

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4435	1	10

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

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STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33701.1.1 (B-4435) F.A. PROJ. BRZ-1100(17)
COUNTY BERTIE
PROJECT DESCRIPTION BRIDGE NO. 44 ON SR 1100 OVER
ROQUIST CREEK AT -L- STATION 15+66

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 (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 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.

EASTERN REGIONAL

DNA

PERSONNEL
T.C. BOTTOMS

S.C. DILLARD

R.E. SMITH

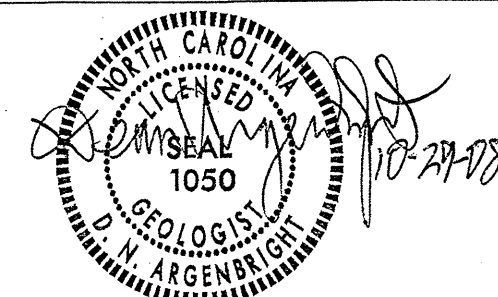
J.M. EDMONDSON

INVESTIGATED BY F.M. WESCOTT III

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE OCTOBER, 2008



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.

DRAWN BY: C.P. TURNER

PROJECT: 33701.1.1 ID: B-4435

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

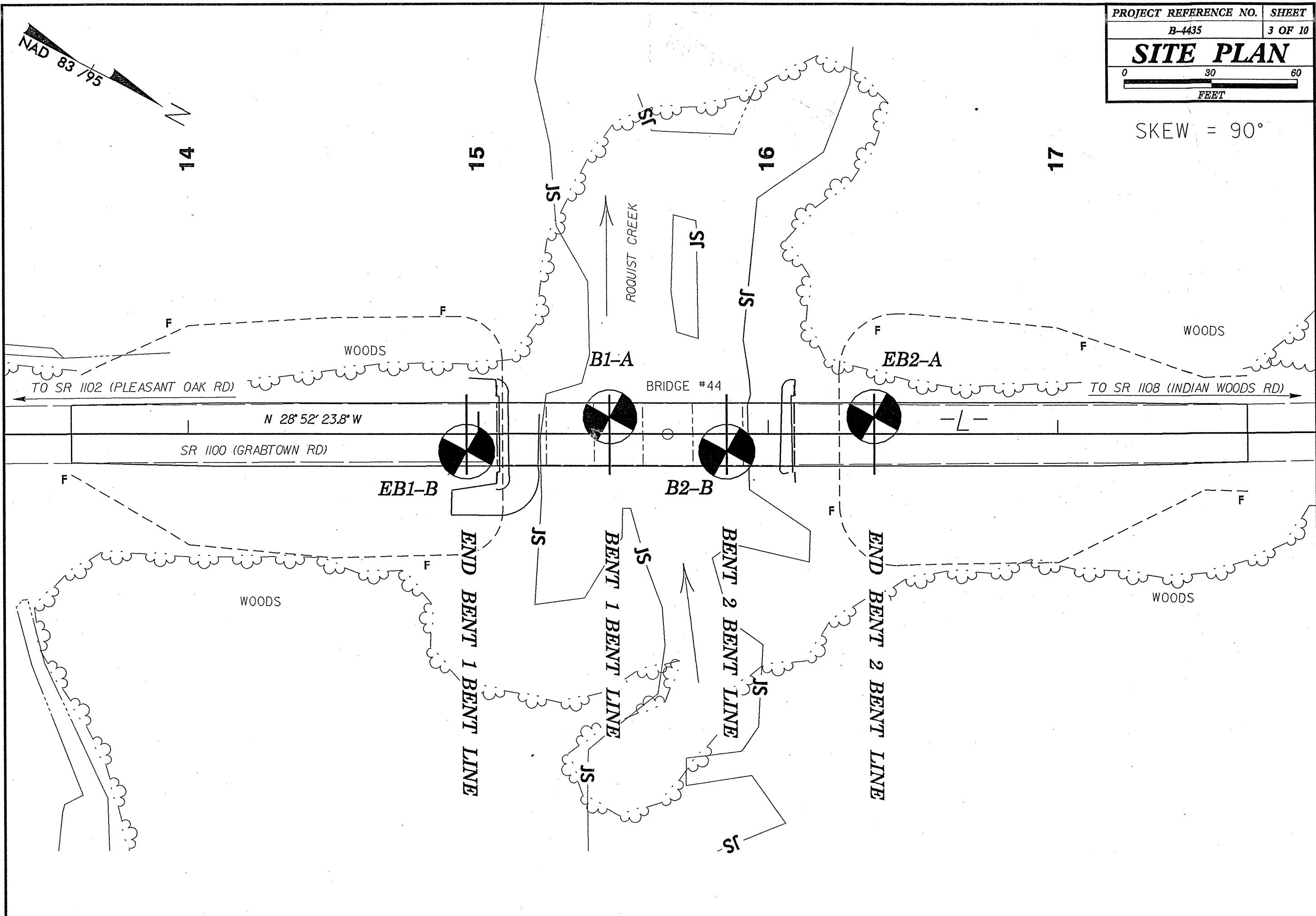
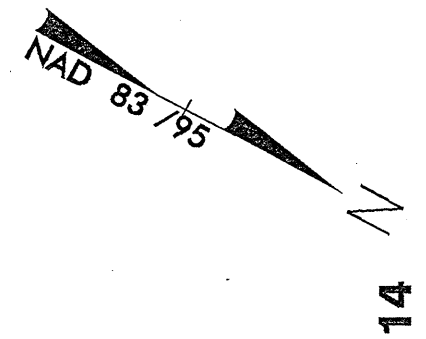
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

