

REFERENCE: HB-0004

PROJECT: 55041

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HB-0004	1	21

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STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY HAYWOOD
 PROJECT DESCRIPTION REPLACE BRIDGE 243 ON I-40
 SITE DESCRIPTION BRIDGE 243 ON I-40 OVER NC 215 (CHAMPION ROAD)

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:
1. 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.
 2. 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.

PERSONNEL

P. GRAINGER
N. YACOBI
B. KEANEY
K. WALKER
M. MOSELEY
C. BOWEN

INVESTIGATED BY P. GRAINGER
 DRAWN BY P. GRAINGER ds
 CHECKED BY K. BUSSEY KB
 SUBMITTED BY HDR
 DATE 3/4/2022



DocuSigned by:
Brian D. Keaney 03/14/2022
 79CD97E4882C436... SIGNATURE DATE

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

SOIL DESCRIPTION

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

SOIL LEGEND AND AASHTO CLASSIFICATION

Table with columns for General Class, Group Class, Symbol, % Passing, Material Passing, Group Index, Usual Types of Major Materials, and Gen. Rating as Subgrade. Includes AASHTO soil classification symbols and descriptions.

PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

Table mapping Primary Soil Type (e.g., Generally Granular Material) to Consistency (e.g., Very Loose, Medium Dense) and Range of Standard Penetration Resistance (N-value).

TEXTURE OR GRAIN SIZE

Table showing U.S. Std. Sieve Size (mm) and corresponding grain size ranges for Boulder, Cobble, Gravel, Coarse Sand, Fine Sand, Silt, and Clay.

SOIL MOISTURE - CORRELATION OF TERMS

Table correlating Soil Moisture Scale (Atterberg Limits), Field Moisture Description (e.g., Saturated, Wet, Moist, Dry), and Guide for Field Moisture Description.

PLASTICITY

Table showing Plasticity Index (PI) ranges and corresponding Dry Strength (Very Low, Slight, Medium, High).

COLOR

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.

GRADATION

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.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

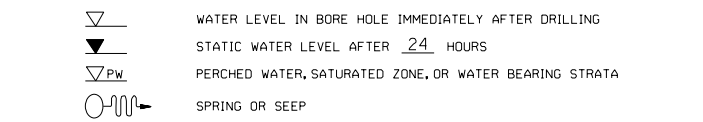
COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE LL < 31
MODERATELY COMPRESSIBLE LL = 31 - 50
HIGHLY COMPRESSIBLE LL > 50

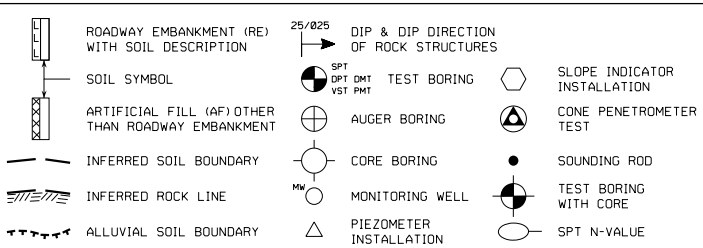
PERCENTAGE OF MATERIAL

Table showing percentages for Organic Material, Granular Soils, Silt-Clay Soils, and Other Material.

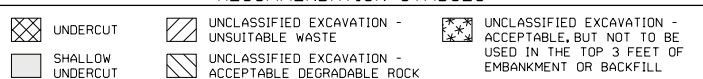
GROUND WATER



MISCELLANEOUS SYMBOLS



RECOMMENDATION SYMBOLS



ABBREVIATIONS

Table of abbreviations for soil and rock tests: 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, 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, UG - Unit Weight, DG - Dry Unit Weight, SAMPLE ABBREVIATIONS: S - Bulk, SS - Split Spoon, ST - Shelby Tube, RS - Rock, RT - Re-compacted Triaxial, CBR - California Bearing Ratio.

EQUIPMENT USED ON SUBJECT PROJECT

Checklist for equipment used: Drill Units (CME-45C, CME-55, CME-550), Advancing Tools (Clay Bits, 6" Continuous Flight Auger, 8" Hollow Augers, Hard Faced Finger Bits, Tung-Carbide Inserts, Casing w/ Advancer, Tricone 2 15/16" Tung-Carb., Core Bit, Mud Rotary), Hammer Type (Automatic, Manual), Core Size (B, H, N Q2), Hand Tools (Post Hole Digger, Hand Auger, Sounding Rod, Vane Shear Test).

ROCK DESCRIPTION

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:

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 SLI) 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 (SLI) 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. IF TESTED, WOULD YIELD SPT REFUSAL.

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. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF.

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. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF.

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 GROUDED OR GOUGED 0.25 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 GROUDED 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

Table mapping Fracture Spacing (Very Wide, Wide, Moderately Close, Close, Very Close) to Spacing (More than 10 feet, 3 to 10 feet, 1 to 3 feet, 0.16 to 1 foot, Less than 0.16 feet).

BEDDING

Table mapping Bedding (Very Thickly Bedded, Thickly Bedded, Thinly Bedded, Very Thinly Bedded, Thickly Laminated, Thinly Laminated) to Thickness (4 feet, 1.5 - 4 feet, 0.16 - 1.5 feet, 0.03 - 0.16 feet, 0.008 - 0.03 feet, < 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.

TERMS AND DEFINITIONS

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 DISLOADED 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 (ROD) - 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.

