

PROJECT: 8.2410801 ID: B-3707

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

STRUCTURE SUBSURFACE INVESTIGATION

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STATE PROJECT 8.2410801 I.D. NO. B-3707

F.A. PROJECT BRZ-1507(I)

COUNTY WARREN

PROJECT DESCRIPTION REPLACEMENT OF

BRIDGE No. 67 ON S.R. 1507 OVER REEDY CREEK

SITE DESCRIPTION REPLACEMENT OF

BRIDGE No. 67 ON S.R. 1507 OVER REEDY CREEK

STATE	STATE PROJECT REFERENCE NO.	SHEET	TOTAL SHEETS
N.C.	B-3707	1	23
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
8.2410801	BRZ-1507(I)	P.E. CONST.	

CAUTION NOTICE

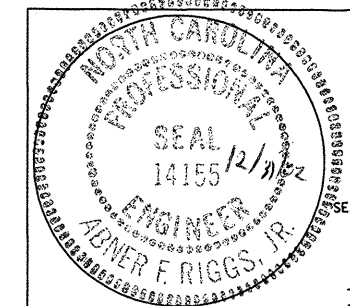
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS 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.

For Letting

INVESTIGATED BY S&ME, INC. PERSONNEL S. JOHNSON
 CHECKED BY A.F. RIGGS, JR. A. NASH
 SUBMITTED BY S&ME, INC. E. MOSELEY
 DATE DEC. 11, 2002 S. LOW
P. PHELPS
T. PEREZ



Adner F. Riggs, Jr.
SIGNATURE

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: T. PEREZ

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

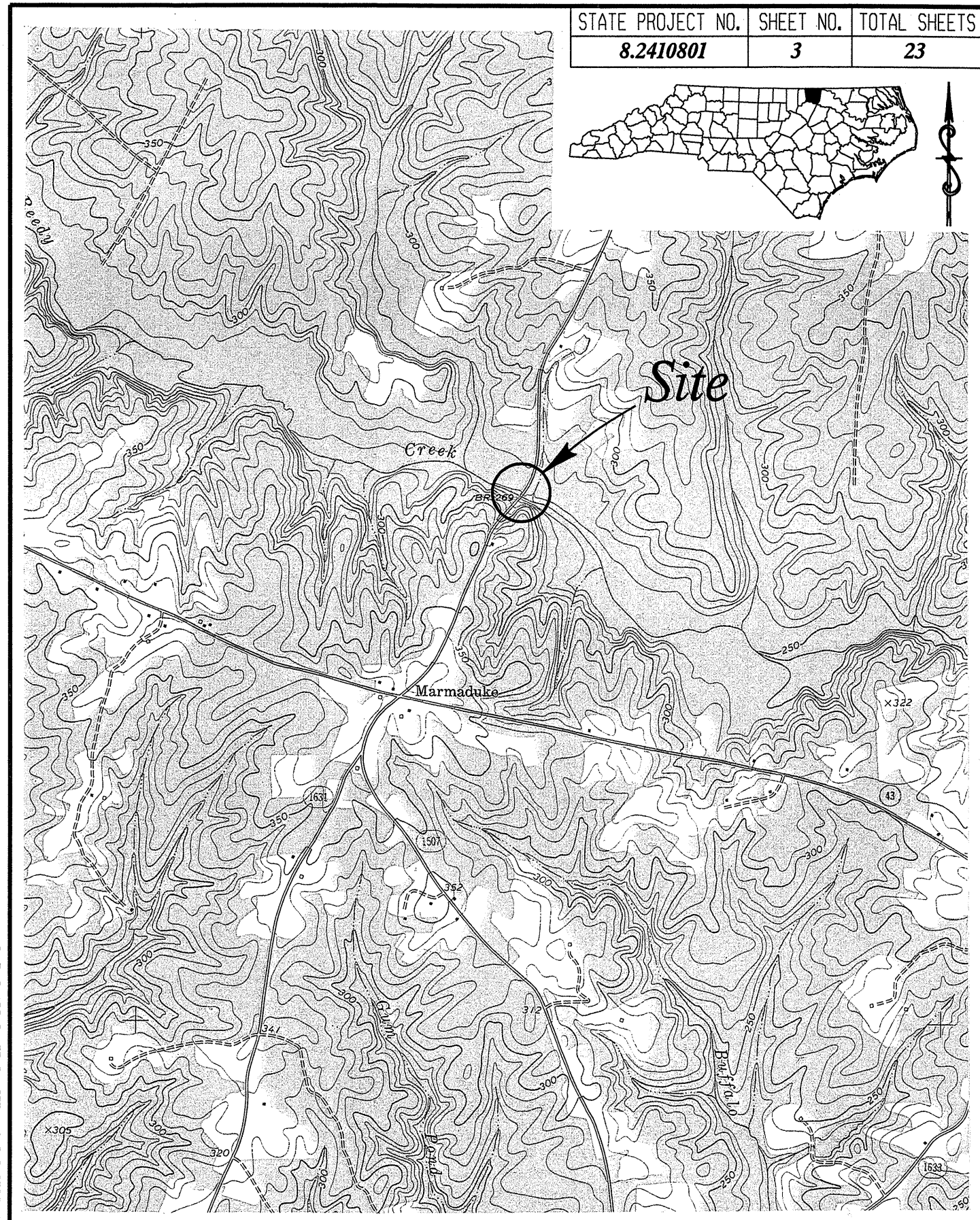
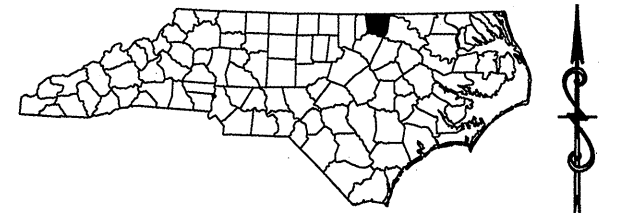
ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
B-3707	8.2410801	2	23

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS																																																																																																																							
<p>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 (AASHTO T208, 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. EXAMPLE:</p> <p align="center"><i>VERY STIFF, GRAY SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>		<p>WELL GRADED- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE UNIFORM. INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)</p> <p>GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p align="center">ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: <u>ANGULAR</u>, <u>SUBANGULAR</u>, <u>SUBROUNDED</u>, OR <u>ROUNDED</u>.</p>		<p>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.</p> <p>ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>		<p>ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.</p> <p>AQUIFER - A WATER BEARING FORMATION OR STRATA.</p> <p>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p>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.</p> <p>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.</p> <p>CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p>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.</p> <p>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p>FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.</p> <p>FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p>FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p>JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p>LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p>MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p>RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p>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.</p> <p>SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p>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.</p> <p>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p>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.</p> <p>STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p>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 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.</p> <p>TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																							
<p align="center">SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1"> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="4">GRANULAR MATERIALS (>5% PASSING #200)</th> <th colspan="4">SILT-CLAY MATERIALS (>85% PASSING #200)</th> <th colspan="2">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-4, A-5</th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1-a</td> <td>A-1-b</td> <td>A-2-4</td> <td>A-2-5</td> <td>A-2-6</td> <td>A-2-7</td> <td></td> <td></td> <td>A-7-8</td> <td>A-7-9</td> </tr> <tr> <td>SYMBOL</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>% PASSING</td> <td>50 MX</td> <td>30 MX</td> <td>15 MX</td> <td>10 MX</td> <td>10 MX</td> <td>10 MX</td> <td>10 MX</td> <td>10 MX</td> <td>10 MX</td> <td>10 MX</td> </tr> <tr> <td>LIQUID LIMIT PLASTIC INDEX</td> <td>6 MX</td> <td>N.P.</td> <td>40 MX</td> <td>40 MX</td> <td>40 MX</td> <td>40 MX</td> <td>40 MX</td> <td>40 MX</td> <td>40 MX</td> <td>40 MX</td> </tr> <tr> <td>GROUP INDEX</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td>STONE FRAGS. GRAVEL AND SAND</td> <td>FINE SAND</td> <td>SILTY OR CLAYEY GRAVEL AND SAND</td> <td>CLAYEY SILT</td> <td>SILTY CLAY</td> <td>CLAYEY SILT</td> <td>CLAYEY SILT</td> <td>CLAYEY SILT</td> <td>CLAYEY SILT</td> <td>CLAYEY SILT</td> </tr> <tr> <td>GEN. RATING AS A SUBGRADE</td> <td colspan="3">EXCELLENT TO GOOD</td> <td colspan="3">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td colspan="2">UNSATURABLE</td> </tr> </table> <p align="center">P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30</p>		GENERAL CLASS.	GRANULAR MATERIALS (>5% PASSING #200)				SILT-CLAY MATERIALS (>85% PASSING #200)				ORGANIC MATERIALS		A-1	A-3	A-2	A-2	A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7			A-7-8	A-7-9	SYMBOL											% PASSING	50 MX	30 MX	15 MX	10 MX	10 MX	10 MX	10 MX	10 MX	10 MX	10 MX	LIQUID LIMIT PLASTIC INDEX	6 MX	N.P.	40 MX	40 MX	40 MX	40 MX	40 MX	40 MX	40 MX	40 MX	GROUP INDEX	0	0	0	0	0	0	0	0	0	0	USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	CLAYEY SILT	SILTY CLAY	CLAYEY SILT	CLAYEY SILT	CLAYEY SILT	CLAYEY SILT	CLAYEY SILT	GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD			FAIR TO POOR			FAIR TO POOR	POOR	UNSATURABLE		<p align="center">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 align="center">COMPRESSIONIBILITY</p> <p>SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30</p> <p>MODERATELY COMPRESSIBLE LIQUID LIMIT 31-50</p> <p>HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50</p>		<p align="center">PERCENTAGE OF MATERIAL</p> <table border="1"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT-CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>>10%</td> <td>>20%</td> <td>HIGHLY</td> </tr> </table>		ORGANIC MATERIAL	GRANULAR SOILS	SILT-CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	>10%	>20%	HIGHLY
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GRAIN SIZE MM 305	75	2.0	0.25	0.05	0.005																																																																																																																								
IN. 12"	3"																																																																																																																												
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DMT - DILATOMETER TEST	γ - UNIT WEIGHT																																																																																																																												
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FRAGS. - FRAGMENTS																																																																																																																													
MED. - MEDIUM																																																																																																																													
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<p align="center">COLOR</p> <p>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.</p>		<p align="center">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1"> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table>		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.																																																																																																																		
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<p align="center">BENCH MARK: NCDOT Travers Station Rebar & Cap Stamped BL-3</p> <p align="center">Located @ Sta. 13+04.18 -BL- (Sta. 18+59.56, 16.42' RT. -L-)</p> <p align="right">ELEVATION: 267.63'</p>		<p>NOTES:</p>																																																																																																																											

STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
8.2410801	3	23



S:\GEO TECH\2002\02 BRIDGES\B-3707 REEDY CREEK\CADD\ -SITE\VIC

SCALE:	1:24,000
CHECKED BY:	AFR
DRAWN BY:	TRP
DATE:	DECEMBER 2002
JOB NO.	105 1-02-147

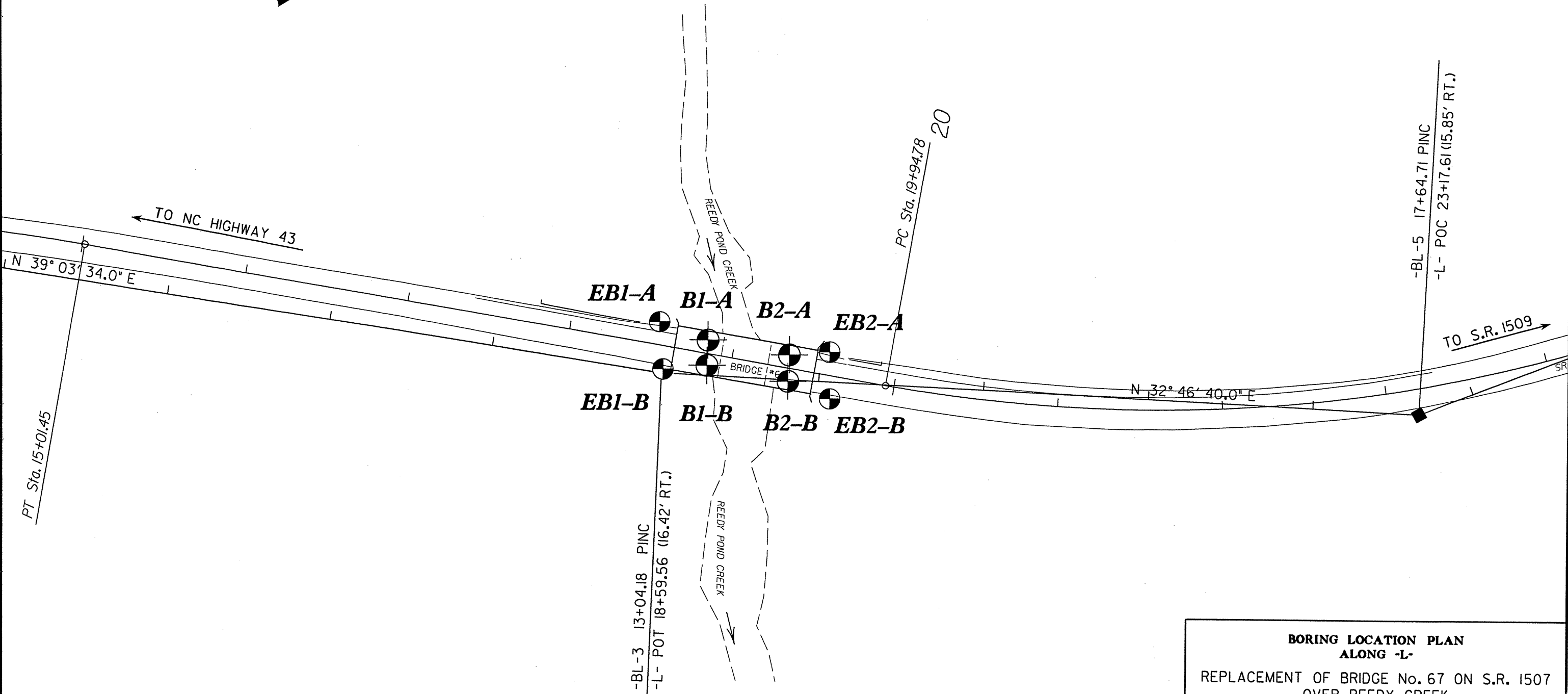
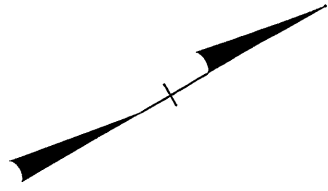


SITE VICINITY MAP
 REPLACEMENT OF BRIDGE No. 67 ON S.R. 1507
 OVER REEDY CREEK
 STATE PROJECT NO. 8.2410801 TIP NO. B-3707
 FEDERAL I.D. NO. BRZ-1507(1)
 WARREN COUNTY, NORTH CAROLINA

FIGURE NO.
1

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3707	4	23
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
8.2410801	BRZ-1507(1)	P.E.	
		CONST.	

15

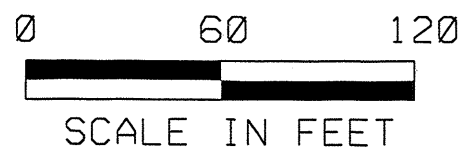


PT Sta. 15+01.45

PC Sta. 19+94.78
20

-BL-5 17+64.71 PINC
-L- POC 23+17.61 (15.85' RT.)

-BL-3 13+04.18 PINC
-L- POT 18+59.56 (16.42' RT.)



