1-b). Organic contents range from trace amounts to highly organic in the alluvium.

Coastal Plain sediments underlie the alluvium. The sediments consists of black to gray, silty clay (A-7-5) and gray to green sand (A-2-4, a-2-6, A-1, b). The cohesive soils are generally stiff to very stiff and commonly contain laminae of very fine sand. The granular soils are medium to very dense, glauconitic, and contain laminae of clay. Lignite and mica are common.

**Groundwater**

Groundwater was encountered at all bent locations and ranges from elevation 80.7 feet to 78.7 feet across the site. Surface water in Big Swamp was measured at elevation 79.5 feet in December of 2004.

**Notice**

This Geotechnical structure inventory report is based on the bridge survey report for Big Swamp dated April 7 2005. If significant changes are made in the design or location of the proposed structure, the subsurface information should be reviewed and modified as necessary.

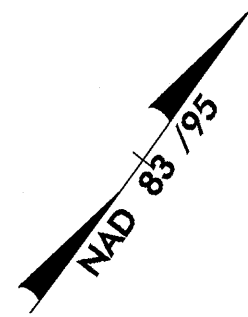
Respectfully submitted,

Handwritten signature of Onuoha B. Oti in black ink.

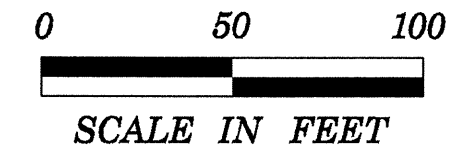
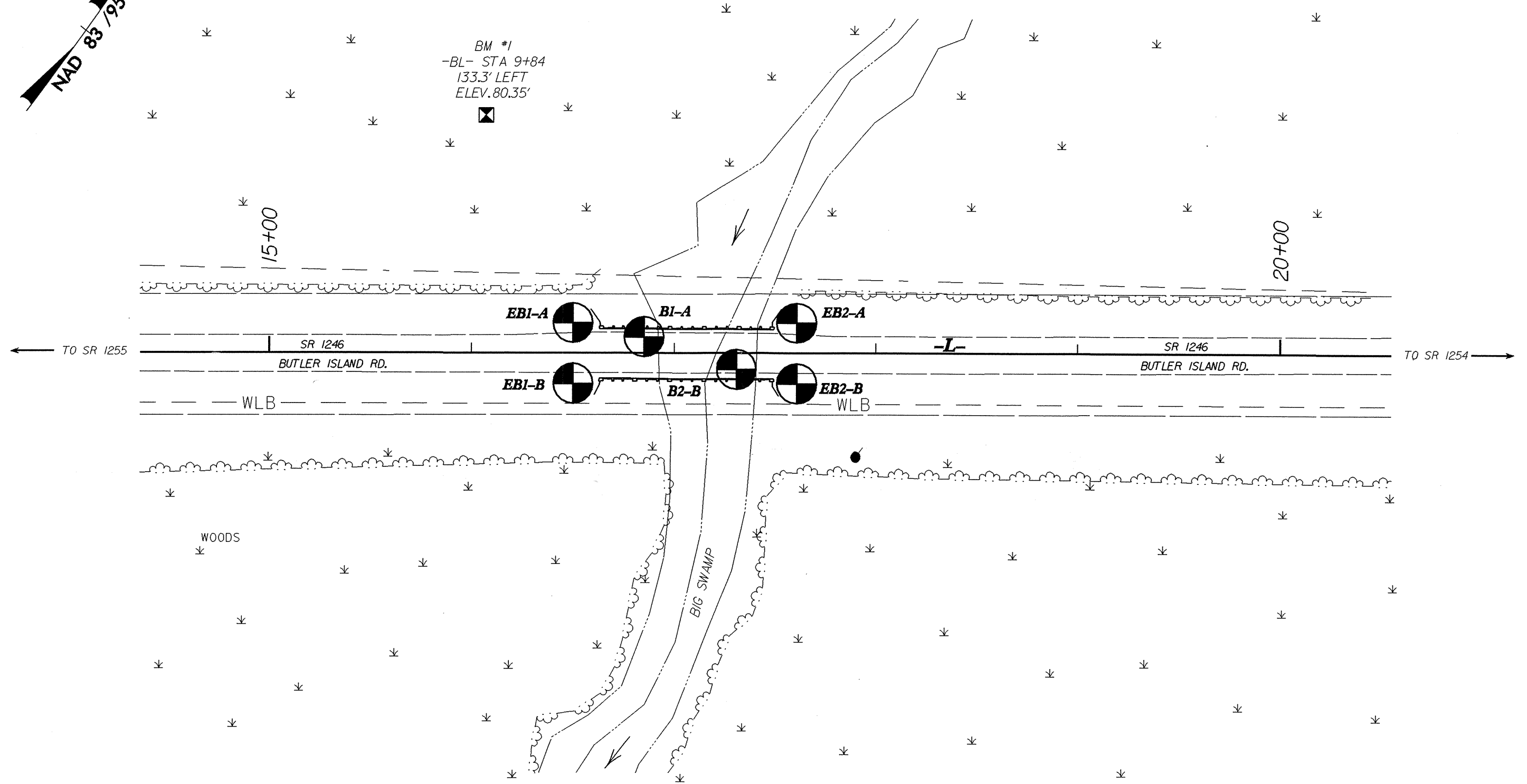
Onuoha B. Oti  
Engineering Geologist

