

STATE	STATE PROJECT REFERENCE NO.	SHEET	TOTAL SHEETS
N.C.	BD-5114Y	1	9

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 45360.1.25 F.A. PROJ. N/A
COUNTY Henderson
PROJECT DESCRIPTION Bridge No. 135 on SR 1215 (Turley Falls Road)
over Shaw Creek

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PERSONNEL

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INVESTIGATED BY F&R, Inc.
CHECKED BY M. Walke, P.E.
SUBMITTED BY F&R, Inc.
DATE August 2013

CAUTION NOTICE

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NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

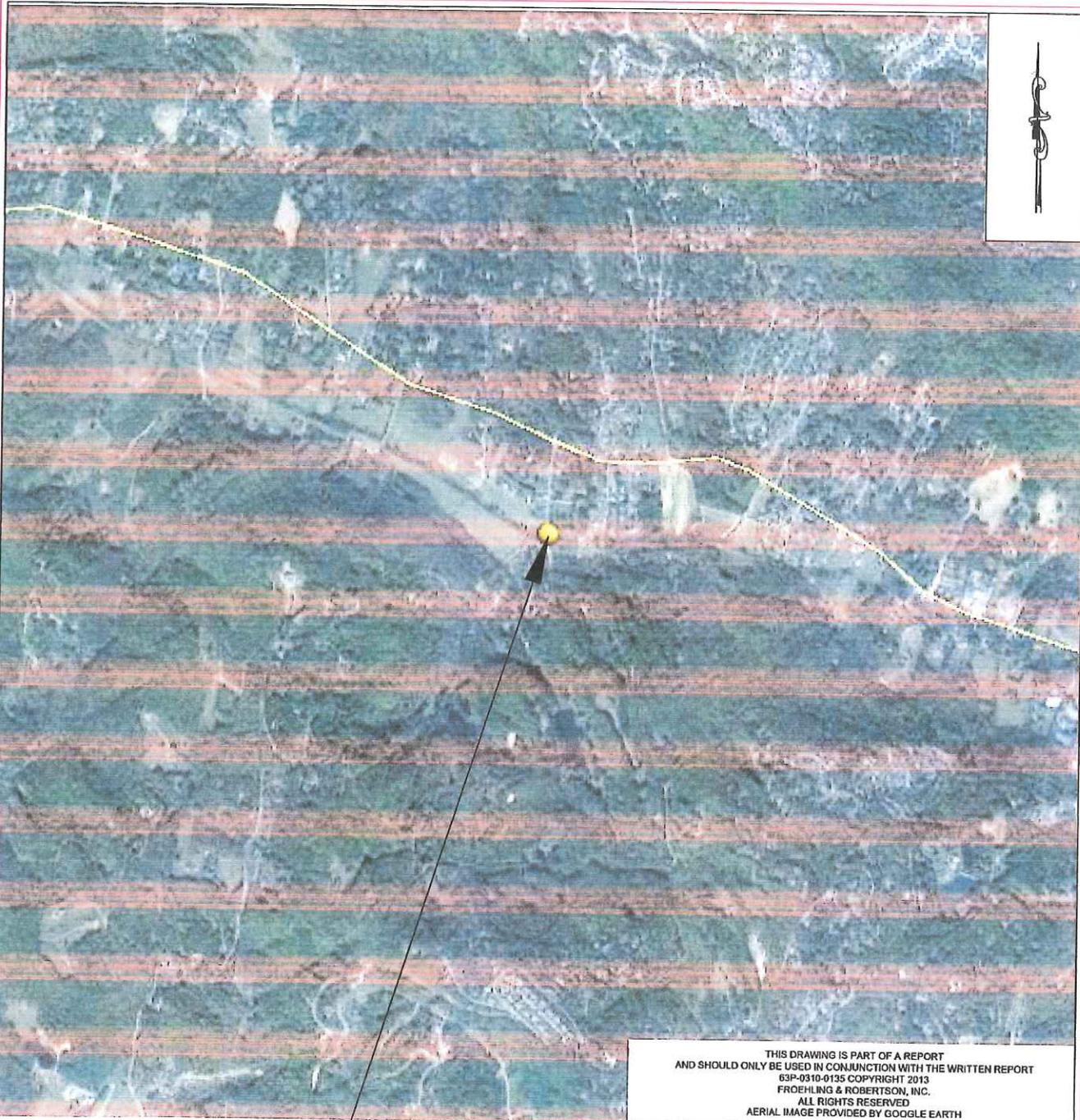
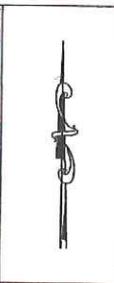
DRAWN BY: M. Brewer, E.I.

