

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 45354.1.12 F.A. PROJ. N/A

COUNTY Montgomery

PROJECT DESCRIPTION Bridge #130 on SR 1318 (Shiloh Church Rd.)  
over Dumas Creek

SITE DESCRIPTION Bridge #130 on SR 1318 (Shiloh Church Rd.)  
over Dumas Creek

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DATE June 27, 2011

**CAUTION NOTICE**

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

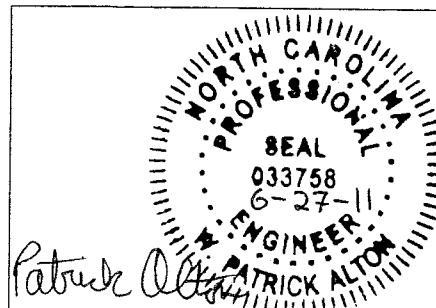
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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: D. Racey



**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING 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 THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.									
										ANGULARITY OF GRAINS									
SOIL LEGEND AND AASHTO CLASSIFICATION										MINERALOGICAL COMPOSITION									
GRANULAR MATERIALS (≤ 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS										MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.									
COMPRESSIONIBILITY										PERCENTAGE OF MATERIAL									
SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE HIGHLY COMPRESSIBLE										LIQUID LIMIT LESS THAN 31 LIQUID LIMIT EQUAL TO 31-50 LIQUID LIMIT GREATER THAN 50									
GRADATION										GROUND WATER									
GRANULAR SOILS SILT-CLAY SOILS MUCK, PEAT										WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP									
CONSISTENCY OR DENSENESS										MISCELLANEOUS SYMBOLS									
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/F <sup>2</sup> )										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD									
GENERALLY GRANULAR MATERIAL (NON-COHESIVE) VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE										TEST BORING TEST BORING W/ CORE SPT N-VALUE SPT REFUSAL									
GENERALLY SILT-CLAY MATERIAL (COHESIVE) VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD										MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST									
TEXTURE OR GRAIN SIZE										ABBREVIATIONS									
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 4.75 2.00 40 0.42 60 0.25 200 0.075 270 0.053										AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST OPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOG. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLT. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED γ <sub>u</sub> - UNIT WEIGHT γ <sub>d</sub> - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO									
BOULDER (BLOR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F. SD.) SILT (SL.) CLAY (CL.)										EQUIPMENT USED ON SUBJECT PROJECT									
GRAIN SIZE MM 305 12 75 3 2.0 0.25 0.05 0.005										DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST									
SOIL MOISTURE - CORRELATION OF TERMS										ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING W/ ADVANCER TRICONE * STEEL TEETH TRICONE * TUNG-CARB. CORE BIT									
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: -B -N 0.3 -H HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST									
LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT										- SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE									
PLASTICITY										COLOR									
NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY										PLASTICITY INDEX (PI) 0-5 6-15 16-25 26 OR MORE DRY STRENGTH VERY LOW SLIGHT MEDIUM HIGH									
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.																			

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**ROCK DESCRIPTION**

**TERMS AND DEFINITIONS**

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)		NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLDWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)		FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)		FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)		COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

**ALLUVIUM (ALLOY.)** - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.  
**AQUIFER** - A WATER BEARING FORMATION OR STRATA.  
**ARENACEOUS** - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.  
**ARGILLACEOUS** - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.  
**ARTESIAN** - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.  
**CALCAREOUS (CALC.)** - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.  
**COLLUVIUM** - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.  
**CORE RECOVERY (REC.)** - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

**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 &gt; 100 BPF</i>
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES &lt; 100 BPF</i>
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

**DIKE** - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.  
**DIP** - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.  
**DIP DIRECTION (DIP AZIMUTH)** - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.  
**FAULT** - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.  
**FISSILE** - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.  
**FLOAT** - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.  
**FLOOD PLAIN (FP)** - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.  
**FORMATION (FM.)** - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.  
**JOINT** - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.  
**LEDGE** - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.  
**LENS** - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.  
**MOTTLED (MOT.)** - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.  
**PERCHED WATER** - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.  
**RESIDUAL (RES.) SOIL** - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.  
**ROCK QUALITY DESIGNATION (ROQI)** - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.  
**SAPROLITE (SAP.)** - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.  
**SILL** - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRODUCED ROCKS.  
**SLICKENSIDE** - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.  
**STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)** - NUMBER OF BLOWS (N OR BPF) OF A 149 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.  
**STRATA CORE RECOVERY (SREC.)** - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.  
**STRATA ROCK QUALITY DESIGNATION (SROQI)** - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.  
**TOPSOIL (TS.)** - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

**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. COUGES 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 GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

**FRAC** - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.  
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**TOPSOIL (TS.)** - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

