

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
NC	17BP.8.R.13	1A	23

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

PROJECT 17BP.8.R.13
COUNTY RANDOLPH
PROJECT DESCRIPTION REPLACE STRUCTURE
NO. 750220 ON SR 2849 OVER BACHELOR
CREEK
SITE DESCRIPTION PROPOSED BRIDGE ON
SR 2849 OVER BACHELOR CREEK

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.

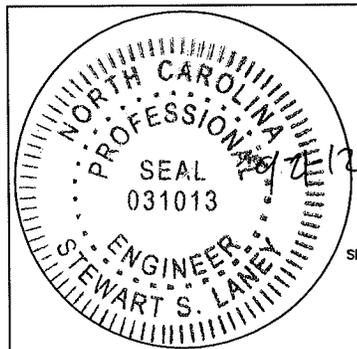
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND 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.

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.

INVESTIGATED BY S&ME, INC. PERSONNEL J. WILLIAMSON
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DATE 9/21/2012 K. HILL
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SEAL

SIGNATURE

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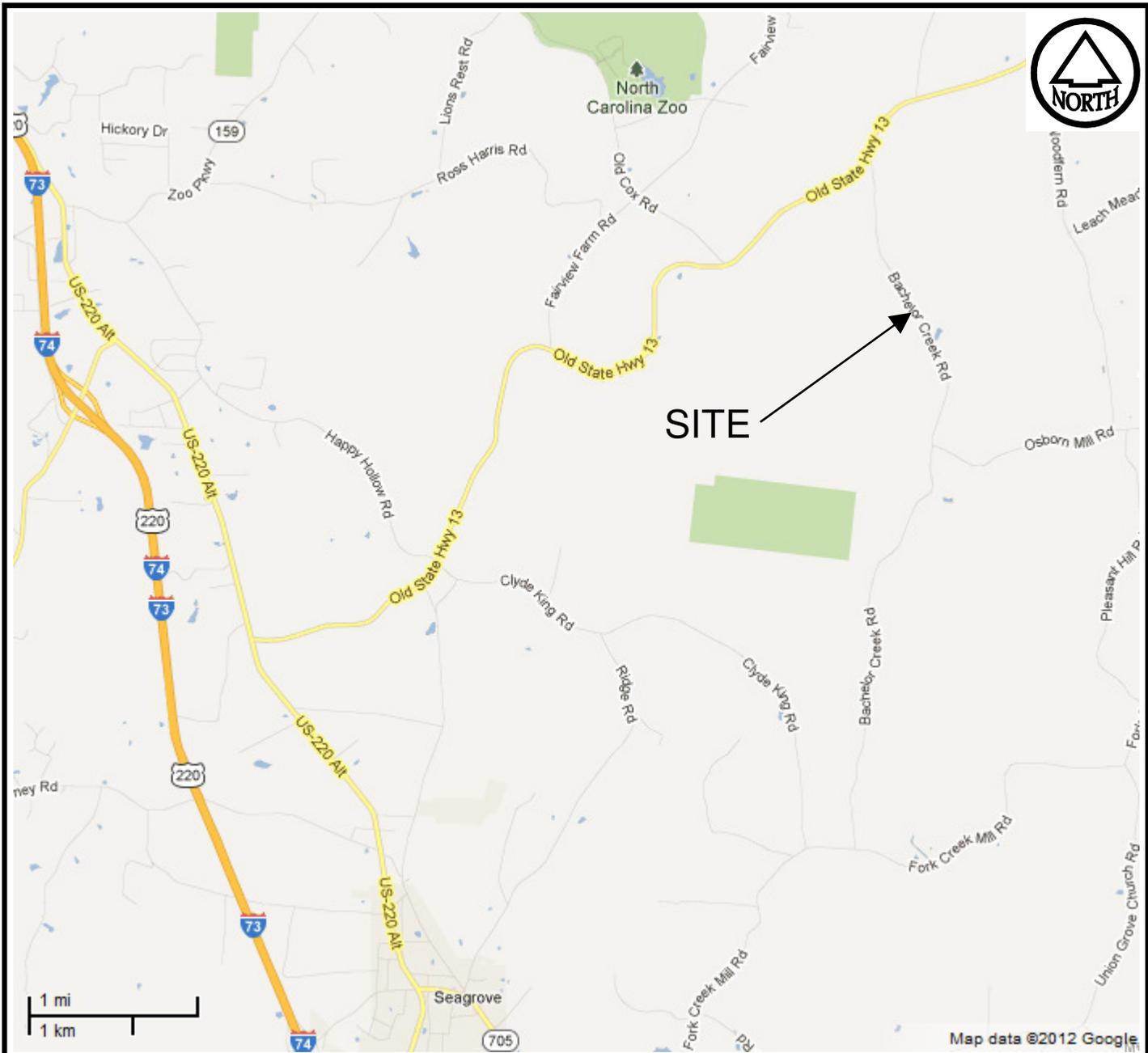
NCDOT Geotechnical Unit Soil and Rock Classification Sheet	Sheets 2A & 2B
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL UNIT SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