PROJECT REF. NO.	SHEET NO.	TOTAL SHEETS
33612.1.1	4	12

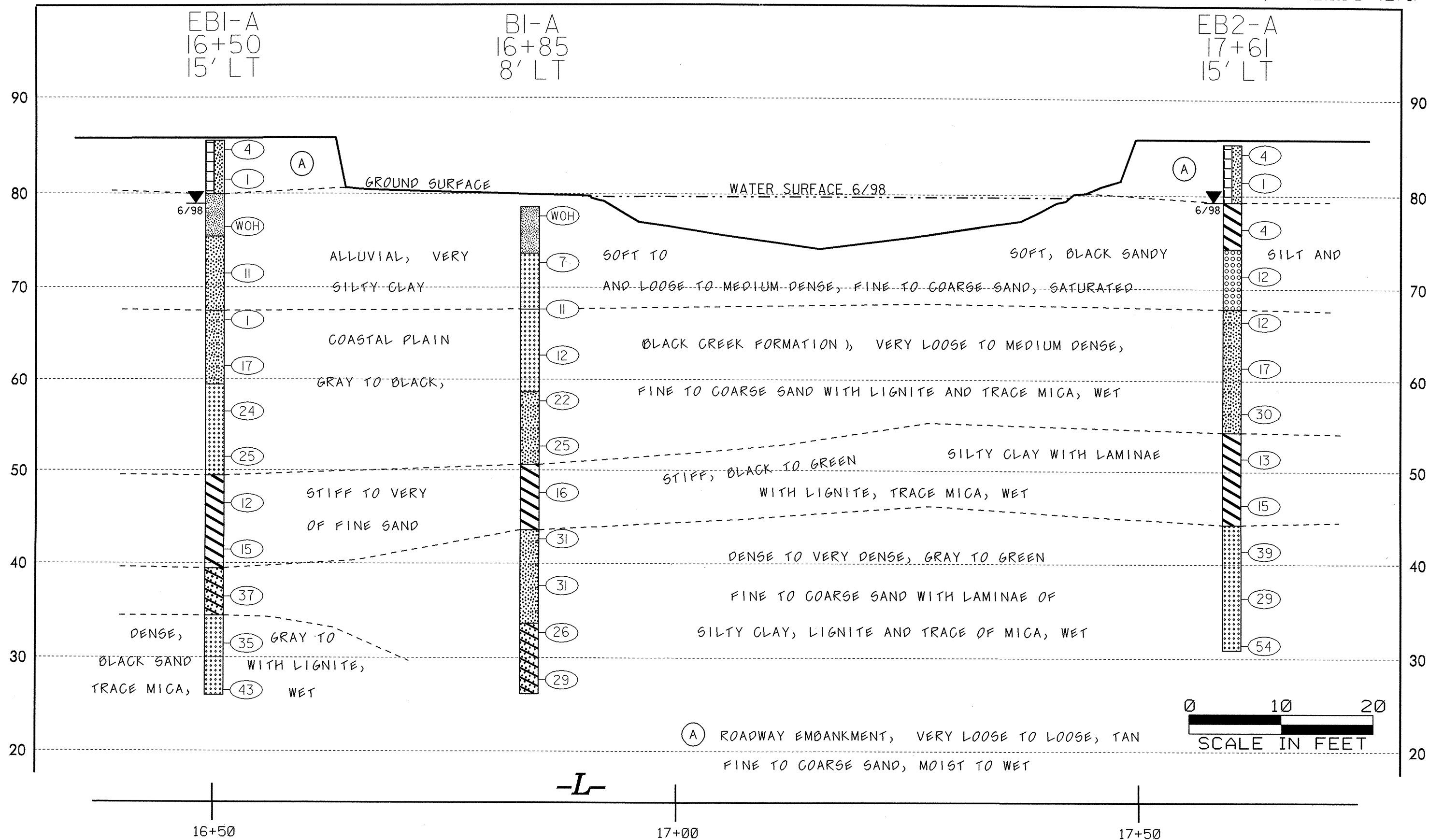