BENCH MARK: CP #1 - #5 Rebar w/ Plastic Blue Cap 2,666.17
CP #2 - #5 Rebar w/ Plastic Blue Cap 2,671.53
ELEVATION: SEE ABOVE FEET

NOTES: BORING COORDINATES OBTAINED FROM COLE SURVEYING & DESIGN, PA FROM SURVEY DATED 2/21/2022 AND TRIMBLE R12 GNSS RECEIVER CERTIFIED WITH FCC PART 15 (CLASS B DEVICE), 24, 32; RCM; PTCRB; BT SIG

FIAD - FILLED IMMEDIATELY AFTER DRILLING

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

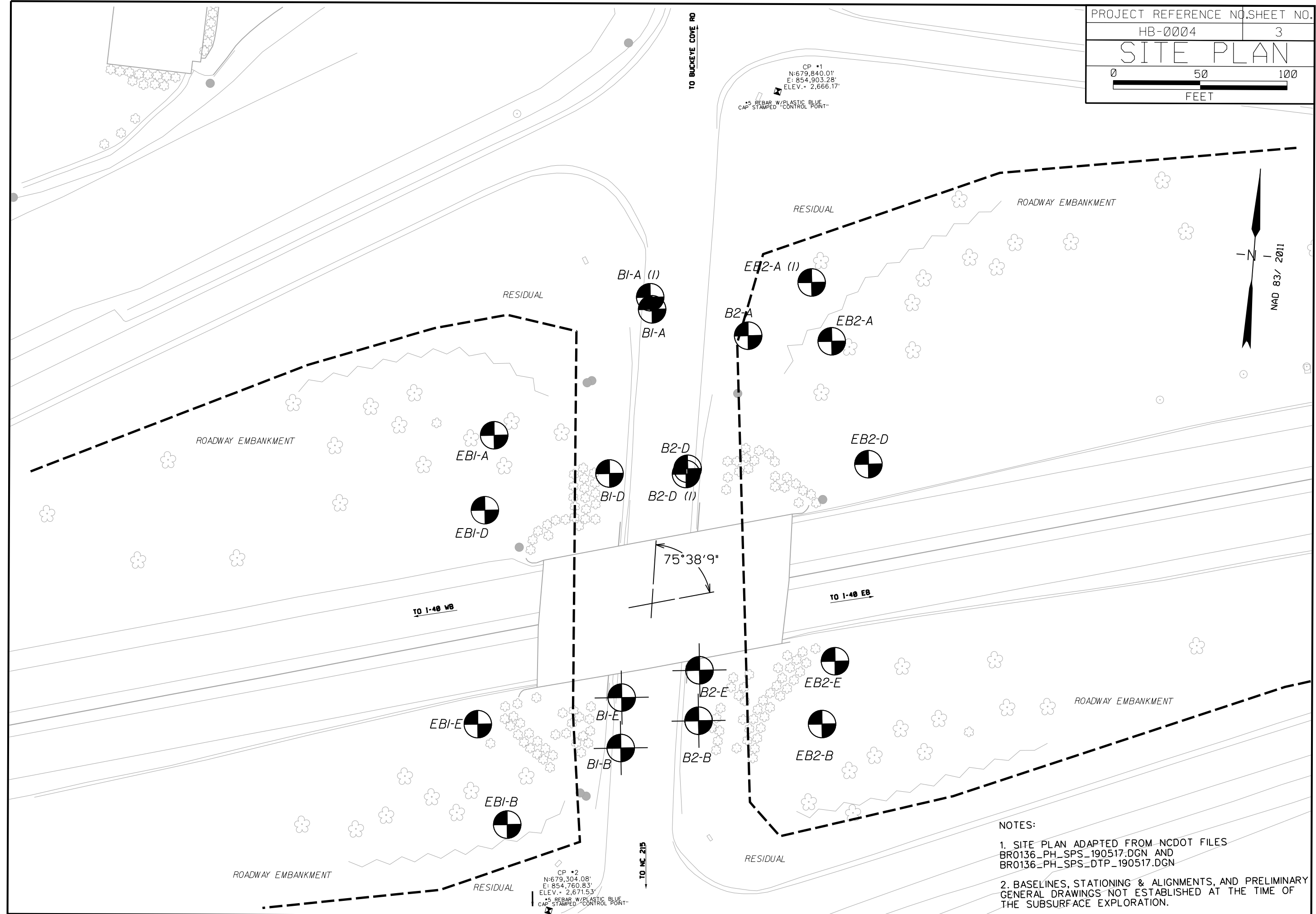
**SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES
FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS**

AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)		SURFACE CONDITIONS					GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)		SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)					
<p>From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. Note that the table does not apply to structurally controlled failures. Where weak planar structural planes are present in an unfavorable orientation with respect to the excavation face, these will dominate the rock mass behaviour. The shear strength of surfaces in rocks that are prone to deterioration as a result of changes in moisture content will be reduced if water is present. When working with rocks in the fair to very poor categories, a shift to the right may be made for wet conditions. Water pressure is dealt with by effective stress analysis.</p>		VERY GOOD	GOOD	FAIR	POOR	VERY POOR	<p>From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.</p>		VERY GOOD	GOOD	FAIR	POOR	VERY POOR	
		Very rough, fresh unweathered surfaces	Rough, slightly weathered, iron stained surfaces	Smooth, moderately weathered and altered surfaces	Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments	Slickensided, highly weathered surfaces with soft clay coatings or fillings			Very Rough, fresh unweathered surfaces	Rough, slightly weathered surfaces	Smooth, moderately weathered and altered surfaces	Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments	Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings	
STRUCTURE		DECREASING SURFACE QUALITY →					COMPOSITION AND STRUCTURE							
	INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities	90			N/A	N/A		A. Thick bedded, very blocky sandstone The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass. In shallow tunnels or slopes these bedding planes may cause structurally controlled instability.	70					
	BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets	80						B. Sandstone with thin inter-layers of siltstone	60					
	VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets		70					C. Sandstone and siltstone in similar amounts		50				
	BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity		60					D. Siltstone or silty shale with sandstone layers			40			
	DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces			50				E. Weak siltstone or clayey shale with sandstone layers				30		
	LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes				40			F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure					20	
					30			G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers						10
					20			H. Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces.						
					10									
		N/A	N/A											

→ Means deformation after tectonic disturbance



NOTES:

- SITE PLAN ADAPTED FROM NCDOT FILES BR0136_PH_SPS_190517.DGN AND BR0136_PH_SPS_DTP_190517.DGN
- BASELINES, STATIONING & ALIGNMENTS, AND PRELIMINARY GENERAL DRAWINGS NOT ESTABLISHED AT THE TIME OF THE SUBSURFACE EXPLORATION.