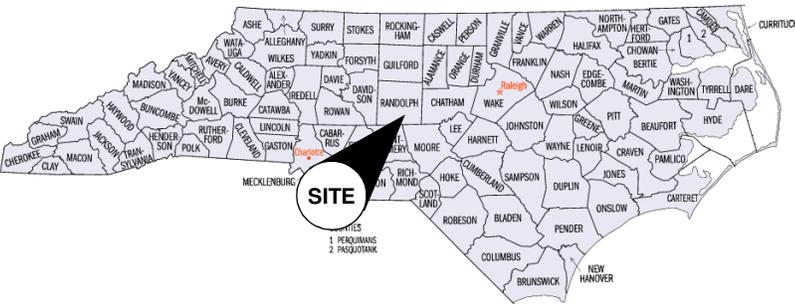
SOIL DESCRIPTION										GRADATION																	
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, 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: VERY STIFF, GRAY SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE 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.																	
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> .										MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.																	
SOIL LEGEND AND AASHTO CLASSIFICATION										MINERALOGICAL COMPOSITION																	
GENERAL CLASS.		GRANULAR MATERIALS (≤35% PASSING #200)				SILT-CLAY MATERIALS (>35% PASSING #200)				ORGANIC MATERIALS				COMPRESSIBILITY													
GROUP CLASS.		A-1		A-3		A-2		A-4		A-5		A-6		A-7		A-1, A-2		A-4, A-5		A-6, A-7							
SYMBOL		A-1-a		A-1-b		A-2-4		A-2-5		A-2-6		A-2-7		A-7-8		A-7-8		A-3		A-3							
% PASSING		# 10		# 40		# 200		GRANULAR SOILS		SILT-CLAY SOILS		MUCK, PEAT		PERCENTAGE OF MATERIAL													
LIQUID LIMIT		PLASTIC INDEX		GROUP INDEX		USUAL TYPES OF MAJOR MATERIALS		GEN. RATING AS A SUBGRADE		P.I. OF A-7-5 ≤L - 30 : P.I. OF A-7-6 ≥L - 30		MISCELLANEOUS SYMBOLS															
USUAL TYPES OF MAJOR MATERIALS		STONE FRAGS. GRAVEL AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND		SILTY SOILS		CLAYEY SOILS		SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS		GROUND WATER											
EXCELLENT TO GOOD		FAIR TO POOR		FAIR TO POOR		POOR		UNSUITABLE		WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.																	
EXCELLENT TO GOOD		FAIR TO POOR		FAIR TO POOR		POOR		UNSUITABLE		STATIC WATER LEVEL AFTER 24 HOURS.																	
EXCELLENT TO GOOD		FAIR TO POOR		FAIR TO POOR		POOR		UNSUITABLE		PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA																	
EXCELLENT TO GOOD		FAIR TO POOR		FAIR TO POOR		POOR		UNSUITABLE		HOLE CAVE																	
EXCELLENT TO GOOD		FAIR TO POOR		FAIR TO POOR		POOR		UNSUITABLE		SPRING OR SEEPAGE																	
CONSISTENCY OR DENSENESS										ABBREVIATIONS																	
PRIMARY SOIL TYPE		COMPACTNESS OR CONSISTENCY		RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)		RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)		ROADWAY EMBANKMENT WITH SOIL DESCRIPTION																			
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)		VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE		<4 4 TO 10 10 TO 30 30 TO 50 >50		N/A		SOIL SYMBOL																			
GENERALLY SILT-CLAY MATERIAL (COHESIVE)		VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD		<2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30		<0.25 0.25 TO 0.5 0.5 TO 1 1 TO 2 2 TO 4 >4		ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS																			
TEXTURE OR GRAIN SIZE										INFERRER SOIL BOUNDARIES																	
U.S. STD. SIEVE SIZE		OPENING (MM)		4		10		40		60		200		270		INFERRER ROCK LINE											
BOULDER (BLDR.)		COBBLE (COB.)		GRAVEL (GR.)		COARSE SAND (CSE. SD.)		FINE SAND (F. SD.)		SILT (SL.)		CLAY (CL.)		ALLUVIAL SOIL BOUNDARY													
GRAIN SIZE		MM		IN.		305		75		2.0		0.25		0.05		0.005		DIP/DIP DIRECTION OF ROCK STRUCTURES									
SOIL MOISTURE - CORRELATION OF TERMS										SOUNDING ROD																	
SOIL MOISTURE SCALE (ATTERBERG LIMITS)		FIELD MOISTURE DESCRIPTION		GUIDE FOR FIELD MOISTURE DESCRIPTION		SPT DPT DMT VST																					
LL		LIQUID LIMIT		- SATURATED - (SAT.)		TEST BORING																					
PLASTIC RANGE (PI)		PLASTIC LIMIT		- WET - (W)		AUGER BORING																					
OM		OPTIMUM MOISTURE		- MOIST - (M)		CORE BORING																					
SL		SHRINKAGE LIMIT		- DRY - (D)		MONITORING WELL																					
PLASTICITY										PIEZOMETER INSTALLATION																	
NONPLASTIC		LOW PLASTICITY		MED. PLASTICITY		HIGH PLASTICITY		PLASTICITY INDEX (PI)		DRY STRENGTH		SLOPE INDICATOR INSTALLATION															
0-5		6-15		16-25		26 OR MORE		VERY LOW		SLIGHT		MEDIUM		HIGH		SPT N-VALUE											
COLOR										ABBREVIATIONS																	
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.										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 _d - DRY UNIT WEIGHT W - MOISTURE CONTENT V. - VERY VST - VANE SHEAR TEST																	
EQUIPMENT USED ON SUBJECT PROJECT										EQUIPMENT USED ON SUBJECT PROJECT																	
DRILL UNITS:		ADVANCING TOOLS:		HAMMER TYPE:		MOBILE B- _____																					
<input type="checkbox"/> DIEDRICH D-50		<input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER		<input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL		<input type="checkbox"/> CME-550x																					
<input checked="" type="checkbox"/> CME-550x		<input type="checkbox"/> 8" HOLLOW AUGERS		CORE SIZE:		<input type="checkbox"/> CME-750																					
<input type="checkbox"/> CME-750		<input type="checkbox"/> HARD FACED FINGER BITS		<input type="checkbox"/> -B _____		<input type="checkbox"/> PORTABLE HOIST																					
<input type="checkbox"/> PORTABLE HOIST		<input type="checkbox"/> TUNG.-CARBIDE INSERTS		<input checked="" type="checkbox"/> -N_Q2 _____		<input type="checkbox"/> OTHER _____																					
<input type="checkbox"/> OTHER _____		<input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER		<input type="checkbox"/> -H _____		<input type="checkbox"/> OTHER _____																					
<input type="checkbox"/> OTHER _____		<input type="checkbox"/> TRICONE _____" STEEL TEETH		HAND TOOLS:		<input type="checkbox"/> OTHER _____																					
<input type="checkbox"/> OTHER _____		<input type="checkbox"/> TRICONE _____" TUNG.-CARB.		<input type="checkbox"/> POST HOLE DIGGER		<input type="checkbox"/> OTHER _____																					
<input type="checkbox"/> OTHER _____		<input type="checkbox"/> CORE BIT		<input type="checkbox"/> HAND AUGER		<input type="checkbox"/> OTHER _____																					
<input type="checkbox"/> OTHER _____		<input type="checkbox"/> OTHER 3-1/4" H.S.A.		<input type="checkbox"/> SOUNDING ROD		<input type="checkbox"/> OTHER _____																					
<input type="checkbox"/> OTHER _____		<input type="checkbox"/> OTHER _____		<input type="checkbox"/> VANE SHEAR TEST		<input type="checkbox"/> OTHER _____																					
<input type="checkbox"/> OTHER _____		<input type="checkbox"/> OTHER _____		<input type="checkbox"/> OTHER _____		<input type="checkbox"/> OTHER _____																					

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

ROCK DESCRIPTION		TERMS AND DEFINITIONS	
<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. 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>WEATHERED ROCK (WR)  NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER FOOT.</p> <p>CRYSTALLINE ROCK (CR)  FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, ONEISS, GABBRO, SCHIST, ETC.</p> <p>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.</p> <p>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.</p>			
WEATHERING			
FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.		
VERY SLIGHT (V. SL.)	ROCK GENERALLY FRESH, JOINTS STAINED. SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.		
SLIGHT (SL.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.		
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.		
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i>		
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF</i>		
VERY SEVERE (V. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF</i>		
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.		
ROCK HARDNESS			
VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.		
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.		
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.		
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.		
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.		
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.		
FRACTURE SPACING		BEDDING	
TERM	SPACING	TERM	THICKNESS
VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	> 4 FEET
WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET
MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET
CLOSE	0.16 TO 1 FEET	VERY THINLY BEDDED	0.03 - 0.16 FEET
VERY CLOSE	LESS THAN 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET
		THINLY LAMINATED	< 0.008 FEET
INDURATION			
FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.			
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.		
		ELEVATION: 542.27'	
NOTES:			
BENCH MARK: RR SPIKE IN 12" MAPLE TREE			