SKIEW ANGLE FOR BENTS: 80° 00' 00" (TYPICAL)

BENCHMARK:
REBAR WITH CAP STAMPED -BL-3
AT STATION 13+04.18 -BL-
ELEV. 267.63'

**BORING LOCATION PLAN
ALONG -L-**
REPLACEMENT OF BRIDGE No. 67 ON S.R. 1507
OVER REEDY CREEK
STATE PROJECT NO. 8.2410801 TIP NO. B-3707
FEDERAL I.D. NO. BRZ-1507(1)
WARREN COUNTY, NORTH CAROLINA



SCALE:	1" = 60'	APPROVED BY:	AFR
DATE:	DECEMBER 2002	DRAWN BY:	TRP
JOB NO.	1051-02-147	FIGURE	2

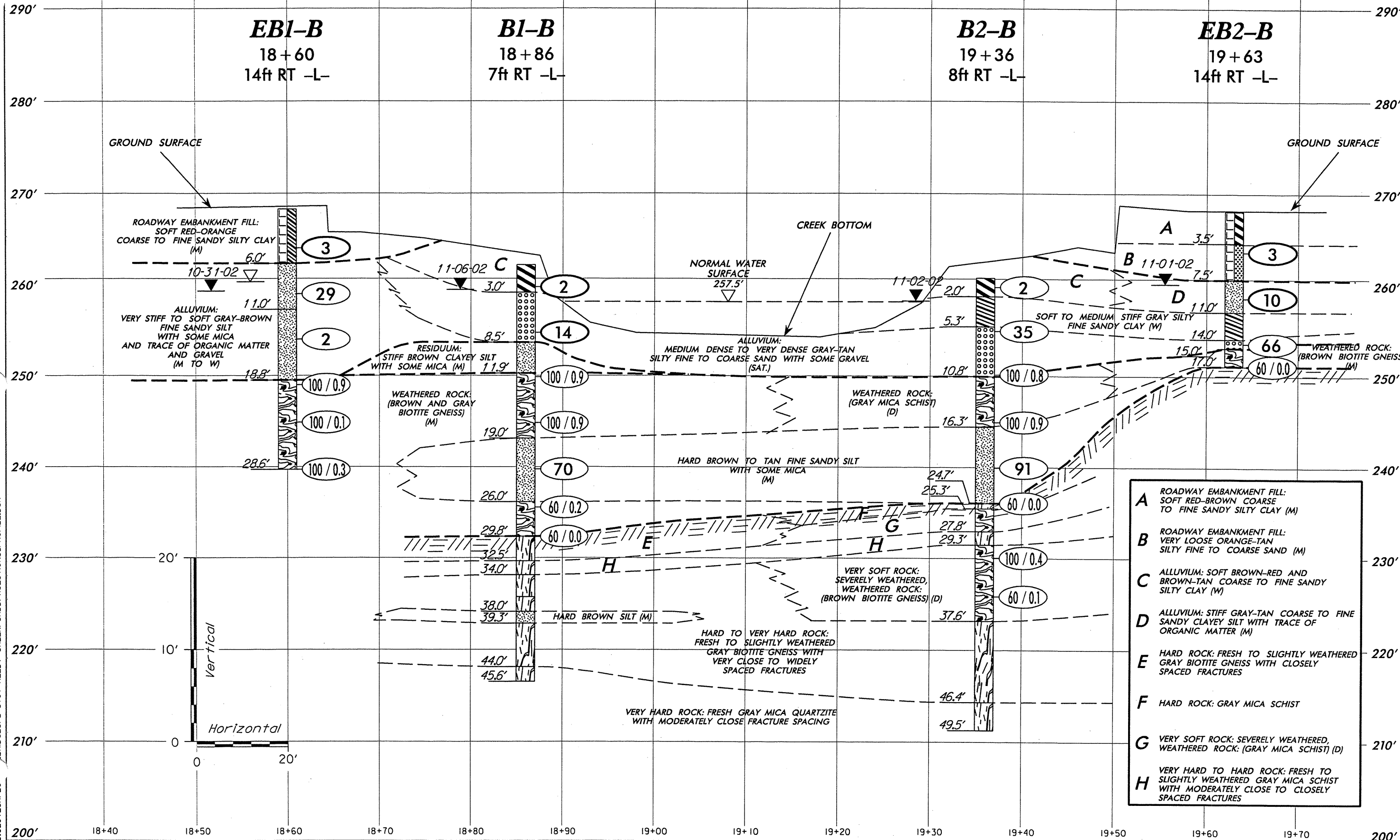
S:\GEO TECH\2002\02 BRIDGES\B-3707 REEDY CREEK\CADD\SITEPLAN

TO NC HIGHWAY 43

GENERALIZED SUBSURFACE PROFILE 14.0' RIGHT -L-

TO S.R. 1509

SHEET NO. 5 TOTAL SHEETS 23



- A** ROADWAY EMBANKMENT FILL: SOFT RED-BROWN COARSE TO FINE SANDY SILTY CLAY (M)
- B** ROADWAY EMBANKMENT FILL: VERY LOOSE ORANGE-TAN SILTY FINE TO COARSE SAND (M)
- C** ALLUVIUM: SOFT BROWN-RED AND BROWN-TAN COARSE TO FINE SANDY SILTY CLAY (W)
- D** ALLUVIUM: STIFF GRAY-TAN COARSE TO FINE SANDY CLAYEY SILT WITH TRACE OF ORGANIC MATTER (M)
- E** HARD ROCK: FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH CLOSELY SPACED FRACTURES
- F** HARD ROCK: GRAY MICA SCHIST
- G** VERY SOFT ROCK: SEVERELY WEATHERED, WEATHERED ROCK: (GRAY MICA SCHIST) (D)
- H** VERY HARD TO HARD ROCK: FRESH TO SLIGHTLY WEATHERED GRAY MICA SCHIST WITH MODERATELY CLOSE TO CLOSELY SPACED FRACTURES

APPROVED BY: AFR
 DRAWN BY: TRP
 DATE: DECEMBER 2002
 JOB NO. 10511-02-147
 FIGURE 3

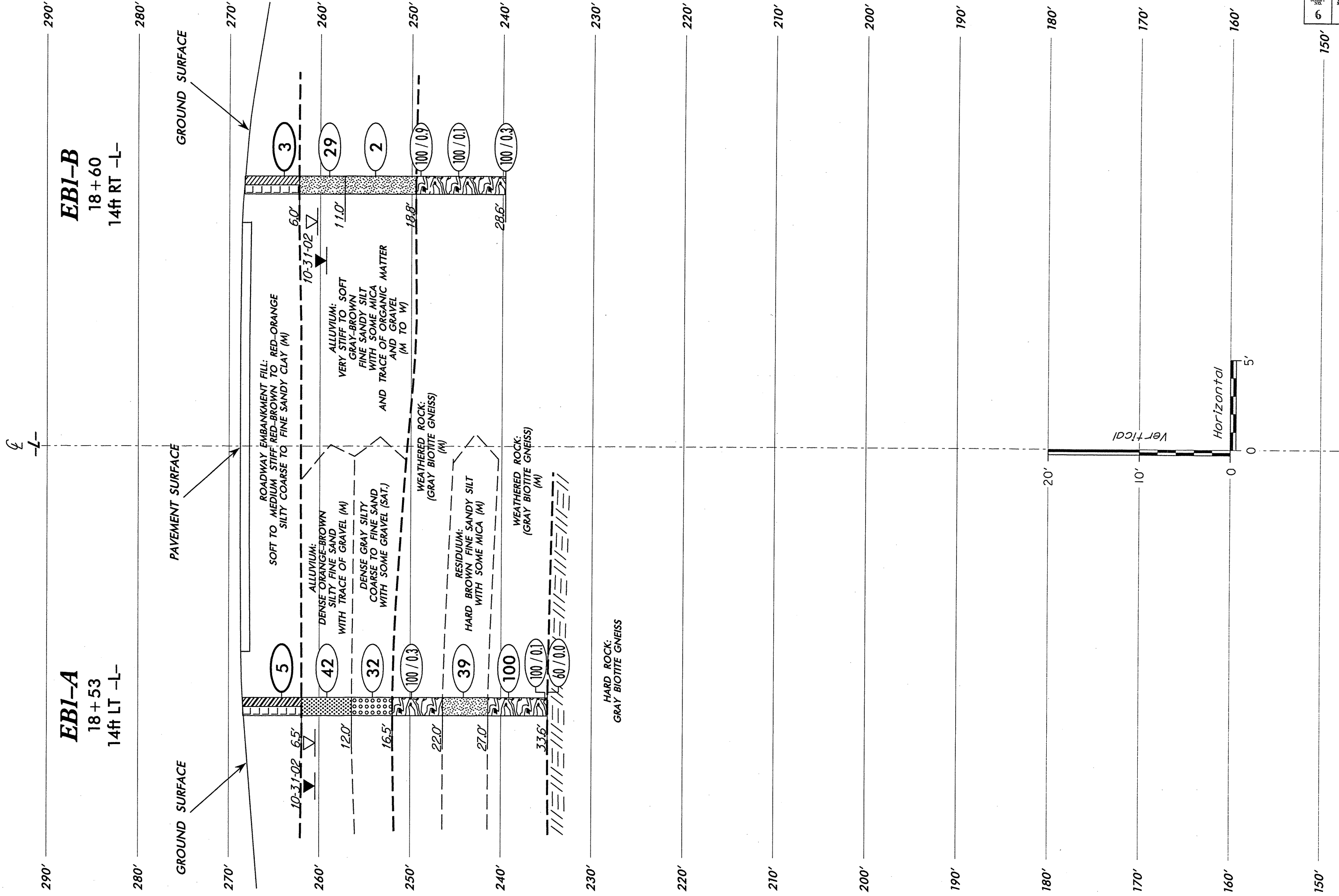
SCALE: (V) 1" = 10'
(H) 1" = 10'

S&M E
 ENVIRONMENTAL SERVICES
 ENGINEERING TESTING

GENERALIZED SUBSURFACE PROFILE
 14' RIGHT -L-
 REPLACEMENT OF BRIDGE NO. 67
 OVER REEDY CREEK ON SR 1507
 STATE PROJECT NO. 8.24.10801 FEDERAL I.D. BRZ 1507 (1)
 TIP No. B-3707 WARREN COUNTY, NORTH CAROLINA

S:\GEO\TECH\2C\BRIDGES\B-3707 REEDY CREEK\CADD\XSECTIONS_PROFILE.DGN

GENERALIZED SUBSURFACE CROSS-SECTION THROUGH END BENT No.1



GENERALIZED SUBSURFACE CROSS SECTION

THROUGH END BENT NO. 1
 REPLACEMENT OF BRIDGE NO. 67
 OVER REEDY CREEK ON SR 1507
 TIP NO. B-3707 STATE PROJECT NO. 8.2410801 FEDERAL I.D. BRZ-1507 (1)
 WARREN COUNTY, NORTH CAROLINA



SCALE: (V) 1" = 10'
 (H) 1" = 5'

