

REFERENCE: N/A

PROJECT: 17BP.12.R.34

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.12.R.34	1	7

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

**STRUCTURE  
SUBSURFACE INVESTIGATION**

COUNTY Cleveland  
 PROJECT DESCRIPTION DIVISION 12 LOW IMPACT  
BRIDGE REPLACEMENT  
 SITE DESCRIPTION BRIDGE NO. 022141 ON SR 1325  
(PADGETT ROAD) OVER MAYNE CREEK

**CONTENTS**

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

**PERSONNEL**

D. Nance

J. White

D. Jeffreys

INVESTIGATED BY ESP Associates, P.A.

DRAWN BY P. Petrucci

CHECKED BY P. Weaver

SUBMITTED BY ESP Associates, P.A.

DATE August, 2015

**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 RELED 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.

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- 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.

NORTH CAROLINA  
LICENSED  
SEAL  
1500  
GEOTECHNICAL ENGINEER  
PAUL M. WEAVER

*Paul M. Weaver*  
SIGNATURE                      8/21/2015  
DATE

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)

SOIL DESCRIPTION										GRADATION									
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										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.									
SOIL LEGEND AND AASHTO CLASSIFICATION										ANGULARITY OF GRAINS									
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS										THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.									
GROUP CLASS. 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-7-5, A-7-6, A-1, A-2, A-3, A-4, A-5, A-6, A-7										MINERALOGICAL COMPOSITION									
SYMBOL										MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KADLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.									
% PASSING #10, #40, #200										COMPRESSIBILITY									
MATERIAL PASSING #40 LL, PI										SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50									
GROUP INDEX										PERCENTAGE OF MATERIAL									
USUAL TYPES OF MAJOR MATERIALS										ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL									
GEN. RATING AS SUBGRADE										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									
CONSISTENCY OR DENSENESS										GROUND WATER									
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )										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									
TEXTURE OR GRAIN SIZE										MISCELLANEOUS SYMBOLS									
U.S. STD. SIEVE SIZE OPENING (MM) 4, 10, 40, 60, 200, 270										ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY									
BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CSE. SD.), FINE SAND (F SD.), SILT (SL.), CLAY (CL.)										DIP & DIP DIRECTION OF ROCK STRUCTURES TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD TEST BORING WITH CORE SPT N-VALUE									
SOIL MOISTURE - CORRELATION OF TERMS										RECOMMENDATION SYMBOLS									
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION										UNDERCUT EXCAVATION SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL									
PLASTICITY										ABBREVIATIONS									
NON PLASTIC, SLIGHTLY PLASTIC, MODERATELY PLASTIC, HIGHLY PLASTIC										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 HL - 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 <sub>d</sub> - DRY UNIT WEIGHT									
EQUIPMENT USED ON SUBJECT PROJECT										HAMMER TYPE: AUTOMATIC, MANUAL CORE SIZE: B, N, H HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST									
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.										DRILL UNITS: CME-45C, CME-55, CME-550, VANE SHEAR TEST, PORTABLE HOIST, CME-550X ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 8" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG.-CARBIDE INSERTS, CASING w/ ADVANCER, TRICONE STEEL TEETH, TRICONE TUNG.-CARB., CORE BIT CME-550X									

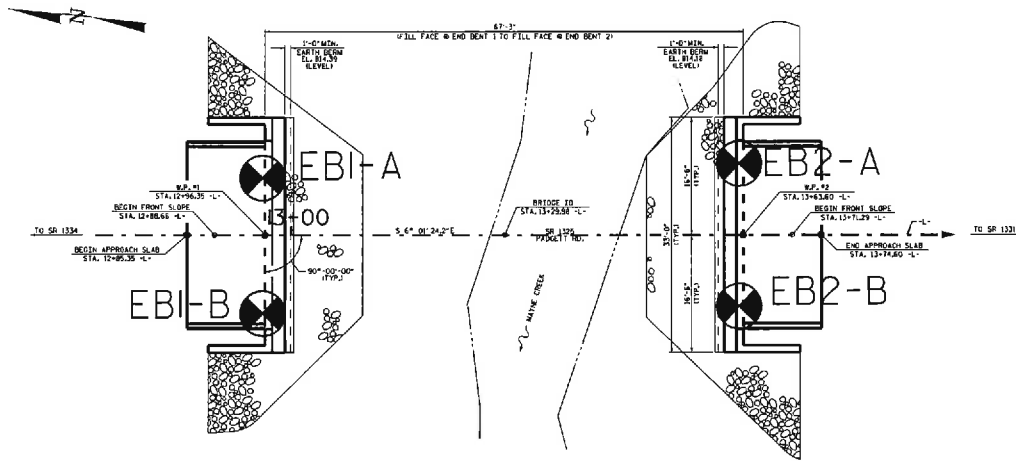
**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
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**SUBSURFACE INVESTIGATION**