**FRAC**

**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

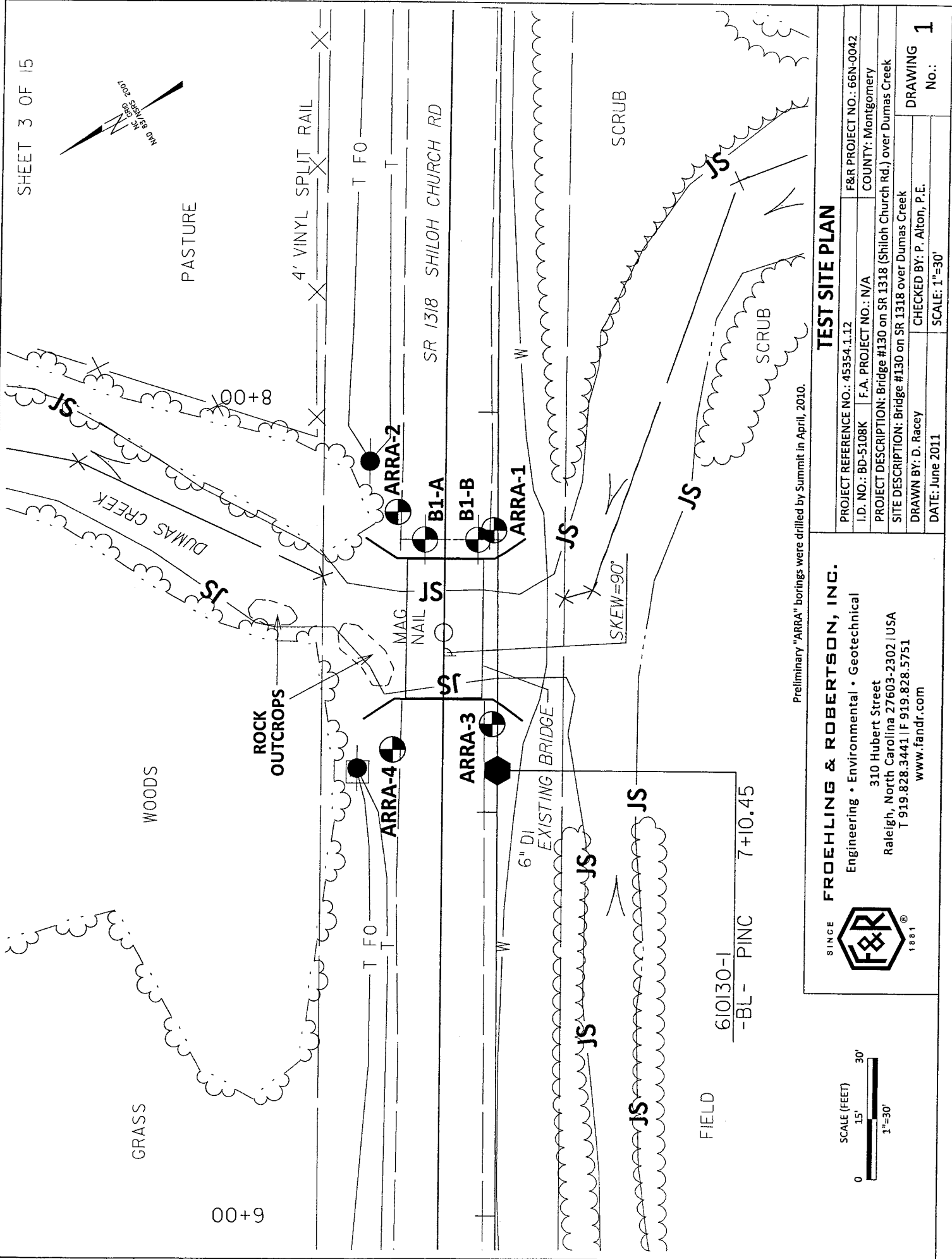
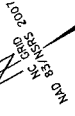
**BENCH MARK:** TBM: BL-103 N: 599072.3140 E: 1725675.8180  
**ELEVATION:** 544.05 **FT.**

**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.

**NOTES:**



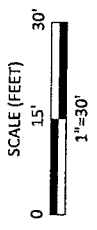
Preliminary "ARRA" borings were drilled by Summit in April, 2010.

