

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-400085	1	8

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

---

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

---

COUNTY GUILFORD

PROJECT DESCRIPTION BRIDGE NO. 85 ON SR 1858  
(BEESON RD.) OVER REEDY FORK

---

**CONTENTS**

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2, 2A	LEGEND
3	SITE PLAN
4-7	BORE LOGS

PERSONNEL

TRIGON EXP.

GOODNIGHT, D.J.

INVESTIGATED BY GOODNIGHT, D.J.

DRAWN BY CROCKETT, S.C.

CHECKED BY HAMM, J.R.

SUBMITTED BY FALCON ENG.

DATE FEBRUARY 2020

**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) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT 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 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.

NOTES:

- THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
- 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.



DocuSigned by:

Stephen C Crockett 2/24/2020

C5CA5FED48E0435  
SIGNATURE

DATE

**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**





**REFERENCE: SF-400085**

**PROJECT: 17BP.7.R.131**

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT  
**SUBSURFACE INVESTIGATION**  
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS  
(PAGE 1 OF 2)

<b>SOIL DESCRIPTION</b> SOIL IS CONSIDERED 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 THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6										<b>GRADATION</b> WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES. <b>ANGULARITY OF GRAINS</b> THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED. <b>MINERALOGICAL COMPOSITION</b> MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE. <b>COMPRESSIBILITY</b> SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50 <b>PERCENTAGE OF MATERIAL</b> <table><tr><td>ORGANIC MATERIAL</td><td>GRANULAR SOILS</td><td>SILT - CLAY SOILS</td><td>OTHER MATERIAL</td></tr><tr><td>TRACE OF ORGANIC MATTER</td><td>2 - 3%</td><td>3 - 5%</td><td>TRACE 1 - 10%</td></tr><tr><td>LITTLE ORGANIC MATTER</td><td>3 - 5%</td><td>5 - 12%</td><td>LITTLE 10 - 20%</td></tr><tr><td>MODERATELY ORGANIC</td><td>5 - 10%</td><td>12 - 20%</td><td>SOME 20 - 35%</td></tr><tr><td>HIGHLY ORGANIC</td><td>&gt; 10%</td><td>&gt; 20%</td><td>HIGHLY 35% AND ABOVE</td></tr></table> <b>GROUND WATER</b> 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										ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE 1 - 10%	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE 10 - 20%	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME 20 - 35%	HIGHLY ORGANIC	> 10%	> 20%	HIGHLY 35% AND ABOVE																																																																																																																																																																																												
ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL																																																																																																																																																																																																																																
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE 1 - 10%																																																																																																																																																																																																																																
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE 10 - 20%																																																																																																																																																																																																																																
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME 20 - 35%																																																																																																																																																																																																																																
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY 35% AND ABOVE																																																																																																																																																																																																																																
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b> <table><tr><td>GENERAL CLASS.</td><td colspan="6">GRANULAR MATERIALS (&lt; 35% PASSING #200)</td><td colspan="4">SILT-CLAY MATERIALS (&gt; 35% PASSING #200)</td><td colspan="2">ORGANIC MATERIALS</td></tr><tr><td>GROUP CLASS.