# TEST SITE PLAN



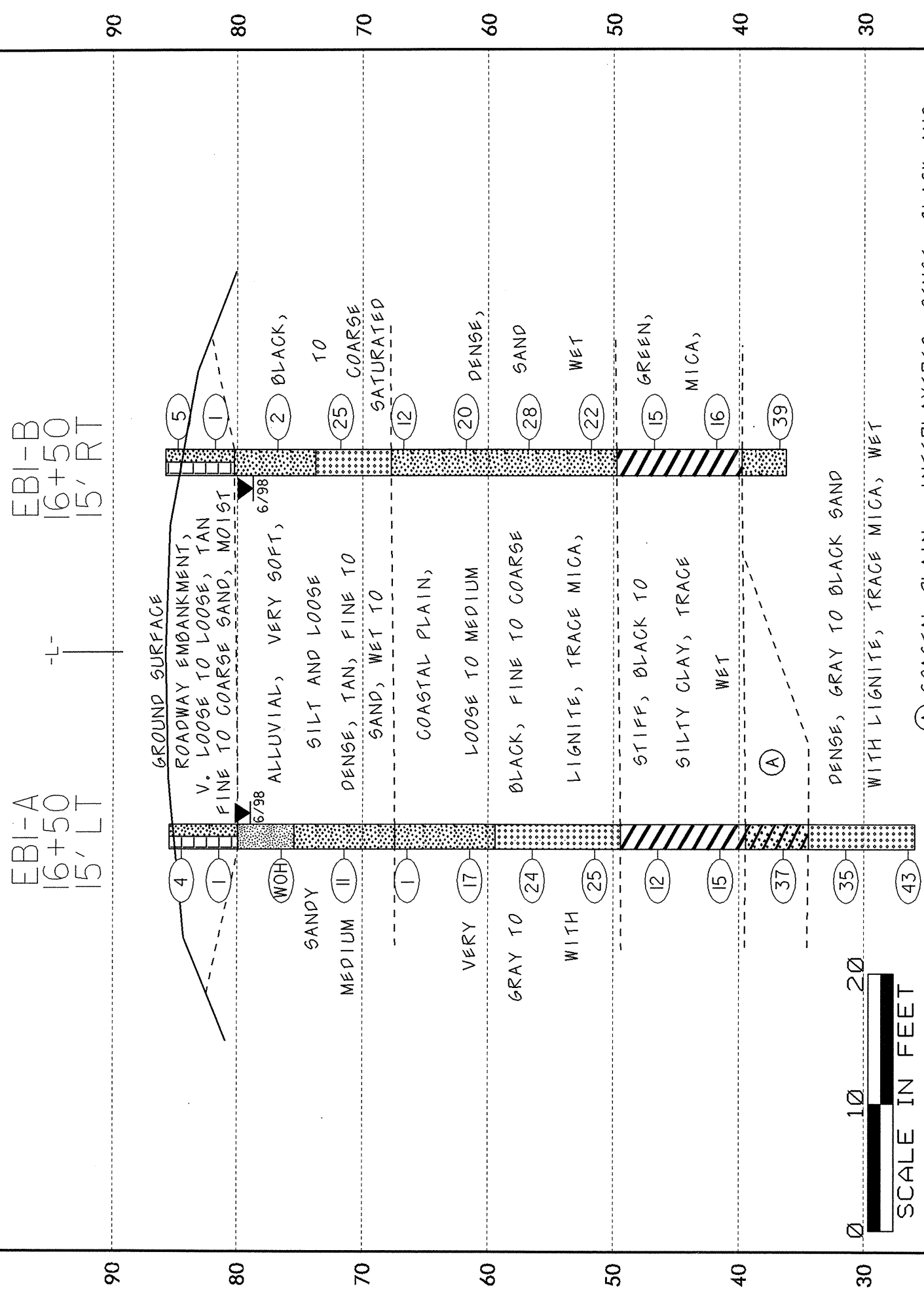
BM #1  
 -BL- STA 9+84  
 133.3' LEFT  
 ELEV. 80.35'