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)									
BORING NO. EB1-A		STATION N/A		OFFSET N/A		ALIGNMENT N/A										
COLLAR ELEV. 2,674.7 ft		TOTAL DEPTH 66.4 ft		NORTHING 679,648		EASTING 854,728										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER M. Moseley		START DATE 01/27/22		COMP. DATE 01/27/22		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						
2675														2,674.7	GROUND SURFACE	0.0
	2,673.7	1.0	4	5	4										ROADWAY EMBANKMENT	
	2,671.2	3.5	3	2	5										Loose to medium dense, red and brown, clayey SAND (A-2-6), trace rock fragments	
2670	2,668.7	6.0	4	4	7											
	2,666.7	8.0	5	6	7										RESIDUAL	8.0
2665															Medium stiff to stiff, red, brown, silty CLAY (A-7-5), micaceous, trace rock fragments	
	2,661.3	13.4	2	3	4											
2660																
	2,656.3	18.4	3	2	4											
2655																
	2,651.3	23.4	5	7	6											
2650																
	2,646.3	28.4	3	3	3											
2645																
	2,641.3	33.4	2	2	4											
2640																
	2,636.3	38.4	3	2	4											
2635																
	2,631.3	43.4	4	5	7											
2630																
	2,626.3	48.4	6	6	10											
2625																
	2,621.3	53.4	11	8	9											
2620																
	2,616.3	58.4	7	14	19											
2615																
	2,611.3	63.4														
2610																
	2,608.6	66.1														

NCDOT BORE DOUBLE HB0004 GINT LOGS.GPJ NC DOT.GDT 3/3/22

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)									
BORING NO. EB1-B		STATION N/A		OFFSET N/A		ALIGNMENT N/A										
COLLAR ELEV. 2,673.2 ft		TOTAL DEPTH 32.3 ft		NORTHING 679,424		EASTING 854,732										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER M. Moseley		START DATE 02/01/22		COMP. DATE 02/01/22		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						
2675														2,673.2	GROUND SURFACE	0.0
	2,672.2	1.0	2	1	5										ROADWAY EMBANKMENT	
	2,669.7	3.5	2	3	4										Loose, red, brown, clayey SAND (A-2-7), micaceous, some rock fragments	3.0
2670															RESIDUAL	
	2,667.2	6.0	4	4	6										Medium stiff to stiff, red, brown, silty CLAY (A-7-5), micaceous	
2665																
	2,665.2	8.0	4	3	5											
2660																
	2,659.6	13.6	8	6	5											
2655																
	2,654.6	18.6	7	18	10											
2650																
	2,649.6	23.6	4	4	6											
2645																
	2,644.6	28.6	5	12	16											
	2,640.9	32.3														

SS-23
W

CRYSTALLINE ROCK
No recovery, METAGRANITE
Boring Terminated with Standard Penetration Test Refusal at Elevation 2,640.9 ft on Crystalline Rock

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)									
BORING NO. EB1-D		STATION N/A		OFFSET N/A		ALIGNMENT N/A										
COLLAR ELEV. 2,682.5 ft		TOTAL DEPTH 76.7 ft		NORTHING 679,605		EASTING 854,722										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER M. Moseley		START DATE 01/28/22		COMP. DATE 01/31/22		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2685																
2680	2,681.5	1.0	2	3	3											
	2,679.0	3.5	3	3	3											
2675	2,676.5	6.0	2	2	2											
	2,674.5	8.0	4	3	3											
2670	2,668.7	13.8	7	6	6											
2665	2,663.7	18.8	3	3	4											
2660	2,658.7	23.8	4	4	4											
2655	2,653.7	28.8	4	4	5											
2650	2,648.7	33.8	5	5	4											
2645	2,643.7	38.8	5	6	6											
2640	2,638.7	43.8	2	3	3											
2635	2,633.7	48.8	5	8	9											
2630	2,628.7	53.8	5	8	10											
2625	2,623.7	58.8	6	6	10											
2620	2,618.7	63.8	8	19	17											
2615	2,613.7	68.8	52	48/0.2												
2610	2,608.7	73.8	40	60/0.2												
	2,605.9	76.6														

NCDOT BORE DOUBLE HB0004 GINT LOGS.GPJ NC_DOT.GDT 3/3/22

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)									
BORING NO. EB1-D		STATION N/A		OFFSET N/A		ALIGNMENT N/A										
COLLAR ELEV. 2,682.5 ft		TOTAL DEPTH 76.7 ft		NORTHING 679,605		EASTING 854,722										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER M. Moseley		START DATE 01/28/22		COMP. DATE 01/31/22		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2605																
Match Line																
No recovery, METAGRANITE Boring Terminated with Standard Penetration Test Refusal at Elevation 2,605.8 ft in Crystalline Rock Rig chatter 65.3 to 68.8 ft bgs																

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST N. Yacobi	
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)
BORING NO. EB1-E		STATION N/A		OFFSET N/A		ALIGNMENT N/A	
COLLAR ELEV. 2,686.7 ft		TOTAL DEPTH 57.7 ft		NORTHING 679,482		EASTING 854,716	
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER M. Moseley		START DATE 02/01/22		COMP. DATE 02/01/22		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)			
2690																	
															2,686.7	GROUND SURFACE	0.0
2685	2,685.7	1.0	3	3	2											ROADWAY EMBANKMENT	
	2,683.2	3.5	3	4	3											Loose, red, brown, clayey SAND (A-2-6)	
2680	2,680.7	6.0	2	1	2												
	2,678.7	8.0	2	2	4										2,678.2	Medium stiff, red, sandy SILT (A-5)	8.5
2675																	
	2,672.8	13.9	4	3	6										2,673.7	Loose, red, brown, clayey SAND (A-2-6)	13.0
2670																	
	2,667.8	18.9	3	4	7										2,668.7	RESIDUAL	18.0
2665																Medium stiff to very stiff, red, brown, silty CLAY (A-7-5), micaceous	
	2,662.8	23.9	4	5	6												
2660																	
	2,657.8	28.9	3	4	3												
2655																	
	2,652.8	33.9	5	6	7												
2650																	
	2,647.8	38.9	4	7	8												
2645																	
	2,642.8	43.9	2	4	4										2,643.7	Medium stiff, dark gray, sandy SILT (A-5)	43.0
2640																	
	2,637.8	48.9	8	7	7										2,638.7	Medium dense, brown, red, clayey SAND (A-2-7), micaceous, saprolitic	48.0
2635																	
	2,632.8	53.9	7	9	14												
2630																	
	2,629.0	57.7													2,629.0	CRYSTALLINE ROCK	57.7
																No recovery, METAGRANITE	
																Boring Terminated with Standard Penetration Test Refusal at Elevation 2,629.0 ft on Crystalline Rock	