</td><td colspan="2">A-1</td><td colspan="2">A-3</td><td colspan="2">A-2</td><td colspan="2">A-4</td><td colspan="2">A-5</td><td colspan="2">A-6</td><td colspan="2">A-7</td><td colspan="2">A-1, A-2</td><td colspan="2">A-4, A-5</td></tr><tr><td>SYMBOL</td><td colspan="2">A-1-a</td><td colspan="2">A-1-b</td><td colspan="2">A-2-4</td><td colspan="2">A-2-5</td><td colspan="2">A-2-6</td><td colspan="2">A-2-7</td><td colspan="2">A-7-5</td><td colspan="2">A-7-6</td><td colspan="2">A-6, A-7</td></tr><tr><td>% PASSING</td><td colspan="2">50 MX</td><td colspan="2">30 MX</td><td colspan="2">15 MX</td><td colspan="2">50 MX</td><td colspan="2">10 MX</td><td colspan="2">50 MX</td><td colspan="2">35 MX</td><td colspan="2">35 MX</td><td colspan="2">35 MX</td></tr><tr><td>MATERIAL PASSING #40</td><td colspan="2">-</td><td colspan="2">-</td><td colspan="2">-</td><td colspan="2">-</td><td colspan="2">-</td><td colspan="2">-</td><td colspan="2">-</td><td colspan="2">-</td><td colspan="2">-</td></tr><tr><td>LL</td><td colspan="2">6 MX</td><td colspan="2">NP</td><td colspan="2">40 MX</td><td colspan="2">41 MN</td><td colspan="2">40 MX</td><td colspan="2">41 MN</td><td colspan="2">40 MX</td><td colspan="2">41 MN</td><td colspan="2">40 MX</td></tr><tr><td>PI</td><td colspan="2">-</td><td colspan="2">-</td><td colspan="2">10 MX</td><td colspan="2">10 MX</td><td colspan="2">11 MN</td><td colspan="2">11 MN</td><td colspan="2">10 MX</td><td colspan="2">10 MX</td><td colspan="2">11 MN</td></tr><tr><td>GROUP INDEX</td><td colspan="2">0</td><td colspan="2">0</td><td colspan="2">0</td><td colspan="2">4 MX</td><td colspan="2">8 MX</td><td colspan="2">12 MX</td><td colspan="2">16 MX</td><td colspan="2">NO MX</td><td colspan="2">NO MX</td></tr><tr><td>USUAL TYPES OF MAJOR MATERIALS</td><td colspan="2">STONE FRAGS, GRAVEL, AND SAND</td><td colspan="2">FINE SAND</td><td colspan="2">SILTY OR CLAYEY GRAVEL AND SAND</td><td colspan="2">SILTY SOILS</td><td colspan="2">CLAYEY SOILS</td><td colspan="2">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td><td colspan="2">HIGHLY ORGANIC SOILS</td><td colspan="2"></td><td colspan="2"></td></tr><tr><td>GEN. RATING AS SUBGRADE</td><td colspan="6">EXCELLENT TO GOOD</td><td colspan="4">FAIR TO POOR</td><td colspan="2">FAIR TO POOR</td><td colspan="2">POOR</td><td colspan="2">UNSATISFACTORY</td><td colspan="2"></td></tr></table> PI OF A-7-5 SUBGROUP IS <= LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30										GENERAL CLASS.	GRANULAR MATERIALS (< 35% PASSING #200)						SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		GROUP CLASS.	A-1		A-3		A-2		A-4		A-5		A-6		A-7		A-1, A-2		A-4, A-5		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		A-6, A-7		% PASSING	50 MX		30 MX		15 MX		50 MX		10 MX		50 MX		35 MX		35 MX		35 MX		MATERIAL PASSING #40	-		-		-		-		-		-		-		-		-		LL	6 MX		NP		40 MX		41 MN		40 MX		41 MN		40 MX		41 MN		40 MX		PI	-		-		10 MX		10 MX		11 MN		11 MN		10 MX		10 MX		11 MN		GROUP INDEX	0		0		0		4 MX		8 MX		12 MX		16 MX		NO 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		SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS						GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD						FAIR TO POOR				FAIR TO POOR		POOR		UNSATISFACTORY				<b>MISCELLANEOUS SYMBOLS</b> <table><tr><td> ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td><td> DIP &amp; DIP DIRECTION OF ROCK STRUCTURES</td><td> TEST BORING</td><td> SLOPE INDICATOR INSTALLATION</td></tr><tr><td> SOIL SYMBOL</td><td> AUGER BORING</td><td> CONE PENETROMETER TEST</td><td> SOUNDING ROD</td></tr><tr><td> ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td><td> CORE BORING</td><td> MONITORING WELL</td><td> TEST BORING WITH CORE</td></tr><tr><td> INFERRED SOIL BOUNDARY</td><td> PIEZOMETER INSTALLATION</td><td> SPT N-VALUE</td><td></td></tr><tr><td> INFERRED ROCK LINE</td><td></td><td></td><td></td></tr><tr><td> ALLUVIAL SOIL BOUNDARY</td><td></td><td></td><td></td></tr></table>										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION	DIP & DIP DIRECTION OF ROCK STRUCTURES	TEST BORING	SLOPE INDICATOR INSTALLATION	SOIL SYMBOL	AUGER BORING	CONE PENETROMETER TEST	SOUNDING ROD	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT	CORE BORING	MONITORING WELL	TEST BORING WITH CORE	INFERRED SOIL BOUNDARY	PIEZOMETER INSTALLATION	SPT N-VALUE		INFERRED ROCK LINE				ALLUVIAL SOIL BOUNDARY			
GENERAL CLASS.	GRANULAR MATERIALS (< 35% PASSING #200)						SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS																																																																																																																																																																																																																								
GROUP CLASS.	A-1		A-3		A-2		A-4		A-5		A-6		A-7		A-1, A-2		A-4, A-5																																																																																																																																																																																																																		
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		A-6, A-7																																																																																																																																																																																																																		
% PASSING	50 MX		30 MX		15 MX		50 MX		10 MX		50 MX		35 MX		35 MX		35 MX																																																																																																																																																																																																																		
MATERIAL PASSING #40	-		-		-		-		-		-		-		-		-																																																																																																																																																																																																																		