DATE: DECEMBER 2002

JOB NO. 1051-02-147

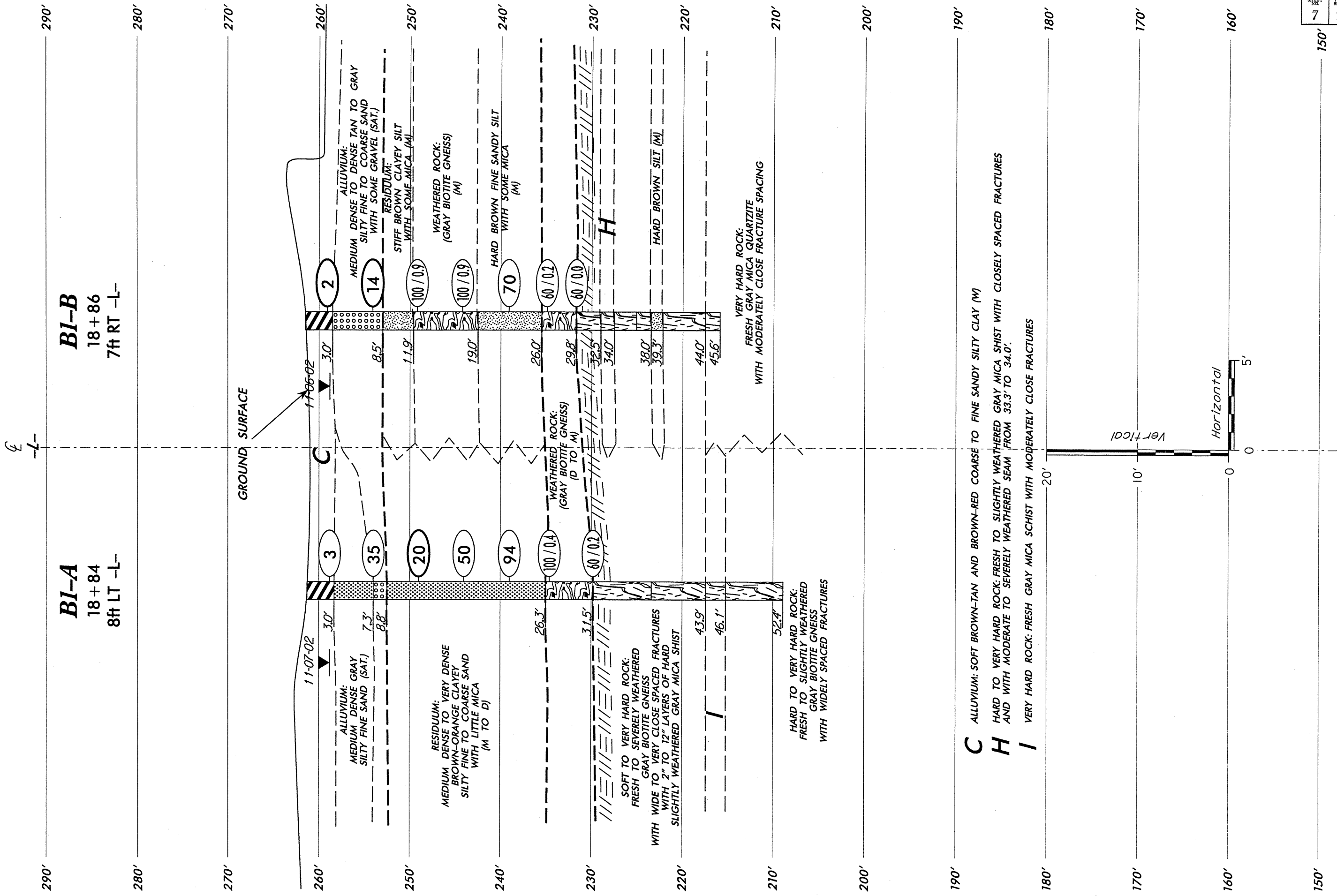
APPROVED BY: AFR

DRAWN BY: TRP

FIGURE 4A

SHEET NO.	TOTAL SHEETS
6	23

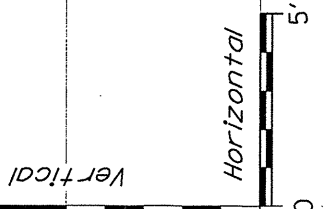
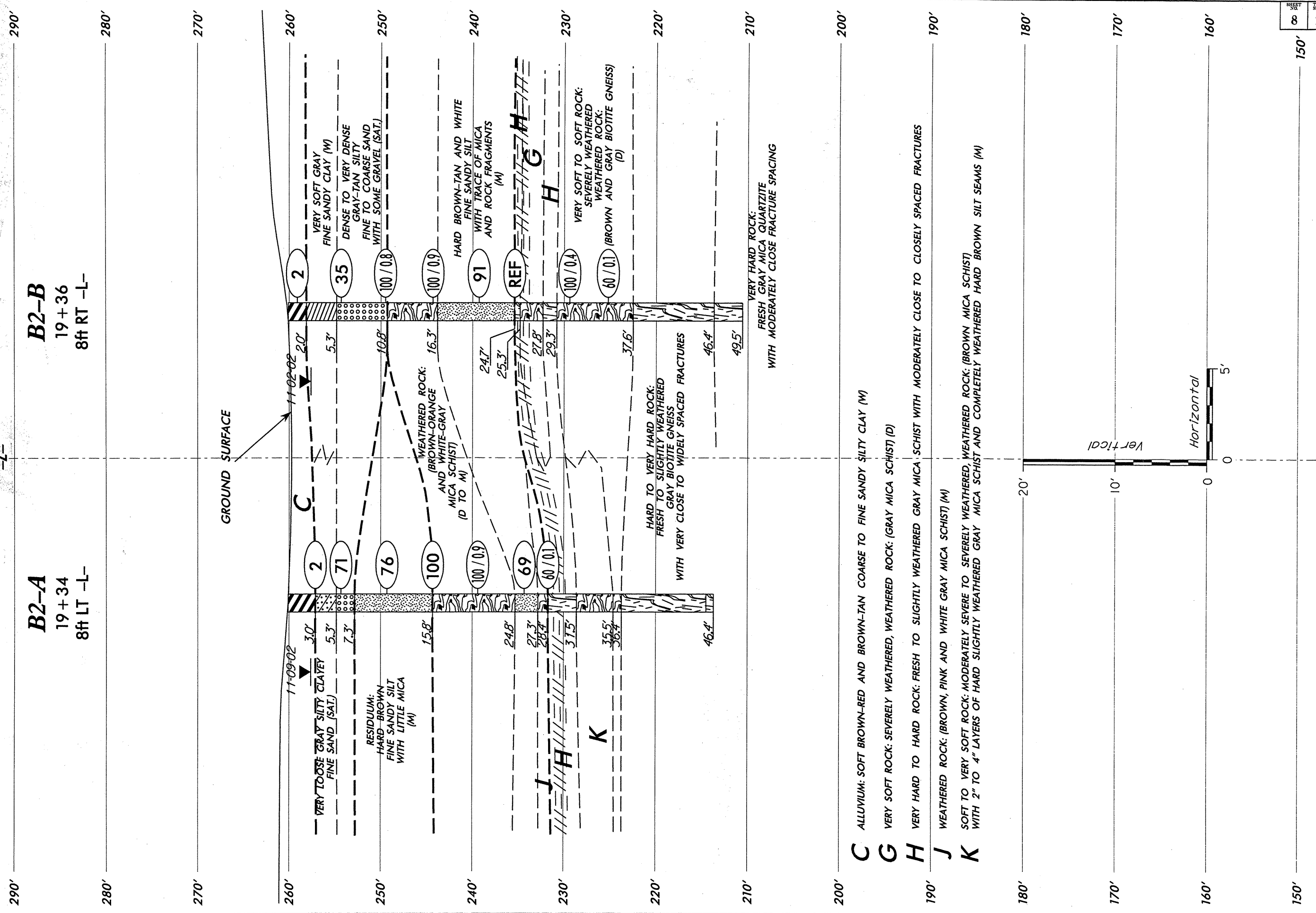
GENERALIZED SUBSURFACE CROSS-SECTION THROUGH INTERIOR BENT No.1



SHEET NO. 7 TOTAL SHEETS 23

GENERALIZED SUBSURFACE CROSS SECTION		SCALE: (V) 1" = 10' (H) 1" = 5'	APPROVED BY: AFR
THROUGH INTERIOR BENT NO. 1		DATE: DECEMBER 2002	DRAWN BY: TRP
REPLACEMENT OF BRIDGE No. 67		JOB NO. 105 1-02-147	FIGURE 4B
OVER REEDY CREEK ON SR 1507			
STATE PROJECT No. 8.24 10801 FEDERAL I.D. BRZ-1507 (1)			
WARREN COUNTY, NORTH CAROLINA			

GENERALIZED SUBSURFACE CROSS-SECTION THROUGH INTERIOR BENT NO. 2



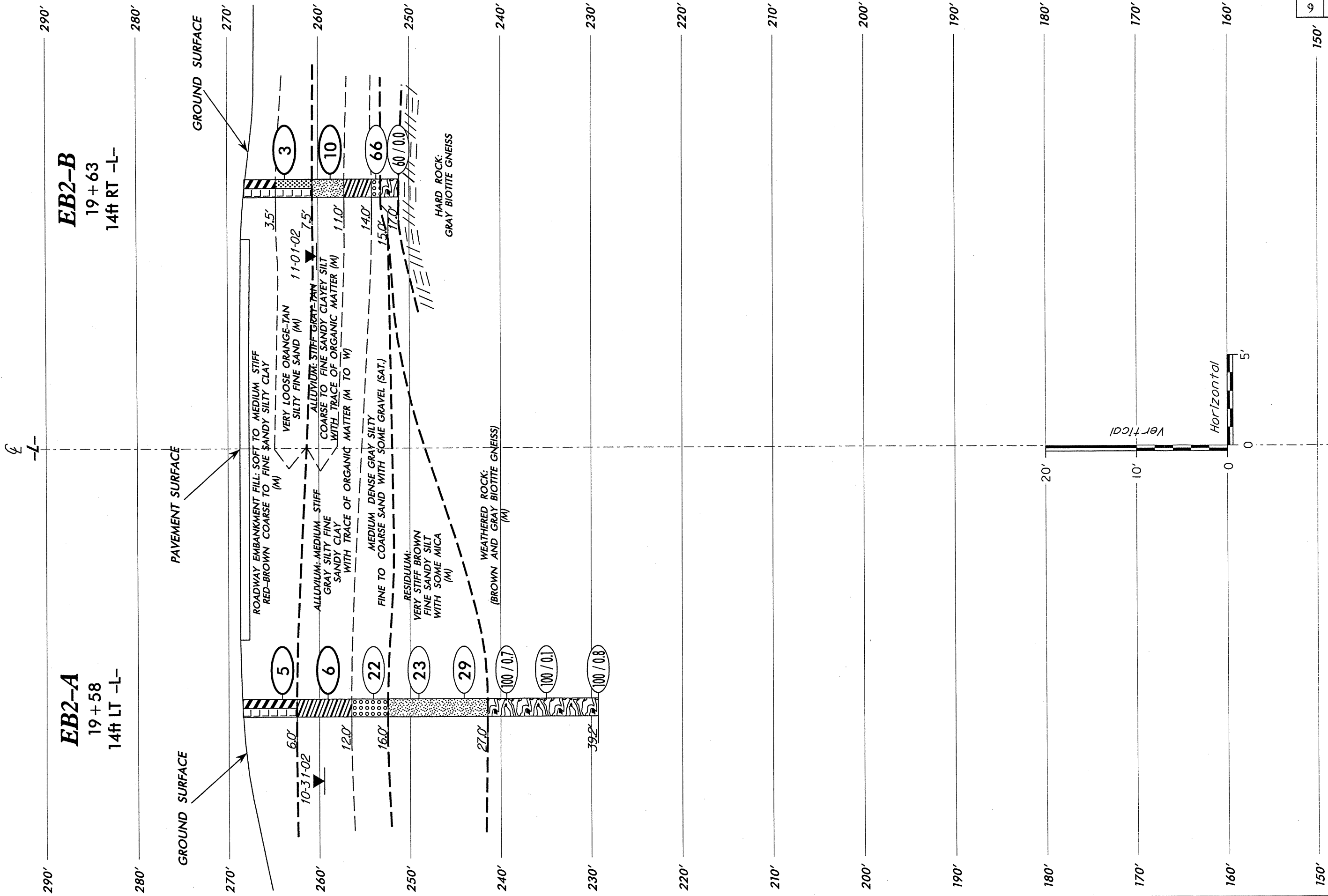
GENERALIZED SUBSURFACE CROSS SECTION

THROUGH INTERIOR BENT NO. 2
 REPLACEMENT OF BRIDGE NO. 67
 OVER REEDY CREEK ON SR 1507
 TIP NO. B-3707 STATE PROJECT NO. 8.2410801 FEDERAL I.D. BRZ-1507 (1)
 WARREN COUNTY, NORTH CAROLINA



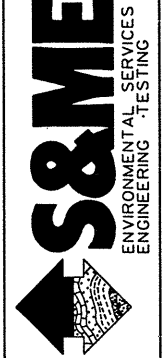
SCALE: (V) 1" = 10' (H) 1" = 5'	APPROVED BY: AFR
DATE: DECEMBER 2002	DRAWN BY: TRP
JOB NO. 1051-02-147	FIGURE 4C

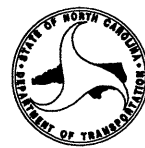
GENERALIZED SUBSURFACE CROSS-SECTION THROUGH END BENT No.2



SHEET NO.	9
TOTAL SHEETS	23

GENERALIZED SUBSURFACE CROSS SECTION		SCALE: (V) 1" = 10' (H) 1" = 5'	APPROVED BY: AFR
THROUGH END BENT NO. 2		DATE: DECEMBER 2002	DRAWN BY: TRP
REPLACEMENT OF BRIDGE No. 67		JOB NO. 105 I-02-147	FIGURE 4D
OVER REEDY CREEK ON SR 1507			
TIP No. B-3707 STATE PROJECT No. 8.2410801 FEDERAL I.D. BRZ-1507 (1)			
WARREN COUNTY, NORTH CAROLINA			





PROJECT NO. 8.2410801		ID. B-3707		COUNTY Warren		GEOLOGIST A.NASH/S.JOHNSON							
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 67 ON S.R. 1507 OVER REEDY CREEK						GROUND WATER (ft)							
BORING NO. EB1-A		BORING LOCATION 18+53		OFFSET 14 ft LT		ALIGNMENT -L-							
COLLAR ELEV. 268.4 ft		NORTHING 949,628.6		EASTING 2,275,786.1		0 HR. 8.0							
TOTAL DEPTH 33.6 ft		DRILL MACHINE CME-750		DRILL METHOD 3/4" HSA		HAMMER TYPE MANUAL							
DATE STARTED 10/30/02		COMPLETED 10/30/02		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
268.4													GROUND SURFACE
265.1	3.3										SS-1	18.5%	ROADWAY EMBANKMENT FILL: MEDIUM STIFF RED-BROWN SILTY FINE TO COARSE SANDY CLAY (A-6)
260.1	8.3	2	2	3							M		ALLUVIUM: DENSE ORANGE-BROWN SILTY FINE SAND (A-2-4) WITH TRACE OF GRAVEL
255.1	13.3	7	16	26							Sat.		DENSE GRAY SILTY FINE TO COARSE SAND (A-1-b) WITH SOME GRAVEL
250.1	18.3	7	17	15							M		WEATHERED ROCK: (GRAY BIOTITE GNEISS)
245.1	23.3	100/0.3									M		RESIDUUM: HARD BROWN FINE SANDY SILT (A-4) WITH SOME MICA
240.1	28.3	12	13	26							M		WEATHERED ROCK: (GRAY BIOTITE GNEISS)
235.1	33.3	32	39	61							M		1) ADVANCED 3-1/4" HSA TO 33.6 FEET.
234.8	33.6	100/0.1									M		BORING TERMINATED WITH STANDARD PENETRATION TEST REFUSAL AT ELEV. 234.8 FEET ON HARD ROCK: GRAY BIOTITE GNEISS.

NCDOT BORE SINGLE 51-147.GPJ NCDOT.GDT 12/30/02



PROJECT NO. 8.2410801		ID. B-3707		COUNTY Warren		GEOLOGIST A.NASH/S.JOHNSON							
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 67 ON S.R. 1507 OVER REEDY CREEK						GROUND WATER (ft)							
BORING NO. EB1-B		BORING LOCATION 18+60		OFFSET 14 ft RT		ALIGNMENT -L-							
COLLAR ELEV. 268.3 ft		NORTHING 949,616.0		EASTING 2,275,812.1		0 HR. 8.0							
TOTAL DEPTH 28.6 ft		DRILL MACHINE CME-750		DRILL METHOD 3/4" HSA		HAMMER TYPE MANUAL							
DATE STARTED 10/30/02		COMPLETED 10/30/02		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
268.3													GROUND SURFACE
265.0	3.3										SS-1	19.0%	ROADWAY EMBANKMENT FILL: SOFT RED-ORANGE COARSE TO FINE SANDY SILTY CLAY (A-6)
260.0	8.3	2	1	2							M		ALLUVIUM: VERY STIFF GRAY-BROWN FINE SANDY SILT (A-4) WITH SOME MICA
255.0	13.3	10	12	17							W		SOFT GRAY FINE SANDY SILT (A-4) WITH TRACE OF ORGANIC MATTER AND GRAVEL
250.0	18.3	7	1	1							M		WEATHERED ROCK: (BROWN AND GRAY BIOTITE GNEISS)
245.0	23.3	8	55	45/0.4							M		1) ADVANCED 3-1/4" HSA TO 28.3 FEET.
240.0	28.3	100/0.3									M		BORING TERMINATED AT ELEV. 239.7 FEET IN WEATHERED ROCK: BROWN AND GRAY BIOTITE GNEISS.

NCDOT BORE SINGLE 51-147.GPJ NCDOT.GDT 12/11/02

PROJECT NO. 8.2410801		ID. B-3707		COUNTY Warren		GEOLOGIST A.NASH/S.JOHNSON							
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 67 ON S.R. 1507 OVER REEDY CREEK						GROUND WATER (ft)							
BORING NO. B1-A		BORING LOCATION 18+84		OFFSET 8 ft LT		ALIGNMENT -L-							
COLLAR ELEV. 261.3 ft		NORTHING 949,648.6		EASTING 2,275,810.6		0 HR. N/A							
TOTAL DEPTH 52.4 ft		DRILL MACHINE CME-750		DRILL METHOD 3/4" HSA/ROTARY WASH W/2-7/8" TRICONE ROLLER&NWD4 CORE BARREL		HAMMER TYPE MANUAL							
DATE STARTED 11/5/02		COMPLETED 11/6/02		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
261.3													GROUND SURFACE
260.0	1.3	1	2	1									ALLUVIUM: SOFT BROWN-TAN COARSE TO FINE SANDY SILTY CLAY (A-7-5)
255.0	6.3												MEDIUM DENSE GRAY SILTY FINE SAND (A-2-4)
250.0	11.3	8	9	26									DENSE TAN SILTY FINE TO COARSE SAND (A-1-b) WITH SOME GRAVEL
245.0	16.3	15	9	11									RESIDUUM: MEDIUM DENSE TO VERY DENSE BROWN-ORANGE CLAYEY SILTY FINE TO COARSE SAND (A-2-4) WITH LITTLE MICA
240.0	21.3	16	24	26									
235.0	26.3	39	44	50									WEATHERED ROCK: (GRAY BIOTITE GNEISS)
230.0	31.3												MODERATELY HARD TO SOFT ROCK: MODERATE TO MODERATELY SEVERE WEATHERED GRAY BIOTITE GNEISS WITH MODERATELY CLOSE TO CLOSELY SPACED FRACTURES AND WITH 2 TO 12 INCH LAYERS OF HARD SLIGHTLY WEATHERED GRAY MICA SCHIST
													HARD TO VERY HARD ROCK: FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH WIDELY SPACED FRACTURES
													VERY HARD ROCK: FRESH GRAY MICA SCHIST WITH MODERATELY CLOSE FRACTURES
													HARD TO VERY HARD ROCK: FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH WIDELY SPACED FRACTURES
													CORING TERMINATED AT ELEV. 208.9 FEET IN HARD ROCK: GRAY BIOTITE GNEISS.