**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 (ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: VERY STIFF, GRAY, SILTY CLAY, MOST 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 IS DESIGNATED BY THE TERMS ANGULAR , SUBANGULAR , SUBROUNDED , OR ROUNDED .										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 (< 30% PASSING #200)					SILT-CLAY MATERIALS (> 35% PASSING #200)					ORGANIC MATERIALS				
GROUP CLASS.					A-1, A-1-a, A-1-b, A-3, A-2-4, A-2-5, A-2-6, A-2-7					A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7									
SYMBOL					[Diagrams showing soil symbols for various groups]					[Diagrams showing soil symbols for various groups]					[Diagrams showing soil symbols for various groups]				
% PASSING					50 MX, 30 MX, 20 MX, 15 MX, 10 MX, 5 MX					10 MX, 5 MX, 2.5 MX, 1.18 MX, 0.60 MX, 0.25 MX					GRANULAR SOILS, SILT-CLAY SOILS, MUCK, PEAT				
LIQUID LIMIT					60, 50, 40, 30, 20, 10					25, 20, 15, 10, 5					SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER, HIGHLY ORGANIC SOILS				
GROUP INDEX					0, 1, 2, 3, 4, 5, 6, 7, 8, 9					0, 1, 2, 3, 4, 5, 6, 7, 8, 9					FAIR TO POOR, POOR, UNSUITABLE				
USUAL TYPES OF MAJOR MATERIALS					FINE SAND, SILTY OR CLAYEY GRAVEL AND SAND, SILTY SOILS, CLAYEY SOILS														
GENERAL RATING AS A SUBGRADE					EXCELLENT TO GOOD					FAIR TO POOR					POOR, UNSUITABLE				
PI OF A-7-5 SUBGROUP IS ≤ LL - 30										PI OF A-7-6 SUBGROUP IS > LL - 30									
CONSISTENCY OR DENSITY										MISCELLANEOUS SYMBOLS									
PRIMARY SOIL TYPE		COMPACTNESS OR CONSISTENCY		RANGE OF STANDARD PENETRATION RESISTANCE (q-VALUE)			RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)			ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION		TEST BORING		TEST BORING W/ CORE					
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			[Symbol]		[Symbol]		[Symbol]					
GENERALLY SILT-CLAY MATERIAL (COHESIVE)		VERY SOFT, SOFT, MEDIUM STIFF, STIFF, VERY STIFF, HARD		2 TO 4, 4 TO 8, 8 TO 15, 15 TO 30, >30			0.25 TO 0.50, 0.5 TO 1.0, 1 TO 2, 2 TO 4, >4			[Symbol]		[Symbol]		[Symbol]					
TEXTURE OR GRAIN SIZE										ABBREVIATIONS									
U.S. STD. SIEVE SIZE OPENING (MM): 4, 10, 40, 60, 200, 270										FRAGS. - FRAGMENTS, HI. - HIGHLY, MED. - MEDIUM, MICA - MICAEOUS, MOD. - MODERATELY, NP - NON PLASTIC, ORG. - ORGANIC, PMT - PRESSUREMETER TEST, SAP. - SAPROLITIC, SDY. - SANDY, SL. - SILT, SILTY, FOSS. - FOSSILIFEROUS, FRAC. - FRACTURED, FRACTURES, w - MOISTURE CONTENT, v - VERY, WEA. - WEATHERED, γ _w - UNIT WEIGHT, γ _d - DRY UNIT WEIGHT, SAMPLE ABBREVIATIONS: S - BULK, SS - SPLIT SPOON, ST - SHELBY TUBE, RS - ROCK, RT - RECOMPACTED TRIAXIAL, CBR - CALIFORNIA BEARING RATIO									
SOIL MOISTURE - CORRELATION OF TERMS										EQUIPMENT USED ON SUBJECT PROJECT									
SOIL MOISTURE SCALE (ATTERBERG LIMITS)		FIELD MOISTURE DESCRIPTION		GUIDE FOR FIELD MOISTURE DESCRIPTION			DRILL UNITS:		ADVANCING TOOLS:		HAMMER TYPE:								
LL - LIQUID LIMIT		- SATURATED - (SAT.)		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE			[] MOBILE B-		[] CLAY BITS		[X] AUTOMATIC [] MANUAL								
PL - PLASTIC LIMIT		- WET - (W)		SEMI-SOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE			[] BK-51		[X] 6" CONTINUOUS FLIGHT AUGER		CORE SIZE:								
OM - OPTIMUM MOISTURE		- MOIST - (M)		SOLID; AT OR NEAR OPTIMUM MOISTURE			[] CME-45C		[] 8" HOLLOW AUGERS		[] -B								
SL - SHRINKAGE LIMIT		- DRY - (D)		REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE			[] CME-550X		[] HARD FACED PINGER BITS		[] -N								
PLASTICITY										DRILL UNITS:									
NONPLASTIC					LOW PLASTICITY					MED. PLASTICITY					HIGH PLASTICITY				
PLASTICITY INDEX (PI)					DRY STRENGTH					[] PORTABLE HOIST					[] TUNG. CARBIDE INSERTS				
0-5					VERY LOW					[] CASINO [] W/ ADVANCER					[] TRICONE *STEEL TEETH				
6-15					SLIGHT					[] TRICONE *TUNG. CARB.					[] CORE BIT				
16-25					MEDIUM					[] CORE BIT					[] VANE SHEAR TEST				
26 OR MORE					HIGH														
COLOR										REVISIONS									
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.										REVISED 09/23/09									