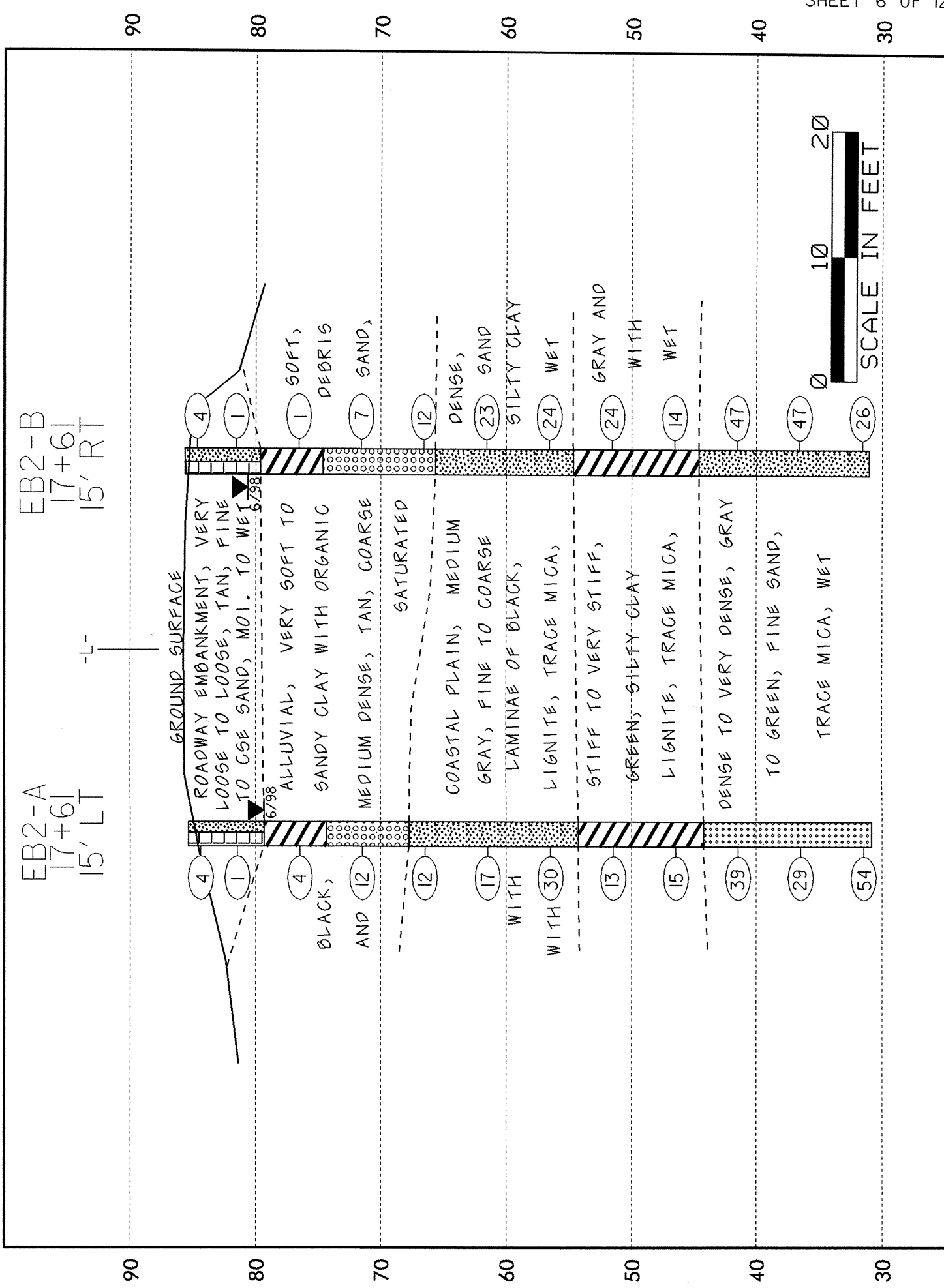
# PROFILE THROUGH BORINGS PROJECTED ALONG -L-



# CROSS SECTION THROUGH END BENT 1 BRIDGE NO. 98, 33612.1.1 (B-4271)



# CROSS SECTION THROUGH END BENT 2 BRIDGE NO. 98, 33612.1.1 (B-4271)







NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 GEOTECHNICAL UNIT BORING LOG

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 GEOTECHNICAL UNIT BORING LOG