NCDOT BORE DOUBLE HB0004 GINT LOGS.GPJ NC_DOT.GDT 3/3/22

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 55041.1.1	TIP HB-0004	COUNTY HAYWOOD	GEOLOGIST P. Grainger
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215			GROUND WTR (ft)
BORING NO. B1-A	STATION N/A	OFFSET N/A	ALIGNMENT N/A
COLLAR ELEV. 2,669.1 ft	TOTAL DEPTH 63.1 ft	NORTHING 679,719	EASTING 854,820
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER M. Moseley	START DATE 02/07/22	COMP. DATE 02/07/22	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					
2670														2,669.1 GROUND SURFACE 0.0	
	2,668.1	1.0	9	7	4									2,668.4 0.7' PAVEMENT 0.7	
2665	2,665.4	3.7	6	5	5									2,666.1 ROADWAY EMBANKMENT 3.0	
	2,662.9	6.2	4	3	8									RESIDUAL	
2660	2,660.4	8.7	2	2	3									2,661.1 Medium dense, red, brown, clayey SAND (A-2-7), micaceous, trace rock fragments 8.0	
	2,656.0	13.1	2	2	3									Medium stiff to very stiff, gray, red, silty CLAY (A-7-5), micaceous, contains rock fragments (quartz), saprolitic	
2655															
2650	2,651.0	18.1	3	2	3										
2645	2,646.0	23.1	2	7	15										
2640	2,641.0	28.1	2	3	5										
2635	2,636.0	33.1	4	5	8										
2630	2,631.0	38.1	2	3	5										
2625	2,626.0	43.1	3	6	7										
2620	2,621.0	48.1	3	5	9										
2615	2,616.0	53.1	3	4	8										
2610	2,611.0	58.1	5	30	70									2,610.5 WEATHERED ROCK 58.6	
	2,606.8	62.3	90	10/0.0										Brown, gray, METAGRANITE	
	2,606.0	63.1	100/0.3											2,606.0 Boring Terminated with Standard Penetration Test Refusal at Elevation 2,606.0 ft on Crystalline Rock 63.1	
			60/0.0											Hard drilling at 59.6 to 62.3' bgs Grinding at 62.1 ft bgs, Auger Refusal at 62.3 ft bgs	

NCDOT BORE DOUBLE HB0004 GINT LOGS.GPJ NC_DOT.GDT 3/3/22

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST P. Grainger											
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)										
BORING NO. B1-A (1)		STATION N/A		OFFSET N/A		ALIGNMENT N/A											
COLLAR ELEV. 2,669.0 ft		TOTAL DEPTH 95.3 ft		NORTHING 679,726		EASTING 854,819											
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER M. Moseley		START DATE 02/08/22		COMP. DATE 02/08/22		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							
2670															2,669.0	GROUND SURFACE	0.0
2665																Offset 10' north of B1-A, augering to 73.8 ft bgs.	
2660																	
2655																	
2650																	
2645																	
2640																	
2635																	
2630																	
2625																	
2620																	
2615																	
2610																	
2605																	
2600																	
2595	2,595.2	73.8	17	17	23										2,596.0	RESIDUAL	73.0
2590	2,590.2	78.8														Hard, gray, orange, white, silty CLAY (A-7-5), micaceous, trace rock fragments	

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST P. Grainger											
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)										
BORING NO. B1-A (1)		STATION N/A		OFFSET N/A		ALIGNMENT N/A											
COLLAR ELEV. 2,669.0 ft		TOTAL DEPTH 95.3 ft		NORTHING 679,726		EASTING 854,819											
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER M. Moseley		START DATE 02/08/22		COMP. DATE 02/08/22		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							
2590			23	19	24										2,669.0	GROUND SURFACE	0.0
2585	2,585.2	83.8	7	14	24											RESIDUAL	
2580	2,580.2	88.8	13	17	23											Hard, gray, orange, white, silty CLAY (A-7-5), micaceous, trace rock fragments (continued)	
2575	2,575.2	93.8	12	41	48												
															2,573.7	Boring Terminated at Elevation 2,573.7 ft in Silty Clay (A-7-5)	95.3

NCDOT BORE DOUBLE HB0004 GINT LOGS.GPJ NC_DOT.GDT 3/2/22

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)									
BORING NO. B1-D		STATION N/A		OFFSET N/A		ALIGNMENT N/A										
COLLAR ELEV. 2,669.9 ft		TOTAL DEPTH 53.9 ft		NORTHING 679,625		EASTING 854,794										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER M. Moseley		START DATE 01/25/22		COMP. DATE 01/27/22		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)		
2670														2,669.9	0.0	GROUND SURFACE
	2,668.9	1.0	2	3	4	7							D			ROADWAY EMBANKMENT
	2,666.4	3.5	2	3	3								M			Loose, brown, red, clayey SAND (A-2-6), fine to medium grained, nonplastic
2665	2,663.9	6.0	2	3	3	6							M	2,662.9	7.0	RESIDUAL
	2,661.4	8.5	2	2	3	5							M			Medium stiff to stiff, dark red, dark gray, brown, silty CLAY (A-7-5), trace medium sands, micaceous
2660	2,656.1	13.8	5	6	6	12							M			
2655	2,651.1	18.8	5	3	5	8							M			
2650	2,646.1	23.8	3	3	3	6							W			
2645	2,641.1	28.8	3	3	5	8							W			
2640	2,636.1	33.8	4	5	9	14							W			
2635	2,631.1	38.8	21	79/0.3						100/0.8				2,631.9	38.0	WEATHERED ROCK
2630	2,626.1	43.8	100/0.4							100/0.4						White, brown, QUARTZ
2625	2,621.1	48.8	62	48/0.1						100/0.6						
2620	2,616.1	53.8	100/0.1							100/0.1				2,616.0	53.9	Boring Terminated at Elevation 2,616.0 ft in Weathered Rock (Quartz)