PROJECT REFERENCE NO. B-4435 SHEET NO. 2 OF 10

SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS																																																																																																																																																																										
<p>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 T206, 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: VERY STIFF, GRANULY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</p>		<p>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) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p>		<p>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:</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, 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 DISLOOSED 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 (SRQD) - 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>																																																																																																																																																																										
<p>SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1"> <tr> <th>GENERAL CLASS.</th> <th colspan="7">GRANULAR MATERIALS (<= 35% PASSING #200)</th> <th colspan="7">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="3">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1-a</th> <th>A-1-b</th> <th>A-2</th> <th>A-2-4</th> <th>A-2-5</th> <th>A-2-6</th> <th>A-2-7</th> <th>A-3</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-7-5</th> <th>A-7-6</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> </tr> <tr> <th>SYMBOL</th> <td colspan="14"></td> <td colspan="3"></td> </tr> <tr> <th>% PASSING</th> <td colspan="7">50 MX 30 MX 15 MX</td> <td colspan="7">SI MN 10 MX 5 MX</td> <td colspan="3">GRANULAR SOILS SILT-CLAY SOILS MUCK, PEAT</td> </tr> <tr> <th>LIQUID LIMIT PLASTIC INDEX</th> <td colspan="7">6 MX</td> <td colspan="7">NP</td> <td colspan="3">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> </tr> <tr> <th>GROUP INDEX</th> <td colspan="7">0</td> <td colspan="7">4 MX</td> <td colspan="3">HIGHLY ORGANIC SOILS</td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td colspan="3">STONE FRAGS, GRAVEL, AND SAND</td> <td colspan="4">FINE SAND</td> <td colspan="4">SILTY OR CLAYEY GRAVEL AND SAND</td> <td colspan="3">SILTY SOILS</td> <td colspan="3">CLAYEY SOILS</td> </tr> <tr> <th>GENERAL RATING AS A SUBGRADE</th> <td colspan="7">EXCELLENT TO GOOD</td> <td colspan="7">FAIR TO POOR</td> <td colspan="3">FAIR TO POOR POOR UNSUITABLE</td> </tr> <tr> <td colspan="18">PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30</td> </tr> </table>		GENERAL CLASS.	GRANULAR MATERIALS (<= 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)							ORGANIC MATERIALS			GROUP CLASS.	A-1-a	A-1-b	A-2	A-2-4	A-2-5	A-2-6	A-2-7	A-3	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	SYMBOL																		% PASSING	50 MX 30 MX 15 MX							SI MN 10 MX 5 MX							GRANULAR SOILS SILT-CLAY SOILS MUCK, PEAT			LIQUID LIMIT PLASTIC INDEX	6 MX							NP							SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER			GROUP INDEX	0							4 MX							HIGHLY ORGANIC SOILS			USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL, AND SAND			FINE SAND				SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS			CLAYEY SOILS			GENERAL RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR							FAIR TO POOR POOR UNSUITABLE			PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30																		<p>ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>		<p>MINERALOGICAL COMPOSITION</p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p>		<p>WEATHERED ROCK (WR)</p> <p>NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</p>		<p>CRYSTALLINE ROCK (CR)</p> <p>FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p>		<p>NON-CRYSTALLINE ROCK (NCR)</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 SEDIMENTARY ROCK (CP)</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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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 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >4																																																																																																																																																																													
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<p>INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>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.</p>		<p>NOTES:</p> <p>BENCH MARK: BM #5 -L- STA. 21+75 25' LT RR SPIKE IN BASE OF 12' GUM ELEVATION: 25.22 FT.</p>																																																																																																																																																																														