**TEST SITE PLAN**

PROJECT REFERENCE NO.: 45354.1.12	F&R PROJECT NO.: 66N-0042
I.D. NO.: BD-5108K	F.A. PROJECT NO.: N/A
COUNTY: Montgomery	
PROJECT DESCRIPTION: Bridge #130 on SR 1318 (Shiloh Church Rd.) over Dumas Creek	
SITE DESCRIPTION: Bridge #130 on SR 1318 over Dumas Creek	
DRAWN BY: D. Racey	CHECKED BY: P. Alton, P.E.
DATE: June 2011	SCALE: 1"=30'
DRAWING No.: <b>1</b>	

**FROEHLING & ROBERTSON, INC.**

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 310 Hubert Street  
 Raleigh, North Carolina 27603-2302 | USA  
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 www.fandr.com



FIELD 610130-1  
 -BL- PINC 7+10.45



# NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 45354.1.12		TIP BD-5108K		COUNTY MONTGOMERY		GEOLOGIST Skeen, M.														
SITE DESCRIPTION Bridge No. 130 on SR 1318 (Shiloh Church Road) over Doomas Creek							GROUND WTR (ft)													
BORING NO. ARRA-4		STATION N/A		OFFSET N/A		ALIGNMENT -L-														
COLLAR ELEV. 545.0 ft		TOTAL DEPTH 14.4 ft		NORTHING 598,990		EASTING 1,725,877														
DRILL RIG/HAMMER EFF./DATE Diedrich D-50		DRILL METHOD H.S. Augers			HAMMER TYPE Automatic															
DRILLER Duggins, W.T.		START DATE 04/05/10		COMP. DATE 04/05/10		SURFACE WATER DEPTH N/A														
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)						
			0.5ft	0.5ft	0.5ft	0	25	50	75	100										
545														545.0	0.0	GROUND SURFACE				
540	541.5	3.5	2	2	3								545.0		ROADWAY EMBANKMENT Red and brown medium stiff fine sandy silty CLAY (A-7-5)					
535	536.5	8.5	4	7	8													538.0	7.0	RESIDUAL Tan and gray medium stiff fine sandy SILT (A-4)
	531.5	13.5																532.0	13.0	
	530.7	14.3	60	40/0.1						100/0.6			530.6	14.4		WEATHERED ROCK (Gray Metavolcanic)				
			60/0.1							60/0.1						Boring Terminated with Standard Penetration Test Refusal at Elevation 530.6 ft on Crystalline Rock: Gray Metavolcanic				
																1) Advanced 2-1/4 HSA to a depth of 14.3 feet.				
																2) Northing, Easting and Collar Elev. taken from bd5108k_ncdot_fs.dgn				

NCDOT BORE SINGLE BD5108K GEO\_BRDG0130.GPJ NC\_DOT.GDT 06/30/11



# NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 45354.1.12		TIP BD-5108K		COUNTY MONTGOMERY		GEOLOGIST Skeen, M.											
SITE DESCRIPTION Bridge No. 130 on SR 1318 (Shiloh Church Road) over Doomas Creek							GROUND WTR (ft)										
BORING NO. ARRA-3		STATION N/A		OFFSET N/A		ALIGNMENT -L-											
COLLAR ELEV. 545.0 ft		TOTAL DEPTH 10.9 ft		NORTHING 598,965		EASTING 1,725,870											
DRILL RIG/HAMMER EFF/DATE Diedrich D-50				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Duggins, W.T.		START DATE 04/05/10		COMP. DATE 04/05/10		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
545															545.0	0.0	GROUND SURFACE
540	541.6	3.4	2	2	2									M	539.0	6.0	ROADWAY EMBANKMENT Red and brown soft fine sandy silty CLAY (A-7-5)
535	536.6	8.4	1	3	5									W	534.5	10.5	ALLUVIAL Red and tan medium stiff fine sandy SILT (A-4), with trace organics
	534.1	10.9	60/0			60/0							No Rec	534.1	10.9	WEATHERED ROCK (Gray Metavolcanic) Boring Terminated by Auger Refusal at Elevation 534.1 ft on Crystalline Rock: Gray Metavolcanic  1) Advanced 2-1/4 HSA to a depth of 10.9 feet.  2) Northing, Easting and Collar Elev. taken from bd5108k_ncdot_fs.dgn	