SITE



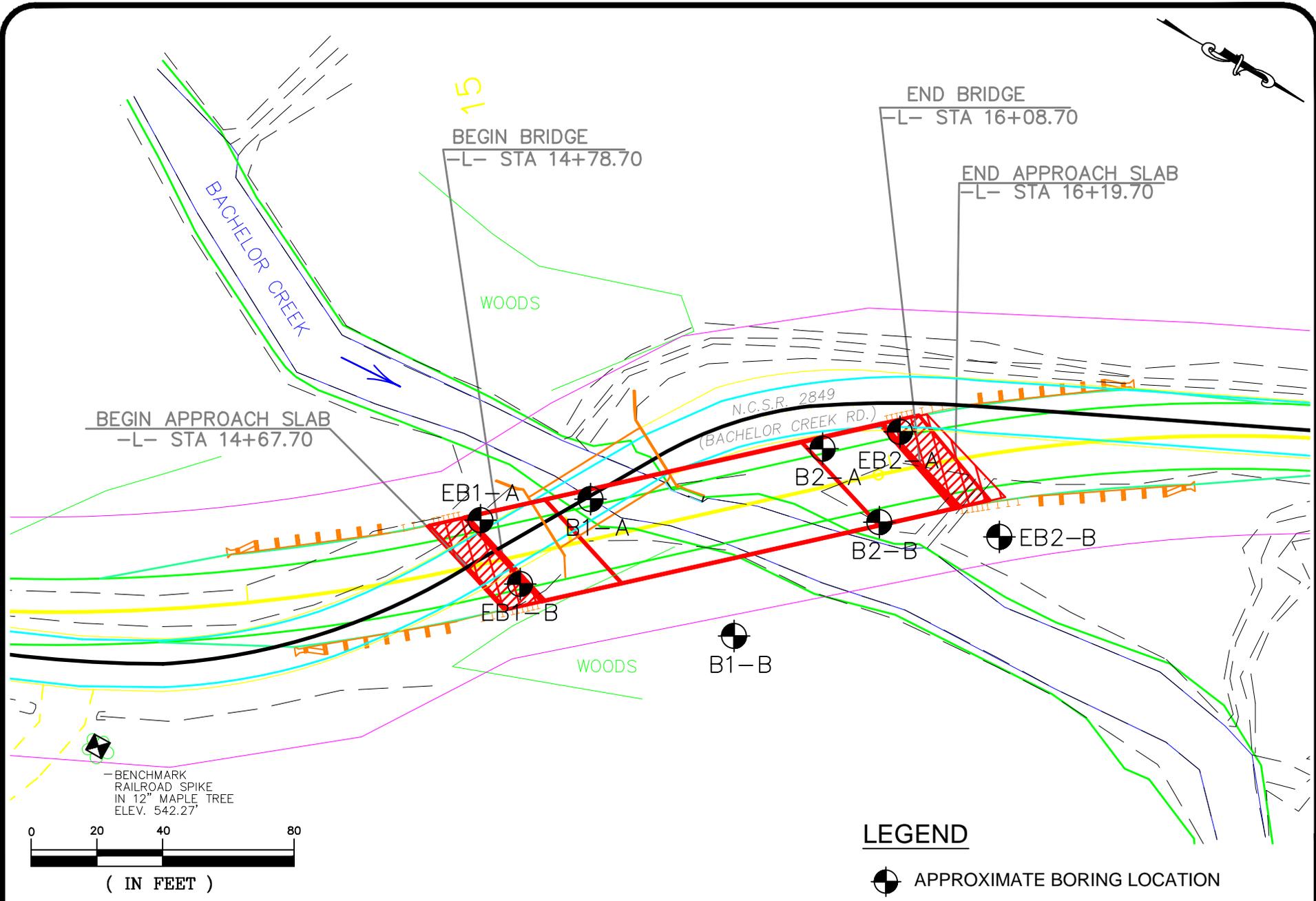
Map data ©2012 Google

SCALE:	AS SHOWN
DRAWN BY:	JRW
CHECKED BY:	LAC
DATE:	9/21/2012



SITE VICINITY MAP REPLACE BRIDGE NO 750220 ON SR 2849 OVER BACHELOR CREEK RANDOLPH COUNTY, NORTH CAROLINA	
PROJECT NO.:	17BP.8.R.13

SHEET NO.	3
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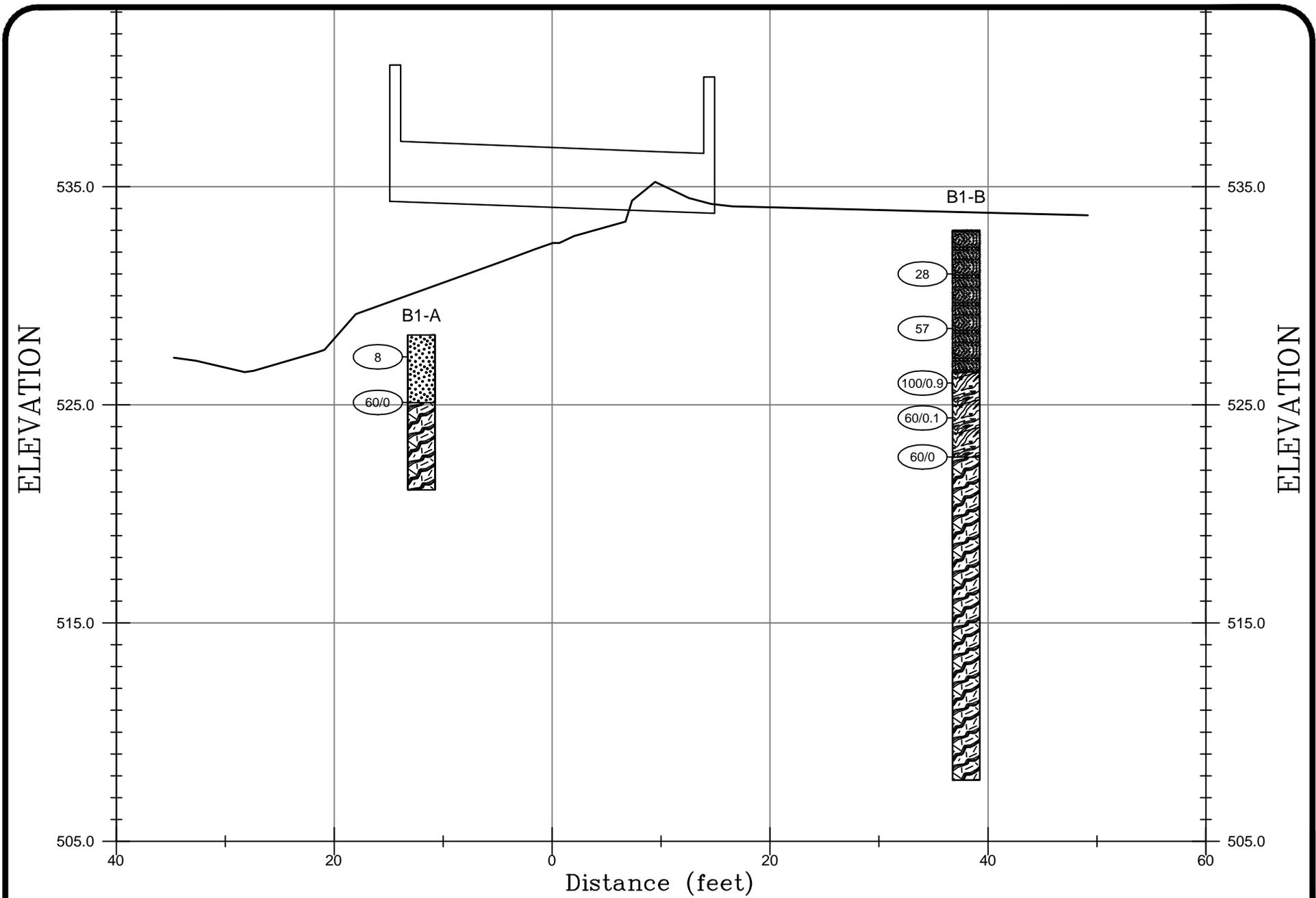
SCALE:	1" = 40'	DATE:	9/21/2012
PROJECT NO.	17BP.8.R.13	DRAWN BY:	JRW
CHECKED BY:	SSL		