SKEW = 90°



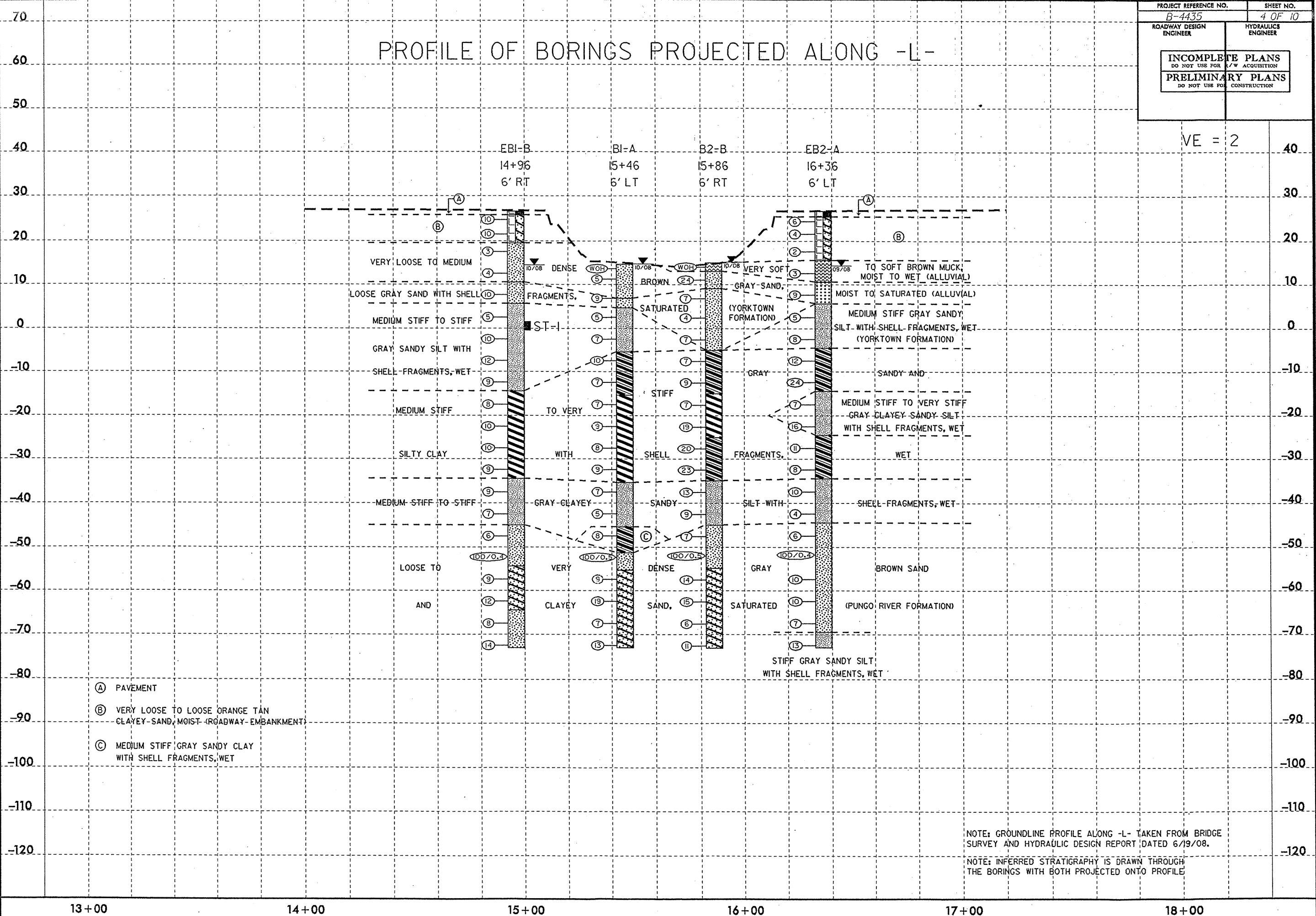
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PROJECT REFERENCE NO. B-4435	SHEET NO. 4 OF 10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