SHEET 8 OF 12

PROJECT NO. 33612.1.1		ID. B-4271		COUNTY SAMPSON		GEOLOGIST D.S. CANADY		GROUND WATER	
SITE DESCRIPTION BRIDGE NO. 98 -L- (SR 1246) OVER BIG SWAMP								0 HR. N/A	
BORING NO. BI-A		BORING LOCATION 16+85		OFFSET 8' LT		ALIGNMENT -L-		24 HR. N/A	
COLLAR ELEVATION 78.6'		NORTHING 429009		EASTING 2137001					
TOTAL DEPTH 52.5'		DRILL MACHINE LONGYEAR BK-5I		DRILL METHOD ROTARY W/MUD		HAMMER TYPE AUTOMATIC			
START DATE 6/11/98		COMPLETION DATE 6/11/98		SURFACE WATER DEPTH 1.1'		DEPTH TO ROCK N/A			
ELEV.	DEPTH (FT.)	BLOW COUNT 0.5' 1.0' 1.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION	
80.0								WATER SURFACE	
78.6	0.0	WOH	WOH	WOH	1.0	X 0		SAT.	
75.0	5.0	6	3	4	1.0	X 7		W	ALLUVIAL, BLACK, SANDY SILT WITH ORGANIC DEBRIS AND TAN SAND
70.0	11.0	3	5	6	1.0	X 11		W	
65.0	16.0	4	5	7	1.0	X 12		W	COASTAL PLAIN, GRAY, COARSE SAND WITH LAMINAE OF BLACK, SILTY CLAY AND FINE TO COARSE SAND WITH LIGNITE, TRACE MICA
60.0	21.0	7	9	13	1.0	X 22		W	
55.0	26.0	10	12	13	1.0	X 25		W	
50.0	31.0	5	7	9	1.0	X 16		W	BLACK TO GREEN, SILTY CLAY, TRACE MICA
45.0	36.0	10	13	18	1.0	X 31		W	
40.0	41.0	11	14	17	1.0	X 31		W	GRAY TO GREEN, FINE TO COARSE SAND WITH LAMINAE OF BLACK SILTY CLAY, WITH LIGNITE, TRACE MICA
35.0	46.0	8	11	15	1.0	X 26		W	
30.0	51.0	9	10	19	1.0	X 29		W	
25.0	52.5								BORING TERMINATED AT ELEVATION 26.4 FEET IN COASTAL PLAIN, COARSE SAND (BLACK CREEK FORMATION)

PROJECT NO. 33612.1.1		ID. B-4271		COUNTY SAMPSON		GEOLOGIST D.S. CANADY		GROUND WATER	
SITE DESCRIPTION BRIDGE NO. 98 -L- (SR 1246) OVER BIG SWAMP								0 HR. N/A	
BORING NO. B2-B		BORING LOCATION 17+31		OFFSET 8' RT		ALIGNMENT -L-		24 HR. N/A	
COLLAR ELEVATION 76.3'		NORTHING 429024		EASTING 2137048					
TOTAL DEPTH 49.9'		DRILL MACHINE LONGYEAR BK-5I		DRILL METHOD ROTARY W/MUD		HAMMER TYPE AUTOMATIC			
START DATE 6/9/98		COMPLETION DATE 6/9/98		SURFACE WATER DEPTH 3.5'		DEPTH TO ROCK N/A			
ELEV.	DEPTH (FT.)	BLOW COUNT 0.5' 1.0' 1.5'	PEN. (FT.)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION	
80.0								WATER SURFACE	
76.3	0.0	1	1	3	1.0	X 4		SAT.	
75.0	3.4	4	3	4	1.0	X 7		W	ALLUVIAL, BROWN, FINE TO COARSE SAND WITH ORGANIC DEBRIS
70.0	8.4	3	4	4	1.0	X 8		W	
65.0	13.4	5	5	9	1.0	X 14		W	COASTAL PLAIN, GRAY, COARSE SAND WITH LIGNITE, TRACE MICA
60.0	18.4	6	9	12	1.0	X 21		W	
55.0	23.4	7	9	10	1.0	X 19		W	BLACK TO GREEN, SILTY CLAY WITH LAMINAE OF FINE SAND, LIGNITE, TRACE MICA
50.0	28.4	5	5	8	1.0	X 13		W	
45.0	33.4	12	15	15	1.0	X 30		W	
40.0	38.4	12	17	24	1.0	X 41		W	GRAY TO GREEN, FINE TO COARSE SAND WITH LIGNITE, TRACE MICA
35.0	43.4	10	14	22	1.0	X 36		W	
30.0	48.4	8	11	21	1.0	X 32		W	
25.0	49.9								BORING TERMINATED AT ELEVATION 26.4 FEET IN COASTAL PLAIN, COARSE SAND (BLACK CREEK FORMATION)