LL	6 MX		NP		40 MX		41 MN		40 MX		41 MN		40 MX		41 MN		40 MX																																																																																																																																																																																																																		
PI	-		-		10 MX		10 MX		11 MN		11 MN		10 MX		10 MX		11 MN																																																																																																																																																																																																																		
GROUP INDEX	0		0		0		4 MX		8 MX		12 MX		16 MX		NO 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		SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS																																																																																																																																																																																																																						
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD						FAIR TO POOR				FAIR TO POOR		POOR		UNSATISFACTORY																																																																																																																																																																																																																				
ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION	DIP & DIP DIRECTION OF ROCK STRUCTURES	TEST BORING	SLOPE INDICATOR INSTALLATION																																																																																																																																																																																																																																
SOIL SYMBOL	AUGER BORING	CONE PENETROMETER TEST	SOUNDING ROD																																																																																																																																																																																																																																
ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT	CORE BORING	MONITORING WELL	TEST BORING WITH CORE																																																																																																																																																																																																																																
INFERRED SOIL BOUNDARY	PIEZOMETER INSTALLATION	SPT N-VALUE																																																																																																																																																																																																																																	
INFERRED ROCK LINE																																																																																																																																																																																																																																			
ALLUVIAL SOIL BOUNDARY																																																																																																																																																																																																																																			
<b>TEXTURE OR GRAIN SIZE</b> <table><tr><td>U.S. STD. SIEVE SIZE</td><td>4</td><td>10</td><td>40</td><td>60</td><td>200</td><td>270</td></tr><tr><td>OPENING (MM)</td><td>4.76</td><td>2.00</td><td>0.42</td><td>0.25</td><td>0.075</td><td>0.053</td></tr><tr><td>BOULDER (BLDR.)</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>COBBLE (COB.)</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>GRAVEL (GR.)</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>COARSE SAND (CSE, SD.)</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>FINE SAND (F SD.)</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>SILT (SL.)</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>CLAY (CL.)</td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table> GRAIN SIZE MM 305 75 2.0 0.25 0.05 0.005 IN. 12 3										U.S. STD. SIEVE SIZE	4	10	40	60	200	270	OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053	BOULDER (BLDR.)							COBBLE (COB.)							GRAVEL (GR.)							COARSE SAND (CSE, SD.)							FINE SAND (F SD.)							SILT (SL.)							CLAY (CL.)							<b>RECOMMENDATION SYMBOLS</b> <table><tr><td> UNDERCUT</td><td> UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td><td> UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</td></tr><tr><td> SHALLOW UNDERCUT</td><td> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</td><td></td></tr></table>										UNDERCUT	UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE	UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL	SHALLOW UNDERCUT	UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK																																																																																																																																												
U.S. STD. SIEVE SIZE	4	10	40	60	200	270																																																																																																																																																																																																																													
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053																																																																																																																																																																																																																													