PROFILE OF BORINGS PROJECTED ALONG -L-

VE = 2 40

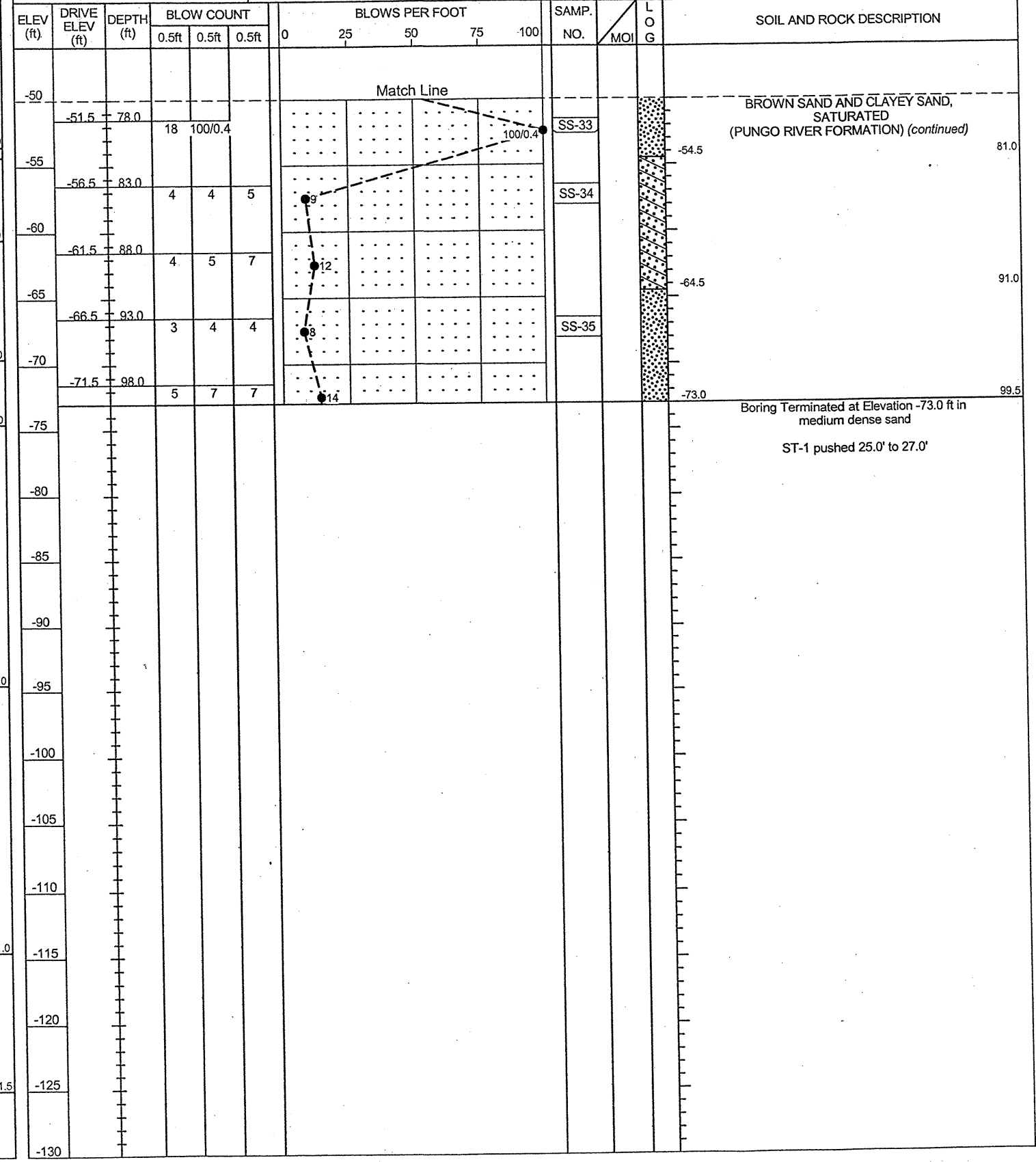
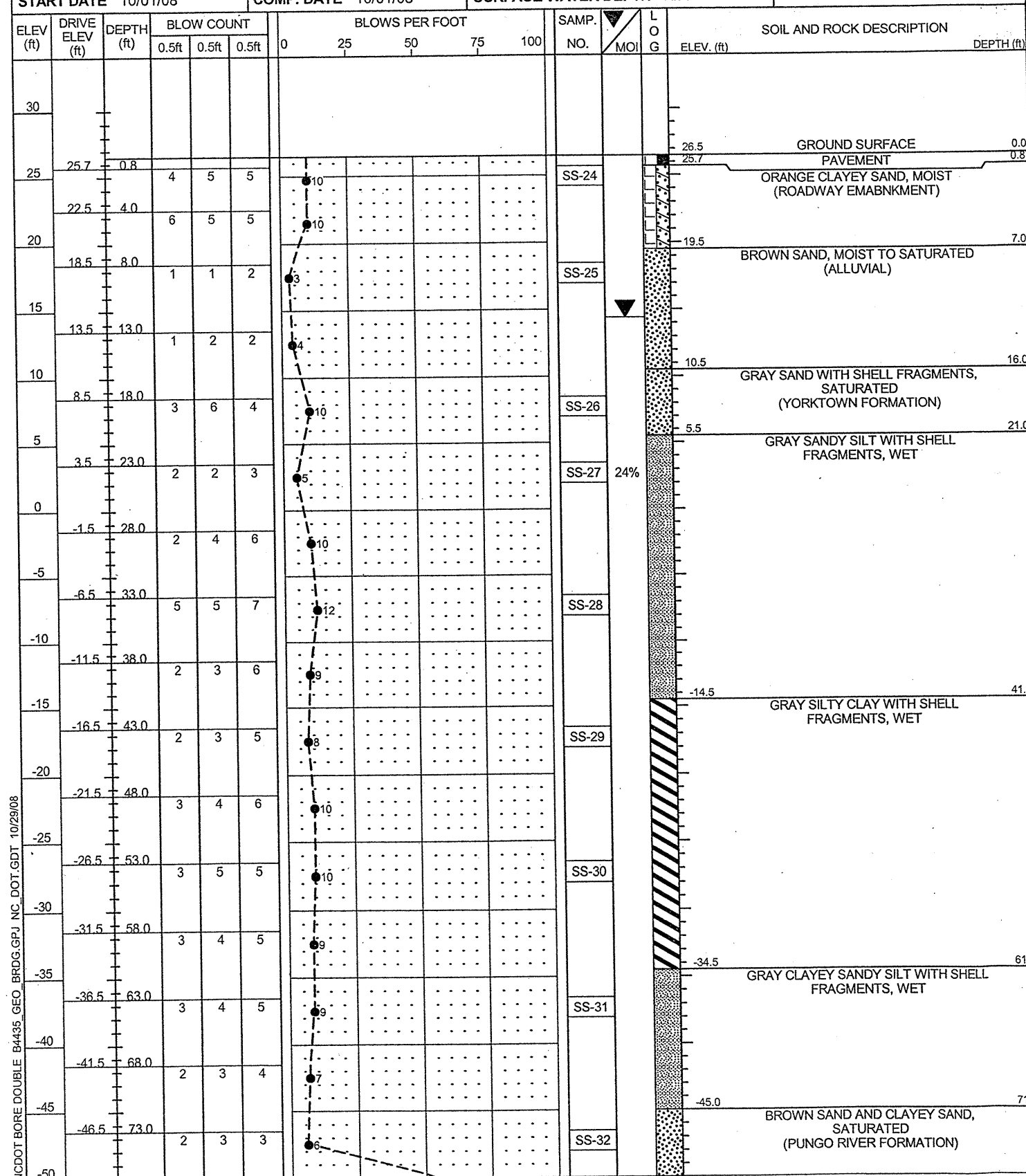