NCDOT BORE DOUBLE HB0004 GINT LOGS.GPJ NC_DOT.GDT 3/1/22

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST P. Grainger									
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)								
BORING NO. B1-E		STATION N/A		OFFSET N/A		ALIGNMENT N/A									
COLLAR ELEV. 2,672.0 ft		TOTAL DEPTH 34.7 ft		NORTHING 679,496		EASTING 854,799									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021		DRILL METHOD H.S. Augers/Mud Rotary		HAMMER TYPE Automatic											
DRILLER M. Moseley		START DATE 02/09/22		COMP. DATE 02/09/22		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					
2675															
2670	2,671.0	1.0	9	10	6								M	GROUND SURFACE 0.0 0.6' PAVEMENT 0.6	
	2,668.5	3.5	5	3	5								M	ROADWAY EMBANKMENT Medium stiff to very stiff, red, brown silty CLAY (A-7-5), micaceous, trace ABC stone	
2665	2,666.0	6.0	4	4	4								M	RESIDUAL Medium stiff, brown, red, gray, silty CLAY (A-7-5), micaceous	
	2,663.5	8.5	3	3	4								M		
2660	2,658.1	13.9	2	3	5								M		
2655	2,653.1	18.9	2	2	5								M		
2650	2,648.1	23.9	49	51/0.2									M	WEATHERED ROCK Brown, gray, orange, METAGRANITE	
2645	2,645.6	26.4	60/0.0											CRYSTALLINE ROCK No Recovery, METAGRANITE	
2640														Boring Terminated at Elevation 2,637.3 ft in Crystalline Rock Hard drilling at 26.0 - 26.4 ft bgs	

NCDOT BORE DOUBLE HB0004 GINT LOGS.GPJ NC_DOT.GDT 3/1/22

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST P. Grainger					
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)				
BORING NO. B1-E		STATION N/A		OFFSET N/A		ALIGNMENT N/A					
COLLAR ELEV. 2,672.0 ft		TOTAL DEPTH 34.7 ft		NORTHING 679,496		EASTING 854,799					
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021		DRILL METHOD H.S. Augers/Mud Rotary		HAMMER TYPE Automatic							
DRILLER M. Moseley		START DATE 02/09/22		COMP. DATE 02/09/22		SURFACE WATER DEPTH N/A					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)	REC. (%)	RQD (%)			
2645.6	2,645.6	26.4	4.3	2:20	(3.5)	(3.5)	(4.6)	(4.6)		Begin Coring @ 26.4 ft	26.4
				2:33	81%	81%	55%	55%		WEATHERED ROCK (continued)	
				2:20						CRYSTALLINE ROCK	
				2:30						Gray, black METAGRANITE, opaque, with quartzite, fresh, moderately hard. From 30.7 ft: Lost recovery, as remaining rock from Run 2 stuck down in borehole	
2640	2,641.3	30.7	4.0	1:12	(1.1)	(1.1)					
	2,637.3	34.7		2:51							
				2:29							
				2:43							
										GSI= 80- 90 Boring Terminated at Elevation 2,637.3 ft in Crystalline Rock Hard drilling at 26.0 - 26.4 ft bgs	

NCDOT BORE DOUBLE HB0004 GINT LOGS.GPJ NC_DOT.GDT 3/1/22

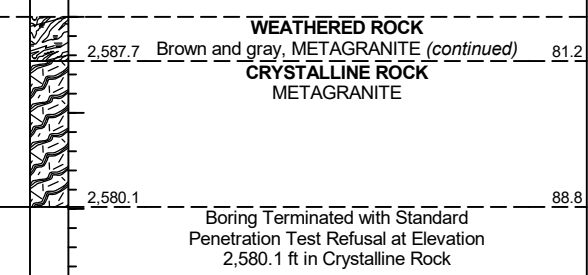
GEOTECHNICAL BORING REPORT

BORE LOG

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)									
BORING NO. B2-A		STATION N/A		OFFSET N/A		ALIGNMENT N/A										
COLLAR ELEV. 2,668.9 ft		TOTAL DEPTH 88.8 ft		NORTHING 679,703		EASTING 854,875										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER M. Moseley		START DATE 01/25/22		COMP. DATE 01/25/22		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						
2670														2,668.9	0.0	GROUND SURFACE
	2,667.9	1.0														ROADWAY EMBANKMENT
	2,665.4	3.5	3	5	5											Loose to medium dense, brown, fine to coarse grained, clayey SAND (A-2-7), micaceous
2665	2,662.9	6.0	4	7	12											
	2,660.4	8.5	3	3	3											RESIDUAL
2660	2,655.2	13.7	2	2	3											Medium stiff to very stiff, brown, red, black, silty CLAY (A-7-5)(6), fine to coarse grained, micaceous
	2,650.2	18.7	2	2	2											
2655	2,645.2	23.7	1	2	3											
	2,640.2	28.7	3	3	4											
2650	2,635.2	33.7	3	3	4											
	2,630.2	38.7	3	3	5											
2645	2,625.2	43.7	4	4	6											
	2,620.2	48.7	3	4	6											
2640	2,615.2	53.7	8	7	13											
	2,610.2	58.7	18	31	40											
2635	2,605.2	63.7	18	25	31											
	2,600.2	68.7	8	12	14											
2630	2,595.2	73.7	15	30	46											
	2,590.2	78.7														

NCDOT BORE DOUBLE HB0004 GINT LOGS.GPJ NC_DOT.GDT 3/3/22

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)									
BORING NO. B2-A		STATION N/A		OFFSET N/A		ALIGNMENT N/A										
COLLAR ELEV. 2,668.9 ft		TOTAL DEPTH 88.8 ft		NORTHING 679,703		EASTING 854,875										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER M. Moseley		START DATE 01/25/22		COMP. DATE 01/25/22		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						
2590																
		100/0.4														
2585	2,585.2	83.7														
	2,580.2	88.7														



GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)								
BORING NO. B2-B		STATION N/A		OFFSET N/A		ALIGNMENT N/A									
COLLAR ELEV. 2,670.2 ft		TOTAL DEPTH 31.6 ft		NORTHING 679,482		EASTING 854,843									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER M. Moseley		START DATE 02/02/22		COMP. DATE 02/03/22		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					
2675															
2670	2,669.2	1.0												2,670.2	0.0
	2,667.2	3.0	2	2	3									2,667.2	3.0
2665	2,664.7	5.5	4	4	4										
	2,662.2	8.0	4	4	5										
2660			5	5	6										
	2,657.1	13.1													
2655			4	4	10										
	2,652.1	18.1	8	13	13										
2650															
	2,648.6	21.6	60	0	0									2,648.6	21.6
2645															
2640															