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

ROCK DESCRIPTION		TERMS AND DEFINITIONS	
<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>		<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND 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 (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN ENPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>	
WEATHERED ROCK (WR)		NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS 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, ONEISS, 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 PHYLITE, 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.	
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 "CLINK" 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 0.65 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 FINGER NAIL.		
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.			
FRAGILE	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: FT.	
NOTES:			
BENCH MARKS: Survey Information provided by Vaughn & Melton, Inc.			



SITE

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SITE LOCATION PLAN

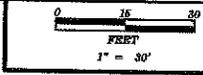
Bridge No. 135 on SR 1215 over
Shaw Creek

Scale: N.T.S. DR: DMB CR: MJW REV:

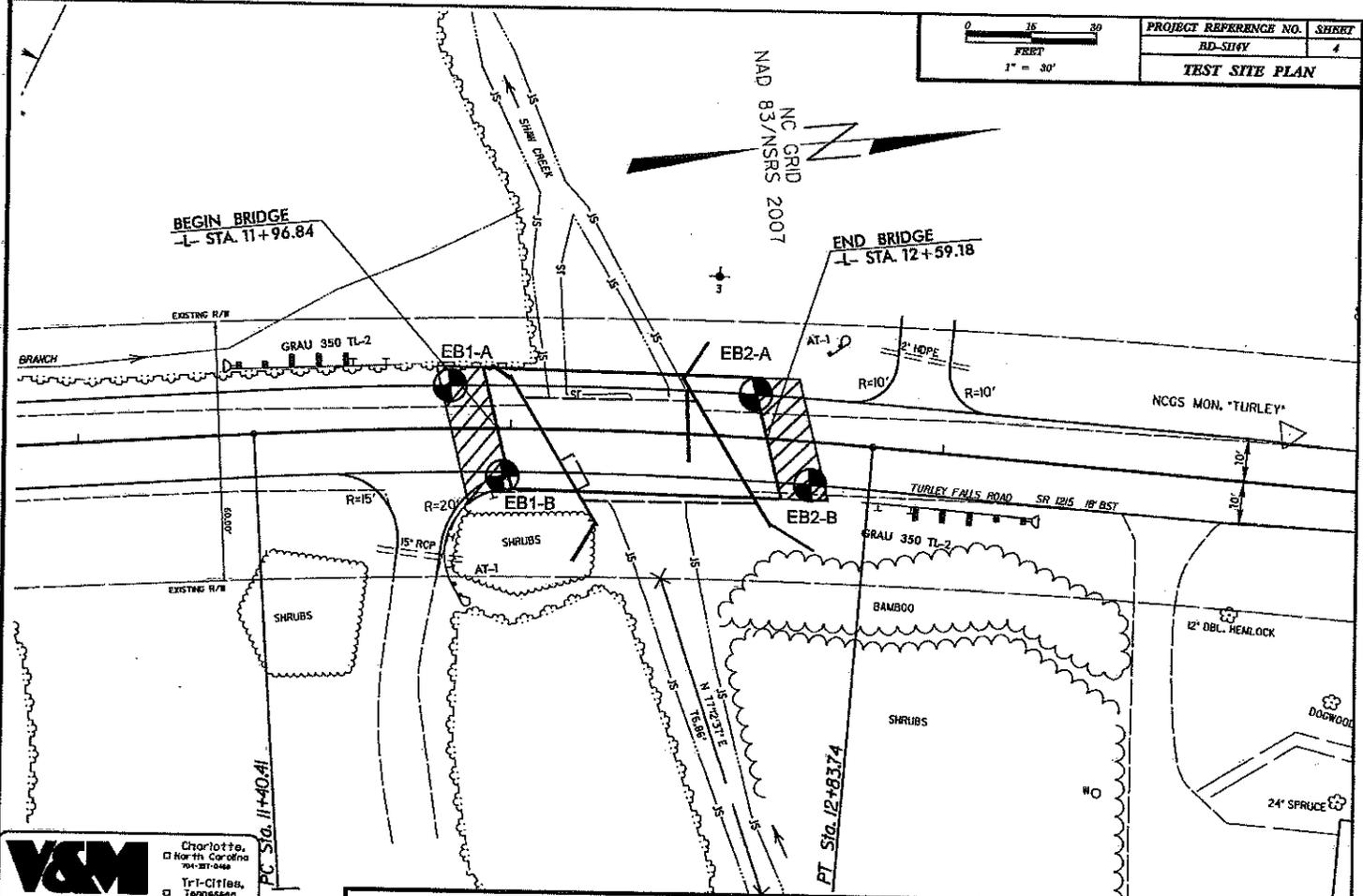
Prepared For: NCDOT TIP No.: BD-5114Y



Froehling & Robertson, Inc.
2505 Hutchison-McDonald Road
Charlotte, North Carolina



PROJECT REFERENCE NO.	SHEET
BD-514Y	4
TEST SITE PLAN	



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TEST SITE PLAN	
PROJECT REFERENCE NO.: 45360.1.25	F&R PROJECT NO.: 63P-0310-0135
J.D. NO.: BD-514Y	F.A. PROJECT NO.: N/A
COUNTY: HENDERSON	
PROJECT DESCRIPTION: Bridge No. 135 on SR 1215 (Turley Falls Road) over Shaw Creek	
SITE DESCRIPTION: Bridge No. 135 on SR 1215 (Turley Falls Road) over Shaw Creek	
DRAWN BY: M. Brewer, E.I.	CHECKED BY: M. Walko, P.E.
DATE: August 2013	SCALE: 1"=30'