13+00 14+00 15+00 16+00 17+00 18+00

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33701.1.1	ID. B-4435	COUNTY BERTIE	GEOLOGIST Bottoms, T. C.
SITE DESCRIPTION BRIDGE NO. 44 ON -L- (SR 1100) OVER ROQUIST CREEK			GROUND WTR (ft)
BORING NO. EB1-B	STATION 14+96	OFFSET 6ft RT	ALIGNMENT -L-
COLLAR ELEV. 26.5 ft	TOTAL DEPTH 99.5 ft	NORTHING 819,331	EASTING 2,590,503
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 10/01/08	COMP. DATE 10/01/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

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NCDOT BORE DOUBLE B4435_GEO_BRDG.GPJ, NC_DOT.GDT, 10/29/08



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 33701.1.1	ID. B-4435	COUNTY BERTIE	GEOLOGIST Bottoms, T. C.
SITE DESCRIPTION BRIDGE NO. 44 ON -L- (SR 1100) OVER ROQUIST CREEK			GROUND WTR (ft)
BORING NO. B1-A	STATION 15+46	OFFSET 6ft LT	ALIGNMENT -L-
COLLAR ELEV. 14.7 ft	TOTAL DEPTH 87.6 ft	NORTHING 819,369	EASTING 2,590,468
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 09/30/08	COMP. DATE 09/30/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