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 GEOTECHNICAL UNIT BORING LOG

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 GEOTECHNICAL UNIT BORING LOG

SHEET 9 OF 12

PROJECT NO. 33612.1.1	ID. B-4271	COUNTY SAMPSON	GEOLOGIST D.S. CANADY
SITE DESCRIPTION BRIDGE NO. 98 -L- (SR 1246) OVER BIG SWAMP			GROUND WATER
BORING NO. EB2-A	BORING LOCATION 17+61	OFFSET 15' LT	ALIGNMENT -L-
COLLAR ELEVATION 85.3'			0 HR. N/A
NORTHING 429060			24 HR. 6.0'
EASTING 2137058			
TOTAL DEPTH 54.4'	DRILL MACHINE LONGYEAR BK-51	DRILL METHOD ROTARY W/MUD	HAMMER TYPE AUTOMATIC
START DATE 6/3/98	COMPLETION DATE 6/3/98	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV. (FT.)	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT				SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION
		0.5'	0.5'	0.5'		0	25	50	75				
85.3	0.0	1	2	2	1.0	X 4							
85.0	2.9	1	1	0	1.0	X 13							ROADWAY EMBANKMENT, TAN, FINE TO COARSE SAND
80.0	7.9	0	2	2	1.0	X 4							ALLUVIAL, BLACK, SANDY CLAY WITH ORGANIC DEBRIS AND TAN, COARSE SAND
75.0	12.9	5	5	7	1.0	X 12							
70.0	17.9	4	5	7	1.0	X 12				SS-37	SAT.		
65.0	22.9	5	8	9	1.0	X 17					SAT.		COASTAL PLAIN, GRAY, COARSE SAND WITH LAMINAE OF BLACK, SILTY CLAY, WITH LIGNITE, TRACE MICA
60.0	27.9	9	13	17	1.0	X 30				SS-38	SAT.		
55.0	32.9	4	6	7	1.0	X 13				SS-39	46.4%		GRAY TO BLACK, SILTY CLAY WITH LIGNITE, TRACE MICA
50.0	37.9	5	7	8	1.0	X 15					W		
45.0	42.9	5	16	23	1.0	X 39				SS-40	W		GRAY TO GREEN, FINE SAND, TRACE MICA
40.0	47.9	13	12	17	1.0	X 29					W		
35.0	52.9	12	20	34	1.0	X 54					W		
30.0	54.4												BORING TERMINATED AT ELEVATION 30.9 FEET IN COASTAL PLAIN, FINE SAND (BLACK CREEK FORMATION)

PROJECT NO. 33612.1.1	ID. B-4271	COUNTY SAMPSON	GEOLOGIST D.S. CANADY
SITE DESCRIPTION BRIDGE NO. 98 -L- (SR 1246) OVER BIG SWAMP			GROUND WATER
BORING NO. EB2-B	BORING LOCATION 17+61	OFFSET 15' RT	ALIGNMENT -L-
COLLAR ELEVATION 85.7'			0 HR. N/A
NORTHING 429036			24 HR. 5.0'
EASTING 2137076			
TOTAL DEPTH 54.6'	DRILL MACHINE LONGYEAR BK-51	DRILL METHOD ROTARY W/MUD	HAMMER TYPE AUTOMATIC
START DATE 6/3/98	COMPLETION DATE 6/3/98	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV. (FT.)	DEPTH (FT.)	BLOW COUNT			PEN. (FT.)	BLOWS PER FOOT				SAMPLE NUMBER	MOI.	LOG	SOIL AND ROCK DESCRIPTION
		0.5'	0.5'	0.5'		0	25	50	75				
85.7	0.0	1	1	3	1.0	X 4							
85.0	3.1	1	0	1	1.0	X 1							ROADWAY EMBANKMENT, TAN, FINE TO COARSE SAND
80.0	8.1	WOH	1	0	1.0	X 1				SS-41	SAT.		ALLUVIAL, BLACK, SANDY CLAY WITH ORGANIC DEBRIS AND TAN, COARSE SAND
75.0	13.1	4	4	3	1.0	X 7				SS-42	SAT.		
70.0	18.1	3	4	8	1.0	X 12					SAT.		
65.0	23.1	8	10	13	1.0	X 23				SS-43	W		COASTAL PLAIN, GRAY, FINE TO COARSE SAND WITH LAMINAE OF BLACK, SILTY SAND WITH LIGNITE, TRACE MICA
60.0	28.1	9	10	14	1.0	X 24					W		
55.0	33.1	9	12	12	1.0	X 24					W		BLACK TO GREEN, SILTY CLAY, TRACE MICA
50.0	38.1	4	6	8	1.0	X 14				SS-44	47.1%		
45.0	43.1	11	20	27	1.0	X 47				SS-45	W		GREEN, FINE SAND, TRACE MICA
40.0	48.1	13	23	24	1.0	X 47					W		
35.0	53.1	10	11	15	1.0	X 26					W		
30.0	54.6												BORING TERMINATED AT ELEVATION 31 FEET IN COASTAL PLAIN, FINE SAND (BLACK CREEK FORMATION)