**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**  
(PAGE 2 OF 2)

ROCK DESCRIPTION		TERMS AND DEFINITIONS	
<p>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:</p>		<p><b>ALLUVIUM (AL-LUV)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.</p> <p><b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.</p> <p><b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p><b>ARGILLACEOUS</b> - 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.</p> <p><b>ARTESIAN</b> - 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.</p> <p><b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p><b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p><b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p><b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p><b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p><b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p><b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p><b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p><b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.</p> <p><b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p><b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p><b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p><b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p><b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p><b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p><b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p><b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p><b>ROCK QUALITY DESIGNATION (ROQ)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p><b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p><b>SILL</b> - 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.</p> <p><b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p><b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS IN 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.</p> <p><b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p><b>STRATA ROCK QUALITY DESIGNATION (SROQ)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.</p> <p><b>TOPSOIL (TS)</b> - 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, 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. <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, WOULD YIELD SPT N VALUES &gt; 100 BPF</i>		
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. <i>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</i>		
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.		
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 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 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.		
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: 22-0141-2 : N 584631.9120 E: 1202787.7160	
		ELEVATION: 819.54 FEET	
<b>NOTES:</b>			
F.I.A.D. = FILLED IMMEDIATELY AFTER DRILLING			

PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.34	3
<b>SITE PLAN</b>	
FEET	



# GEOTECHNICAL BORING REPORT BORE LOG

WBS 17BP.12.R.34	TIP N/A	COUNTY CLEVELAND	GEOLOGIST Nance, D.
SITE DESCRIPTION Bridge No. 022141 on SR 1325 (Padgett Road) over Mayne Creek			GROUND WTR (ft)
BORING NO. EB1-A	STATION 12+96	OFFSET 8 ft LT	ALIGNMENT -L-
COLLAR ELEV. 820.2 ft	TOTAL DEPTH 14.7 ft	NORTHING 584,702	EASTING 1,202,775
DRILL RIG/HAMMER EFF./DATE SDS8513 CME-550X 91% 09/05/2014		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER White, J.	START DATE 08/13/15	COMP. DATE 08/13/15	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					
825															
820														GROUND SURFACE	0.0
815	816.7	3.5	3	2	1									ROADWAY EMBANKMENT Red to Brown, Very Loose to Loose, Silty, Coarse to Fine SAND (A-2-4)	
810	811.7	8.5	4	4	2										
	806.7	13.5	1	100	0.3										
	805.5	14.7	60	0.0										WEATHERED ROCK BIOTITE GNEISS	14.0
														Boring Terminated with Standard Penetration Test Refusal at Elevation 805.5 ft on Crystalline Rock: BIOTITE GNEISS	14.7

NCDOT BORE SINGLE BRIDGE 141 GINT LOGS.GPJ NC\_DOT.GDT 8/21/15

# GEOTECHNICAL BORING REPORT BORE LOG

WBS 17BP.12.R.34		TIP N/A		COUNTY CLEVELAND		GEOLOGIST Nance, D.										
SITE DESCRIPTION Bridge No. 022141 on SR 1325 (Padgett Road) over Mayne Creek							GROUND WTR (ft)									
BORING NO. EB1-B		STATION 12+96		OFFSET 11 ft RT		ALIGNMENT -L-	0 HR. Dry									
COLLAR ELEV. 819.7 ft		TOTAL DEPTH 13.5 ft		NORTHING 584,700		EASTING 1,202,756	24 HR. FIAD									
DRILL RIG/HAMMER EFF./DATE SDS8513 CME-550X 91% 09/05/2014				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER White, J.		START DATE 08/13/15		COMP. DATE 08/13/15		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					ELEV. (ft)	
820														819.7	0.0	GROUND SURFACE
815	816.2	3.5	6	7	9											ROADWAY EMBANKMENT Red to Brown, Medium Dense to Loose, Silty, Coarse to Fine SAND (A-2-4)
810	811.2	8.5	3	2	3											
	806.2	13.5												806.2	13.5	
			60/0.0													Boring Terminated with Standard Penetration Test Refusal at Elevation 806.2 ft on Crystalline Rock: BIOTITE GNEISS