S&ME
 WWW.SMEINC.COM
 ENGINEERING LICENSE NO: F-0176

FIELD EXPLORATION PLAN

 REPLACE STRUCTURE 750220
 ON SR 2849 OVER BACHELOR CREEK
 RANDOLPH COUNTY, NORTH CAROLINA

SHEET NO.
4

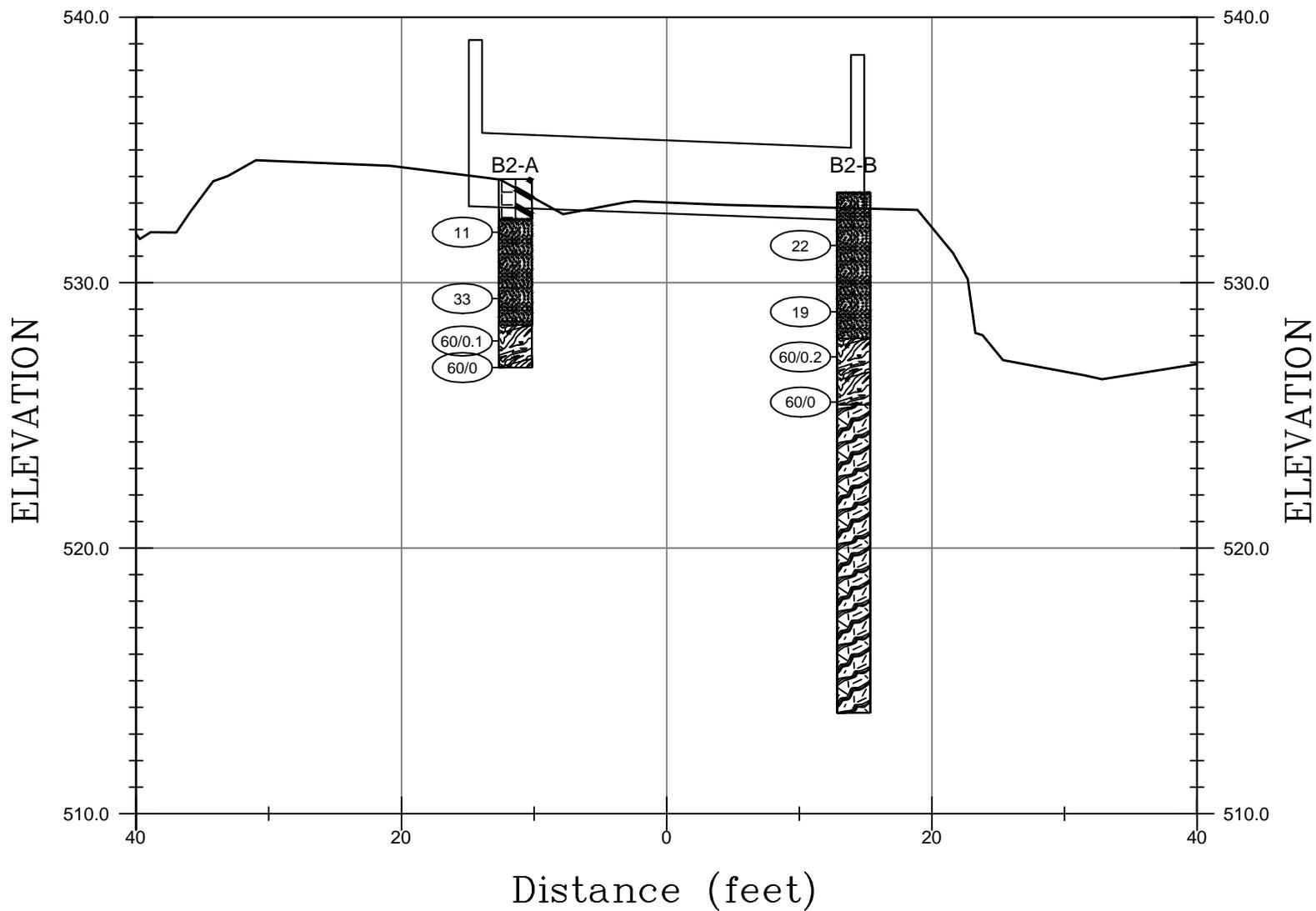


SCALE:	AS SHOWN	DATE:	9/21/2012
PROJECT NO.	17BP.8.R.13	DRAWN BY:	LAC
CHECKED BY:	SSL		


S&ME
 WWW.SMEINC.COM
 ENGINEERING LICENSE NO: F-0176

GENERALIZED SUBSURFACE CROSS SECTION
INTERIOR BENT No. 1 STA 15+03.93 -L-
 REPLACE STRUCTURE 750220
 ON SR 2849 OVER BACHELOR CREEK
 RANDOLPH COUNTY, NORTH CAROLINA

SHEET NO.
5



SCALE:	AS SHOWN	DATE:	9/21/2012
PROJECT NO.	17BP.8.R.13	DRAWN BY:	LAC
CHECKED BY:	SSL		


S&ME
 WWW.SMEINC.COM
 ENGINEERING LICENSE NO: F-0176

GENERALIZED SUBSURFACE CROSS SECTION
INTERIOR BENT No. 2 STA 15+84.08 -L-
 REPLACE STRUCTURE 750220
 ON SR 2849 OVER BACHELOR CREEK
 RANDOLPH COUNTY, NORTH CAROLINA