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 45360.1.25 TIP BD-5114Y COUNTY Henderson GEOLOGIST R. Kral

SITE DESCRIPTION Bridge 440135 on SR 1215 over Shaw Creek

BORING NO. EB1-A	STATION 11+86	OFFSET 10 ft LT	ALIGNMENT -L-	GROUND WTR (ft)
COLLAR ELEV. 2,115.2 ft	TOTAL DEPTH 48.9 ft	NORTHING 592,816	EASTING 950,361	
				0 HR. 8.0
				24 HR. 8.0

DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012 DRILL METHOD H.S. Augers HAMMER TYPE Automatic

DRILLER C. Boyce START DATE 03/07/13 COMP. DATE 03/07/13 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					
2120															
2115	2,115.2	0.0	1	1	1									2,115.2	GROUND SURFACE
2110	2,111.7	3.5	0	1	1										ROADWAY EMBANKMENT Dark brown and gray silty fine to coarse SAND (A-2-4) with clay lenses throughout
2105	2,108.7	8.5	2	2	1										
2100	2,101.7	13.5	3	4	5										RESIDUAL Tan, brown, white and gray micaceous silty fine to coarse SAND (A-2-4)
2095	2,096.7	18.5	5	7	11										
2090	2,091.7	23.5	8	13	21										
2085	2,086.7	28.5	30	35	65/0.4									2,086.2	WEATHERED ROCK Tan, brown, white and gray GNEISS
2080	2,081.7	33.5	28	74/0.5											
2075	2,076.7	38.5	40	60/0.2											
2070	2,071.7	43.5	33	67/0.3											
	2,066.7	48.5	100/0.4											2,066.3	Boring Terminated at Elevation 2,066.3 ft In Weathered Rock (GNEISS)

NCDOT BORE SINGLE 63P-0310-0135 - DIVISION 14 BRIDGE 135.GPJ NC_DOT.GDT 9/8/13



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 45360.1.25 TIP BD-5114Y COUNTY Henderson GEOLOGIST R. Kral

SITE DESCRIPTION Bridge 440135 on SR 1215 over Shaw Creek

BORING NO. EB1-B	STATION 11+98	OFFSET 11 ft RT	ALIGNMENT -L-	GROUND WTR (ft) 0 HR. 12.0 24 HR. 12.0
COLLAR ELEV. 2,115.7 ft	TOTAL DEPTH 48.8 ft	NORTHING 592,826	EASTING 950,383	
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012				

DRILLER C. Boyce START DATE 03/07/13 COMP. DATE 03/07/13 DRILL METHOD H.S. Augers HAMMER TYPE Automatic

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	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
2120																	
2115	2,115.7	0.0	2	1	1									2,115.7	GROUND SURFACE	0.0	
2110	2,112.2	3.5	0	1	1									2,112.2	ROADWAY EMBANKMENT Dark brown silty fine to coarse SAND (A-2-4), trace to little rock fragments	3.5	
																Orange silty CLAY (A-7-5), trace sand	
2105	2,107.2	8.5	0	0	0									2,107.7	RESIDUAL	8.0	
																Tan, white and brown micaceous fine to coarse sandy SILT (A-4(0))	
2100	2,102.2	13.5	3	3	5												
2095	2,097.2	18.5	3	4	7												
2090	2,092.2	23.5	8	6	9												
2085	2,087.2	28.5	10	15	22												
2080	2,082.2	33.5	24	100/0.9													
2075	2,077.2	38.5	42	51	48/0.2												
2070	2,072.2	43.5	52	48/0.3													
	2,067.2	48.5	100/0.3											2,066.9			

NCDOT BORE SINGLE 63P-0510-0135 - DIVISION 14 BRIDGE 135.GPJ NC_DOT_GDT_93/13

Boring Terminated at Elevation 2,066.9 ft in Weathered Rock (GNEISS)



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 45360.1.25 TIP BD-5114Y COUNTY Henderson GEOLOGIST R. Kral