BOULDER (BLDR.)																																																																																																																																																																																																																																			
COBBLE (COB.)																																																																																																																																																																																																																																			
GRAVEL (GR.)																																																																																																																																																																																																																																			
COARSE SAND (CSE, SD.)																																																																																																																																																																																																																																			
FINE SAND (F SD.)																																																																																																																																																																																																																																			
SILT (SL.)																																																																																																																																																																																																																																			
CLAY (CL.)																																																																																																																																																																																																																																			
UNDERCUT	UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE	UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL																																																																																																																																																																																																																																	
SHALLOW UNDERCUT	UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK																																																																																																																																																																																																																																		
<b>SOIL MOISTURE - CORRELATION OF TERMS</b> <table><tr><td>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</td><td>FIELD MOISTURE DESCRIPTION</td><td>GUIDE FOR FIELD MOISTURE DESCRIPTION</td></tr><tr><td rowspan="2">LL - LIQUID LIMIT PL - PLASTIC LIMIT PLASTIC RANGE (PI)</td><td>- SATURATED - (SAT.)</td><td>USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</td></tr><tr><td>- WET - (W)</td><td>SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</td></tr><tr><td rowspan="2">OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT</td><td>- MOIST - (M)</td><td>SOLID; AT OR NEAR OPTIMUM MOISTURE</td></tr><tr><td>- DRY - (D)</td><td>REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td></tr></table>										SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION	LL - LIQUID LIMIT PL - PLASTIC LIMIT PLASTIC RANGE (PI)	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	<b>ABBREVIATIONS</b> <table><tr><td>AR - AUGER REFUSAL</td><td>MED. - MEDIUM</td><td>VST - VANE SHEAR TEST</td></tr><tr><td>BT - BORING TERMINATED</td><td>MICA - MICACEOUS</td><td>WEA. - WEATHERED</td></tr><tr><td>CL - CLAY</td><td>MOD. - MODERATELY</td><td>γ - UNIT WEIGHT</td></tr><tr><td>CPT - CONE PENETRATION TEST</td><td>NP - NON PLASTIC</td><td>γ<sub>d</sub> - DRY UNIT WEIGHT</td></tr><tr><td>CSE. - COARSE</td><td>ORG. - ORGANIC</td><td><b>SAMPLE ABBREVIATIONS</b></td></tr><tr><td>DMT - DILATOMETER TEST</td><td>PMT - PRESSUREMETER TEST</td><td>S - BULK</td></tr><tr><td>DPT - DYNAMIC PENETRATION TEST</td><td>SAP. - SAPROLITIC</td><td>SS - SPLIT SPOON</td></tr><tr><td>e - VOID RATIO</td><td>SD. - SAND, SANDY</td><td>ST - SHELBY TUBE</td></tr><tr><td>F - FINE</td><td>SL. - SILT, SILTY</td><td>RS - ROCK</td></tr><tr><td>FOSS. - FOSSILIFEROUS</td><td>SLI. - SLIGHTLY</td><td>RT - RECOMPACTED TRIAXIAL</td></tr><tr><td>FRAC. - FRACTURED, FRACTURES</td><td>TCR - TRICONE REFUSAL</td><td>CBR - CALIFORNIA BEARING RATIO</td></tr><tr><td>FRAGS. - FRAGMENTS</td><td>w - MOISTURE CONTENT</td><td></td></tr><tr><td>HL - HIGHLY</td><td>V - VERY</td><td></td></tr></table>										AR - AUGER REFUSAL	MED. - MEDIUM	VST - VANE SHEAR TEST	BT - BORING TERMINATED	MICA - MICACEOUS	WEA. - WEATHERED	CL - CLAY	MOD. - MODERATELY	γ - UNIT WEIGHT	CPT - CONE PENETRATION TEST	NP - NON PLASTIC	γ <sub>d</sub> - DRY UNIT WEIGHT	CSE. - COARSE	ORG. - ORGANIC	<b>SAMPLE ABBREVIATIONS</b>	DMT - DILATOMETER TEST	PMT - PRESSUREMETER TEST	S - BULK	DPT - DYNAMIC PENETRATION TEST	SAP. - SAPROLITIC	SS - SPLIT SPOON	e - VOID RATIO	SD. - SAND, SANDY	ST - SHELBY TUBE	F - FINE	SL. - SILT, SILTY	RS - ROCK	FOSS. - FOSSILIFEROUS	SLI. - SLIGHTLY	RT - RECOMPACTED TRIAXIAL	FRAC. - FRACTURED, FRACTURES	TCR - TRICONE REFUSAL	CBR - CALIFORNIA BEARING RATIO	FRAGS. - FRAGMENTS	w - MOISTURE CONTENT		HL - HIGHLY	V - VERY																																																																																																																																																													
SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION																																																																																																																																																																																																																																	
LL - LIQUID LIMIT PL - PLASTIC LIMIT PLASTIC RANGE (PI)	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE																																																																																																																																																																																																																																	
	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE																																																																																																																																																																																																																																	
OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE																																																																																																																																																																																																																																	
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE																																																																																																																																																																																																																																	
AR - AUGER REFUSAL	MED. - MEDIUM	VST - VANE SHEAR TEST																																																																																																																																																																																																																																	
BT - BORING TERMINATED	MICA - MICACEOUS	WEA. - WEATHERED																																																																																																																																																																																																																																	
CL - CLAY	MOD. - MODERATELY	γ - UNIT WEIGHT																																																																																																																																																																																																																																	
CPT - CONE PENETRATION TEST	NP - NON PLASTIC	γ <sub>d</sub> - DRY UNIT WEIGHT																																																																																																																																																																																																																																	
CSE. - COARSE	ORG. - ORGANIC	<b>SAMPLE ABBREVIATIONS</b>																																																																																																																																																																																																																																	
DMT - DILATOMETER TEST	PMT - PRESSUREMETER TEST	S - BULK																																																																																																																																																																																																																																	
DPT - DYNAMIC PENETRATION TEST	SAP. - SAPROLITIC	SS - SPLIT SPOON																																																																																																																																																																																																																																	
e - VOID RATIO	SD. - SAND, SANDY	ST - SHELBY TUBE																																																																																																																																																																																																																																	
F - FINE	SL. - SILT, SILTY	RS - ROCK																																																																																																																																																																																																																																	
FOSS. - FOSSILIFEROUS	SLI. - SLIGHTLY	RT - RECOMPACTED TRIAXIAL																																																																																																																																																																																																																																	
FRAC. - FRACTURED, FRACTURES	TCR - TRICONE REFUSAL	CBR - CALIFORNIA BEARING RATIO																																																																																																																																																																																																																																	
FRAGS. - FRAGMENTS	w - MOISTURE CONTENT																																																																																																																																																																																																																																		