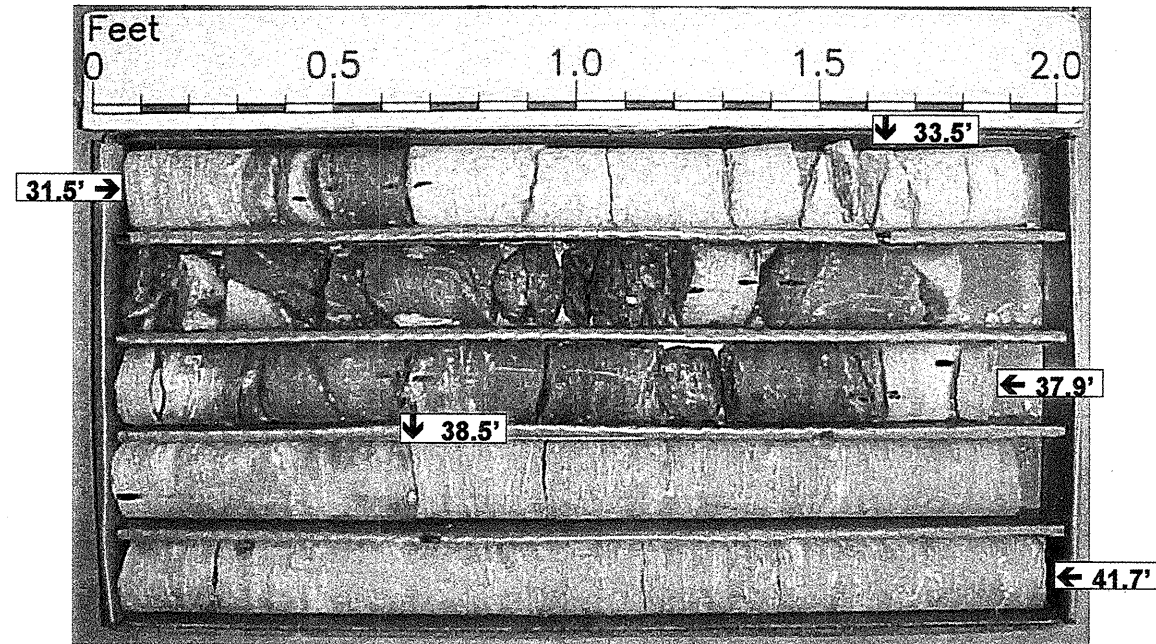
NCDOT BORE SINGLE 51-147.GPJ NCDOT.GDT 12/31/02

PROJECT NO. 8.2410801		ID. B-3707		COUNTY Warren		GEOLOGIST A.NASH/S.JOHNSON				
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 67 ON S.R. 1507 OVER REEDY CREEK						GROUND WATER (ft)				
BORING NO. B1-A		BORING LOCATION 18+84		OFFSET 8 ft LT		ALIGNMENT -L-				
COLLAR ELEV. 261.3 ft		NORTHING 949,648.6		EASTING 2,275,810.6		0 HR. N/A				
TOTAL DEPTH 52.4 ft		DRILL MACHINE CME-750		DRILL METHOD 3/4" HSA/ROTARY WASH W/2-7/8" TRICONE ROLLER&NWD4 CORE BARREL		HAMMER TYPE MANUAL				
DATE STARTED 11/5/02		COMPLETED 11/6/02		SURFACE WATER DEPTH N/A						
CORE SIZE NWD4		TOTAL RUN 20.9 ft		DRILLER E. MOSELEY						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS
				REC. (%)	RQD (%)		REC. (%)	RQD (%)		
										Begin Coring @ 31.5 ft
229.8	31.5	2.0	10:00	(1.6)	(1.4)					MODERATELY HARD TO SOFT ROCK: MODERATE TO MODERATELY SEVERE WEATHERED GRAY BIOTITE GNEISS WITH MODERATELY CLOSE TO CLOSELY SPACED FRACTURES AND WITH 2 TO 12 INCH LAYERS OF HARD SLIGHTLY WEATHERED GRAY MICA SCHIST
227.8	33.5	5.0	10:00	80%	70%					
			5:00	(4.5)	(1.4)					
			4:00	90%	28%					
			3:45							
			2:00							
222.8	38.5	3.9	2:00	(3.9)	(3.9)		(11.5)	(8.2)		7 JOINTS @ 10 TO 20 DEGREES
			2:45	100%	100%					HARD TO VERY HARD ROCK:
			3:15							FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH WIDELY SPACED FRACTURES
			2:30							
218.9	42.4	5.0	2:30/0.9	(4.9)	(4.9)	RS-1				
			2:45	98%	98%					
			3:00				(2.2)	(2.2)		VERY HARD ROCK:
			3:00				100%	100%		FRESH GRAY MICA SCHIST WITH MODERATELY CLOSE FRACTURES
213.9	47.4	5.0	3:30	(6.2)	(6.2)					1 JOINT @ 20 DEGREES
			3:30							HARD TO VERY HARD ROCK:
			2:30	(5.0)	(5.0)					FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH WIDELY SPACED FRACTURES
			4:30	100%	100%					1 JOINT @ 15 DEGREES
			4:30							
			3:30							
208.9	52.4		3:30							CORING TERMINATED AT ELEV. 208.9 FEET IN HARD ROCK: GRAY BIOTITE GNEISS.

NCDOT CORE SINGLE 51-147.GPJ NCDOT.GDT 12/30/02

CORE PHOTOS

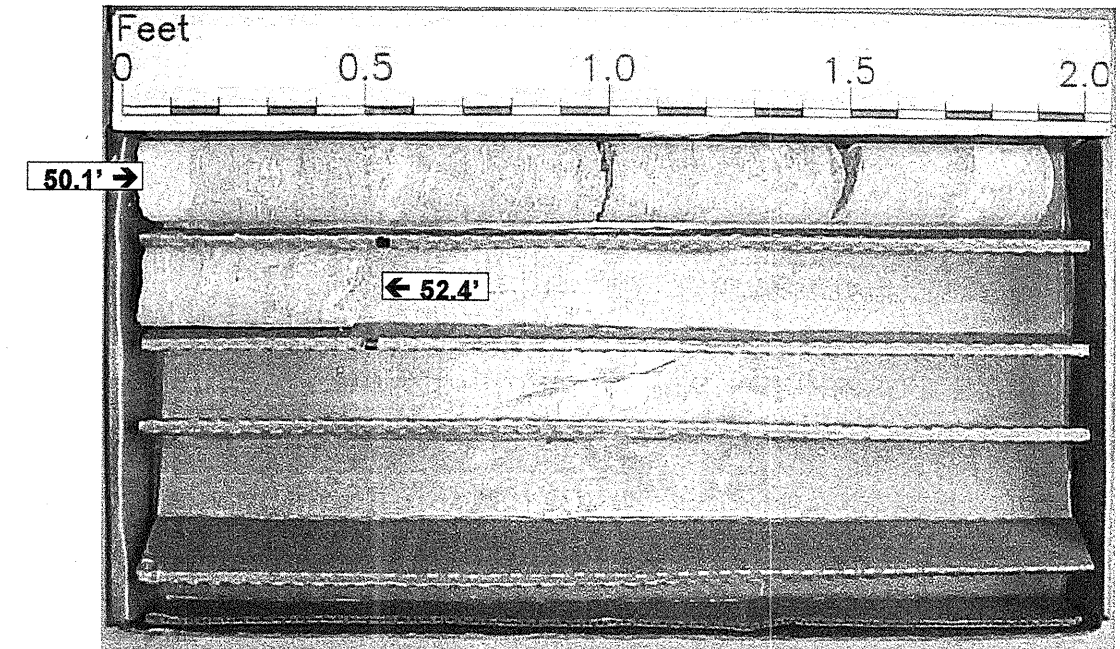
Project No: 8.2410801	I.D. No.: B-3707	County: Warren	Boring No.: B1-A
Site Description: Replacement of Bridge No. 67 Over Reedy Creek on SR 1507		Driller: E. Moseley	
Collar Elev.: 261.3 ft.	Core Size: NWD4	Equipment: CME-750	Geologist: S. Johnson
Elev. at T.D.: 208.9 ft.	Total Depth: 52.4 ft.	Total Run: 20.9 ft.	Date: 11/6/2002



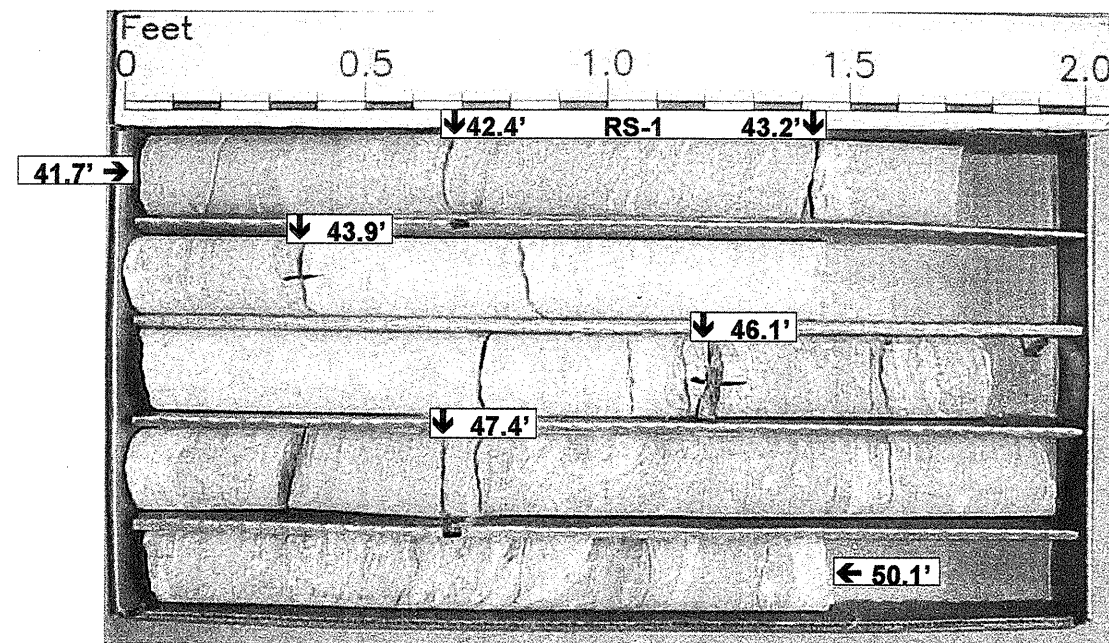
Box 1 of 3
Top of Box @ 31.5 feet; Bottom of Box @ 41.7 feet

CORE PHOTOS

Project No: 8.2410801	I.D. No.: B-3707	County: Warren	Boring No.: B1-A
Site Description: Replacement of Bridge No. 67 Over Reedy Creek on SR 1507		Driller: E. Moseley	
Collar Elev.: 261.3 ft.	Core Size: NWD4	Equipment: CME-750	Geologist: S. Johnson
Elev. at T.D.: 208.9 ft.	Total Depth: 52.4 ft.	Total Run: 20.9 ft.	Date: 11/6/2002



Box 3 of 3
Top of Box @ 50.1 feet; Bottom of Box @ 52.4 feet



Box 2 of 3
Top of Box @ 41.7 feet; Bottom of Box @ 50.1 feet



PROJECT NO. 8.2410801		ID. B-3707		COUNTY Warren		GEOLOGIST A.NASH/S.JOHNSON						
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 67 ON S.R. 1507 OVER REEDY CREEK							GROUND WATER (ft)					
BORING NO. B1-B		BORING LOCATION 18+86		OFFSET 7 ft RT		ALIGNMENT -L-	0 HR. N/A					
COLLAR ELEV. 261.5 ft		NORTHING 949,640.5		EASTING 2,275,823.4			24 HR. 2.7 on 11-06-02					
TOTAL DEPTH 45.6 ft		DRILL MACHINE CME-750		DRILL METHOD 3 1/2" HSA/ROTARY WASH WITH NQ-2 CORE BARREL		HAMMER TYPE MANUAL						
DATE STARTED 11/4/02		COMPLETED 11/5/02		SURFACE WATER DEPTH N/A								
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
		0.5ft	0.5ft	0.5ft	0	20	40	60	80			
261.5					GROUND SURFACE							261.5 0.0
260.1	1.4	1	1	1	28.7%					SS-1		258.5 3.0
255.1	6.4	3	5	9	14					SS-2	Sat.	253.0 8.5
250.1	11.4	4	96/0.4		100/0.9					M		249.6 11.9
245.1	16.4	20	80/0.4		100/0.9					M		242.5 19.0
240.1	21.4	24	34	36	70					M		235.5 26.0
235.1	26.4	60/0.2			60/0.2					M		231.7 29.8
231.7	29.8	60/0.0			60/0.0					M		229.0 32.5
										M		227.5 34.0
										M		225.1 36.4
										M		223.5 38.0
										M		222.2 39.3
										RS-2		217.5 44.0
												215.9 45.6
CORING TERMINATED AT ELEV. 215.9 FEET IN HARD ROCK: GRAY MICA QUARTZITE.												
<p>HARD TO VERY HARD ROCK: FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH MODERATELY CLOSE TO WIDELY SPACED FRACTURES</p> <p>HARD TO MODERATELY HARD ROCK: SLIGHT TO VERY SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH CLOSELY TO VERY CLOSELY SPACED FRACTURES</p> <p>COMPLETELY WEATHERED HARD BROWN SILT</p> <p>HARD TO VERY HARD ROCK: FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH MODERATELY CLOSE TO WIDELY SPACED FRACTURES</p> <p>VERY HARD ROCK: FRESH GRAY MICA QUARTZITE WITH MODERATELY CLOSE FRACTURE SPACING</p>												

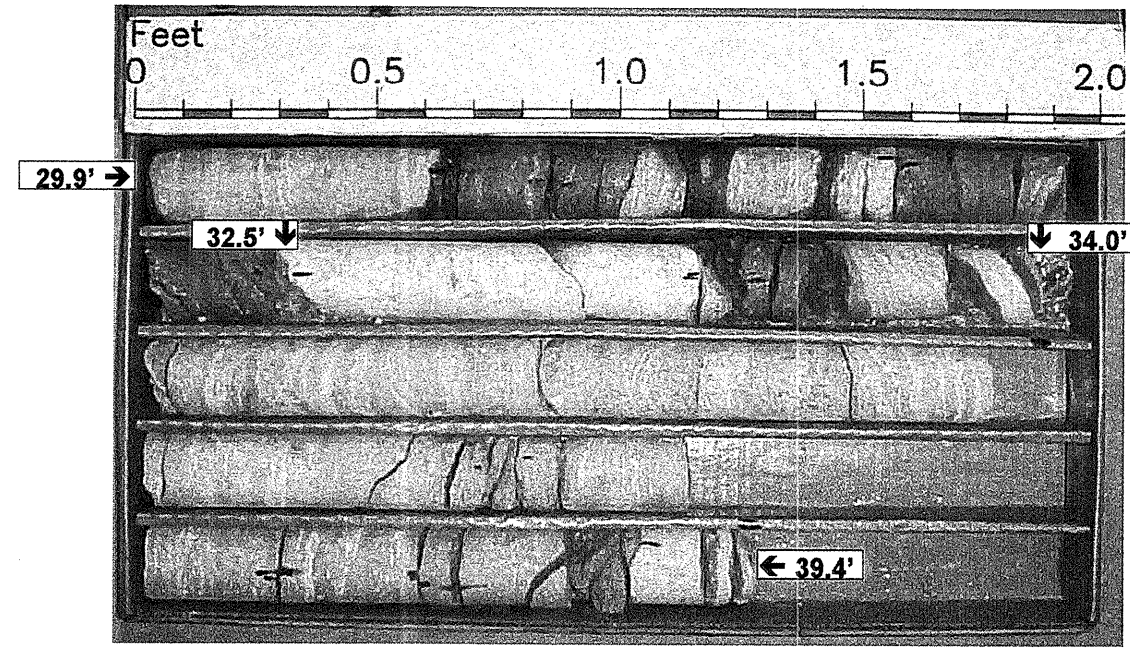
NCDOT BORE SINGLE 51-147.GPJ NCDOT.GDT 12/30/02

- 1) ADVANCED 3-1/4" HSA TO 29.8 FEET.
- 2) SET 29.6 FEET OF NW CASING (TEMP 6.9 FEET).
- 3) ADVANCED 2-7/8" TRICONE ROLLET TO 29.9 FEET.
- 4) ADVANCED NQ-2 CORE BARREL FROM 29.9 FEET TO 45.6 FEET.
- 5) CREEK WATER USED AS DRILLING FLUID WITH POLYMER ADDED.
- 6) DRILLING FLUID DENSITY APPROXIMATELY 62.4 PCF.
- 7) NO DRILLING FLUID LOSS OBSERVED.