NCDOT BORE SINGLE BD5108K\_GEO\_BRDG0130.GPJ NC\_DOT.GDT 06/30/11



# NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 45354.1.12	TIP BD-5108K	COUNTY MONTGOMERY	GEOLOGIST D. Racey (Field Professional)
SITE DESCRIPTION Bridge #130 on SR 1318 (Shiloh Church Rd.) over Dumas Creek			GROUND WTR (ft)
BORING NO. B1-A	STATION N/A	OFFSET N/A	ALIGNMENT N/A
0 HR. Dry			
COLLAR ELEV. 545.4 ft	TOTAL DEPTH 33.1 ft	NORTHING 598,957	EASTING 1,725,919
24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 85% 12/14/2009		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic
DRILLER J. Gilchrist	START DATE 06/16/11	COMP. DATE 06/16/11	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
550																	
545	544.3	1.1													545.4	GROUND SURFACE	0.0
															544.3	ASPHALT	1.1
	541.9	3.5	10	8	4	12									543.1	ROADWAY EMBANKMENT	2.3
540			3	3	3	6										Tan, silty fine SAND (A-2-4), with trace quartz fragments.	
																Red & tan, silty CLAY (A-7-5), with trace fine sand.	
	536.9	8.5	2	1	1	2									536.9	ALLUVIAL	8.5
535																Tan & gray, fine to coarse sandy CLAY (A-6).	
	531.9	13.5	3	1	2	3									533.4	Gray, highly sandy SILT (A-4).	12.0
530															530.9	Gray, silty fine SAND (A-2-4), with trace gravel & clay.	14.5
															529.9		15.5
	527.6	17.8	60/0.0							60/0.0					527.6	WEATHERED ROCK (Gray METAVOLCANIC ROCK)	17.8
525																CRYSTALLINE ROCK (Gray METAVOLCANIC ROCK)	
520																	
515																	
															512.3		33.1
															Boring Terminated at Elevation 512.3 ft in CRYSTALLINE ROCK (METAVOLCANIC)		
<p>NOTES:</p> <ol style="list-style-type: none"> <li>1) 0.0-1.1' = Asphalt</li> <li>2) Field Professional indicates strata break in split spoon at depths of 2.3' &amp; 14.5'.</li> <li>3) Driller indicates harder drilling at a depth of 15.5'.</li> <li>4) Auger refusal at 17.8', began coring at a depth of 17.8'.</li> <li>5) 0 hr. water level measured inside HSA before coring.</li> <li>6) Boring Filled Immediately After Drilling (FIAD) due to location in roadway.</li> </ol>																	

NCDOT BORE SINGLE BD-5108K GEO BRDG0130.GPJ NC\_DOT\_GDT 6/27/11



# NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS 45354.1.12		TIP BD-5108K		COUNTY MONTGOMERY		GEOLOGIST D. Racey (Field Professional)							
SITE DESCRIPTION Bridge #130 on SR 1318 (Shiloh Church Rd.) over Dumas Creek									GROUND WTR (ft)				
BORING NO. B1-A		STATION N/A		OFFSET N/A		ALIGNMENT N/A		0 HR. Dry					
COLLAR ELEV. 545.4 ft		TOTAL DEPTH 33.1 ft		NORTHING 598,957		EASTING 1,725,919		24 HR. FIAD					
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 85% 12/14/2009				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic							
DRILLER J. Gilchrist		START DATE 06/16/11		COMP. DATE 06/16/11		SURFACE WATER DEPTH N/A							
CORE SIZE NQ3				TOTAL RUN 15.3 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)	
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %				
527.6													
	527.6	17.8	3.3	4:10/1.0 5:02/1.0 4:30/1.0	(3.3) 100%	(3.3) 100%		(15.1) 99%	(14.5) 95%		527.6		
525	524.3	21.1		1:05/0.3 4:30/1.0 4:20/1.0 4:17/1.0 4:15/1.0 4:37/1.0	(5.0) 100%	(5.0) 100%							
520	519.3	26.1	5.0										
				3:52/1.0 4:02/1.0 4:27/1.0 4:22/1.0 4:23/1.0	(5.0) 100%	(4.5) 90%							
515	514.3	31.1											
	512.3	33.1	2.0	5:18/1.0 5:27/1.0	(1.8) 90%	(1.7) 85%						512.3	33.1
<p>Boring Terminated at Elevation 512.3 ft in CRYSTALLINE ROCK (METAVOLCANIC)</p>													
<p>NOTES:</p> <ol style="list-style-type: none"> <li>1) 0.0-1.1' = Asphalt</li> <li>2) Field Professional indicates strata break in split spoon at depths of 2.3' &amp; 14.5'.</li> <li>3) Driller indicates harder drilling at a depth of 15.5'.</li> <li>4) Auger refusal at 17.8', began coring at a depth of 17.8'.</li> <li>5) 0 hr. water level measured inside HSA before coring.</li> <li>6) Boring Filled Immediately After Drilling (FIAD) due to location in roadway.</li> </ol>													