**EB1-A**

<b>SOIL TEST RESULTS</b>															
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	15' LT	16+50	28.0-29.5	A-3(0)	24	NP	67.9	22.8	5.3	4.0	98	77	10	-	-
SS-53	15' LT	16+50	48.0-49.5	A-2-6(1)	31	15	37.8	33.7	10.3	18.2	97	81	29	-	-

**EB1-B**

<b>SOIL TEST RESULTS</b>															
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-46	15' RT	16+50	8.0-9.5	A-2-4(0)	21	NP	17.6	51.5	18.8	12.1	100	98	35	-	-
SS-47	15' RT	16+50	13.0-14.5	A-3(0)	20	NP	69.1	25.9	3.0	2.0	80	52	5	-	-
SS-48	15' RT	16+50	18.0-19.5	A-2-4(0)	28	NP	36.0	47.1	8.9	8.1	100	91	18	-	-
SS-49	15' RT	16+50	23.0-24.5	A-2-4(0)	26	NP	53.5	31.9	6.5	8.1	100	82	15	-	-
SS-50	15' RT	16+50	38.0-39.5	A-7-6(64)	91	63	2.4	10.3	28.7	58.6	100	99	89	-	-
SS-50	15' RT	16+50	48.0-49.5	A-2-4(0)	24	NP	28.7	51.1	12.1	8.1	100	89	21	-	-

**B1-A**

<b>SOIL TEST RESULTS</b>															
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-59	8' LT	16+85	6.0-7.5	A-3(0)	22	NP	45.8	46.0	4.1	4.1	100	84	10	-	-
SS-60	8' LT	16+85	11.0-12.5	A-3(0)	24	NP	57.2	33.7	5.1	4.1	100	80	10	-	-
SS-61	8' LT	16+85	21.0-22.5	A-2-4(0)	30	NP	43.0	36.5	10.3	10.1	100	89	21	-	-
SS-62	8' LT	16+85	31.0-32.5	A-7-6(53)	83	58	4.3	13.6	31.4	50.7	100	98	84	45.4	-
SS-63	8' LT	16+85	36.0-37.5	A-2-4(0)	21	NP	46.0	35.7	8.1	10.1	95	78	18	-	-
SS-64	8' LT	16+85	46.0-47.5	A-2-6(1)	34	18	45.4	23.3	13.0	18.3	89	60	29	-	-

**B2-B**

<b>SOIL TEST RESULTS</b>															
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-54	8' RT	17+31	3.4-4.9	A-3(0)	22	NP	60.8	36.6	2.6	0.0	100	80	3	-	-
SS-55	8' RT	17+31	8.4-9.9	A-2-4(0)	25	NP	53.1	30.5	8.3	8.1	100	83	17	-	-
SS-56	8' RT	17+31	23.4-24.9	A-7-6(17)	52	35	24.6	17.8	19.2	38.4	100	93	59	-	-
SS-57	8' RT	17+31	28.4-29.9	A-7-6(50)	78	54	2.6	15.2	27.7	54.5	100	99	85	-	-
SS-58	8' RT	17+31	33.4-34.9	A-2-4(0)	23	NP	30.9	53.7	9.3	6.1	100	95	16	-	-

**EB2-A**

<b>SOIL TEST RESULTS</b>															
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-37	15' LT	17+61	17.9-19.4	A-2-4(0)	24	NP	64.2	19.2	10.5	6.1	100	77	17	-	-
SS-38	15' LT	17+61	27.9-29.4	A-2-4(0)	28	NP	58.4	27.5	8.1	6.1	94	76	14	-	-
SS-39	15' LT	17+61	37.9-39.4	A-7-5(50)	84	54	4.4	14.5	28.5	52.5	100	98	83	46.4	-
SS-40	15' LT	17+61	42.9-44.4	A-3(0)	26	NP	17.0	75.8	5.3	2.0	100	99	8	-	-