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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				
15	14.7	0.0	WOH	WOH	WOH								GROUND SURFACE	0.0
	12.3	2.4	WOH	1	4						SS-13		GRAY SAND, SATURATED (ALLUVIAL)	
10	7.8	6.9		4	4	5					SS-14		GRAY SAND WITH SHELL FRAGMENTS, SATURATED (YORKTOWN FORMATION)	7.9
5	3.6	11.1		1	2	3					SS-15		GRAY SANDY SILT WITH SHELL FRAGMENTS, WET	10.0
0	-1.4	16.1		2	3	4								
-5	-6.4	21.1		2	4	6					SS-16		GRAY SANDY AND SILTY CLAY WITH SHELL FRAGMENTS, WET	20.0
-10	-11.4	26.1		2	3	4								
-15	-16.4	31.1		2	3	4					SS-17			30.0
-20	-21.4	36.1		4	4	5								
-25	-26.4	41.1		3	4	4					SS-18			
-30	-31.4	46.1		3	5	4								
-35	-36.4	51.1		2	3	4					SS-19		GRAY CLAYEY SANDY SILT, WITH SHELL FRAGMENTS, WET	50.0
-40	-41.4	56.1		2	2	3								
-45	-46.4	61.1		3	3	5					SS-20		GRAY SANDY CLAY WITH SHELL FRAGMENTS, WET	60.0
-50	-51.4	66.1		100/0.5							SS-21		BROWN SAND AND CLAYEY SAND, SATURATED (PUNGO RIVER FORMATION)	66.0
-55	-56.4	71.1		4	4	5					SS-22			70.0
-60	-61.4	76.1		3	5	14								
-65														

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				
-65														
	-66.4	81.1		3	3	4					SS-23			
-70	-71.4	86.1		4	6	7								
-75														
-80														
-85														
-90														
-95														
-100														
-105														
-110														
-115														
-120														
-125														
-130														
-135														
-140														
-145														

NCDOT BORE DOUBLE B4435.GEO.BRDG.GPJ NC.DOT.GDT 10/29/08

Boring Terminated at Elevation -72.9 ft in medium dense clayey sand



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

PROJECT NO. 33701.1.1	ID. B-4435	COUNTY BERTIE	GEOLOGIST Bottoms, T. C.
SITE DESCRIPTION BRIDGE NO. 44 ON -L- (SR 1100) OVER ROQUIST CREEK			GROUND WTR (ft)
BORING NO. B2-B	STATION 15+86	OFFSET 6ft RT	ALIGNMENT -L-
COLLAR ELEV. 15.0 ft	TOTAL DEPTH 88.1 ft	NORTHING 819,410	EASTING 2,590,459
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 10/02/08	COMP. DATE 10/02/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

PROJECT NO. 33701.1.1	ID. B-4435	COUNTY BERTIE	GEOLOGIST Bottoms, T. C.
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START DATE 10/02/08	COMP. DATE 10/02/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
15														15.0	GROUND SURFACE	0.0
	15.0	0.0	WOH	WOH	WOH										BROWN MUCK, WET (ALLUVIAL)	2.0
	12.0	3.0	WOH	13	11										GRAY SAND, SATURATED	
10																
	7.7	7.3	4	3	4										GRAY SAND WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION)	-6.0
5																
	3.4	11.6	1	2	2											
0																
	-1.6	16.6	1	3	4											
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-20																
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	-26.6	41.6	6	8	12											
-30																
	-31.6	46.6	6	8	15											
-35																
	-36.6	51.6	4	6	7											
-40																
	-41.6	56.6	3	4	5											
-45																
	-46.6	61.6	2	3	4											
-50																
	-51.6	66.6	100/0.5													
-55																
	-56.6	71.6	4	5	9											
-60																
	-61.6	76.6	4	6	9											
-65																

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
-65																
	-66.6	81.6	2	3	3											
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NCDOT BORE DOUBLE B4435, GEO BRDG.GPJ NC_DOT_GDT_10/29/08

Boring Terminated at Elevation -73.1 ft in medium dense clayey sand



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

PROJECT NO. 33701.1.1	ID. B-4435	COUNTY BERTIE	GEOLOGIST Bottoms, T. C.
SITE DESCRIPTION BRIDGE NO. 44 ON -L- (SR 1100) OVER ROQUIST CREEK			GROUND WTR (ft)
BORING NO. EB2-A	STATION 16+36	OFFSET 6ft LT	ALIGNMENT -L-
COLLAR ELEV. 26.6 ft	TOTAL DEPTH 99.5 ft	NORTHING 819,448	EASTING 2,590,425
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 09/24/08	COMP. DATE 09/24/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV (ft)	DRIVE 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						
30																
25	25.4	1.2														
	22.6	4.0	2	3	3											
20	18.6	8.0	1	2	2											
	13.6	13.0	1	1	1											
15	13.6	13.0	1	1	2											
10	8.6	18.0	1	1	2											
	8.6	18.0	5	6	3											
5	3.6	23.0	2	2	3											
0	-1.4	28.0	2	3	5											
-5	-6.4	33.0	4	5	7											
-10	-11.4	38.0	6	10	14											
-15	-16.4	43.0	3	3	4											
-20	-21.4	48.0	5	7	9											
-25	-26.4	53.0	4	5	6											
-30	-31.4	58.0	2	4	4											
-35	-36.4	63.0	4	4	6											
-40	-41.4	68.0	2	2	2											
-45	-46.4	73.0	1	3	3											
-50																