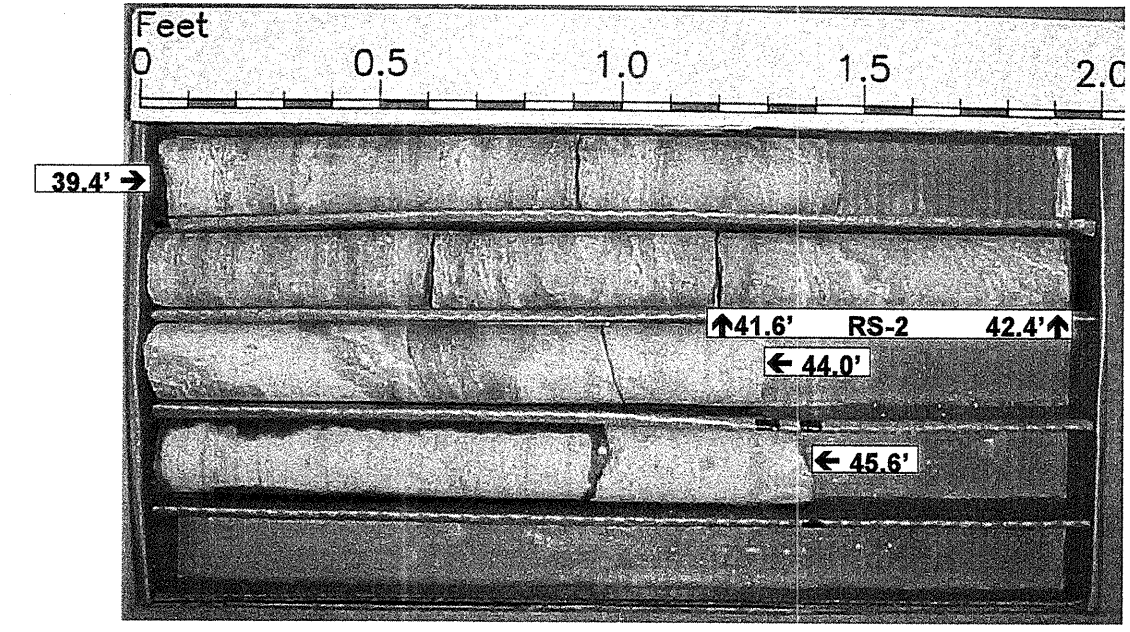
PROJECT NO. 8.2410801		ID. B-3707		COUNTY Warren		GEOLOGIST A.NASH/S.JOHNSON			
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 67 ON S.R. 1507 OVER REEDY CREEK						GROUND WATER (ft)			
BORING NO. B1-B		BORING LOCATION 18+86		OFFSET 7 ft RT		ALIGNMENT -L-			
COLLAR ELEV. 261.5 ft		NORTHING 949,640.5		EASTING 2,275,823.4		0 HR. N/A			
TOTAL DEPTH 45.6 ft		DRILL MACHINE CME-750		DRILL METHOD 3/4" HSA/ROTARY WASH WITH NQ-2 CORE BARREL		HAMMER TYPE MANUAL			
DATE STARTED 11/4/02		COMPLETED 11/5/02		SURFACE WATER DEPTH N/A					
CORE SIZE NQ-2		TOTAL RUN 15.7 ft		DRILLER E. MOSELEY					
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN (ft) REC. (%) ROD (%)		STRATA REC. (%) ROD (%)		L O G	DESCRIPTION AND REMARKS
									231.6 Begin Coring @ 29.9 ft 29.9
231.6	29.9	4.1	4:15 4:00 3:30	(3.7) 90%	(2.0) 49%	(2.2) 81%	(1.1) 41%		229.0 HARD ROCK: FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH CLOSELY SPACED FRACTURES AND WITH 4 TO 8 INCH LAYERS OF MODERATELY SEVERE TO SEVERELY WEATHERED GRAY BIOTITE GNEISS
227.5	34.0		4:00/1.1			(1.5) 100%	(0.9) 60%		225.1 3 JOINTS @ 10 DEGREES 1 JOINT @ 30 DEGREES
		5.0	2:15 2:15 3:15 2:45 1:45	(4.0) 80%	(3.2) 64%	(2.4) 100%	(2.4) 100%		225.1 HARD ROCK: FRESH GRAY MICA SCHIST WITH CLOSELY SPACED FRACTURES AND WITH MODERATE TO SEVERELY WEATHERED SEAM FROM 33.3 TO 34.0 FEET
222.5	39.0					(1.6) 100%	(0.8) 50%		
		5.0	2:15 3:30 3:00 3:15 3:45	(4.7) 94%	(4.7) 94%	(0.0) 100%	(4.7) 100%		217.5 HARD TO VERY HARD ROCK: FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH MODERATELY CLOSE TO WIDELY SPACED FRACTURES
217.5	44.0					(1.4) 88%	(1.4) 88%		215.9 6 JOINTS @ 10 DEGREES 1 JOINT @ 20 DEGREES
215.9	45.6	1.6	7:00 4:00/0.6	(1.4) 88%	(1.4) 88%	(1.4) 88%	(1.4) 88%		215.9 HARD TO MODERATELY HARD ROCK: SLIGHT TO VERY SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH CLOSELY TO VERY CLOSELY SPACED FRACTURES COMPLETELY WEATHERED HARD BROWN SILT HARD TO VERY HARD ROCK: FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH MODERATELY CLOSE TO WIDELY SPACED FRACTURES VERY HARD ROCK: FRESH GRAY MICA QUARTZITE WITH MODERATELY CLOSE FRACTURE SPACING CORING TERMINATED AT ELEV. 215.9 FEET IN HARD ROCK: GRAY MICA QUARTZITE.

CORE PHOTOS

Project No: 8.2410801	I.D. No.: B-3707	County: Warren	Boring No.: B1-B
Site Description: Replacement of Bridge No. 67 Over Reedy Creek on SR 1507			Driller: E. Moseley
Collar Elev.: 261.5 ft.	Core Size: NQ-2	Equipment: CME-750	Geologist: S. Johnson
Elev. at T.D.: 215.9 ft.	Total Depth: 45.6 ft.	Total Run: 15.7 ft.	Date: 11/5/2002



Box 1 of 2
Top of Box @ 29.9 feet; Bottom of Box @ 39.4 feet



Box 2 of 2
Top of Box @ 39.4 feet; Bottom of Box @ 45.6 feet

NCDOT CORE SINCE 51-147.GPJ NCDOT.GDT 12/30/02



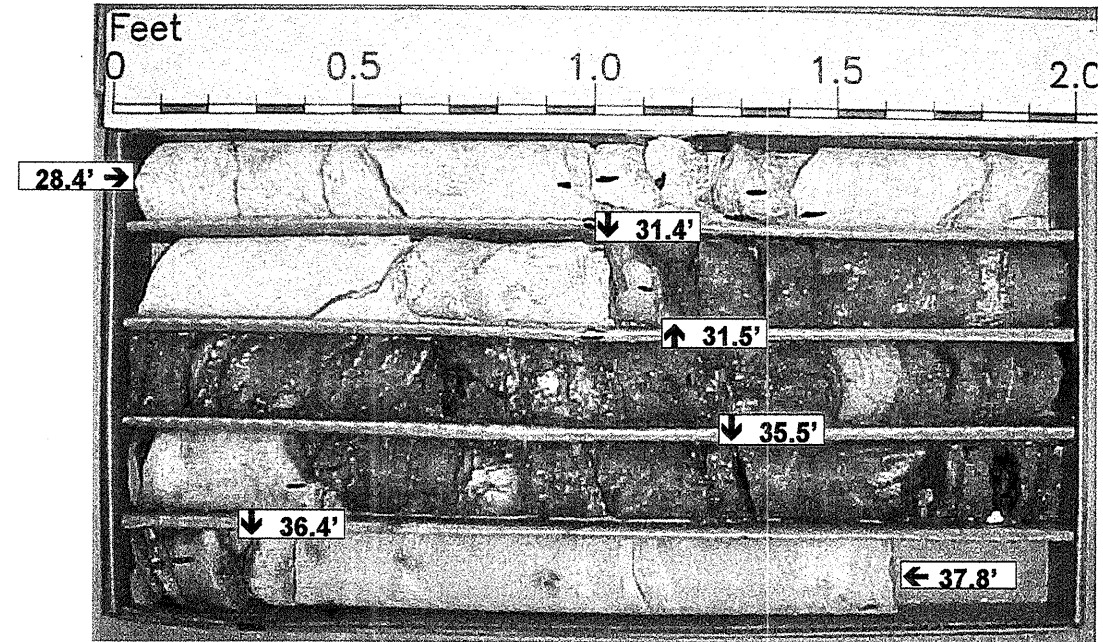
PROJECT NO. 8.2410801		ID. B-3707		COUNTY Warren		GEOLOGIST A.NASH/A.RIGGS								
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 67 ON S.R. 1507 OVER REEDY CREEK							GROUND WATER (ft)							
BORING NO. B2-A		BORING LOCATION 19+34		OFFSET 8 ft LT	ALIGNMENT -L-		0 HR. N/A							
COLLAR ELEV. 260.1 ft		NORTHING 949,686.9		EASTING 2,275,842.7		24 HR. 2.5 on 11-09-02								
TOTAL DEPTH 46.4 ft		DRILL MACHINE CME-750	DRILL METHOD 3/4" HSA/ROTARY WASH W/2-7/8" TRICONE ROLLER & NWD4 CORE BARREL		HAMMER TYPE		MANUAL							
DATE STARTED 11/7/02		COMPLETED 11/8/02		SURFACE WATER DEPTH N/A										
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100	
260.1					GROUND SURFACE							260.1	0.0	
258.1	2.0											W	ALLUVIUM: SOFT GRAY AND BROWN FINE SANDY SILTY CLAY (A-7-5)	3.0
255.3	4.8	2	1	1								W	VERY LOOSE GRAY SILTY CLAYEY FINE SAND (A-2-6)	5.3
250.3	9.8	3	28	43								Sat	VERY DENSE GRAY FINE TO COARSE SAND (A-1-b) WITH SOME GRAVEL	7.3
245.3	14.8	5	14	62								M	RESIDUUM: HARD BROWN FINE SANDY SILT (A-4) WITH LITTLE MICA	15.8
240.3	19.8	43	57									M	WEATHERED ROCK: (BROWN-ORANGE AND WHITE GRAY MICA SCHIST)	
235.3	24.8	34	66/0.4									M	HARD BROWN-TAN AND WHITE FINE SANDY SILT (A-4)	24.8
231.8	28.3	16	34	35								M	WITH TRACE OF MICA AND ROCK FRAGMENTS	27.3
		60/0.1										M	WEATHERED ROCK: (BROWN, PINK AND WHITE GRAY MICA SCHIST)	28.4
												M	VERY HARD TO HARD ROCK: FRESH TO SLIGHTLY WEATHERED GRAY MICA SCHIST WITH MODERATELY CLOSE TO CLOSELY SPACED FRACTURES	31.5
												M	SOFT TO VERY SOFT ROCK: SEVERE TO VERY SEVERELY WEATHERED WEATHERED ROCK: (BROWN MICA SCHIST) WITH 2 TO 4 INCH LAYERS OF HARD SLIGHTLY WEATHERED GRAY METAMORPHOSED MICA GRANITE COMPLETELY WEATHERED HARD BROWN SILT SEAM FROM 31.5 TO 32.0 FEET.	35.5
												M	SOFT ROCK: SEVERELY WEATHERED WEATHERED ROCK: (GRAY BIOTITE GNEISS)	36.4
												M	HARD TO VERY HARD ROCK: FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH WIDELY SPACED FRACTURES	45.6
												M	FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH CLOSE TO VERY CLOSELY SPACED FRACTURES	46.4
												M	CORING TERMINATED AT ELEV. 213.7 FEET IN HARD ROCK: GRAY BIOTITE GNEISS.	

NCDOT BORE SINGLE 51-147.GPJ NCDOT.GDT 12/30/02

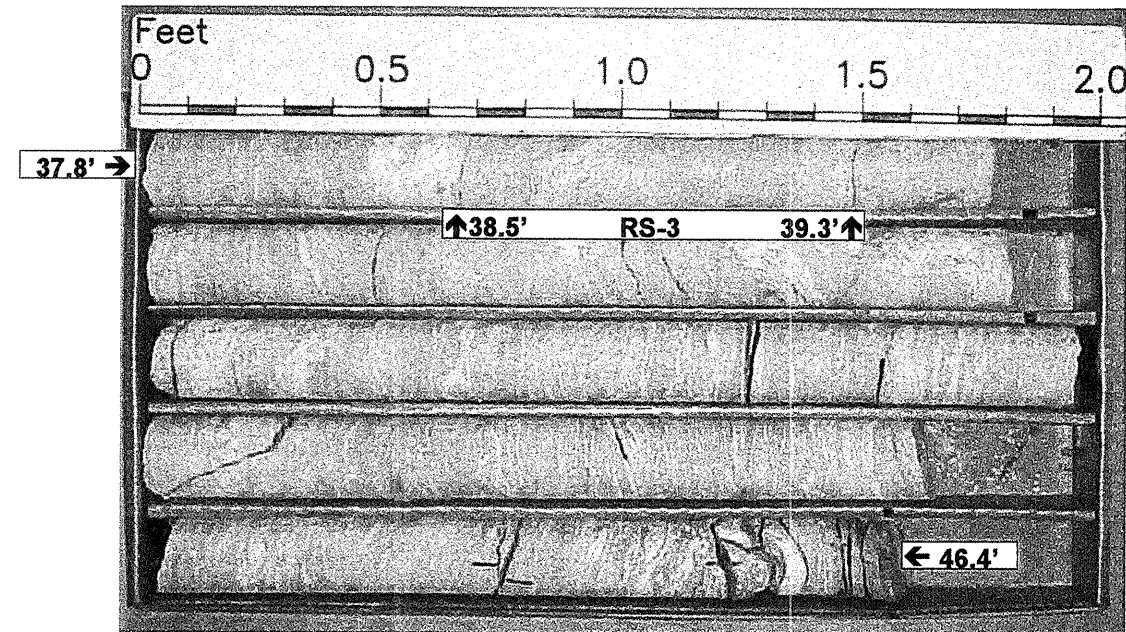
- 1) PUSHED SHELBY TUBE 0 TO 2 FEET.
- 2) ADVANCED 3-1/4" HSA TO 28.3 FEET.
- 3) ADVANCED 2-7/8" ROLLER CONE BIT TO 28.4 FEET.
- 4) ADVANCED NWD4 CORE BARREL FROM 28.4 FEET TO 46.4 FEET.
- 5) CREEK WATER USED AS DRILLING FLUID WITH QUICKGEL ADDED.
- 6) DRILLING FLUID DENSITY APPROXIMATELY 62.4 PCF.
- 7) NO DRILLING FLUID LOSS OBSERVED
- 8) ADVANCED NW CASING TO 28.4 FEET.
- 9) TEMPORARY CASING 8.4 FEET.
- 10) DETECTED FUEL LIKE ODOR FROM 36.4 TO 46.4 FEET.
- 11) BACKFILL BORING WITH BENTONITE AT TERMINATION OF BORING.