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST N. Yacobi						
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)					
BORING NO. B2-B		STATION N/A		OFFSET N/A		ALIGNMENT N/A						
COLLAR ELEV. 2,670.2 ft		TOTAL DEPTH 31.6 ft		NORTHING 679,482		EASTING 854,843						
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic						
DRILLER M. Moseley		START DATE 02/02/22		COMP. DATE 02/03/22		SURFACE WATER DEPTH N/A						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	TOTAL RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %			
2648.6	2,648.6	21.6	3.0	2:16 2:08 2:05	(2.5) 83%	(2.5) 83%		(8.8) 88%	(8.8) 88%		Begin Coring @ 21.6 ft	21.6
2645	2,645.6	24.6	5.0	2:15 2:19 2:03 1:59 2:11	(4.3) 86%	(4.3) 86%					Gray to dark gray METAGRANITE, with large white quartz bands, slightly weathered to fresh, hard, no fractures, garnets 2mm to 15mm, From 24.6 to 31.6 ft: Large quartz bands, abundant 2mm to 15 mm garnets.	
2640	2,640.6	29.6	2.0	2:28 2:41	(2.0) 100%	(2.0) 100%					GSI= 95-100	31.6
	2,638.6	31.6									Boring Terminated at Elevation 2,638.6 ft in Crystalline Rock	

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)								
BORING NO. B2-E		STATION N/A		OFFSET N/A		ALIGNMENT N/A									
COLLAR ELEV. 2,670.8 ft		TOTAL DEPTH 34.4 ft		NORTHING 679,511		EASTING 854,844									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER M. Moseley		START DATE 02/02/22		COMP. DATE 02/02/22		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					
2675															
2670	2,669.8	1.0	5	5	7									2,670.8	0.0
	2,667.3	3.5	3	3	3										
2665	2,664.8	6.0	3	3	5										
	2,662.3	8.5	3	4	7										
2660															
	2,657.2	13.6	9	12	10										
2655															
	2,652.2	18.6	8	6	6										
2650															
	2,647.2	23.6	100/0.4											2,648.8	22.0
2645															
	2,642.2	28.6	100/0.2											2,641.5	29.3
2640	2,641.7	29.1	100/0.2												
														2,636.4	34.4
Boring Terminated at Elevation 2,636.4 ft in Crystalline Rock															

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST N. Yacobi					
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)				
BORING NO. B2-E		STATION N/A		OFFSET N/A		ALIGNMENT N/A					
COLLAR ELEV. 2,670.8 ft		TOTAL DEPTH 34.4 ft		NORTHING 679,511		EASTING 854,844					
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic						
DRILLER M. Moseley		START DATE 02/02/22		COMP. DATE 02/02/22		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 5.1 ft		DESCRIPTION AND REMARKS							
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC (ft) %	STRATA RQD (ft) %	LOG	DEPTH (ft)
2641.5	2,641.5	29.3	1.0	1:55	(0.5)	(0.0)		(1.6)	(0.8)		29.3
2640	2,640.5	30.3	4.1	3:50	50%	0%		31%	16%		29.3
				2:00	(1.1)	(0.8)					
				1:33	27%	20%					
				2:54							
	2,636.4	34.4									34.4
Begin Coring @ 29.3 ft CRYSTALLINE ROCK Dark gray to gray METAGRANITE, slightly weathered to fresh, moderately hard, close fracture spacing											
GSI= 75 - 80 Boring Terminated at Elevation 2,636.4 ft in Crystalline Rock											

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)								
BORING NO. EB2-B		STATION N/A		OFFSET N/A		ALIGNMENT N/A									
COLLAR ELEV. 2,685.8 ft		TOTAL DEPTH 22.2 ft		NORTHING 679,479		EASTING 854,914									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER M. Moseley		START DATE 02/02/22		COMP. DATE 02/02/22		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					
2690															
2685	2,684.8	1.0	4	4	4									2,685.8	GROUND SURFACE
	2,682.3	3.5	4	4	6									2,680.3	ROADWAY EMBANKMENT Loose, brown, clayey SAND (A-2-7)
2680	2,679.8	6.0	5	6	10									2,677.8	RESIDUAL Very stiff, brown, silty CLAY (A-7-5), micaceous
	2,677.8	8.0	8	10	39									2,672.8	Dense, brown to gray, SAND (A-1-b) with rock fragments
2675	2,672.6	13.2	4	4	6									2,672.8	Stiff, brown, silty CLAY (A-7-5), trace rock fragments
2670	2,667.6	18.2	8	4	7										
2665	2,663.6	22.2												2,663.6	CRYSTALLINE ROCK No recovery, METAGRANITE Boring Terminated with Standard Penetration Test Refusal at Elevation 2,663.6 ft on Crystalline Rock

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST P. Grainger									
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)								
BORING NO. EB2-D		STATION N/A		OFFSET N/A		ALIGNMENT N/A									
COLLAR ELEV. 2,689.8 ft		TOTAL DEPTH 39.0 ft		NORTHING 679,628		EASTING 854,943									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER M. Moseley		START DATE 02/14/22		COMP. DATE 02/14/22		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					
2690															
	2,688.8	1.0	3	3	6									2,689.8	GROUND SURFACE
2685	2,686.3	3.5	2	2	2										ROADWAY EMBANKMENT Loose, brown, clayey SAND (A-2-7)(0), micaceous, trace rock fragments
	2,683.8	6.0	2	3	2										
2680	2,681.3	8.5	3	3	4									2,676.3	RESIDUAL Stiff to very stiff, brown, orange, gray, silty CLAY (A-7-5), micaceous, saprolitic, trace rock fragments
2675	2,675.8	14.0	4	5	8										
2670	2,670.8	19.0	6	9	12										
2665	2,665.8	24.0	5	4	6										
2660	2,660.8	29.0	9	10	11										
2655	2,655.8	34.0	7	11	15										
	2,650.8	39.0												2,650.8	CRYSTALLINE ROCK No recovery, METAGRANITE Boring Terminated with Standard Penetration Test Refusal at Elevation 2,650.8 ft on Crystalline Rock

