

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.14.R.107	1	8

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 17BP.14.R.107 F.A. PROJ. N/A
COUNTY JACKSON
PROJECT DESCRIPTION BRIDGE NO. 337 ON SR 1448 (UNITY ROAD) OVER FISHER CREEK

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PERSONNEL

R. DELOST

M. MORGAN

B. CAYTON

INVESTIGATED BY ICA ENGINEERING

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SUBMITTED BY ICA ENGINEERING

DATE NOVEMBER 2013

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. 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. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

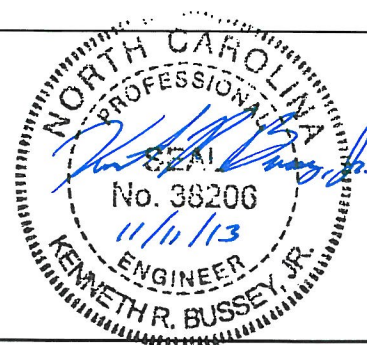
SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE. INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA, AND BOREHOLE INFORMATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS. THE LABORATORY SAMPLE DATA AND THE IN SITU (ON-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 DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION 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 THE 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: T. RIDEOUT



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: 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.															
														ANGULARITY OF GRAINS															
														THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS <u>ANGULAR</u> , <u>SUBANGULAR</u> , <u>SUBROUNDED</u> , OR <u>ROUNDED</u> .															
SOIL LEGEND AND AASHTO CLASSIFICATION														MINERALOGICAL COMPOSITION															
GENERAL CLASS.		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.													
GROUP CLASS.		A-1		A-3		A-2		A-4		A-5		A-6		A-7		A-1, A-2 A-3		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-7-5 A-7-6													
		○○○○○○○○○○		○○○○○○○○○○		○○○○○○○○○○		○○○○○○○○○○		○○○○○○○○○○		○○○○○○○○○○		○○○○○○○○○○		○○○○○○○○○○		○○○○○○○○○○											
% PASSING		50 MX		30 MX		50 MX		51 MN																					
* 10		30 MX		50 MX		51 MN																							
* 40		15 MX		25 MX		10 MX		35 MX		35 MX		35 MX		35 MX		36 MN		36 MN		36 MN									
* 200																													
LIQUID LIMIT		6 MX		NP		40 MX		41 MN		40 MX		41 MN		40 MX		41 MN		40 MX		41 MN									
PLASTIC INDEX						10 MX		10 MX		11 MN		11 MN		10 MX		10 MX		11 MN		11 MN									
GROUP INDEX		0		0		0		4 MX		8 MX		12 MX		16 MX		No MX													
USUAL TYPES OF MAJOR MATERIALS		STONE FRAGS, GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND		SILTY SOILS		CLAYEY SOILS																			
GEN. RATING AS A SUBGRADE		EXCELLENT TO GOOD						FAIR TO POOR						FAIR TO POOR		POOR		UNSATURABLE											
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30																													
CONSISTENCY OR DENSENESS														MISCELLANEOUS SYMBOLS															
PRIMARY SOIL TYPE		COMPACTNESS OR CONSISTENCY		RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)		RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)		ROADWAY EMBANKMENT (RE) 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 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >4		ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT																					
								INFERRED SOIL BOUNDARY																					
								INFERRED ROCK LINE																					
								ALLUVIAL SOIL BOUNDARY																					
								DIP & DIP DIRECTION OF ROCK STRUCTURES																					
								SOUNDING ROD																					
ABBREVIATIONS																													
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, FRACTURES		FRAGS - FRAGMENTS		HI. - HIGHLY					
MED. - MEDIUM		MICA - MICACEOUS		MOD. - MODERATELY		NP - NON PLASTIC		ORG. - ORGANIC		PMT - PRESSUREMETER TEST		SAP. - SAPROLITIC		SD. - SAND, SANDY		SL. - SILT, SILTY		SLI. - SLIGHTLY		TCR - TRICONE REFUSAL		w - MOISTURE CONTENT		V - VERY					
VST - VANE SHEAR TEST		WEA. - WEATHERED		γ - 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																	
EQUIPMENT USED ON SUBJECT PROJECT																													
DRILL UNITS:				ADVANCING TOOLS:				HAMMER TYPE:																					
☐ MOBILE B- ____				☐ CLAY BITS				☒ AUTOMATIC ☐ MANUAL																					
☐ BK-51				☐ 6" CONTINUOUS FLIGHT AUGER				CORE SIZE:																					
☒ CME-45C				☐ 8" HOLLOW AUGERS				☐ -B ____																					
☐ CME-550				☐ HARD FACED FINGER BITS				☐ -N ____																					
☐ PORTABLE HOIST				☐ TUNG.-CARBIDE INSERTS				☐ -H ____																					
☒ CME-55				☒ CASING ☒ W/ ADVANCER				HAND TOOLS:																					
				☐ TRICONE ____ " STEEL TEETH				☐ POST HOLE DIGGER																					
				☐ TRICONE ____ " TUNG.-CARB.				☐ HAND AUGER																					
				☐ CORE BIT				☐ SOUNDING ROD																					
				☐ ____				☐ VANE SHEAR TEST																					
								☐ ____																					