**EB2-B**

<b>SOIL TEST RESULTS</b>															
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-41	15' RT	17+61	8.1-9.6	A-7-5(6)	43	13	20.6	24.0	35.2	20.2	100	93	59	-	-
SS-42	15' RT	17+61	13.1-14.6	A-1-b(0)	20	NP	94.6	3.8	1.6	0.0	68	14	1	-	-
SS-43	15' RT	17+61	23.1-24.6	A-2-4(0)	34	NP	41.2	35.6	13.1	10.1	100	86	24	-	-
SS-44	15' RT	17+61	38.1-39.6	A-7-6(57)	83	57	2.4	10.5	28.5	58.6	100	98	89	47.1	-
SS-45	15' RT	17+61	43.1-44.6	A-2-4(0)	25	NP	14.1	76.8	5.1	4.0	100	99	11	-	-



**FIELD  
SCOUR REPORT**

WBS: 33612.1.1 TIP: B-4271 COUNTY: SAMPSON

DESCRIPTION(1): BRIDGE NO.98 ON SR 1246 (BUTLER ISLAND RD) OVER BIG SWAMP.

**EXISTING BRIDGE**

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

Bridge No.: 98 Length: 86.6' Total Bents: 6 Bents in Channel: 3 Bents in Floodplain: 3  
Foundation Type: TIMBER PILES

**EVIDENCE OF SCOUR(2)**

Abutments or End Bent Slopes: NO EVIDENCE OF SCOUR.

Interior Bents: B1 MINIMAL TO NO SCOUR, B2 MINOR CONTRACTION SCOUR AT BENT LOCATION, B3 AND B4 MINIMAL TO NO SCOUR.

Channel Bed: GENERAL DEGRADATIONAL SCOUR.

Channel Bank: NO EVIDENCE OF SCOUR. BANKS ARE STABLE AND COVERED WITH VEGETATION.

**EXISTING SCOUR PROTECTION**

Type(3): ASPHALT COVERED, TIMBER ABUTMENTS AT WINGWALLS.

Extent(4): EXTEND TO TOE OF SLOPE, BASE OF EMBANKMENT.

Effectiveness(5): VERY EFFECTIVE.

Obstructions(6): NONE OBSERVED

**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 geotechnically adjusted scour elevation (GASE) 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 GASE. If the GASE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The GASE 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): LOOSE TO MED. DENSE, ALLUVIAL, FINE TO COARSE SAND (A-3).

Channel Bank Material(8): SOFT, ALLUVIAL, SILTY CLAY (A-7-5) AND SANDY SILT (A-4).

Channel Bank Cover(9): TREES, GRASSES AND SHRUBS.

Floodplain Width(10): 600 FEET.

Floodplain Cover(11): TREES, SWAMP VEGETATION.

Stream is(12): Aggrading \_\_\_\_\_ Degrading  Static \_\_\_\_\_

Channel Migration Tendency(13): \_\_\_\_\_

Observations and Other Comments: NONE.

**GEOTECHNICALLY ADJUSTED SCOUR ELEVATIONS(14)** Feet  Meters \_\_\_\_\_

**BENTS**

	B1	B2								
61.0'	61.1'									

Comparison of GASE to Hydraulics Unit theoretical scour:  
GASE IS UNCHANGE FROM HYDRAULICS UNIT'S THEORETICAL SCOUR FOR 100 YEAR EVENT

**SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL**

Bed or Bank	SS-54	SS-41	NS				
Sample No.	SS-54	SS-41	NS				
Retained #4							
Passed #10	100	100					
Passed #40	80	93					
Passed #200	3	59					
Coarse Sand	60.8	20.6					
Fine Sand	36.6	24					
Silt	2.6	35.2					
Clay	0	20.2					
LL	22	43					
PI	NP	13					
AASHTO	A-3(0)	A-7-5(6)	A-4				
Station	17+31	17+31					
Offset	8' RT	15' RT					
Depth	3.4'-4.9'	8.1' -9.6'					

Reported by: *Onuoha B. Oti*  
Onuoha B. Oti

Date: 8/11/2005



SITE PHOTO

BRIDGE NO. 98 ON SR 1246 (BUTLER ISLAND RD.) OVER BIG SWAMP