NCDOT BORE SINGLE BRIDGE 141 GINT LOGS.GPJ NC\_DOT\_GDT\_8/21/15

# GEOTECHNICAL BORING REPORT BORE LOG

WBS 17BP.12.R.34		TIP N/A		COUNTY CLEVELAND		GEOLOGIST Nance, D.											
SITE DESCRIPTION Bridge No. 022141 on SR 1325 (Padgett Road) over Mayne Creek							GROUND WTR (ft)										
BORING NO. EB2-A		STATION 13+63		OFFSET 10 ft LT		ALIGNMENT -L-	0 HR. 17.0										
COLLAR ELEV. 820.0 ft		TOTAL DEPTH 17.3 ft		NORTHING 584,636		EASTING 1,202,784	24 HR. FIAD										
DRILL RIG/HAMMER EFF./DATE SDS8513 CME-550X 91% 09/05/2014				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER White, J.		START DATE 08/13/15		COMP. DATE 08/13/15		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			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
820															820.0	GROUND SURFACE	0.0
815	816.5	3.5	1	2	3	•	•	•	•	•	•	•	•	•		ROADWAY EMBANKMENT Red to Brown, Loose to Very Loose, Silty, Coarse to Fine SAND (A-2-4)	
810	811.5	8.5	2	1	2	•	•	•	•	•	•	•	•				
805	806.5	13.5	WOH	1	1	•	•	•	•	•	•	•	•		807.0	ALLUVIAL	13.0
	802.7	17.3				•	•	•	•	•	•	•	•		802.7	Gray, Very Loose, Silty, Fine SAND (A-3)	17.3
		60/0.0														Boring Terminated with Standard Penetration Test Refusal at Elevation 802.7 ft on Crystalline Rock: BIOTITE GNEISS	

NCDOT BORE SINGLE BRIDGE 141 GINT LOGS.GPJ NC\_DOT.GDT 8/21/15

# GEOTECHNICAL BORING REPORT BORE LOG

<b>WBS</b> 17BP.12.R.34			<b>TIP</b> N/A			<b>COUNTY</b> CLEVELAND			<b>GEOLOGIST</b> Nance, D.								
<b>SITE DESCRIPTION</b> Bridge No. 022141 on SR 1325 (Padgett Road) over Mayne Creek										<b>GROUND WTR (ft)</b>							
<b>BORING NO.</b> EB2-B			<b>STATION</b> 13+63			<b>OFFSET</b> 10 ft RT			<b>ALIGNMENT</b> -L-		0 HR. Dry						
<b>COLLAR ELEV.</b> 820.4 ft			<b>TOTAL DEPTH</b> 13.5 ft			<b>NORTHING</b> 584,634			<b>EASTING</b> 1,202,764		24 HR. FIAD						
<b>DRILL RIG/HAMMER EFF./DATE</b> SDS8513 CME-550X 91% 09/05/2014						<b>DRILL METHOD</b> H.S. Augers			<b>HAMMER TYPE</b> Automatic								
<b>DRILLER</b> White, J.			<b>START DATE</b> 08/13/15			<b>COMP. DATE</b> 08/13/15			<b>SURFACE WATER DEPTH</b> N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
825																	
820															820.4	0.0	GROUND SURFACE
																	ROADWAY EMBANKMENT
																	Red to Brown, Soft to Medium Stiff, Coarse to Fine Sandy SILT (A-4)
815	816.9	3.5	3	2	2	4							D				
810	811.9	8.5	2	2	2	4							M				Red to Tan, Loose, Silty, Coarse to Fine SAND (A-2-4)
	806.9	13.5	60/0.0			60/0.0									806.9	13.5	Boring Terminated with Standard Penetration Test Refusal at Elevation 806.9 ft on Crystalline Rock: BIOTITE GNEISS

NCDOT BORE SINGLE BRIDGE 141 GINT LOGS.GPJ NC\_DOT\_GDT\_8/21/15