				PROJECT REFERENCE NO.		SHEET NO.	
				17BP.14.R.107		2A	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION							
DIVISION OF HIGHWAYS							
GEOTECHNICAL ENGINEERING UNIT							
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS							
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:				ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.			
WEATHERED ROCK (WR) 				AQUIFER - A WATER BEARING FORMATION OR STRATA.			
CRYSTALLINE ROCK (CR) 				ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.			
NON-CRYSTALLINE ROCK (NCR) 				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.			
COASTAL PLAIN SEDIMENTARY ROCK (CP) 				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 EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.			
				SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.			
				STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.			
				STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.			
				STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.			
				TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.			
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. <u>IF TESTED, WOULD YIELD SPT REFUSAL</u>			
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. <u>IF TESTED, YIELDS SPT N VALUES > 100 BPF</u>			
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. <u>IF TESTED, YIELDS SPT N VALUES < 100 BPF</u>			
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 THINLY 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.			
				BENCH MARK: ORANGE PAINT CIRCLE LABELED *G* ON NORTHWEST CORNER OF BRIDGE DECK, NEAREST EB1-A.			
				ELEVATION: 100 FT.			
				NOTES:			

PROJECT REFERENCE NO.	SHEET
17BP.14.R.107	3
SITE PLAN	
0 50 100  FEET	



[illegible]



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 5

WBS 17BP.14.R.107		TIP N/A		COUNTY JACKSON		GEOLOGIST DeLost, R.	
SITE DESCRIPTION Bridge No. 337 on SR 1448 (Unity Road) Over Fisher Creek							GROUND WTR (ft)
BORING NO. EB1-B		STATION N/A		OFFSET N/A		ALIGNMENT N/A	
COLLAR ELEV. 100.0 ft		TOTAL DEPTH 68.7 ft		NORTHING 627,227		EASTING 750,180	
DRILL RIG/HAMMER EFF./DATE ICA9935 CME-55 90% 07/11/2013				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic	
DRILLER Cayton, B.		START DATE 10/21/13		COMP. DATE 10/22/13		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						
100															100.0	0.0
95	96.4	3.6	1	4	14											5.5
90	91.4	8.6	25	14	12											
85	86.4	13.6	1	1	2											
80	81.4	18.6	1	1	1											
75	76.4	23.6	WOH	1	WOH											
70	71.4	28.6	1	2	4											
65	66.4	33.6	2	4	6											
60	61.4	38.6	4	5	9											
55	56.4	43.6	3	6	9											
50	51.4	48.6	10	14	18											
45	46.4	53.6	9	6	12											
40	41.4	58.6	29	39	31											
35	36.4	63.6	100/0.3													
	31.4	68.6	60/0.1													

GROUND SURFACE
 100.0
ROADWAY EMBANKMENT
 Tan, brown-red, micaceous, silty, f. to cse. sand w/rock frags.
 94.5
RESIDUAL
 Tan, white & black, micaceous, silty, f. to cse. saprolitic sand.
 88.1
 Tan, black & tan-yellow, micaceous, f. sandy, clayey, saprolitic silt.
 53.4
 Tan, gray, black & white, silty, micaceous, clayey, saprolitic sand.
 38.5
WEATHERED ROCK
 Weathered rock (Gneiss)
 31.4
CRYSTALLINE ROCK
 Crystalline rock (Gneiss)
 Boring Terminated with Standard Penetration Test Refusal at Elevation 31.3 ft in Crystalline Rock (Gneiss).
 Lost circulation @ 10.1'
 FIAD = Boring filled in after drilling.