NCDOT CORE\_SINGLE\_BD-5108K\_GEO\_BRDG0130.GPJ\_NC\_DOT\_GDT\_6/27/11



# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 45354.1.12	TIP BD-5108K	COUNTY MONTGOMERY	GEOLOGIST D. Racey (Field Professional)
SITE DESCRIPTION Bridge #130 on SR 1318 (Shiloh Church Rd.) over Dumas Creek			GROUND WTR (ft)
BORING NO. B1-B	STATION N/A	OFFSET N/A	ALIGNMENT N/A
COLLAR ELEV. 545.4 ft	TOTAL DEPTH 32.5 ft	NORTHING 598,946	EASTING 1,725,912
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 85% 12/14/2009		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic
DRILLER J. Gilchrist	START DATE 06/15/11	COMP. DATE 06/15/11	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
550																
545	544.7	0.7												545.4	0.0	GROUND SURFACE
														544.7	0.7	ASPHALT
			5	4	1									543.5	1.9	ROADWAY EMBANKMENT
540	541.9	3.5	2	3	3											Tan, silty fine to coarse SAND (A-2-4), with trace clay, quartz fragments & gravel.
																Red, tan & gray, silty CLAY (A-7-5), with little to some fine sand, little coarse sand, trace quartz fragments.
	536.9	8.5	3	3	1									536.9	8.5	ALLUVIAL
535																Tan & gray, fine sandy SILT (A-4), with trace clay.
	531.9	13.5	7	7	8									533.4	12.0	Gray, silty fine to coarse SAND (A-2-4), with little clay, trace rounded gravel.
530														529.9	15.5	WEATHERED ROCK
	528.3	17.1												528.3	17.1	(Gray METAVOLCANIC ROCK)
		60/0.1												528.2	17.2	CRYSTALLINE ROCK
525														526.4	19.0	(Gray METAVOLCANIC ROCK)
520																
515																
														512.9	32.5	Boring Terminated at Elevation 512.9 ft in CRYSTALLINE ROCK (METAVOLCANIC)

**NOTES:**

- 1) 0.0-0.7' = Asphalt
- 2) Field Professional indicates strata break in split spoon at a depth of 1.9'.
- 3) Driller indicates harder drilling at a depth of 15.5'.
- 4) Auger refusal at 17.1', began coring at a depth of 17.2'.
- 5) 0 hr. water level measured inside HSA before coring.
- 6) Boring Filled Immediately After Drilling (FIAD) due to location in roadway.



# NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS 45354.1.12		TIP BD-5108K		COUNTY MONTGOMERY		GEOLOGIST D. Racey (Field Professional)					
SITE DESCRIPTION Bridge #130 on SR 1318 (Shiloh Church Rd.) over Dumas Creek							GROUND WTR (ft)				
BORING NO. B1-B		STATION N/A		OFFSET N/A		ALIGNMENT N/A	0 HR. 15.8				
COLLAR ELEV. 545.4 ft		TOTAL DEPTH 32.5 ft		NORTHING 598,946		EASTING 1,725,912	24 HR. FIAD				
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 85% 12/14/2009				DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic					
DRILLER J. Gilchrist		START DATE 06/15/11		COMP. DATE 06/15/11		SURFACE WATER DEPTH N/A					
CORE SIZE NQ3				TOTAL RUN 15.3 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) %			
528.2										Begin Coring @ 17.2 ft	
	528.2	17.2	3.3	4:00/1.0 2:55/1.0 4:33/1.0	(2.9) 88%	(1.9) 58%	(1.4) 78%	(0.6) 33%		CRISTALLINE ROCK	17.2
525	524.9	20.5	5.0	1:25/0.3 3:32/1.0 3:31/1.0 3:40/1.0 3:45/1.0 3:50/1.0	(5.0) 100%	(5.0) 100%	(13.2) 98%	(12.6) 93%		Gray, moderately severe weathered, soft to medium hard METAVOLCANIC ROCK, close fracture spacing. R <sub>1</sub> =1, R <sub>2</sub> =8, R <sub>3</sub> =5, R <sub>4</sub> =0, R <sub>5</sub> =0 RMR = 14 ROCK TYPE = E	19.0
520	519.9	25.5	4.5	3:49/1.0 4:16/1.0 4:11/1.0 4:15/1.0	(4.5) 100%	(4.5) 100%				Gray, very slightly weathered to fresh, very hard to hard METAVOLCANIC ROCK, close to wide fracture spacing. RS-1: 20.8'-21.1' qu=8,640 psi R <sub>1</sub> =7, R <sub>2</sub> =20, R <sub>3</sub> =10, R <sub>4</sub> =12, R <sub>5</sub> =7 RMR = 56 ROCK TYPE = E	
515	515.4	30.0	2.5	3:29/0.5 3:40/1.0 3:20/1.0 1:05/0.5	(2.2) 88%	(1.8) 72%					Boring Terminated at Elevation 512.9 ft in CRISTALLINE ROCK (METAVOLCANIC)
	512.9	32.5									

- NOTES:
- 1) 0.0-0.7' = Asphalt
  - 2) Field Professional indicates strata break in split spoon at a depth of 1.9'.
  - 3) Driller indicates harder drilling at a depth of 15.5'.
  - 4) Auger refusal at 17.1', began coring at a depth of 17.2'.
  - 5) 0 hr. water level measured inside HSA before coring.
  - 6) Boring Filled Immediately After Drilling (FIAD) due to location in roadway.