NCDOT BORE DOUBLE HB0004 GINT LOGS.GPJ NC_DOT.GDT 3/3/22

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 55041.1.1		TIP HB-0004		COUNTY HAYWOOD		GEOLOGIST N. Yacobi											
SITE DESCRIPTION Bridge No. 243 on I-40 over NC 215							GROUND WTR (ft)										
BORING NO. EB2-E		STATION N/A		OFFSET N/A		ALIGNMENT N/A											
COLLAR ELEV. 2,690.4 ft		TOTAL DEPTH 36.4 ft		NORTHING 679,515		EASTING 854,922											
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/18/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER M. Moseley		START DATE 02/01/22		COMP. DATE 02/01/22		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)			
2695																	
2690	2,689.4	1.0	3	4	4									2,690.4	0.0	GROUND SURFACE	
	2,686.9	3.5	2	4	3									2,687.4	3.0	ROADWAY EMBANKMENT Loose, red, brown, clayey SAND (A-2-6), some mica	
2685	2,684.4	6.0	3	3	4											Loose, brown, black, orange, clayey SAND (A-2-7), micaceous	
	2,681.9	8.5	3	4	5												
2680																	
	2,676.9	13.5	6	7	10									2,677.4	13.0	RESIDUAL Stiff to hard, brown, silty CLAY (A-7-5)	
2675																	
	2,671.9	18.5	6	6	7												
2670																	
	2,666.9	23.5	16	21	27												
2665																	
	2,661.9	28.5	5	9	10												
2660																	
	2,656.9	33.5	66	34/0.1										2,657.4	33.0	WEATHERED ROCK Gray, METAGRANITE	
2655														2,654.1	36.3	CRYSTALLINE ROCK No recovery, METAGRANITE	
	2,654.1	36.3	60/0.1											2,654.0	36.4	Boring Terminated with Standard Penetration Test Refusal at Elevation 2,654.0 ft in Crystalline Rock	