PROJECT NO. 8.2410801		ID. B-3707		COUNTY Warren		GEOLOGIST A.NASH/A.RIGGS			
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 67 ON S.R. 1507 OVER REEDY CREEK						GROUND WATER (ft)			
BORING NO. B2-A		BORING LOCATION 19+34		OFFSET 8 ft LT		ALIGNMENT -L-			
COLLAR ELEV. 260.1 ft		NORTHING 949,686.9		EASTING 2,275,842.7		0 HR. N/A			
TOTAL DEPTH 46.4 ft		DRILL MACHINE CME-750		DRILL METHOD 3/4" HSA/ROTARY WASH W/2-7/8" TRICONE ROLLER & NWD4 CORE BARREL		24 HR. 2.5 on 11-09-02			
DATE STARTED 11/7/02		COMPLETED 11/8/02		SURFACE WATER DEPTH N/A					
CORE SIZE NWD4		TOTAL RUN 18.0 ft		DRILLER E. MOSELEY					
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN (ft) %		STRATA (ft) %		LOG	DESCRIPTION AND REMARKS
				REC. (%)	ROD (%)	REC. (%)	ROD (%)		
									231.7 Begin Coring @ 28.4 ft 28.4
231.7	28.4	3.0	4:50	(2.7)	(2.4)	(2.8)	(2.5)		VERY HARD TO HARD ROCK:
			3:30	90%	80%	90%	81%		FRESH TO SLIGHTLY WEATHERED GRAY MICA SCHIST WITH
228.7	31.4	5.0	3:05						MODERATELY CLOSE TO CLOSELY SPACED FRACTURES
			3:45	(4.9)	(0.4)	(3.9)			2 JOINTS AT 20 TO 40 DEGREES
			3:00	98%	8%	78%			SOFT TO VERY SOFT ROCK:
			3:00						SEVERE TO VERY SEVERELY WEATHERED WEATHERED ROCK:
223.7	36.4	5.0	2:30			(0.9)	(9.2)		(BROWN MICA SCHIST) WITH 2 TO 4 INCH LAYERS OF HARD SLIGHTLY
			2:00	(5.0)	(5.0)	(9.2)	(9.2)		WEATHERED GRAY MICA SCHIST
			2:30	100%	100%	100%	100%		COMPLETELY WEATHERED HARD BROWN SILT SEAM FROM 31.5 TO
			3:15						32.0 FEET.
			3:15						SOFT ROCK:
218.7	41.4	5.0	3:15						SEVERELY WEATHERED WEATHERED ROCK:
			3:30	(5.0)	(4.7)				(GRAY BIOTITE GNEISS)
			3:30	100%	94%				HARD TO VERY HARD ROCK:
			3:15						FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH WIDELY
			3:30						SPACED FRACTURES
213.7	46.4	5.0	3:00			(0.8)	(0.5)		214.5 45.6
			3:30	100%	63%	100%	63%		213.7 46.4
			3:30						HARD ROCK:
									FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH CLOSE
									TO VERY CLOSELY SPACED FRACTURES
									3 JOINTS AT 15 TO 20 DEGREES
									CORING TERMINATED AT ELEV. 213.7 FEET IN HARD ROCK:
									GRAY BIOTITE GNEISS.

Project No: 8.2410801	I.D. No.: B-3707	County: Warren	Boring No.: B2-A
Site Description: Replacement of Bridge No. 67 Over Reedy Creek on SR 1507			Driller: E. Moseley
Collar Elev.: 260.1 ft.	Core Size: NWD4	Equipment: CME-750	Geologist: S. Johnson
Elev. at T.D.: 213.7 ft.	Total Depth: 46.4 ft.	Total Run: 18.0 ft.	Date: 11/8/2002



Box 1 of 2
Top of Box @ 28.4 feet; Bottom of Box @ 37.8 feet



Box 2 of 2
Top of Box @ 37.8 feet; Bottom of Box @ 46.4 feet



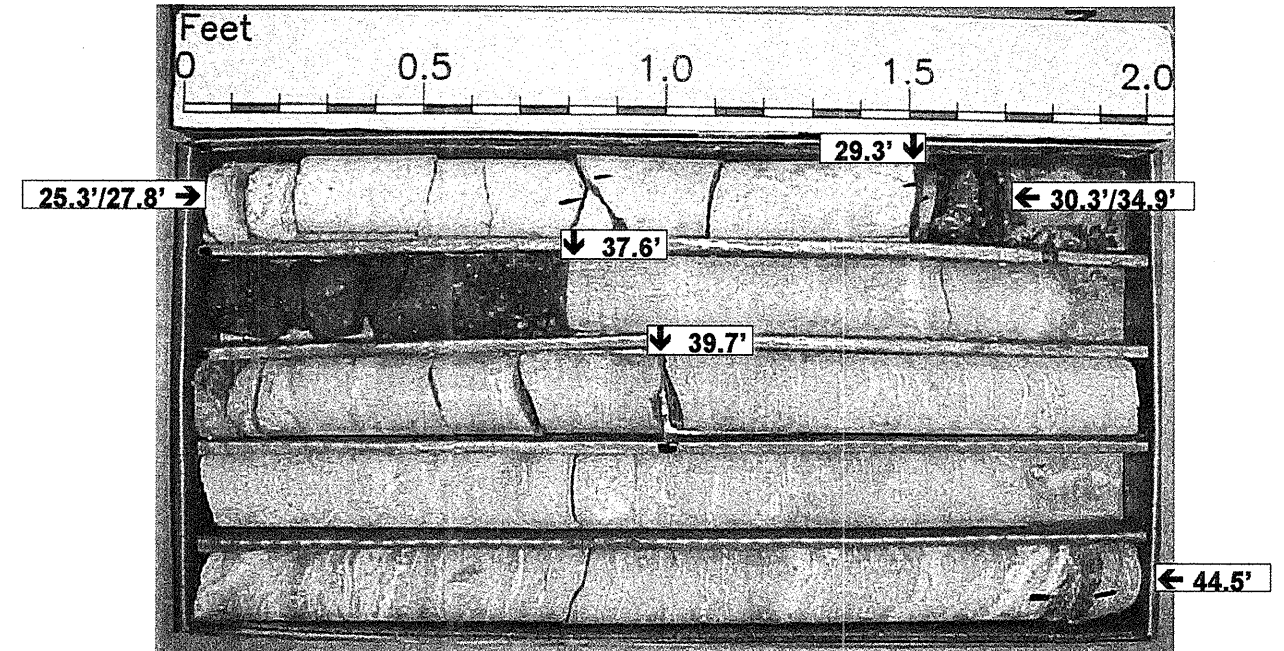
PROJECT NO. 8.2410801		ID. B-3707		COUNTY Warren		GEOLOGIST A.NASH/A.RIGGS								
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 67 ON S.R. 1507 OVER REEDY CREEK							GROUND WATER (ft)							
BORING NO. B2-B		BORING LOCATION 19+36		OFFSET 8 ft RT		ALIGNMENT -L-	0 HR. N/A							
COLLAR ELEV. 260.1 ft		NORTHING 949,678.2		EASTING 2,275,856.2			24 HR. 2.5 on 11-02-02							
TOTAL DEPTH 49.5 ft		DRILL MACHINE CME-750		DRILL METHOD 3 1/2" HSA/ROTARY WASH WITH TRICONE ROLLER & NWD4 CORE BARREL		HAMMER TYPE MANUAL								
DATE STARTED 10/31/02		COMPLETED 11/1/02		SURFACE WATER DEPTH N/A										
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100	
260.1					GROUND SURFACE									
260.1	0.0	1	1	1	02						W	260.1	0.0	ALLUVIUM: SOFT BROWN-TAN FINE SANDY SILTY CLAY (A-7-5)
255.3	4.8	WOH		21	14	35					Sat.	254.8	5.3	SOFT GRAY FINE SANDY CLAY (A-6)
250.3	9.8	4	7	93/0.3					100/0.8		Sat.	249.3	10.8	DENSE GRAY-TAN SILTY FINE TO COARSE SAND (A-1-b) WITH SOME GRAVEL
245.3	14.8	38	54	46/0.4					100/0.8		D	243.8	16.3	WEATHERED ROCK: (GRAY MICA SCHIST)
240.3	19.8	42	35	56					091		M			HARD BROWN TO TAN FINE SANDY SILT (A-4)
235.4	24.7	60/0.0							60/0.0		D	235.4	24.7	HARD ROCK: GRAY MICA SCHIST
229.8	30.3	100/0.4							100/0.4		D	232.3	27.8	VERY SOFT ROCK: SEVERELY WEATHERED WEATHERED ROCK: (GRAY MICA SCHIST)
225.3	34.8	60/0.1							60/0.1		D	230.8	29.3	VERY HARD TO HARD ROCK: FRESH TO SLIGHTLY WEATHERED GRAY MICA SCHIST WITH CLOSE FRACTURE SPACING
											D	222.5	37.6	VERY SOFT ROCK: SEVERELY WEATHERED WEATHERED ROCK: (BROWN BIOTITE GNEISS)
											D	213.7	46.4	HARD TO VERY HARD ROCK: FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH WIDELY SPACED FRACTURES
											RS-4	210.6	49.5	VERY HARD ROCK: FRESH GRAY MICA QUARTZITE WITH MODERATELY CLOSE FRACTURE SPACING
					CORING TERMINATED AT ELEV. 210.6 FEET IN HARD ROCK: GRAY MICA QUARTZITE.									
													1) ADVANCED 3-1/4" HSA TO 19.8 FEET. 2) ADVANCED 2-7/8" TRICONE ROLLER TO 25.3 FEET. 3) ADVANCED NWD4 CORE BARREL FROM 25.3 FEET TO 30.3 FEET. 4) ADVANCED 2-7/8" TRICONE ROLLER TO 34.9 FEET. 5) ADVANCED NWD4 CORE BARREL FROM 34.9 FEET TO 49.5 FEET. 6) CREEK WATER USED AS DRILLING FLUID WITH POLYMER ADDED. 7) DRILLING FLUID DENSITY APPROXIMATELY 62.4 PCF. 8) NO DRILLING FLUID LOSS OBSERVED. 9) ADVANCED NW CASING TO 34.8 FEET. 10) TEMPORARY CASING 8.5 FEET.	

NCDOT BORE SINGLE 51-147.GPJ NCDOT.GDT 12/31/02

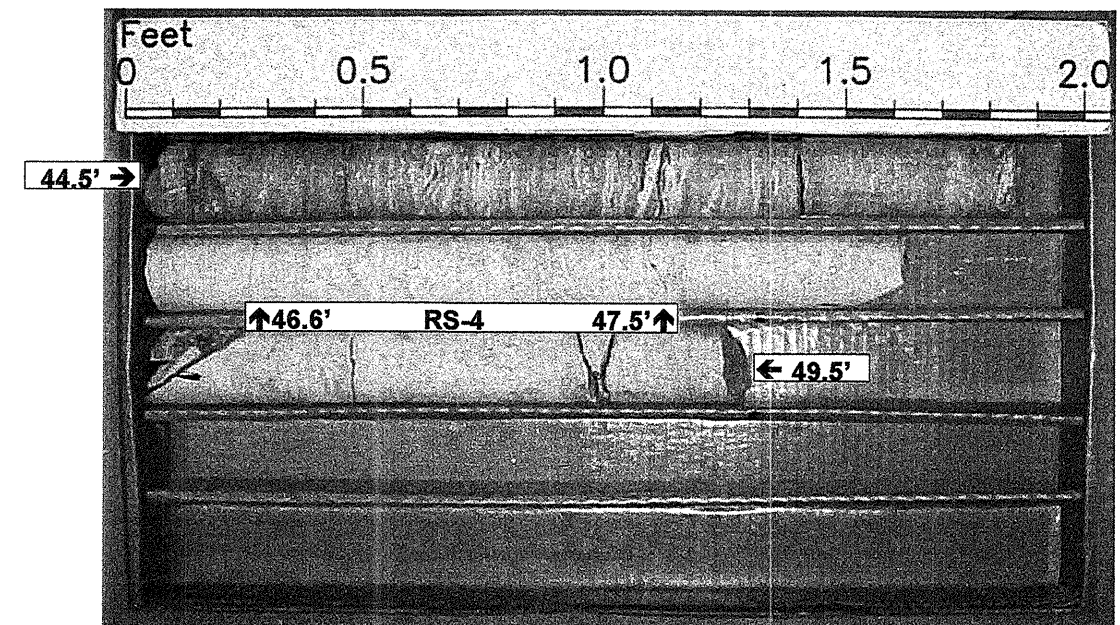
PROJECT NO. 8.2410801		ID. B-3707		COUNTY Warren		GEOLOGIST A.NASH/A.RIGGS				
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 67 ON S.R. 1507 OVER REEDY CREEK						GROUND WATER (ft)				
BORING NO. B2-B		BORING LOCATION 19+36		OFFSET 8 ft RT		ALIGNMENT -L-				
COLLAR ELEV. 260.1 ft		NORTHING 949,678.2		EASTING 2,275,856.2		0 HR. N/A				
TOTAL DEPTH 49.5 ft		DRILL MACHINE CME-750		DRILL METHOD 3/4" HSA/ROTARY WASH WITH TRICONE ROLLER & NWD4 CORE BARREL		24 HR. 2.5 on 11-02-02				
DATE STARTED 10/31/02		COMPLETED 11/1/02		SURFACE WATER DEPTH N/A						
CORE SIZE NWD4		TOTAL RUN 19.6 ft		DRILLER E. MOSELEY						
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (%)	RQD (%)	SAMP. NO.	STRATA REC. (%)	RQD (%)	LOG	DESCRIPTION AND REMARKS
										234.8 Begin Coring @ 25.3 ft 25.3
234.8	25.3	2.5	2:50	(0.0)			(0.0)			232.3 VERY SOFT ROCK: SEVERELY WEATHERED WEATHERED ROCK: (GRAY MICA SCHIST) 27.8
232.3	27.8	2.5	2:28	0%			0%			230.8 VERY HARD TO HARD ROCK: (GRAY MICA SCHIST) 29.3
229.8	30.3	2.5	1:20/0.5 0:40/0.5 2:42 2:30 N=100/0.4 0:00/4.6	(1.7) 68%	(1.5) 60%		(1.5) 100%	(1.5) 100%		230.8 FRESH TO SLIGHTLY WEATHERED GRAY MICA SCHIST WITH CLOSE FRACTURE SPACING 1 JOINT AT 40 DEGREES 29.3
225.3	34.8	4.8	1:58N=60/0.7 2:00 2:00 3:00	(2.8) 58%	(2.1) 44%		(8.7) 100%	(8.7) 100%		222.5 VERY SOFT ROCK: SEVERELY TO COMPLETELY WEATHERED WEATHERED ROCK: (BROWN BIOTITE GNEISS) 37.6
220.4	39.7	4.8	5:00/0.8 2:30/0.8 5:00 4:00 4:00	(4.7) 98%	(4.7) 98%		(8.7) 100%	(8.7) 100%		222.5 HARD TO VERY HARD ROCK: FRESH TO SLIGHTLY WEATHERED GRAY BIOTITE GNEISS WITH WIDELY SPACED FRACTURES 1 JOINT AT 30 DEGREES 37.6
215.6	44.5	5.0	3:25 3:00 3:20 3:00 3:00	(4.5) 90%	(4.5) 90%	RS-4	(2.6) 84%	(2.6) 84%		213.7 VERY HARD ROCK: FRESH GRAY MICA QUARTZITE WITH MODERATELY CLOSE FRACTURE SPACING 1 JOINT AT 65 DEGREES 46.4
210.6	49.5									210.6 FRESH GRAY MICA QUARTZITE WITH MODERATELY CLOSE FRACTURE SPACING 1 JOINT AT 65 DEGREES CORING TERMINATED AT ELEV. 210.6 FEET IN HARD ROCK: GRAY MICA QUARTZITE. 49.5

CORE PHOTOS

Project No: 8.2410801	I.D. No.: B-3707	County: Warren	Boring No.: B2-B
Site Description: Replacement of Bridge No. 67 Over Reedy Creek on SR 1507		Driller: E. Moseley	
Collar Elev.: 260.1 ft.	Core Size: NWD4	Equipment: CME-750	Geologist: S. Johnson
Elev. at T.D.: 210.6 ft.	Total Depth: 49.5 ft.	Total Run: 23.7 ft.	Date: 11/01/2002



Box 1 of 2
Top of Box @ 25.3 feet; Bottom of Box @ 44.5 feet



Box 2 of 2
Top of Box @ 44.5 feet; Bottom of Box @ 49.5 feet



PROJECT NO. 8.2410801		ID. B-3707		COUNTY Warren		GEOLOGIST A.NASH/S.JOHNSON							
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 67 ON S.R. 1507 OVER REEDY CREEK						GROUND WATER (ft)							
BORING NO. EB2-A		BORING LOCATION 19+58		OFFSET 14 ft LT		ALIGNMENT -L-							
COLLAR ELEV. 268.4 ft		NORTHING 949,709.2		EASTING 2,275,853.5		0 HR. N/M							
TOTAL DEPTH 39.2 ft		DRILL MACHINE CME-750		DRILL METHOD 3/4" HSA		HAMMER TYPE MANUAL							
DATE STARTED 10/30/02		COMPLETED 10/30/02		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
268.4													GROUND SURFACE
265.0	3.4	3	2	3							SS-1	35.6%	ROADWAY EMBANKMENT FILL: MEDIUM STIFF RED-BROWN COARSE TO FINE SANDY SILTY CLAY (A-7-6)
260.0	8.4	3	3	3							SS-2	38.1%	ALLUVIUM: MEDIUM STIFF GRAY SILTY FINE SANDY CLAY (A-6) WITH TRACE OF ORGANIC MATTER
255.0	13.4	3	7	15							Sat.		MEDIUM DENSE GRAY SILTY FINE TO COARSE SAND (A-1-b) WITH SOME GRAVEL
250.0	18.4	9	10	13							M		RESIDUUM: VERY STIFF BROWN FINE SANDY SILT (A-4) WITH SOME MICA
245.0	23.4	13	12	17							M		
240.0	28.4	77	23/0.2								M		WEATHERED ROCK: (BROWN AND GRAY BIOTITE GNEISS)
235.0	33.4	100/0.1									M		
230.0	38.4	33	67/0.3								M		
													BORING TERMINATED AT ELEV. 229.2 FEET IN WEATHERED ROCK: BROWN AND GRAY BIOTITE GNEISS.
													1) ADVANCED 3-1/4" HSA TO 38.4 FEET.