HL - HIGHLY	V - VERY																																																																																																																																																																																																																																		
<b>PLASTICITY</b> <table><tr><td>NON PLASTIC</td><td>0-5</td><td>VERY LOW</td></tr><tr><td>SLIGHTLY PLASTIC</td><td>6-15</td><td>SLIGHT</td></tr><tr><td>MODERATELY PLASTIC</td><td>16-25</td><td>MEDIUM</td></tr><tr><td>HIGHLY PLASTIC</td><td>26 OR MORE</td><td>HIGH</td></tr></table>										NON PLASTIC	0-5	VERY LOW	SLIGHTLY PLASTIC	6-15	SLIGHT	MODERATELY PLASTIC	16-25	MEDIUM	HIGHLY PLASTIC	26 OR MORE	HIGH	<b>EQUIPMENT USED ON SUBJECT PROJECT</b> <table><tr><td>DRILL UNITS: <input type="checkbox"/> CME-45C <input type="checkbox"/> CME-55 <input type="checkbox"/> CME-550 <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> PORTABLE HOIST <input checked="" type="checkbox"/> MOBILE B-57 <input type="checkbox"/></td><td>ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input checked="" type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG-CARBIDE INSERTS <input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE " STEEL TEETH <input type="checkbox"/> TRICONE " TUNG.-CARB. <input type="checkbox"/> CORE BIT <input type="checkbox"/></td><td>HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL  CORE SIZE: <input type="checkbox"/> -B <input type="checkbox"/> -H <input type="checkbox"/> -N  HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/></td></tr></table>										DRILL UNITS: <input type="checkbox"/> CME-45C <input type="checkbox"/> CME-55 <input type="checkbox"/> CME-550 <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> PORTABLE HOIST <input checked="" type="checkbox"/> MOBILE B-57 <input type="checkbox"/>	ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input checked="" type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG-CARBIDE INSERTS <input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE " STEEL TEETH <input type="checkbox"/> TRICONE " TUNG.-CARB. <input type="checkbox"/> CORE BIT <input type="checkbox"/>	HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL  CORE SIZE: <input type="checkbox"/> -B <input type="checkbox"/> -H <input type="checkbox"/> -N  HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/>																																																																																																																																																																																																	
NON PLASTIC	0-5	VERY LOW																																																																																																																																																																																																																																	
SLIGHTLY PLASTIC	6-15	SLIGHT																																																																																																																																																																																																																																	
MODERATELY PLASTIC	16-25	MEDIUM																																																																																																																																																																																																																																	
HIGHLY PLASTIC	26 OR MORE	HIGH																																																																																																																																																																																																																																	
DRILL UNITS: <input type="checkbox"/> CME-45C <input type="checkbox"/> CME-55 <input type="checkbox"/> CME-550 <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/> PORTABLE HOIST <input checked="" type="checkbox"/> MOBILE B-57 <input type="checkbox"/>	ADVANCING TOOLS: <input type="checkbox"/> CLAY BITS <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER <input checked="" type="checkbox"/> 8" HOLLOW AUGERS <input type="checkbox"/> HARD FACED FINGER BITS <input type="checkbox"/> TUNG-CARBIDE INSERTS <input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER <input type="checkbox"/> TRICONE " STEEL TEETH <input type="checkbox"/> TRICONE " TUNG.-CARB. <input type="checkbox"/> CORE BIT <input type="checkbox"/>	HAMMER TYPE: <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL  CORE SIZE: <input type="checkbox"/> -B <input type="checkbox"/> -H <input type="checkbox"/> -N  HAND TOOLS: <input type="checkbox"/> POST HOLE DIGGER <input type="checkbox"/> HAND AUGER <input type="checkbox"/> SOUNDING ROD <input type="checkbox"/> VANE SHEAR TEST <input type="checkbox"/>																																																																																																																																																																																																																																	
<b>COLOR</b> 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.																																																																																																																																																																																																																																			