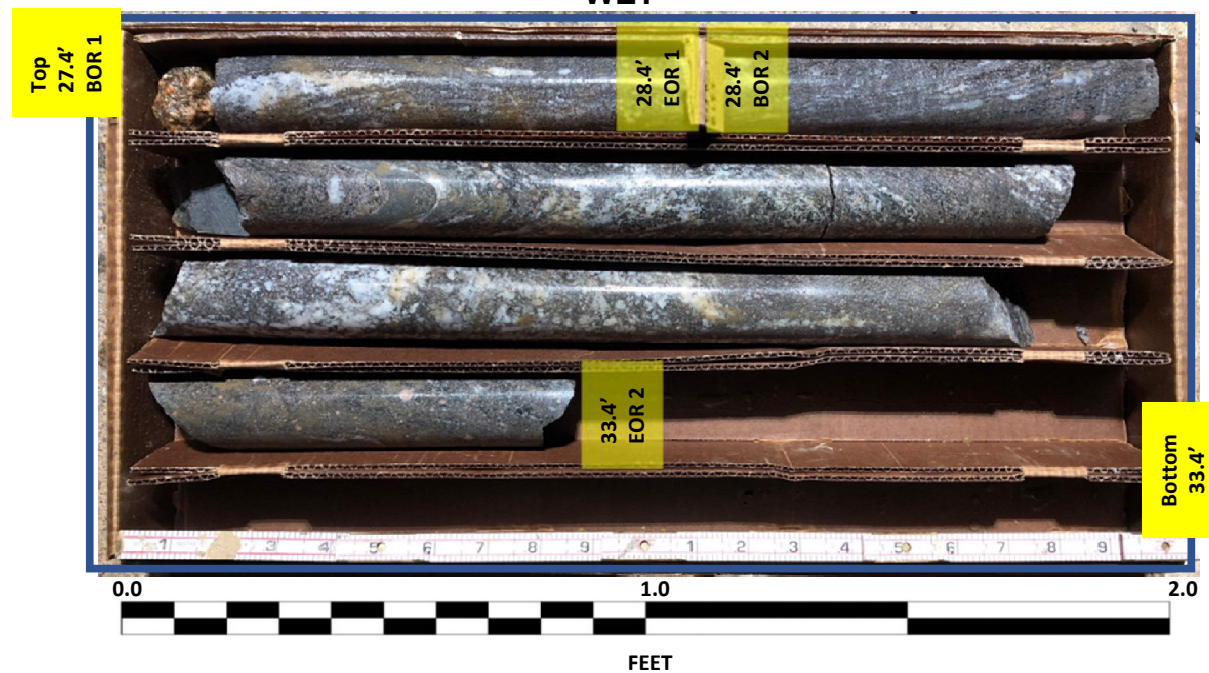
NCDOT BORE DOUBLE HB0004 GINT LOGS.GPJ NC_DOT.GDT 3/3/22

CORE PHOTOGRAPHIC RECORD

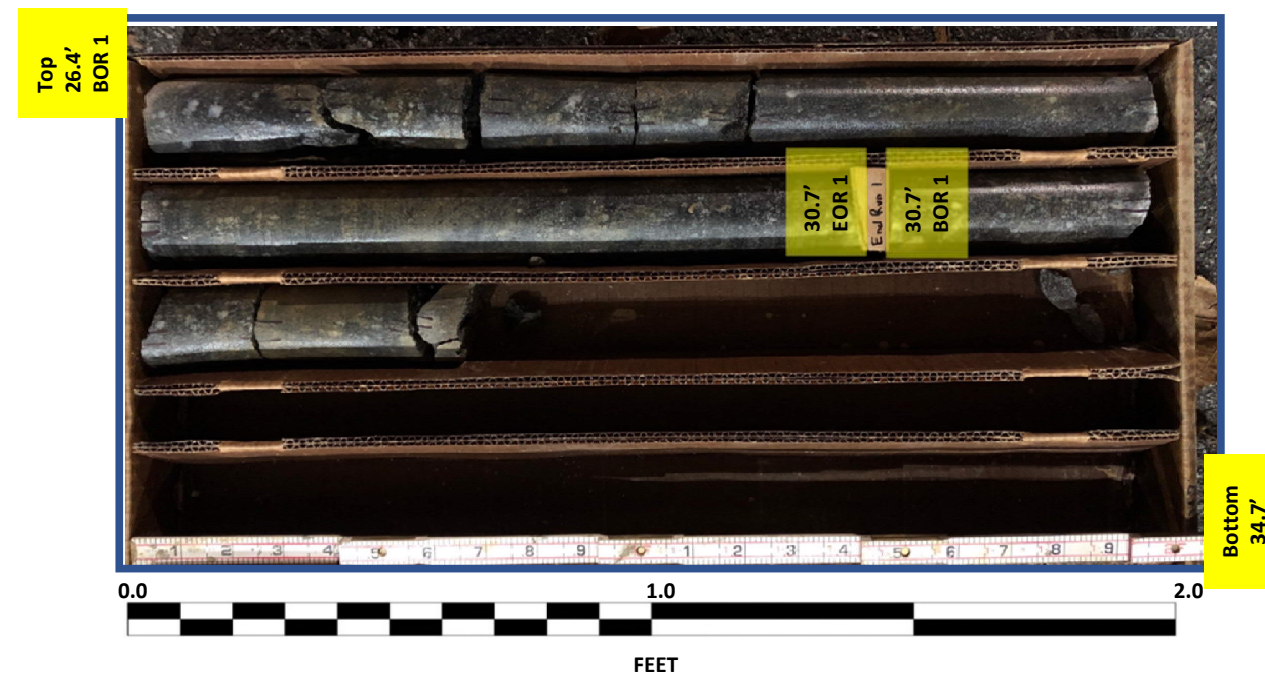
55041.1.1 (HB-0004)

Bridge No. 243 on I-40 over NC 215 (Champion Road)

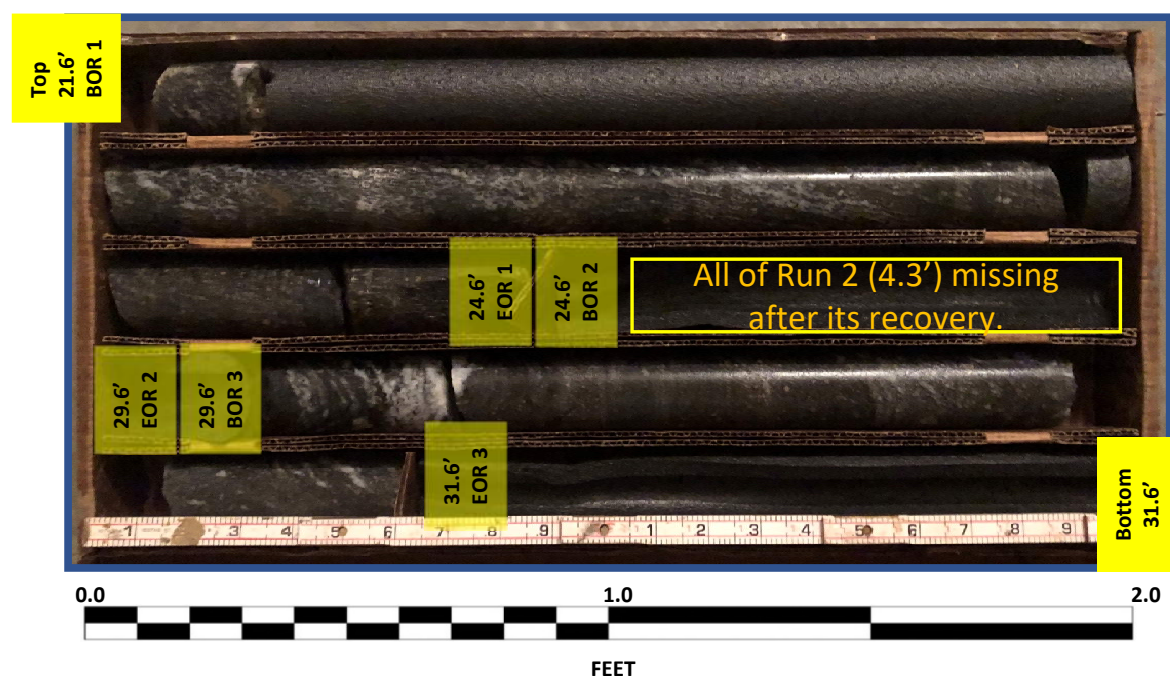
B1-B
Box 1 of 1: 27.4 – 33.4 FEET
WET



B1-E
Box 1 of 1: 26.4 – 34.7 FEET
WET



B-2B
Box 1 of 1: 21.6 – 31.6 FEET
WET



B-2E
Box 1 of 1: 29.3 – 34.4 FEET
WET



SOIL TEST RESULTS



HDR Engineering, Inc. of the Carolinas
 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
 N.C.B.E.L.S. License Number: F-0116

SOIL TEST RESULTS

BORING NO.	SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
								C. SAND	F. SAND	SILT	CLAY	10	40	200		
EB1-A	SS-9	N/A	N/A	33.4' - 34.9'	A-5(1)	46	3	23.4	29.4	34.0	13.2	97.1	84.4	51.4	54	-
EB1-B	SS-23	N/A	N/A	23.6' - 25.1'	A-2-6(1)	39	16	34.4	22.1	32.6	10.9	52.1	38.7	24.7	N/A	-
B1-B	SS-83	N/A	N/A	8.5' - 10.0'	A-7-5(6)	56	12	23.3	26.3	31.1	19.3	98.1	83.1	54.6	40	-
B2-A	SS-113	N/A	N/A	13.7' - 15.2'	A-7-5(6)	44	12	18.7	21.3	37.9	22.1	91.5	77.6	58.3	40	-
EB2-D	SS-185	N/A	N/A	8.5' - 10.0'	A-2-7(0)	43	12	38.5	28.7	20.1	12.7	85.1	63.4	29.7	N/A	-

Site Photographs



Photo 1: Looking South towards End Bent 1 and Bent 1



Photo 2: Looking North towards End Bent 2 and Bent 2



Photo 3: Looking East towards End Bent 2 and Bent 2 under Bridge 243



Photo 4: Looking southwest towards End Bent 1 and Bent 1 under Bridge 243