NCDOT BORE SINGLE 050&000_GEO_BRDG0337_BORE.GPJ NC_DOT.GDT 11/11/13



WBS 17BP.14.R.107			TIP N/A			COUNTY JACKSON			GEOLOGIST DeLost, R.					
SITE DESCRIPTION Bridge No. 337 on SR 1448 (Unity Road) Over Fisher Creek									GROUND WTR (ft)					
BORING NO. EB2-A			STATION N/A			OFFSET N/A			ALIGNMENT N/A					
COLLAR ELEV. 100.0 ft			TOTAL DEPTH 64.9 ft			NORTHING 627,241			EASTING 750,207					
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 79% 08/22/2013						DRILL METHOD NW Casing w/ Advancer			HAMMER TYPE Automatic					
DRILLER Morgan, M.			START DATE 10/22/13			COMP. DATE 10/22/13			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)
100													100.0	0.0
95	95.2	4.8	4	14	21									
90	90.2	9.8	10	24	31									
85	85.2	14.8	1	2	3									
80	80.2	19.8	2	3	5									
75	75.2	24.8	1	2	4									
70	70.2	29.8	2	4	6									
65	65.2	34.8	2	4	7									
60	60.2	39.8	5	5	9									
55	55.2	44.8	4	6	10									
50	50.2	49.8	9	12	16									
45	45.2	54.8	36	64/0.3										
40	40.2	59.8	14	20	38									
	35.2	64.8	60/0.1											



WBS 17BP.14.R.107			TIP N/A		COUNTY JACKSON			GEOLOGIST DeLost, R.				
SITE DESCRIPTION Bridge No. 337 on SR 1448 (Unity Road) Over Fisher Creek								GROUND WTR (ft)				
BORING NO. EB2-B			STATION N/A			OFFSET N/A		ALIGNMENT N/A				
COLLAR ELEV. 99.8 ft			TOTAL DEPTH 65.3 ft			NORTHING 627,232		EASTING 750,209				
								0 HR. N/A				
								24 HR. FIAD				
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 79% 08/22/2013						DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic				
DRILLER Morgan, M.			START DATE 10/22/13			COMP. DATE 10/22/13		SURFACE WATER DEPTH N/A				
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100		ELEV. (ft) DEPTH (ft)
100												99.8 GROUND SURFACE 0.0
95	94.6	5.2	6	3	16							ROADWAY EMBANKMENT Tan, black, multi-colored, silty, micaceous, f. sand.
90	89.6	10.2	7	35	23							92.8 COLLUVIAL 7.0 Tan, black & white, silty, micaceous, f. to cse. sand w/gravel.
85	84.6	15.2	1	2	3							87.3 RESIDUAL 12.5 Tan, brown & black, micaceous, f. sandy, silty, saprolitic clay.
80	79.6	20.2	2	3	5							
75	74.6	25.2	2	2	4							
70	69.6	30.2	3	4	6							
65	64.6	35.2	3	6	8							66.3 Red-tan, white & black, micaceous, f. sandy, saprolitic silt. 33.5
60	59.6	40.2	5	9	11							56.8 White, black & tan, micaceous, silty, clayey, saprolitic, f. sand. 43.0
55	54.6	45.2	7	5	10							
50	49.6	50.2	8	19	28							44.3 WEATHERED ROCK 55.5 Weathered rock (Gneiss)
45	44.6	55.2	13	30	70/0.4							
40	39.6	60.2	24	45	55							
35	34.6	65.2										34.6 CRYSTALLINE ROCK 65.2 Crystalline rock (Gneiss) Boring Terminated with Standard Penetration Test Refusal at Elevation 34.5 ft in Crystalline Rock (Gneiss). FIAD = Boring filled in after drilling.