SHEET NO.
6



NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS N/A		TIP 17BP.8.R.13		COUNTY Randolph		GEOLOGIST J. Williamson					
SITE DESCRIPTION Proposed Bridge on SR 2849 Over Bachelor Creek							GROUND WTR (ft)				
BORING NO. EB1-A		STATION 14+75		OFFSET 13 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 536.5 ft		TOTAL DEPTH 19.7 ft		NORTHING 674,790		EASTING 1,783,904					
DRILL RIG/HAMMER EFF./DATE CME-550X 84% 9/5/2012				DRILL METHOD 3 1/4" HSA/NQ2 CORE		HAMMER TYPE Automatic					
DRILLER J. White		START DATE 08/07/12		COMP. DATE 08/07/12		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 8.4 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
525.2	525.2	11.3	4.4	2:30/1.4	(4.0) 91%	(1.7) 39%	(1.1) 100%	(0.8) 73%		Begin Coring @ 11.3 ft	11.3
				1:00/1.0			(0.0) 0%	(0.0) 0%		Gray METAVOLCANIC, Slightly Weathered, Hard, Close Fracture Spacing with 2 Joints at 60°	12.4
				2:15/1.0			(1.7) 53%	(0.0) 0%		CRISTALLINE ROCK Completely Weathered - No Recovery	12.8
				2:15/1.0						CRISTALLINE ROCK Gray METAVOLCANIC, Slightly Weathered, Hard, Close Fracture Spacing with 3 Joints at 60° and 1 Vertical Joint	16.0
520	520.8	15.7	4.0	3:00/1.0	(4.0) 100%	(3.6) 90%	(5.2) 141%	(4.5) 122%		CRISTALLINE ROCK Gray METAVOLCANIC, Very Slightly Weathered, Very Hard, Moderately Close to Close Fracture Spacing with 1 Joint at 60°, 1 Joint at 45°, and 1 Joint at 30°	19.7
				4:45/1.0							
				3:30/1.0							
				4:30/1.0							
	516.8	19.7								Boring Terminated at Elevation 516.8 ft In Crystalline Rock (Metavolcanic)	19.7
<p style="text-align: center;">1) 3 1/4" Hollow Stem Augers Advanced to 11.3 Feet 2) Standard Penetration Test Refusal at 11.3 Feet 3) HW Casing Advanced to 11.3 Feet 4) NQ2 Coring From 11.3 to 19.7 Feet 5) Water Used as Coring Fluid 6) Approximate Coring Fluid Density 62.4 pcf</p>											

NCDOT CORE SINGLE 22D.GPJ NC_DOT.GDT 9/21/12



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS N/A	TIP 17BP.8.R.13	COUNTY Randolph	GEOLOGIST J. Williamson
SITE DESCRIPTION Proposed Bridge on SR 2849 Over Bachelor Creek			GROUND WTR (ft)
BORING NO. EB1-B	STATION 14+82	OFFSET 8 ft RT	ALIGNMENT -L-
COLLAR ELEV. 536.9 ft	TOTAL DEPTH 10.1 ft	NORTHING 674,810	EASTING 1,783,915
DRILL RIG/HAMMER EFF./DATE CME-550X 84% 9/5/2012		DRILL METHOD 3 1/4" HSA	HAMMER TYPE Automatic
DRILLER J. White	START DATE 08/07/12	COMP. DATE 08/07/12	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
540																
														536.9	GROUND SURFACE	0.0
	535.9	1.0	3	4	7									535.4	ROADWAY EMBANKMENT Red Brown Silty CLAY (A-7-5)	1.5
535															RESIDUUM Orange Tan White Sandy SILT (A-4)	
	533.4	3.5	9	8	9											
	530.9	6.0	8	10	9											
530																
	528.4	8.5	12	35	65/0.1											
	526.8	10.1												527.4	WEATHERED ROCK (Metavolcanic)	9.5
			60/0											526.8		10.1
															Boring Terminated with Standard Penetration Test Refusal at Elevation 526.8 ft On Crystalline Rock (Metavolcanic) 1) 3 1/4" Hollow Stem Augers Advanced to 10.1 Feet 2) Standard Penetration Test Refusal at 10.1 Feet	

NCDOT BORE SINGLE 220.GPJ NC_DOT.GDT 9/21/12



NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS N/A		TIP 17BP.8.R.13		COUNTY Randolph		GEOLOGIST J. Williamson					
SITE DESCRIPTION Proposed Bridge on SR 2849 Over Bachelor Creek							GROUND WTR (ft)				
BORING NO. EB1-B		STATION 14+82		OFFSET 8 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 536.9 ft		TOTAL DEPTH 10.1 ft		NORTHING 674,810		EASTING 1,783,915					
DRILL RIG/HAMMER EFF./DATE CME-550X 84% 9/5/2012				DRILL METHOD 3 1/4" HSA		HAMMER TYPE Automatic					
DRILLER J. White		START DATE 08/07/12		COMP. DATE 08/07/12		SURFACE WATER DEPTH N/A					
CORE SIZE N/A		TOTAL RUN 0.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %			
536.9										Ground Surface	
				N=11						ROADWAY EMBANKMENT	
535				N=17						RESIDUUM	1.5
				N=19							
530				N=100/0.6							
				N=60/0							
										WEATHERED ROCK	9.5
										Boring Terminated with Standard Penetration Test Refusal at Elevation 526.8 ft On Crystalline Rock (Metavolcanic)	10.1
										1) 3 1/4" Hollow Stem Augers Advanced to 10.1 Feet 2) Standard Penetration Test Refusal at 10.1 Feet	

NCDOT CORE SINGLE 22D.GPJ NC_DOT.GDT 9/21/12



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS N/A	TIP 17BP.8.R.13	COUNTY Randolph	GEOLOGIST J. Williamson
SITE DESCRIPTION Proposed Bridge on SR 2849 Over Bachelor Creek			GROUND WTR (ft)
BORING NO. B1-A	STATION 15+09	OFFSET 12 ft LT	ALIGNMENT -L-
COLLAR ELEV. 536.9 ft	TOTAL DEPTH 15.8 ft	NORTHING 674,816	EASTING 1,783,882
DRILL RIG/HAMMER EFF./DATE CME-550X 84% 9/5/2012		DRILL METHOD 3 1/4" HSA/NQ2 CORE	HAMMER TYPE Automatic
DRILLER J. White	START DATE 08/08/12	COMP. DATE 08/08/12	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
540																
														536.9	GROUND SURFACE	0.0
														536.5	Timber Bridge Deck	0.4
															Space Under Bridge Deck	
535																
530																
	528.2	8.7	1	3	5									528.2		8.7
															ALLUVIUM Brown Silty Fine to Coarse SAND (A-2-4), some organic matter (wood fragments)	
525	525.1	11.8	60/0											525.1		11.8
															CRYSTALLINE ROCK (Metavolcanic)	
														521.1		15.8
															Boring Terminated at Elevation 521.1 ft In Crystalline Rock (Metavolcanic) 1) 3 1/4" Hollow Stem Augers Advanced to 11.8 Feet 2) Standard Penetration Test Refusal at 11.8 Feet 3) HW Casing Advanced to 11.8 Feet 4) NQ2 Coring From 11.8 to 15.8 Feet 5) Coring Terminated Due to Equipment Failure 6) Water Used as Coring Fluid 7) Approximate Coring Fluid Density 62.4 pcf	