NCDOT BORE SINGLE 51-147.GPJ NCDOT.GDT 12/30/02



PROJECT NO. 8.2410801		ID. B-3707		COUNTY Warren		GEOLOGIST A.NASH/A.RIGGS							
SITE DESCRIPTION REPLACEMENT OF BRIDGE NO. 67 ON S.R. 1507 OVER REEDY CREEK						GROUND WATER (ft)							
BORING NO. EB2-B		BORING LOCATION 19+63		OFFSET 14 ft RT		ALIGNMENT -L-							
COLLAR ELEV. 268.1 ft		NORTHING 949,695.1		EASTING 2,275,878.2		0 HR. N/M							
TOTAL DEPTH 17.0 ft		DRILL MACHINE CME-750		DRILL METHOD 3/4" HSA		HAMMER TYPE MANUAL							
DATE STARTED 10/31/02		COMPLETED 10/31/02		SURFACE WATER DEPTH N/A									
ELEV. (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
		0.5ft	0.5ft	0.5ft	0	20	40	60	80				100
268.1													GROUND SURFACE
264.6	3.5	2	1	2							SS-1	M	ROADWAY EMBANKMENT FILL: SOFT RED-BROWN COARSE TO FINE SANDY SILTY CLAY (A-7-6)
259.6	8.5	2	7	3							SS-2	22.3%	VERY LOOSE ORANGE-TAN SILTY FINE TO COARSE SAND (A-2-4)
254.6	13.5	3	13	53							W		ALLUVIUM: STIFF GRAY-TAN COARSE TO FINE SANDY CLAYEY SILT (A-4) WITH TRACE OF ORGANIC MATTER
251.1	17.0	60/0.0									Sat.		MEDIUM STIFF GRAY SILTY FINE SANDY CLAY (A-6) WITH SOME GRAVEL
											M		VERY DENSE GRAY-TAN SILTY FINE TO COARSE SAND (A-1-b) WITH SOME GRAVEL WEATHERED ROCK: (BROWN BIOTITE GNEISS)
													1) ADVANCED 3-1/4" HSA TO 17.0 FEET. 2) DETECTED FUEL LIKE ODOR BETWEEN 7.5-14 FEET.
													BORING TERMINATED WITH STANDARD PENETRATION TEST REFUSAL AT ELEV. 251.1 FEET ON HARD ROCK: BROWN BIOTITE GNEISS.

NCDOT BORE SINGLE 51-147.GPJ NCDOT.GDT 12/30/02

Summary of Laboratory Results Soil Classification and Gradation

Borehole	Sample	Depth (ft)	AASHTO Classification	% Passing Sieve #			Soil Mortar Fraction					Plasticity Index	Moisture Content (%)	Organic Content (%)	
				10	40	60	200	Coarse Sand Retained on No. 60	Fine Sand	Silt	Clay				Liquid Limit
				97	69	58	38								
EB1-A	SS-1	3.3-4.8	A-6 (1)	97	69	58	38	40	25	17	18	38	12	18.5	
EB1-B	SS-1	3.3-4.8	A-6 (3)	91	78	69	46	24	31	20	25	29	13	19.0	
B1-A	SS-3	11.3-12.8	A-2-4 (0)	90	68	57	32	37	34	21	8	37	6		
B1-B	SS-1	1.4-2.9	A-7-6 (11)	100	95	91	69	9	29	34	28	43	16	28.7	
B1-B	SS-2	6.4-7.9	A-1-b (0)	70	35	23	5	67	27	4	2	18	NP		
EB2-A	SS-1	3.4-4.9	A-7-6 (7)	96	78	70	51	28	23	15	34	47	20	35.6	
EB2-A	SS-2	8.4-9.9	A-6 (7)	100	97	92	63	8	32	22	38	35	14	38.1	
EB2-B	SS-1	3.5-5.0	A-2-4 (0)	95	69	51	15	47	41	6	6	14	NP		
EB2-B	SS-2	8.5-10.0	A-4 (0)	97	82	71	42	27	35	20	18	24	6	22.3	

PROJECT DESCRIPTION: Replacement of Bridge No. 67 on S.R. 1507 over Reedy Creek
STATE PROJECT No.: 8.2410801

TIP No.: B-3707
FEDERAL I.D. No. BRZ-1507(1)
COUNTY: Warren, NORTH CAROLINA
S&ME JOB No.: 1051-02-147
CHECKED BY: AFR/JSJ

UNCONFINED COMPRESSION (ASTM D2938)

PROJECT: Replacement of Bridge No. 67 on S.R. 1507 over Reedy Creek (B-3707)
LOCATION: Warren County, N.C.

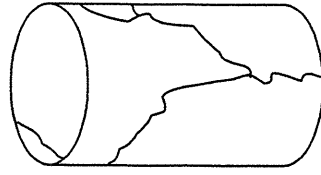
JOB No.: 1051-02-147

Date: 12/11/02

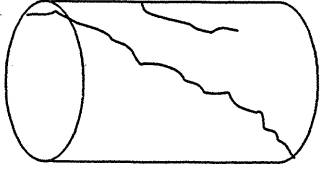
Tested by: JBB

Boring No.	Sample No.	Depth (ft)	Specimen Dimension, in.		Unit Wt. (lb/ft ³)	Moisture Content (%)	Loading Rate (psi/min)	Max. Load (lb)	Strength (psi)
			Length	Diameter					
B1-A	RS-1	42.4 - 43.2	4.02	2.05	173.3	0.05	1137	55700	16876
B1-B	RS-2	41.6 - 42.4	3.97	1.98	172.7	0.05	1352	45400	14745
B2-A	RS-3	38.5 - 39.3	4.02	2.05	172.8	0.04	553	23750	7196
B2-B	RS-4	46.6 - 47.3	3.93	1.98	164.8	0.12	1616	43720	14199

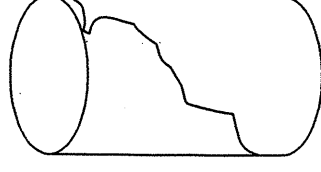
B1-A



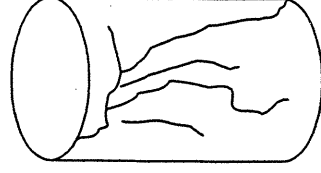
B1-B



B2-A



B2-B



GEOTECHNICAL UNIT FIELD SCOUR REPORT

PROJECT: 8.2410801 ID: B-3707 COUNTY: Warren

DESCRIPTION(1): Replacement of Bridge No. 67 on S.R. 1507 over Reedy Creek

INFORMATION ON EXISTING BRIDGES Information obtained from: field inspection
 microfilm(Reel: _____ Pos: _____)
 other Bridge Survey and Hydraulic Design Report

COUNTY BRIDGE NO. 67 BRIDGE LENGTH 86'7" NO. BENTS IN: CHANNEL 2 FLOOD PLAIN 4

FOUNDATION TYPE: Timber piles and timber piles on concrete piers

EVIDENCE OF SCOUR(2):

ABUTMENTS OR END BENT SLOPES: Minor evidence of erosion beneath bridge at both north & south abutments

INTERIOR BENTS: Interior Bent No. 3 and 4 show evidence of scour

CHANNEL BED: None observed

CHANNEL BANKS: Some bank erosion observed on northeast side and under bridge between interior bents No. 3 & 4

EXISTING SCOUR PROTECTION:

TYPE(3): Timber abutments

EXTENT(4): Timber abutments extend beyond abutments as wingwalls

EFFECTIVENESS(5): Relatively effective with no significant erosion adjacent to abutments

OBSTRUCTIONS(6) (DAMS, DEBRIS, ETC.): Several trees fallen into creek both upstream and downstream

DESIGN INFORMATION

CHANNEL BED MATERIAL(7) (SAMPLE RESULTS ATTACHED): Tan to gray slightly silty fine to coarse sand (A-1-b) (0) with some gravel

CHANNEL BANK MATERIAL(8) (SAMPLE RESULTS ATTACHED): Gray silty fine sandy clay (A-6) (7), brown-tan and red-brown coarse to fine sandy silty clay (A-7-6) (11) and gray-tan coarse to fine sandy silt (A-4) (0)

FOUNDATION BEARING MATERIAL(9): Weathered rock

CHANNEL BANK COVER(10): Trees and underbrush

FLOOD PLAIN WIDTH(11): 1000 +/- feet

FLOOD PLAIN COVER(12): Trees and underbrush

DESIGN INFORMATION CONT.

PAGE 2

STREAM IS DEGRADING AGGRADING (13)

OTHER OBSERVATIONS AND COMMENTS: Broad flood plain to the north and rises sharply to the south.

Remains of old timber abutment between end bent no. 1 and interior bent no. 1 and between end bent no. 2 and interior bent no. 4

CHANNEL MIGRATION TENDENCY (14): Migration tendency to the north

REPORTED BY: S&ME, Inc. DATE: 11/5/02

GEOTECHNICALLY ADJUSTED SCOUR ELEVATION (15):

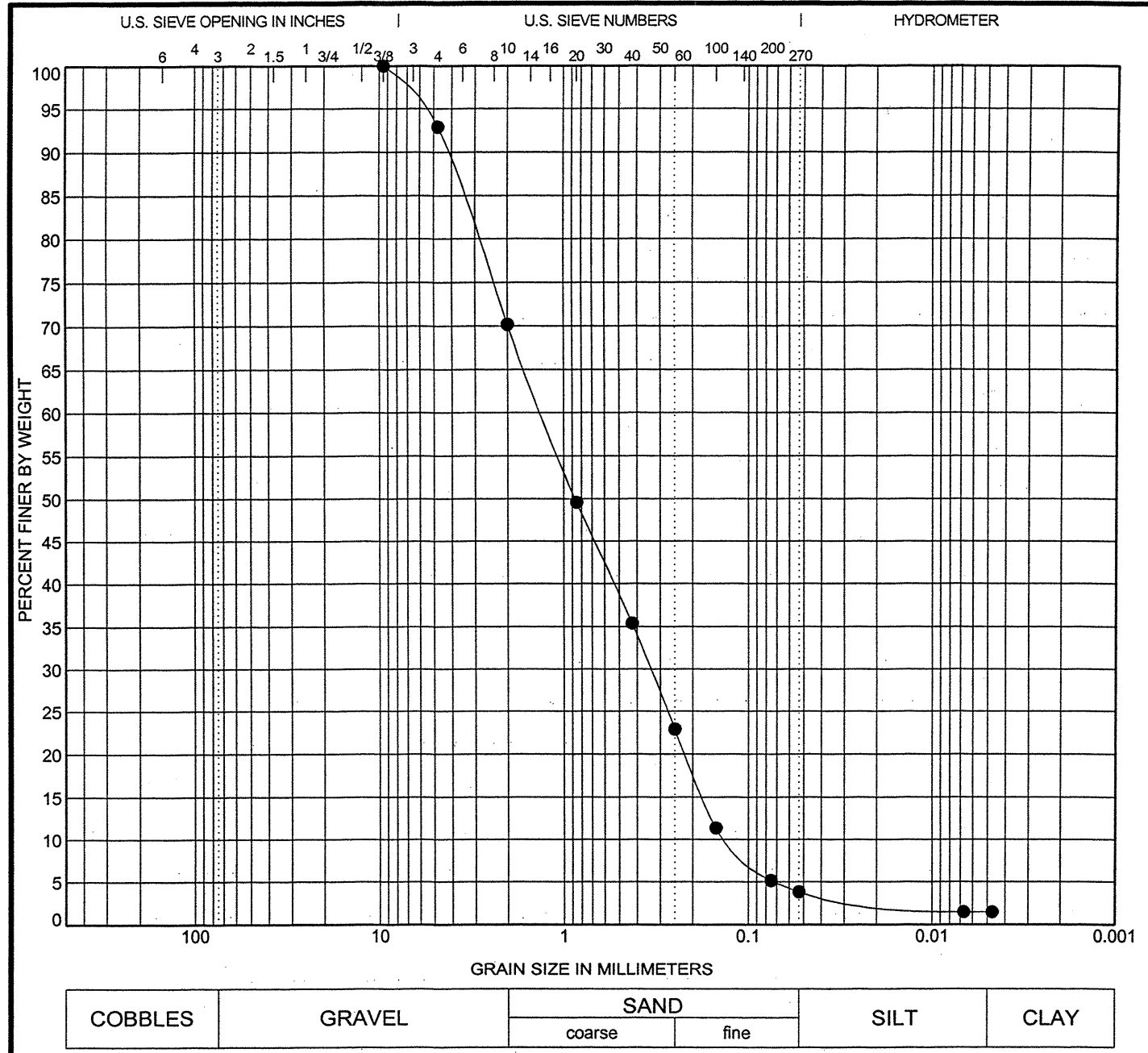
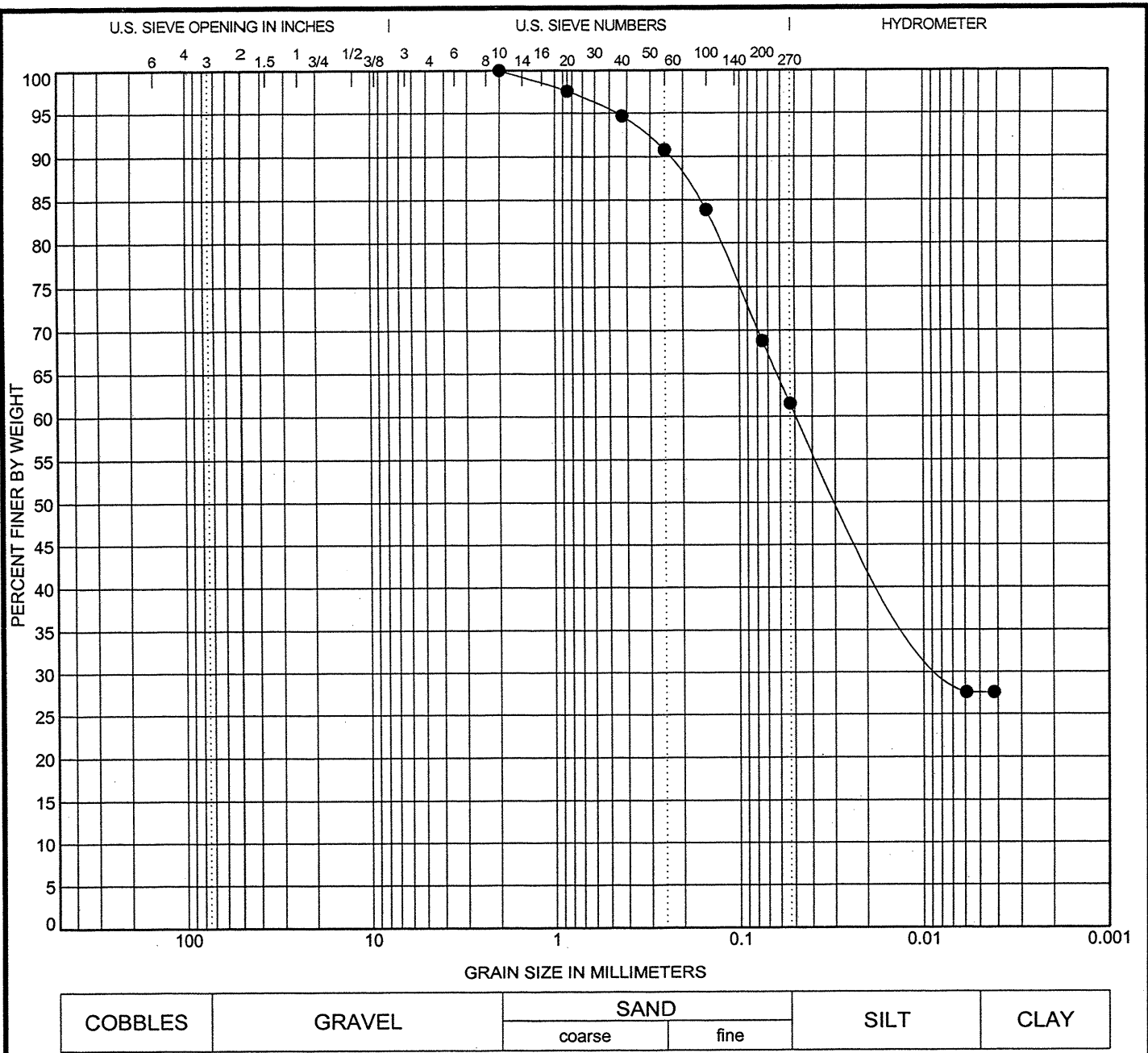
1 EFA tube was submitted to the Materials and Test Lab. An adjusted scour will be provided by the

Hydraulics Unit based on the EFA results.