PROJECT NO. 33701.1.1	ID. B-4435	COUNTY BERTIE	GEOLOGIST Bottoms, T. C.
SITE DESCRIPTION BRIDGE NO. 44 ON -L- (SR 1100) OVER ROQUIST CREEK			GROUND WTR (ft)
BORING NO. EB2-A	STATION 16+36	OFFSET 6ft LT	ALIGNMENT -L-
COLLAR ELEV. 26.6 ft	TOTAL DEPTH 99.5 ft	NORTHING 819,448	EASTING 2,590,425
DRILL MACHINE CME-45B	DRILL METHOD Mud Rotary	HAMMER TYPE Automatic	
START DATE 09/24/08	COMP. DATE 09/24/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A

ELEV (ft)	DRIVE 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						
-50																
	-51.4	78.0														
			100	0.4												
-55	-56.4	83.0	5	5	5											
-60	-61.4	88.0	5	5	5											
-65	-66.4	93.0	3	4	3											
-70	-71.4	98.0	4	6	7											
-75																
-80																
-85																
-90																
-95																
-100																
-105																
-110																
-115																
-120																
-125																
-130																

NCDOT BORE DOUBLE B4435_GEO_BRDG.GPJ NC_DOT.GDT 10/29/08

Bridge No. 44 on SR 1100 over Roquist Creek

HOLE #	SAMPLE #	PASS 10	PASS 40	PASS 200	CSESAND	FINESAND	SI	CL	LL	PI	CLASS	DEPTH	MOIST.	ORG.
EB2-A	SS-1	97	74	35	47.5	18.4	6.4	27.7	34	14	A-2-6(1)	1.2-2.7		
	SS-2	93	72	34	43.5	20.8	8.0	27.7	33	17	A-2-6(1)	8.0-9.5	13.1	
	SS-3	100	75	5	63.3	32.9	2.2	1.6	15	NP	A-3(0)	18.0-19.5		
	SS-4	94	87	42	14.4	51.9	24.0	9.6	29	7	A-4(0)	23.0-24.5		
	SS-5	100	99	62	1.0	54.3	25.1	19.6	34	11	A-6(5)	33.0-34.5		
	SS-6	100	96	78	5.0	35.5	31.9	27.7	36	10	A-4(8)	43.0-44.5		
	SS-7	100	99	83	1.0	32.1	39.3	27.7	35	11	A-6(9)	53.0-54.5		
	SS-8	93	85	52	10.2	47.9	22.2	19.6	28	5	A-4(1)	63.0-64.5		
	SS-9	90	61	23	59.5	17.4	7.4	15.6	22	7	A-2-4(0)	73.0-74.5		
	SS-10	100	79	21	50.7	34.1	7.6	7.6	19	NP	A-2-4(0)	78.0-78.4		
	SS-11	100	85	32	37.3	33.5	17.6	11.6	24	7	A-2-4(0)	88.0-89.5		
	SS-12	100	95	43	15.0	47.1	12.2	25.7	28	9	A-4(1)	98.0-99.5		
B1-A	SS-13	100	98	32	13.4	64.1	12.8	9.6	17	NP	A-2-4(0)	2.4-3.9		
	SS-14	91	73	18	39.3	44.1	7.0	9.6	20	NP	A-2-4(0)	7.9-8.4		
	SS-15	96	90	42	13.8	54.1	14.4	17.6	32	10	A-4(1)	11.1-12.6		
	SS-16	100	99	65	0.8	49.6	20.0	29.6	33	11	A-6(5)	21.1-22.6		
	SS-17	100	90	70	12.4	33.6	28.4	25.6	41	17	A-7-6(11)	31.1-32.6		
	SS-18	100	99	88	0.8	25.0	40.6	33.6	42	17	A-7-6(16)	41.1-42.6		
	SS-19	93	91	53	9.8	48.0	22.6	19.6	30	8	A-4(2)	51.1-52.6		
	SS-20	100	98	89	2.2	21.2	49.0	27.6	36	12	A-6(11)	61.1-62.6		
	SS-21	100	78	20	53.8	32.0	4.6	9.6	18	NP	A-2-4(0)	66.1-66.6		
	SS-22	97	81	30	43.2	24.0	15.2	17.6	33	13	A-2-6(0)	71.1-72.6		
	SS-23	100	77	30	41.0	32.2	5.2	21.6	36	12	A-2-6(0)	81.1-82.6		
EB1-B	SS-24	96	74	31	49.0	21.2	6.2	23.6	23	11	A-2-6(0)	1.0-2.3		
	SS-25	100	96	28	19.6	59.6	1.2	19.6	18	NP	A-2-4(0)	8.0-9.5		