NCDOT BORE SINGLE 220.GPJ NC_DOT.GDT 9/21/12



NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS N/A		TIP 17BP.8.R.13		COUNTY Randolph		GEOLOGIST J. Williamson						
SITE DESCRIPTION Proposed Bridge on SR 2849 Over Bachelor Creek							GROUND WTR (ft)					
BORING NO. B1-A		STATION 15+09		OFFSET 12 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 536.9 ft		TOTAL DEPTH 15.8 ft		NORTHING 674,816		EASTING 1,783,882						
DRILL RIG/HAMMER EFF./DATE CME-550X 84% 9/5/2012				DRILL METHOD 3 1/4" HSA/NQ2 CORE		HAMMER TYPE Automatic						
DRILLER J. White		START DATE 08/08/12		COMP. DATE 08/08/12		SURFACE WATER DEPTH N/A						
CORE SIZE NQ2		TOTAL RUN 4.0 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)	
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %				
525.1	525.1	11.8	4.0	3:00/1.0	(3.6) 90%	(3.4) 85%	(3.6) 90%	(3.4) 85%		Begin Coring @ 11.8 ft	11.8	
				2:15/1.0							11.8	
				2:00/1.0								
	521.1	15.8		1:30/1.0							521.1	15.8
										Boring Terminated at Elevation 521.1 ft In Crystalline Rock (Metavolcanic)		
										1) 3 1/4" Hollow Stem Augers Advanced to 11.8 Feet 2) Standard Penetration Test Refusal at 11.8 Feet 3) HW Casing Advanced to 11.8 Feet 4) NQ2 Coring From 11.8 to 15.8 Feet 5) Coring Terminated Due to Equipment Failure 6) Water Used as Coring Fluid 7) Approximate Coring Fluid Density 62.4 pcf		



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS N/A	TIP 17BP.8.R.13	COUNTY Randolph	GEOLOGIST J. Williamson
SITE DESCRIPTION Proposed Bridge on SR 2849 Over Bachelor Creek			GROUND WTR (ft)
BORING NO. B1-B	STATION 15+42	OFFSET 38 ft RT	ALIGNMENT -L-
COLLAR ELEV. 533.0 ft	TOTAL DEPTH 25.2 ft	NORTHING 674,876	EASTING 1,783,897
DRILL RIG/HAMMER EFF./DATE CME-550X 84% 9/5/2012		DRILL METHOD 3 1/4" HSA/NQ2 CORE	HAMMER TYPE Automatic
DRILLER J. White	START DATE 08/08/12	COMP. DATE 08/09/12	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
535																
														533.0	GROUND SURFACE	0.0
	532.0	1.0	4	11	17										RESIDUUM Orange White Sandy SILT (A-4)	
530	529.5	3.5	27	28	29											
	527.0	6.0	24	42	58/0.4											
525	524.5	8.5	60/0.1											526.5	WEATHERED ROCK (Metavolcanic)	6.5
	522.6	10.4	60/0											522.6	CRYSTALLINE ROCK (Metavolcanic)	10.4
520																
515																
510																
														507.8		25.2
<p style="text-align: center;">Boring Terminated at Elevation 507.8 ft In Crystalline Rock (Metavolcanic)</p> <ol style="list-style-type: none"> 1) 3 1/4" Hollow Stem Augers Advanced to 10.4 Feet 2) Standard Penetration Test Refusal at 10.4 Feet 3) HW Casing Advanced to 10.4 Feet 4) NQ2 Coring From 10.4 to 25.2 Feet 5) Water Used as Coring Fluid 6) Approximate Coring Fluid Density 62.4 pcf 																

NCDOT BORE SINGLE 220.GPJ NC_DOT.GDT 9/21/12



NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS N/A		TIP 17BP.8.R.13		COUNTY Randolph		GEOLOGIST J. Williamson						
SITE DESCRIPTION Proposed Bridge on SR 2849 Over Bachelor Creek									GROUND WTR (ft)			
BORING NO. B1-B		STATION 15+42		OFFSET 38 ft RT		ALIGNMENT -L-		0 HR. N/A				
COLLAR ELEV. 533.0 ft		TOTAL DEPTH 25.2 ft		NORTHING 674,876		EASTING 1,783,897		24 HR. N/A				
DRILL RIG/HAMMER EFF./DATE CME-550X 84% 9/5/2012				DRILL METHOD 3 1/4" HSA/NQ2 CORE		HAMMER TYPE Automatic						
DRILLER J. White		START DATE 08/08/12		COMP. DATE 08/09/12		SURFACE WATER DEPTH N/A						
CORE SIZE NQ2		TOTAL RUN 14.8 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)	
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %				
522.6		10.4	4.8	2:15/1.0	(4.5) 94%	(4.1) 85%	(14.5) 98%	(13.9) 94%		Begin Coring @ 10.4 ft		
	522.6			2:30/1.0						CRYSTALLINE ROCK Gray METAVOLCANIC, Slightly Weathered, Hard, Close Fracture Spacing with 5 Joints at 45°, 4 Joints at 30°, and 2 Joints at 60°	10.4	
520				3:00/1.0								
				2:45/1.0								
	517.8	15.2		2:30/0.8								
			5.0	1:45/1.0	(5.0) 100%	(4.8) 96%						
515				1:45/1.0								
				1:45/1.0								
	512.8	20.2		2:00/1.0								
			5.0	2:00/1.0	(5.0) 100%	(5.0) 100%						
510				2:00/1.0								
				2:15/1.0								
				2:45/1.0								
	507.8	25.2		2:30/1.0								
										Boring Terminated at Elevation 507.8 ft In Crystalline Rock (Metavolcanic)	25.2	
										1) 3 1/4" Hollow Stem Augers Advanced to 10.4 Feet 2) Standard Penetration Test Refusal at 10.4 Feet 3) HW Casing Advanced to 10.4 Feet 4) NQ2 Coring From 10.4 to 25.2 Feet 5) Water Used as Coring Fluid 6) Approximate Coring Fluid Density 62.4 pcf		

NCDOT CORE SINGLE 220.GPJ NC_DOT.GDT 9/21/12



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS N/A	TIP 17BP.8.R.13	COUNTY Randolph	GEOLOGIST J. Williamson
SITE DESCRIPTION Proposed Bridge on SR 2849 Over Bachelor Creek			GROUND WTR (ft)
BORING NO. B2-A	STATION 15+81	OFFSET 11 ft LT	ALIGNMENT -L-
COLLAR ELEV. 533.9 ft	TOTAL DEPTH 7.1 ft	NORTHING 674,870	EASTING 1,783,834
DRILL RIG/HAMMER EFF./DATE CME-550X 84% 9/5/2012		DRILL METHOD 3 1/4" HSA	HAMMER TYPE Automatic
DRILLER J. White	START DATE 08/07/12	COMP. DATE 08/07/12	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					ELEV. (ft)	
535														533.9	GROUND SURFACE	0.0
	532.9	1.0												532.4	ROADWAY EMBANKMENT Red Brown Silty CLAY (A-7-5)	1.5
			2	3	8										RESIDUUM Orange Yellow Sandy SILT (A-4)	
530	530.4	3.5	13	16	17											
	527.9	6.0												528.4	WEATHERED ROCK (Metavolcanic)	5.5
	526.8	7.1	60/0.1											526.8		7.1
			60/0												Boring Terminated with Standard Penetration Test Refusal at Elevation 526.8 ft On Crystalline Rock (Metavolcanic)	
															1) 3 1/4" Hollow Stem Augers Advanced to 7.1 Feet 2) Standard Penetration Test Refusal at 7.1 Feet	