NCDOT CORE SINGLE BD-5108K GEO BRDG0130.GPJ NC\_DOT\_GDT 6/27/11





# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

WBS 45354.1.12	TIP BD-5108K	COUNTY MONTGOMERY	GEOLOGIST Skeen, M.
SITE DESCRIPTION Bridge No. 130 on SR 1318 (Shiloh Church Road) over Doomas Creek			GROUND WTR (ft)
BORING NO. ARRA-1	STATION N/A	OFFSET N/A	ALIGNMENT -L-
COLLAR ELEV. 545.1 ft	TOTAL DEPTH 15.2 ft	NORTHING 598,941	EASTING 1,725,912
DRILL RIG/HAMMER EFF./DATE Diedrich D-50		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Duggins, W.T.	START DATE 04/05/10	COMP. DATE 04/05/10	SURFACE WATER DEPTH N/A

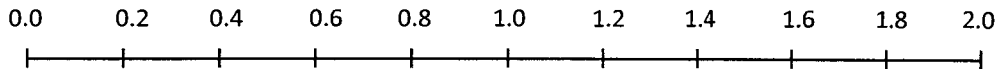
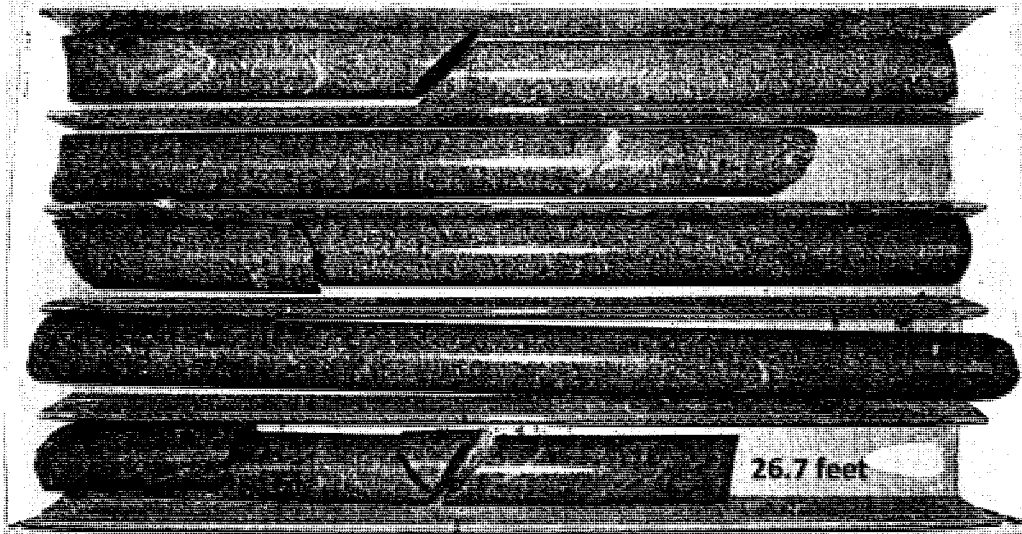
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
550															
545															
540	541.6	3.5	1	2	2								M	545.1 GROUND SURFACE 0.0 544.6 ASPHALT (6 inches) ROADWAY EMBANKMENT Red and brown soft fine sandy silty CLAY (A-7-5)	
535	536.6	8.5	1	WOH	WOH								W	537.1 ALLUVIAL 8.0 Gray very soft clayey SILT (A-5)	
530	531.6	13.5												532.6 RESIDUAL 12.5 Gray medium dense silty fine SAND (A-2-4)	
	530.0	15.1	5	7	10								M No Rec	530.1 WEATHERED ROCK 15.0 (Gray Metavolcanic) Boring Terminated with Standard Penetration Test Refusal at Elevation 529.9 ft on Crystalline Rock: Gray Metavolcanic  1) Advanced 2-1/4 HSA to a depth of 15.1 feet.  2) Northing, Easting and Collar Elev. taken from bd5108k_ncdot_fs.dgn	
			60/0.1												60/0.1