	SS-26	83	68	16	38.6	44.8	7.0	9.6	21	NP	A-2-4(0)	18.0-19.5		
	SS-27	91	86	41	11.2	55.8	21.4	11.6	29	8	A-4(0)	23.0-24.5	24.2	
	SS-28	100	99	50	1.0	62.2	19.2	17.6	33	7	A-4(1)	33.0-34.5		
	SS-29	89	88	80	1.6	26.0	38.8	33.6	47	24	A-7-6(20)	43.0-44.5		
	SS-30	100	99	84	1.8	27.6	35.0	35.6	41	22	A-7-6(18)	53.0-54.5		
	SS-31	100	98	73	2.2	44.8	33.3	19.7	30	5	A-4(3)	63.0-64.5		
	SS-32	87	66	29	45.8	24.7	13.8	15.7	24	9	A-2-4(0)	73.0-74.5		
	SS-33	98	77	20	51.3	34.4	6.7	7.6	15	NP	A-2-4(0)	78.0-78.9		
	SS-34	97	75	35	41.8	28.7	17.8	11.7	33	11	A-2-6(0)	83.0-84.5		
	SS-35	100	74	23	48.6	29.9	11.8	9.6	30	7	A-2-4(0)	93.0-94.5		
B2-B	SS-36	93	78	20	36.0	46.4	9.9	7.6	22	NP	A-2-4(0)	7.3-8.8		
	SS-37	95	86	32	20.9	53.7	7.7	17.7	25	NP	A-2-4(0)	11.6-13.1		
	SS-38	100	99	70	1.2	49.6	21.4	27.7	37	11	A-6(7)	21.6-23.1		
	SS-39	85	75	60	14.1	29.3	28.8	27.7	41	21	A-7-6(10)	31.6-33.1		
	SS-40	100	99	86	1.0	27.5	41.7	29.7	34	13	A-6(11)	41.6-43.1		
	SS-41	94	88	59	7.2	42.4	30.7	19.7	29	4	A-4(1)	51.6-53.1		
	SS-42	86	62	23	55.1	20.1	9.1	15.7	23	7	A-2-4(0)	61.6-63.1		
	SS-43	98	75	19	54.1	31.4	6.9	7.6	17	NP	A-2-4(0)	66.6-67.1		
	SS-44	98	81	29	44.8	27.3	10.2	17.7	29	11	A-2-6(0)	71.6-73.1		
	SS-45	100	76	30	41.2	32.0	11.2	15.7	33	13	A-2-6(0)	81.6-83.1		



**FIELD
SCOUR REPORT**

WBS: 33701.1.1 TIP: B-4435 COUNTY: Bertie

DESCRIPTION(1): Bridge No. 44 on SR 1100 over Roquist Creek

EXISTING BRIDGE

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

Bridge No.: 44 Length: 103 Total Bents: 7 Bents in Channel: 5 Bents in Floodplain: 2
Foundation Type: Timber pile

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): 15+/- feet from outside edge of bridge

Effectiveness(5): Appears satisfactory

Obstructions(6): Old concrete debris and fallen trees in channel

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 (SS-13) and Muck (not enough to sample)

Channel Bank Material(8): Sand (SS-25) and Muck (not enough to sample)

Channel Bank Cover(9): Wooded

Floodplain Width(10): 500+/- feet

Floodplain Cover(11): Wooded

Stream is(12): Aggrading _____ Degrading _____ Static

Channel Migration Tendency(13): Not likely, but possibly toward south toward End Bent 1

Observations and Other Comments: _____

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

	BENTS													
	B1	B2												
50 yr scour	6.3	6.5												
100 yr scour	5.5	5.8												
500yr scour	2.9	2.9												

Comparison of DSE to Hydraulics Unit theoretical scour:
Design Scour Elevation agrees with the Hydraulics Unit's 50 yr. maximum 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 9,
"Soil Test Results",
for samples:
Channel bank SS-25
Channel bed SS-13

Reported by: Frank M. [Signature] Date: 10-29-08