NCDOT BORE SINGLE 220.GPJ NC_DOT.GDT 9/21/12



NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS N/A		TIP 17BP.8.R.13		COUNTY Randolph		GEOLOGIST J. Williamson					
SITE DESCRIPTION Proposed Bridge on SR 2849 Over Bachelor Creek							GROUND WTR (ft)				
BORING NO. B2-A		STATION 15+81		OFFSET 11 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 533.9 ft		TOTAL DEPTH 7.1 ft		NORTHING 674,870		EASTING 1,783,834					
DRILL RIG/HAMMER EFF./DATE CME-550X 84% 9/5/2012				DRILL METHOD 3 1/4" HSA		HAMMER TYPE Automatic					
DRILLER J. White		START DATE 08/07/12		COMP. DATE 08/07/12		SURFACE WATER DEPTH N/A					
CORE SIZE N/A		TOTAL RUN 0.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
533.9										Ground Surface	
				N=11						ROADWAY EMBANKMENT	
										532.4	1.5
				N=33						RESIDUUM	
530										528.4	5.5
				N=60/0.1						WEATHERED ROCK	
				N=60/0						526.8	7.1
<p>Boring Terminated with Standard Penetration Test Refusal at Elevation 526.8 ft On Crystalline Rock (Metavolcanic)</p> <p>1) 3 1/4" Hollow Stem Augers Advanced to 7.1 Feet 2) Standard Penetration Test Refusal at 7.1 Feet</p>											

NCDOT CORE SINGLE 22D.GPJ NC_DOT.GDT 9/21/12



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS N/A	TIP 17BP.8.R.13	COUNTY Randolph	GEOLOGIST J. Williamson
SITE DESCRIPTION Proposed Bridge on SR 2849 Over Bachelor Creek			GROUND WTR (ft)
BORING NO. B2-B	STATION 15+93	OFFSET 14 ft RT	ALIGNMENT -L-
COLLAR ELEV. 533.4 ft	TOTAL DEPTH 19.6 ft	NORTHING 674,896	EASTING 1,783,845
DRILL RIG/HAMMER EFF./DATE CME-550X 84% 9/5/2012		DRILL METHOD 3 1/4" HSA/NQ2 CORE	HAMMER TYPE Automatic
DRILLER J. White	START DATE 08/09/12	COMP. DATE 08/09/12	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
535															
	532.4	1.0	4	11	11									533.4	0.0
530	529.9	3.5	8	8	11										
	527.4	6.0	60/0.2											527.9	5.5
525	525.5	7.9	60/0											525.4	8.0
520															
515															
														513.8	19.6
<p>Boring Terminated at Elevation 513.8 ft In Crystalline Rock (Metavolcanic)</p> <ol style="list-style-type: none"> 1) 3 1/4" Hollow Stem Augers Advanced to 8.0 Feet 2) Standard Penetration Test Refusal at 8.0 Feet 3) HW Casing Advanced to 8.0 Feet 4) NQ2 Coring From 8.0 to 19.6 Feet 5) Water Used as Coring Fluid 6) Approximate Coring Fluid Density 62.4 pcf 															

NCDOT BORE SINGLE 220.GPJ NC_DOT.GDT 9/21/12



NCDOT GEOTECHNICAL ENGINEERING UNIT

CORE BORING REPORT

WBS N/A		TIP 17BP.8.R.13		COUNTY Randolph		GEOLOGIST J. Williamson						
SITE DESCRIPTION Proposed Bridge on SR 2849 Over Bachelor Creek									GROUND WTR (ft)			
BORING NO. B2-B		STATION 15+93		OFFSET 14 ft RT		ALIGNMENT -L-		0 HR. N/A				
COLLAR ELEV. 533.4 ft		TOTAL DEPTH 19.6 ft		NORTHING 674,896		EASTING 1,783,845		24 HR. N/A				
DRILL RIG/HAMMER EFF./DATE CME-550X 84% 9/5/2012				DRILL METHOD 3 1/4" HSA/NQ2 CORE		HAMMER TYPE Automatic						
DRILLER J. White		START DATE 08/09/12		COMP. DATE 08/09/12		SURFACE WATER DEPTH N/A						
CORE SIZE NQ2		TOTAL RUN 11.6 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)	
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %				
525.4	525.4	8.0	3.1	4:30/1.1	(3.0) 97%	(2.6) 84%	(11.1) 96%	(10.1) 87%		Begin Coring @ 8.0 ft	8.0	
				3:15/1.0						Gray METAVOLCANIC, Very Slightly Weathered, Hard, Close Fracture Spacing with 6 Joints at 60° and 1 Joint at 45°		
	522.3	11.1		3:30/1.0								
520			3.8	3:15/1.0	(3.8) 100%	(3.7) 98%						
				3:15/1.0								
	518.5	14.9		3:30/1.0								
			4.7	4:00/1.0	(4.3) 91%	(3.8) 81%						
515				4:30/1.0								
				2:45/1.0								
				2:30/1.0								
	513.8	19.6		2:45/1.0								
										Boring Terminated at Elevation 513.8 ft In Crystalline Rock (Metavolcanic)	19.6	
										1) 3 1/4" Hollow Stem Augers Advanced to 8.0 Feet 2) Standard Penetration Test Refusal at 8.0 Feet 3) HW Casing Advanced to 8.0 Feet 4) NQ2 Coring From 8.0 to 19.6 Feet 5) Water Used as Coring Fluid 6) Approximate Coring Fluid Density 62.4 pcf		

NCDOT CORE SINGLE 22D.GPJ NC_DOT.GDT 9/21/12



NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS N/A		TIP 17BP.8.R.13		COUNTY Randolph		GEOLOGIST J. Williamson					
SITE DESCRIPTION Proposed Bridge on SR 2849 Over Bachelor Creek							GROUND WTR (ft)				
BORING NO. EB2-A		STATION 16+05		OFFSET 11 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 532.7 ft		TOTAL DEPTH 8.1 ft		NORTHING 674,888		EASTING 1,783,818					
DRILL RIG/HAMMER EFF./DATE CME-550X 84% 9/5/2012				DRILL METHOD 3 1/4" HSA		HAMMER TYPE Automatic					
DRILLER J. White		START DATE 08/08/12		COMP. DATE 08/08/12		SURFACE WATER DEPTH N/A					
CORE SIZE N/A		TOTAL RUN 0.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %			
532.7										Ground Surface	
				N=15						ROADWAY EMBANKMENT	1.0
	530			N=25						RESIDUUM	
				N=100/0.7						RESIDUUM	4.5
				N=60/0.2 N=60/0						WEATHERED ROCK	5.5
	525									Boring Terminated with Standard Penetration Test Refusal at Elevation 524.6 ft On Crystalline Rock (Metavolcanic)	8.1
										1) 3 1/4" Hollow Stem Augers Advanced to 8.1 Feet 2) Standard Penetration Test Refusal at 8.1 Feet	