SITE DESCRIPTION Bridge 440135 on SR 1215 over Shaw Creek

BORING NO. EB2-A	STATION 12+56	OFFSET 10 ft LT	ALIGNMENT -L-	GROUND WTR (ft) 0 HR. 8.0 24 HR. 8.0
COLLAR ELEV. 2,115.5 ft	TOTAL DEPTH 53.8 ft	NORTHING 592,886	EASTING 950,369	
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012				

DRILLER C. Boyce START DATE 03/06/13 COMP. DATE 03/06/13 DRILL METHOD H.S. Augers HAMMER TYPE Automatic

DRILLER C. Boyce START DATE 03/06/13 COMP. DATE 03/06/13 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					
2120															
2115	2,115.5	0.0	3	4	2	5								2,115.5	GROUND SURFACE
2110	2,112.0	3.5	0	1	1	2								2,112.5	ROADWAY EMBANKMENT Red-orange clayey SILT (A-5)
2105	2,107.0	8.5	3	2	0	2								2,107.5	Tan and brown silty fine to coarse SAND (A-2-4)
2100	2,102.0	13.5	6	4	4	8								2,102.5	ALLUVIAL Gray fine sandy SILT (A-4(3))
2095	2,097.0	18.5	4	5	5	10									RESIDUAL Tan, orange, gray and white micaceous silty fine to coarse SAND (A-2-4)
2090	2,092.0	23.5	7	6	10	16									
2085	2,087.0	28.5	4	7	10	17									
2080	2,082.0	33.5	9	15	14	29									
2075	2,077.0	38.5	13	17	17	34									
2070	2,072.0	43.5	100/0.5			100/0.5								2,072.0	WEATHERED ROCK Tan, gray and white GNEISS
2065	2,067.0	48.5	36	64/0.2		100/0.7									
	2,062.0	53.5	100/0.3			100/0.3								2,061.7	Boring Terminated at Elevation 2,061.7 R in Weathered Rock (GNEISS)

NCDOT BORE SINGLE 69P-0310-0135 - DIVISION 14 BRIDGE 135.GPJ NC_DOT.GDT 9/3/13



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 45360.1.25 TIP BD-5114Y COUNTY Henderson GEOLOGIST R. Kral

SITE DESCRIPTION Bridge 440135 on SR 1215 over Shaw Creek

BORING NO. EB2-B	STATION 12+70	OFFSET 10 ft RT	ALIGNMENT -L-	GROUND WTR (ft)	
COLLAR ELEV. 2,116.1 ft	TOTAL DEPTH 59.0 ft	NORTHING 592,897	EASTING 950,391		0 HR. 8.0
					24 HR. 8.0

DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012 DRILL METHOD H.S. Augers HAMMER TYPE Automatic

DRILLER C. Boyce START DATE 03/07/13 COMP. DATE 03/07/13 SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	L O G	SOIL AND ROCK DESCRIPTION			
			0.5R	0.5R	0.5R	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
2120																	
2115	2,116.1	0.0	2	1	2										2,116.1	0.0	
2110	2,112.6	3.5	1	1	2										2,113.1	3.0	
2105	2,107.6	8.5	0	3	4										2,108.1	8.0	
2100	2,102.6	13.5	1	2	2												
2085	2,097.6	18.5	2	2	4												
2090	2,092.6	23.5	3	4	6												
2085	2,087.6	28.5	3	5	9												
2080	2,082.6	33.5	5	8	19												
2075	2,077.6	38.5	14	21	22												
2070	2,072.6	43.5	20	32	46												
2065	2,067.6	48.5	100/0.5												2,067.6	48.5	
2060	2,062.6	53.5	83	17/0.3													
	2,057.1	58.5	100/0.5												2,057.1	59.0	

NCDOT BORE SINGLE 69P-0910-0135 - DIVISION 14 BRIDGE 135.GPJ NC DOT.GDT 9/8/13

Boring Terminated at Elevation 2,057.1 ft in Weathered Rock (GNEISS)