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
**GEOTECHNICAL ENGINEERING UNIT**  
**SUBSURFACE INVESTIGATION**  
**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**  
**(PAGE 2 OF 2)**

ROCK DESCRIPTION			TERMS AND DEFINITIONS		
HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. 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. 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, SUCH 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 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 (SROD) - 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.		
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, 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.			
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. <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, WOULD YIELD SPT N VALUES &gt; 100 BPF</u>				
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES &lt; 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 PEICES 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 FOOT	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 MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.					
FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.			BENCH MARK: BM-1, RAILROAD SPIKE SET IN 15' WALNUT TREE	
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.			N: 869292 E: 1700456	
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.			-L- STA. 13+88.63 OFFSET: 123.27' LT ELEVATION: 837.83 FEET	
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.			NOTES:	
				FIAD - FILLED IMMEDIATELY AFTER DRILLING	
				DATE: 8-15-14	

BRIDGE NO. 85 ON SR 1858 (BEESON RD.)  
OVER REEDY FORK  
GUILFORD COUNTY, NORTH CAROLINA  
WBS NO.: 17BP.7.R.131 | TIP NO.: SF-400085  
FALCON PROJECT NO.: G18065.06

BORE LOG

WBS 17BP.7.R.131			TIP SF-400085			COUNTY GUILFORD			GEOLOGIST Goodnight, D. J.					
SITE DESCRIPTION BRIDGE NO. 85 ON SR 1858 (BEESON RD.) OVER REEDY FORK									GROUND WTR (ft)					
BORING NO. EB1-A			STATION 15+47			OFFSET 14 ft LT			ALIGNMENT -L-			0 HR. 11.3		
COLLAR ELEV. 840.0 ft			TOTAL DEPTH 25.9 ft			NORTHING 869,087			EASTING 1,700,472			24 HR. FIAD		
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER Estep, J. E.			START DATE 08/22/19			COMP. DATE 08/22/19			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				
840													840.0	0.0
	839.0	1.0	5	7	3								839.0	1.0
	836.5	3.5												
835			11	6	2									
	834.0	6.0	WOH	1	2								834.5	5.5
	831.5	8.5												
830			2	1	0								832.0	8.0
	826.5	13.5											828.0	12.0
825			1	3	3									
	821.5	18.5											823.0	17.0
820			1	1	0									
	816.5	23.5											816.0	24.0
815			5	4	96/0.4								814.2	25.8
	814.2	25.8											814.1	25.9
			60/0.1											

NCDOT BORE SINGLE SF400085 BORINGS GPJ NC\_DOT.GDT 2/18/20

WBS 17BP.7.R.131			TIP SF-400085			COUNTY GUILFORD			GEOLOGIST Goodnight, D. J.								
SITE DESCRIPTION BRIDGE NO. 85 ON SR 1858 (BEESON RD.) OVER REEDY FORK									GROUND WTR (ft)								
BORING NO. EB1-B			STATION 15+44			OFFSET 33 ft RT			ALIGNMENT -L-			0 HR. 4.2					
COLLAR ELEV. 833.1 ft			TOTAL DEPTH 23.5 ft			NORTHING 869,067			EASTING 1,700,429			24 HR. FIAD					
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019						DRILL METHOD H.S. Augers				HAMMER TYPE Automatic							
DRILLER Estep, J. E.			START DATE 08/22/19			COMP. DATE 08/23/19			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							
835																	
	832.1	1.0													833.1	0.4' TOPSOIL	0.0
830	829.6	3.5	1	2	1										830.1	ALLUVIAL TAN, F. SANDY SILT (A-4) W/ LITTLE MICA	3.0
	827.1	6.0	1	1	0										827.6	TAN, SLI. SILTY F. TO CSE. SAND (A-1-b)	5.5
825	824.6	8.5	2	2	1											LIGHT GRAY, F. TO CSE. SAND (A-1-a)	
820	819.6	13.5	2	4	5												
815	814.6	18.5	15	75	25/0.1										814.1	WEATHERED ROCK TAN AND GRAY, BIOTITE GNEISS	19.0
810	809.6	23.5													809.6	Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 809.6 ft ON CRYSTALLINE ROCK: BIOTITE GNEISS	23.5

[illegible]

NC DOT BORE SINGLE SF400085\_BORINGS.GPJ NC\_DOT\_GDT 2/18/20

BORE LOG

WBS 17BP.7.R.131			TIP SF-400085			COUNTY GUILFORD			GEOLOGIST Goodnight, D. J.						
SITE DESCRIPTION BRIDGE NO. 85 ON SR 1858 (BEESON RD.) OVER REEDY FORK									GROUND WTR (ft)						
BORING NO. EB2-B			STATION 16+44			OFFSET 4 ft RT			ALIGNMENT -L-			0 HR. 13.9			
COLLAR ELEV. 840.0 ft			TOTAL DEPTH 18.5 ft			NORTHING 868,994			EASTING 1,700,505			24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 03/22/2019						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER Estep, J. E.			START DATE 08/23/19			COMP. DATE 08/23/19			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)
840														840.0	0.0
835	839.0	1.0	2	2	3							M		ROADWAY EMBANKMENT BROWN, SILTY SAND (A-2-4) WITH TRACE GRAVEL, COBBLES, AND BOULDERS	
	836.5	3.5	5	11	10							M			
	834.0	6.0	3	3	2							M			
830	831.5	8.5	2	1	0							M			
825	826.5	13.5	10	41	51									827.5	12.5
														825.0	15.0
	821.5	18.5	60/0.0											821.5	18.5
														Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 821.5 ft ON CRYSTALLINE ROCK: BIOTITE GNEISS	

NCDOT BORE SINGLE SF400085 BORINGS GPJ NC\_DOT\_GDT 2/18/20