NCDOT CORE SINGLE 22D.GPJ NC_DOT.GDT 9/21/12



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS N/A	TIP 17BP.8.R.13	COUNTY Randolph	GEOLOGIST J. Williamson
SITE DESCRIPTION Proposed Bridge on SR 2849 Over Bachelor Creek			
BORING NO. EB2-B	STATION 16+29	OFFSET 25 ft RT	ALIGNMENT -L-
COLLAR ELEV. 533.1 ft	TOTAL DEPTH 15.5 ft	NORTHING 674,930	EASTING 1,783,831
DRILL RIG/HAMMER EFF./DATE CME-550X 84% 9/5/2012		DRILL METHOD 3 1/4" HSA	HAMMER TYPE Automatic
DRILLER J. White	START DATE 08/09/12	COMP. DATE 08/09/12	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
535																
														533.1	GROUND SURFACE	0.0
	532.1	1.0	4	9	10										RESIDUUM Tan White Sandy SILT (A-4)	
530	529.6	3.5	21	28	36											
	527.1	6.0	19	81/0.4												
525	525.2	7.9	60/0											526.6	WEATHERED ROCK (Metavolcanic)	6.5
														525.2	CRYSTALLINE ROCK (Metavolcanic)	7.9
520																
														517.6	Boring Terminated at Elevation 517.6 ft In Crystalline Rock (Metavolcanic)	15.5
															1) 3 1/4" Hollow Stem Augers Advanced to 7.9 Feet 2) Standard Penetration Test Refusal at 7.9 Feet 3) HW Casing Advanced to 7.9 Feet 4) NQ2 Coring From 7.9 to 15.5 Feet 5) Water Used as Coring Fluid 6) Approximate Coring Fluid Density 62.4 pcf	

NCDOT BORE SINGLE 220.GPJ NC_DOT.GDT 9/21/12



NCDOT GEOTECHNICAL ENGINEERING UNIT

CORE BORING REPORT

WBS N/A		TIP 17BP.8.R.13		COUNTY Randolph		GEOLOGIST J. Williamson					
SITE DESCRIPTION Proposed Bridge on SR 2849 Over Bachelor Creek							GROUND WTR (ft)				
BORING NO. EB2-B		STATION 16+29		OFFSET 25 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 533.1 ft		TOTAL DEPTH 15.5 ft		NORTHING 674,930		EASTING 1,783,831					
DRILL RIG/HAMMER EFF./DATE CME-550X 84% 9/5/2012				DRILL METHOD 3 1/4" HSA		HAMMER TYPE Automatic					
DRILLER J. White		START DATE 08/09/12		COMP. DATE 08/09/12		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 7.6 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
525.2	525.2	7.9	2.6	3:15/1.0	(2.6) 100%	(2.5) 96%	(7.6) 100%	(7.2) 95%		Begin Coring @ 7.9 ft	7.9
	522.6	10.5	5.0	2:45/1.0						CRYSTALLINE ROCK Gray Metavolcanic, Very Slightly Weathered, Hard, Close Fracture Spacing with 3 Joints at 60°	
				2:15/0.6							
				2:00/1.0	(5.0) 100%	(4.7) 94%					
				2:00/1.0							
520				2:30/1.0							
				1:45/1.0							
	517.6	15.5		2:30/1.0						Boring Terminated at Elevation 517.6 ft In Crystalline Rock (Metavolcanic)	15.5
										1) 3 1/4" Hollow Stem Augers Advanced to 7.9 Feet 2) Standard Penetration Test Refusal at 7.9 Feet 3) HW Casing Advanced to 7.9 Feet 4) NQ2 Coring From 7.9 to 15.5 Feet 5) Water Used as Coring Fluid 6) Approximate Coring Fluid Density 62.4 pcf	

NCDOT CORE SINGLE 22D.GPJ NC_DOT.GDT 9/21/12

Project No: 1351-11-343G	Project ID: 17BP.8.R.47	County: Randolph	Boring No.: EB1-A
Site Description: Proposed Bridge on SR 2849 over Bachelor Creek			Driller: J. White
Collar Elev.: 536.5	Core Size: NQ-2	Equipment: CME-550	Geologist: J. Williamson
Elev. at T.D.: 516.8	Total Depth: 19.7'	Total Run: 8.4'	Date: 08/07/2012



Box 1 of 1

Top of Box @ 11.3 feet; Bottom of Box @ 19.7 feet

Note: Rock is Completely Weathered from 12.4'-12.8' (No Recovery)

Project No: 1351-11-343G	Project ID: 17BP.8.R.13	County: Randolph	Boring No.: B1-A
Site Description: Proposed Bridge on SR 2849 over Bachelor Creek			Driller: J. White
Collar Elev.: 536.9	Core Size: NQ-2	Equipment: CME-550	Geologist: J. Williamson
Elev. at T.D.: 521.1	Total Depth: 15.8'	Total Run: 4.0'	Date: 08/08/2012



Box 1 of 1

Top of Box @ 11.8 feet; Bottom of Box @ 15.8 feet

Project No: 1351-11-343G	Project ID: 17BP.8.R.13	County: Randolph	Boring No.: B1-B
Site Description: Proposed Bridge on SR 2849 over Bachelor Creek			Driller: J. White
Collar Elev.: 533.0	Core Size: NQ-2	Equipment: CME-550	Geologist: J. Williamson
Elev. at T.D.: 507.8	Total Depth: 25.2'	Total Run: 14.8'	Date: 08/09/2012



Box 1 of 2
 Top of Box @ 10.4 feet; Bottom of Box @ 18.7 feet



Box 2 of 2
 Top of Box @ 18.7 feet; Bottom of Box @ 25.2 feet

Project No: 1351-11-343G	Project ID: 17BP.8.R.13	County: Randolph	Boring No.: B2-B
Site Description: Proposed Bridge on SR 2849 over Bachelor Creek			Driller: J. White
Collar Elev.: 533.4	Core Size: NQ-2	Equipment: CME-550	Geologist: J. Williamson
Elev. at T.D.: 513.8	Total Depth: 19.6'	Total Run: 11.6'	Date: 08/09/2012



Box 1 of 2

Top of Box @ 8.0 feet; Bottom of Box @ 15.9 feet



Box 2 of 2

Top of Box @ 15.9 feet; Bottom of Box @ 19.6 feet

<i>Project No:</i> 1351-11-343G	<i>Project ID:</i> 17BP.8.R.13	<i>County:</i> Randolph	<i>Boring No.:</i> EB2-B
<i>Site Description:</i> Proposed Bridge on SR 2849 over Bachelor Creek			<i>Driller:</i> J. White
<i>Collar Elev.:</i> 533.1	<i>Core Size:</i> NQ-2	<i>Equipment:</i> CME-550	<i>Geologist:</i> J. Williamson
<i>Elev. at T.D.:</i> 517.6	<i>Total Depth:</i> 15.5'	<i>Total Run:</i> 7.6'	<i>Date:</i> 08/09/2012



Box 1 of 1
Top of Box @ 7.9 feet; Bottom of Box @ 15.5 feet



Photograph No. 1:
View looking northwest up-station from southeast approach



Photograph No. 2:
View looking southeast down-station from northwest approach



Photograph No. 3:
View looking south upstream from bridge deck



Photograph No. 4:
View looking north downstream from bridge deck



Photograph No. 5:
View looking southeast at left side of End Bent 1



Photograph No. 6:
View looking southeast at right side of End Bent 1



Photograph No. 7:
View looking northwest at left side of End Bent 2



Photograph No. 8:
View looking northwest at right side of End Bent 2