NCDOT BORE SINGLE BD5108K\_GEO\_BRDG0130.GPJ NC\_DOT\_GDT 06/30/11



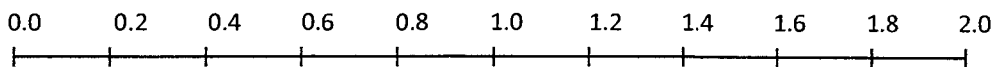
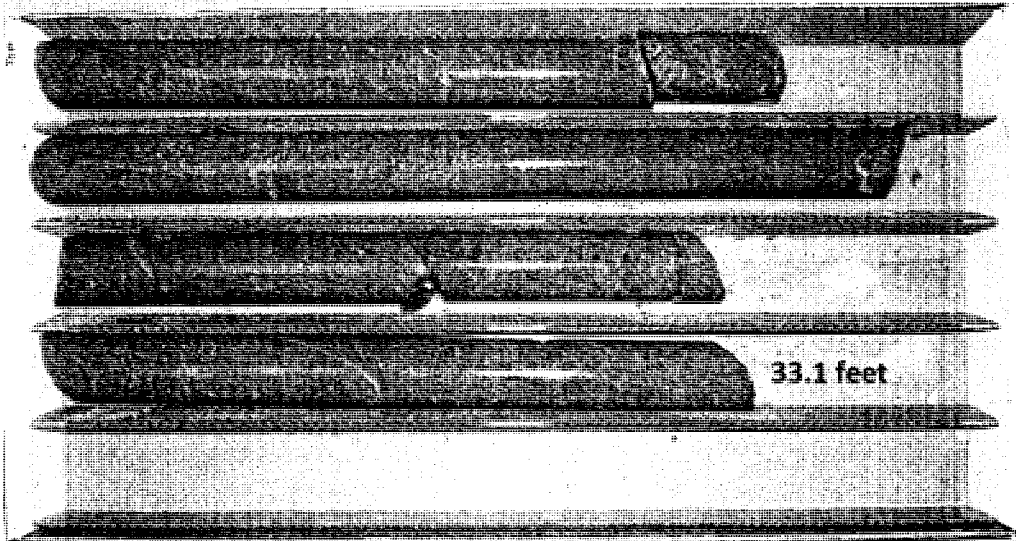
# Bridge No. 130 on SR 1318 over Dumas Creek CORE PHOTOGRAPHS: B1-A

17.8 feet



SCALE IN FEET

26.7 feet

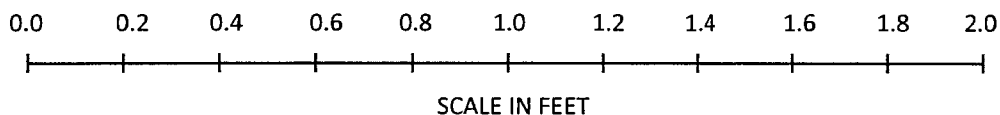
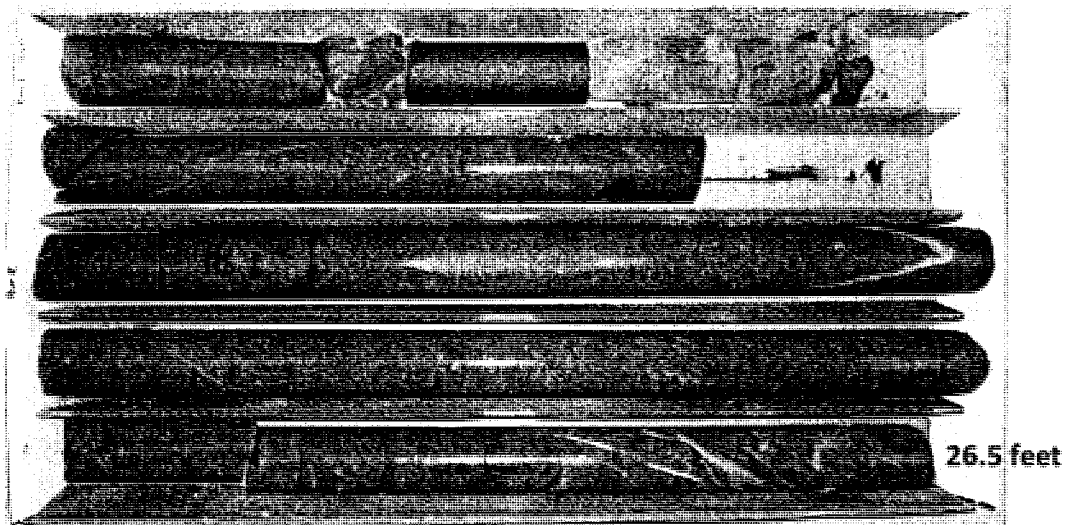