REPORTED BY: DATE: 12/31/02

INSTRUCTIONS

- (1) GIVE THE DESCRIPTION OF THE SPECIFIC SITE GIVING ROUTE NUMBER AND BODY OF WATER CROSSED.
- (2) NOTE ANY EVIDENCE OF SCOUR AT THE EXISTING END BENTS OR ABUTMENTS (UNDERMINING, SLOUGHING, SCOUR LOCATIONS, DEGRADATIONS, ETC.)
- (3) NOTE ANY EXISTING SCOUR PROTECTION (RIP RAP, ETC.)
- (4) DESCRIBE THE EXTENT OF ANY EXISTING SCOUR PROTECTION.
- (5) DESCRIBE WHETHER OR NOT THE SCOUR PROTECTION APPEARS TO BE WORKING.
- (6) NOTE ANY DAMS, FALLEN TREES, DEBRIS AT BENTS, ETC.
- (7) DESCRIBE THE CHANNEL BED MATERIAL: A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
- (8) DESCRIBE THE CHANNEL BANK MATERIAL: A SAMPLE SHOULD BE TAKEN FOR GRAIN SIZE DISTRIBUTION, ATTACH LAB RESULTS.
- (9) DESCRIBE THE FOUNDATION BEARING MATERIAL,
- (10) DESCRIBE THE BANK COVERING (GRASS, TREES, RIP RAP, NONE, ETC.)
- (11) GIVE THE APPROXIMATE FLOOD PLAIN WIDTH (ESTIMATE).
- (12) DESCRIBE THE FLOOD PLAIN COVERING (GRASS, TREES, CROPS, ETC.)
- (13) CHECK THE APPROPRIATE SPACE AS TO WHETHER THE STREAM IS DEGRADING OR AGGRADING
- (14) DESCRIBE THE POTENTIAL OF THE BODY OF WATER TO MIGRATE Laterally DURING THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS).
- (15) GIVE THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION EXPECTED OVER THE LIFE OF THE BRIDGE (APPROXIMATELY 100 YEARS). THIS CAN BE GIVEN AS AN ELEVATION RANGE ACROSS THE SITE, OR ON A BENT BY BENT BASIS WHERE VARIATIONS EXIST. DISCUSS RELATIONSHIP BETWEEN THE HYDRAULICS THEORETICAL SCOUR AND THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION. THE GEOTECHNICALLY ADJUSTED SCOUR ELEVATION IS BASED ON THE ERODABILITY OF MATERIALS WITH CONSIDERATION FOR JOINTING, FOLIATION, BEDDING ORIENTATION AND FREQUENCY; CORE RECOVERY PERCENTAGE; PERCENTAGE RQD; DIFFERENTIAL WEATHERING, SHEAR STRENGTH; OBSERVATIONS AT EXISTING STRUCTURES; OTHER TESTS DEEMED APPROPRIATE; AND OVERALL GEOLOGIC CONDITIONS AT THE SITE.



AS DEFINED BY NCDOT		Fine Sand		< 0.25 mm and > 0.053 mm	
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.053 mm and > 0.005 mm		
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm		

Test Boring: **B1-B** Station: 18+86 -L- Offset: 7 ft RT Depth: 1.4 - 2.9 ft
 Sample: **SS-1**
 Soil Description: **A-7-6 (11)**

Moisture Content:	28.7	SOIL MORTAR	TOTAL SAMPLE	Liquid Limit:	43		
Specific Gravity:	2.65	Coarse Sand:	9	9	Plastic Limit:	27	
Cc		Fine Sand:	29	30	Plasticity Index:	16	
Cu		Silt:	34	33	% Passing #270:	61	
D ₉₀	0.236	D ₅₀	0.025	28	28	% Organic Content:	NM

AS DEFINED BY NCDOT		Fine Sand		< 0.25 mm and > 0.053 mm	
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.053 mm and > 0.005 mm		
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm		

Test Boring: **B1-B** Station: 18+86 -L- Offset: 7 ft RT Depth: 6.4 - 7.9 ft
 Sample: **SS-2**
 Soil Description: **A-1-b (0)**

Moisture Content:	16.0	SOIL MORTAR	TOTAL SAMPLE	Liquid Limit:	18		
Specific Gravity:	2.65	Coarse Sand:	67	47	Plastic Limit:	NP	
Cc	0.68	Fine Sand:	27	19	Plasticity Index:	NP	
Cu	10.18	Silt:	4	2	% Passing #270:	4	
D ₉₀	4.25	D ₅₀	0.865	2	2	% Organic Content:	NM

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GRAIN SIZE DISTRIBUTION

Replacement of Bridge No. 67 on S.R. 1507 over Reedy Creek

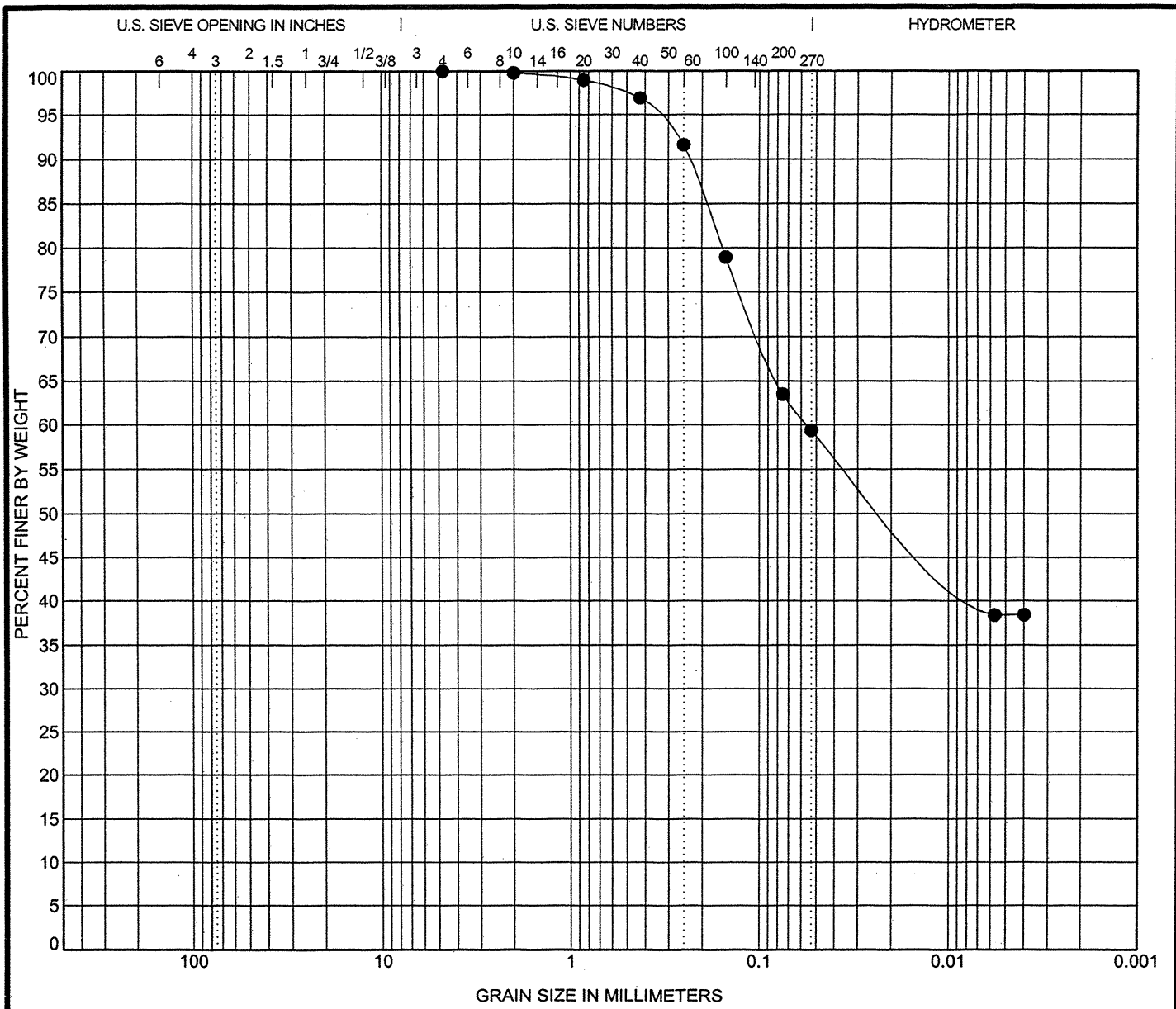
TIP No. B-3707 STATE PROJECT NO. 8.2410801
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GRAIN SIZE DISTRIBUTION

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 Warren COUNTY, NORTH CAROLINA



COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

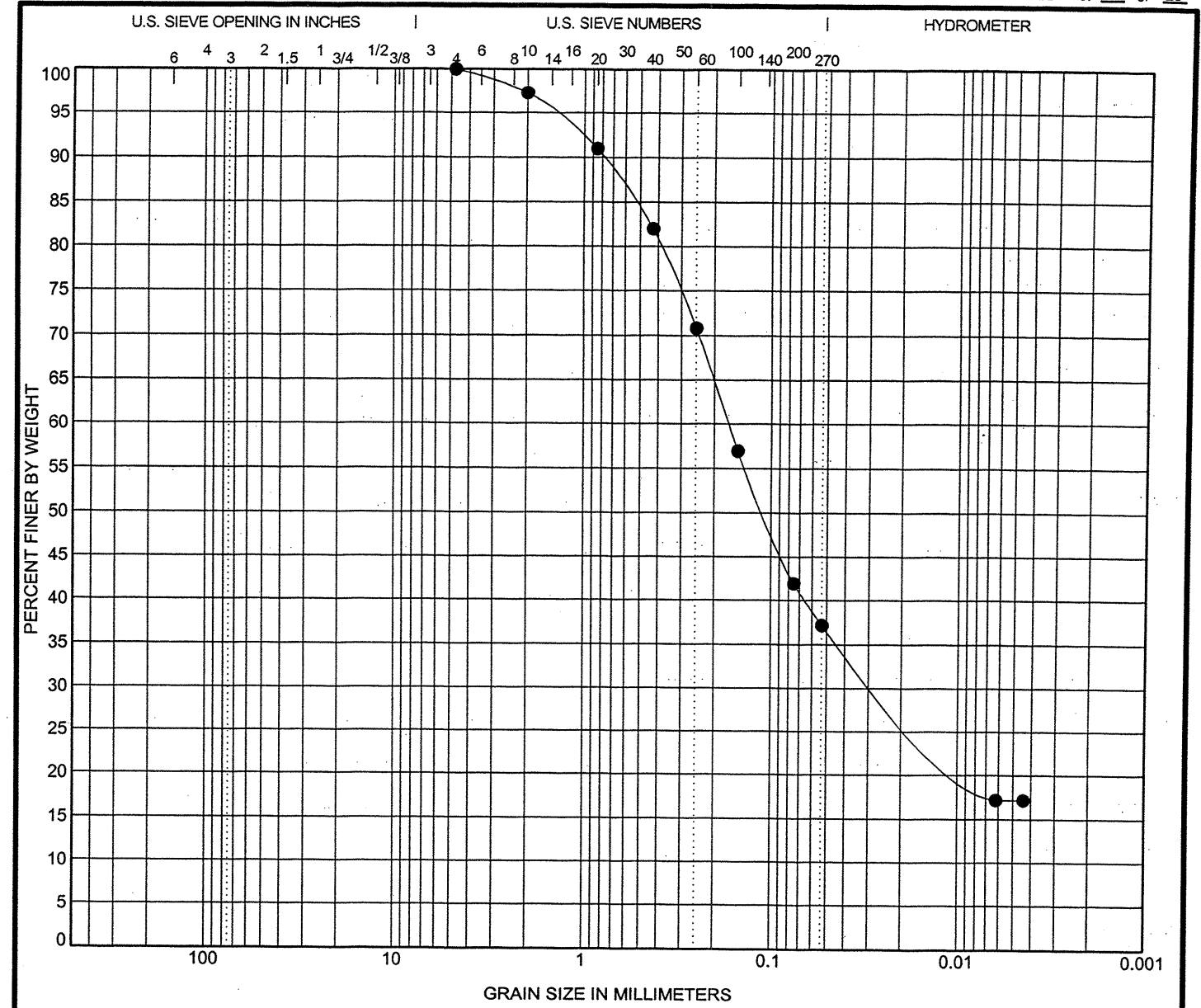
AS DEFINED BY NCDOT		Fine Sand	< 0.25 mm and > 0.053 mm
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.053 mm and > 0.005 mm
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm

Test Boring: **EB2-A** Station: 19+58 -L- Offset: 14 ft LT Depth: 8.4 - 9.9 ft
 Sample: **SS-2**
 Soil Description: **A-6 (7)**

Moisture Content: 38.1	SOIL MORTAR	TOTAL SAMPLE	Liquid Limit: 35
Specific Gravity: 2.65	Coarse Sand: 8	8	Plastic Limit: 21
Cc	Fine Sand: 32	33	Plasticity Index: 14
Cu	Silt: 22	21	% Passing #270: 59
D ₉₀ 0.234 D ₅₀ 0.02	Clay: 38	38	% Organic Content: NM

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COBBLES	GRAVEL	SAND		SILT	CLAY
		coarse	fine		

AS DEFINED BY NCDOT		Fine Sand	< 0.25 mm and > 0.053 mm
Gravel	< 75 mm and > 2.00 mm	Silt	< 0.053 mm and > 0.005 mm
Coarse Sand	< 2.00 mm and > 0.25 mm	Clay	< 0.005 mm

Test Boring: **EB2-B** Station: 19+63 -L- Offset: 14 ft RT Depth: 8.5 - 10.0 ft
 Sample: **SS-2**
 Soil Description: **A-4 (0)**

Moisture Content: 22.3	SOIL MORTAR	TOTAL SAMPLE	Liquid Limit: 24
Specific Gravity: 2.65	Coarse Sand: 27	26	Plastic Limit: 18
Cc	Fine Sand: 35	34	Plasticity Index: 6
Cu	Silt: 20	20	% Passing #270: 37
D ₉₀ 0.788 D ₅₀ 0.109	Clay: 18	17	% Organic Content: NM

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