SCALE IN FEET

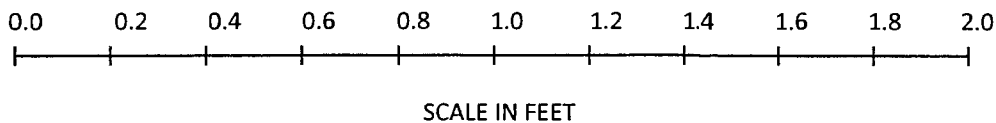
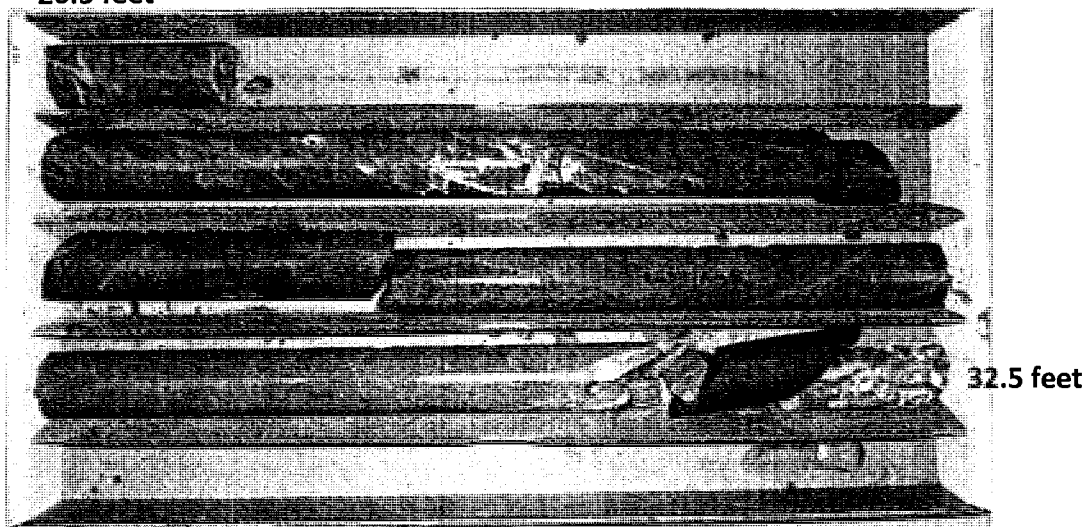


# Bridge No. 130 on SR 1318 over Dumas Creek CORE PHOTOGRAPHS: B1-B

17.2 feet



26.5 feet





FIELD  
SCOUR REPORT

WBS: 45354.1.12 TIP: BD-5108K COUNTY: Montgomery

DESCRIPTION(1): Bridge No. 130 on SR 1318 over Dumas Creek

**EXISTING BRIDGE**

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

Bridge No.: 130 Length: 35.5 Total Bents: 2 Bents in Channel: 0 Bents in Floodplain: 0  
Foundation Type: Timber cap on concrete encased piles

**EVIDENCE OF SCOUR(2)**

Abutments or End Bent Slopes: Scouring @ NW end of abutment

Interior Bents: N/A

Channel Bed: None

Channel Bank: Scouring ~50 feet north of bridge on west bank

**EXISTING SCOUR PROTECTION**

Type(3): Old abutments

Extent(4): Southern half of bridge, both sides

Effectiveness(5): Working

Obstructions(6): Beaver dam ~30 feet south, debris from dam collecting on rocks under bridge

**INSTRUCTIONS**

- 1 Describe the specific site's location, including route number and body of water crossed.
- 2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- 3 Note existing scour protection (e.g. rip rap).
- 4 Describe extent of existing scour protection.
- 5 Describe whether or not the scour protection appears to be working.
- 6 Note obstructions such as dams, fallen trees, debris at bents, etc.
- 7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- 8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- 9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- 10 Determine the approximate floodplain width from field observation or a topographic map.
- 11 Describe the material covering the floodplain (e.g. grass, trees, crops).
- 12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- 14 Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoretical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

**DESIGN INFORMATION**

Channel Bed Material(7): Brown, f-cse SAND (A-1-b), with gravel  
Sample S-1

Channel Bank Material(8): Brown, f sandy SILT (A-4), with roots  
Sample S-2

Channel Bank Cover(9): Grass, weeds

Floodplain Width(10): 300' SW, 0' SE, 50' NW, 200' NE

Floodplain Cover(11): Grass SW, NE; trees/grass NW

Stream is(12): Aggrading  Degrading  Static

Channel Migration Tendency(13): West

Observations and Other Comments: \_\_\_\_\_

Reported by: *Derick Racey* Date: 6/15/2011  
 Derick Racey

**DESIGN SCOUR ELEVATIONS(14)**

Feet  Meters

**BENTS**  
**B1**

330.4'										

Comparison of DSE to Hydraulics Unit theoretical scour:  
 Geotechnical Engineering Unit agrees with the Hydraulics Unit theoretical scour.

DSE determined by: *Cheryl A. Youngblood* Date: 6/24/2011  
 Cheryl A. Youngblood, LG, CPG

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

Bed or Bank									
Sample No.	No soil samples were lab tested during this investigation. Soils were visually classified in the								
Retained #4									
Passed #10									
Passed #40									
Passed #200									
Coarse Sand									
Fine Sand									
Silt									
Clay									
LL									
PI									
AASHTO									
Station									
Offset									
Depth									