REFERENCE: I-2513AC

PROJECT: 34165

STATE	TOWN OF HOLLY SPRINGS PROJECT NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-2513AC	1	24

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY *BUNCOMBE*

PROJECT DESCRIPTION *I-26/I-40/I-240 INTERCHANGE TO SR 3548 (HAYWOOD RD)*

SITE DESCRIPTION *BRIDGE NO. 208 ON -L- (I-26/I-240) OVER HOMINY CREEK AND SR 3620 (HOMINY CREEK RD) BETWEEN I-40 WB AND NC 191*

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SHEET NO.	DESCRIPTION
1	TITLE SHEET
2, 2A	LEGEND
3	SITE PLAN
4	PROFILE
5-8	CROSS SECTIONS
9-21	BORE LOGS, CORE LOGS, AND CORE PHOTOS

APPENDICES

APPENDIX	TITLE	SHEETS
A	LABORATORY RESULTS	22-23

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.

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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

CG2

GOODNIGHT, D.J.

NCDOT

INVESTIGATED BY *FALCON ENG.*

DRAWN BY *CROCKETT, S.C.*

CHECKED BY *HUNSBERGER, W.S.*

SUBMITTED BY *FALCON ENG.*

DATE *SEPTEMBER 2024*

NORTH CAROLINA PROFESSIONAL SEAL 048207 ENGINEER STEPHEN C. CROCKETT

DocuSigned by:
Stephen Crockett 9/24/2024
C5CA5FED48E0435...
SIGNATURE DATE

TOWN OF HOLLY SPRINGS PROJECT NO.	SHEET NO.
I-2513AC	2

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

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-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
#40	30 MX	50 MX	51 MN											
#200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
MATERIAL PASSING #40 LL	–		–	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PI	6 MX		NP	10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

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

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4

TEXTURE OR GRAIN SIZE

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.)

GRAIN SIZE MM: 305, 75, 2.0, 0.25, 0.05, 0.005
IN.: 12, 3

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT; PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	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

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

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- 25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES
- SOIL SYMBOL
- SPT DPT DMT VST PMT TEST BORING
- SLOPE INDICATOR INSTALLATION
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- AUGER BORING
- CONE PENETROMETER TEST
- INFERRED SOIL BOUNDARY
- CORE BORING
- SOUNDING ROD
- INFERRED ROCK LINE
- MW MONITORING WELL
- TEST BORING WITH CORE
- ALLUVIAL SOIL BOUNDARY
- PIEZOMETER INSTALLATION
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- 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

ABBREVIATIONS

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_d - DRY UNIT WEIGHT
CSE. - COARSE	ORG. - ORGANIC	
DMT - DILATOMETER TEST	PMT - PRESSUREMETER TEST	SAMPLE ABBREVIATIONS
DPT - DYNAMIC PENETRATION TEST	SAP. - SAPROLITIC	S - BULK
e - VOID RATIO	SD. - SAND, SANDY	SS - SPLIT SPOON
F - FINE	SL. - SILT, SILTY	ST - SHELBY TUBE
FOSS. - FOSSILIFEROUS	SLI. - SLIGHTLY	RS - ROCK
FRAC. - FRACTURED, FRACTURES	TCR - TRICONE REFUSAL	RT - RECOMPACTED TRIAXIAL
FRAGS. - FRAGMENTS	w - MOISTURE CONTENT	CBR - CALIFORNIA BEARING RATIO
HI. - HIGHLY	V - VERY	

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [ ] CME-55
- [X] CME-550X
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [X] DIEDRICH D-50
- [ ] ______

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [ ] W/ ADVANCER
- [ ] TRICONE ______ " STEEL TEETH
- [ ] TRICONE ______ " TUNG.-CARB.
- [X] CORE BIT
- [ ] ______

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B ______ [ ] -H ______
- [X] -N Q

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 YEILD 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 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

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FOOT
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 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.

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 DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: BL-15, -L- STA. 43+89, 56' LT
N: 679099 E: 930201
ELEVATION: 2029.48 FEET

NOTES:
FIAD - FILLED IMMEDIATELY AFTER DRILLING

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
I-2513AA	2A

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)

GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)

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.

STRUCTURE

- INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities
- BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets
- VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets
- BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity
- DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces
- LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes

DECREASING INTERLOCKING OF ROCK PIECES ⇩

SURFACE CONDITIONS

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

DECREASING SURFACE QUALITY ⇨

90			N/A	N/A
80				
70				
60				
50				
40				
30				
20				
10				
N/A	N/A			

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

GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos. P and Hoek E., 2000)

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.

COMPOSITION AND STRUCTURE

- **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.*
- **B.** *Sandstone with thin interlayers of siltstone*
- **C.** *Sandstone and siltstone in similar amounts*
- **D.** *Siltstone or silty shale with sandstone layers*
- **E.** *Weak siltstone or clayey shale with sandstone layers*
- **C, D, E,** and **G** - may be more or less folded than illustrated but this does not change the strength. Tectonic deformation, faulting and loss of continuity moves these categories to **F** and **H.**
- **F.** *Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure*
- **G.** *Undisturbed silty or clayey shale with or without a few very thin sandstone layers*
- **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.***

——— Means deformation after tectonic disturbance

SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)

VERY GOOD	GOOD	FAIR	POOR	VERY POOR
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

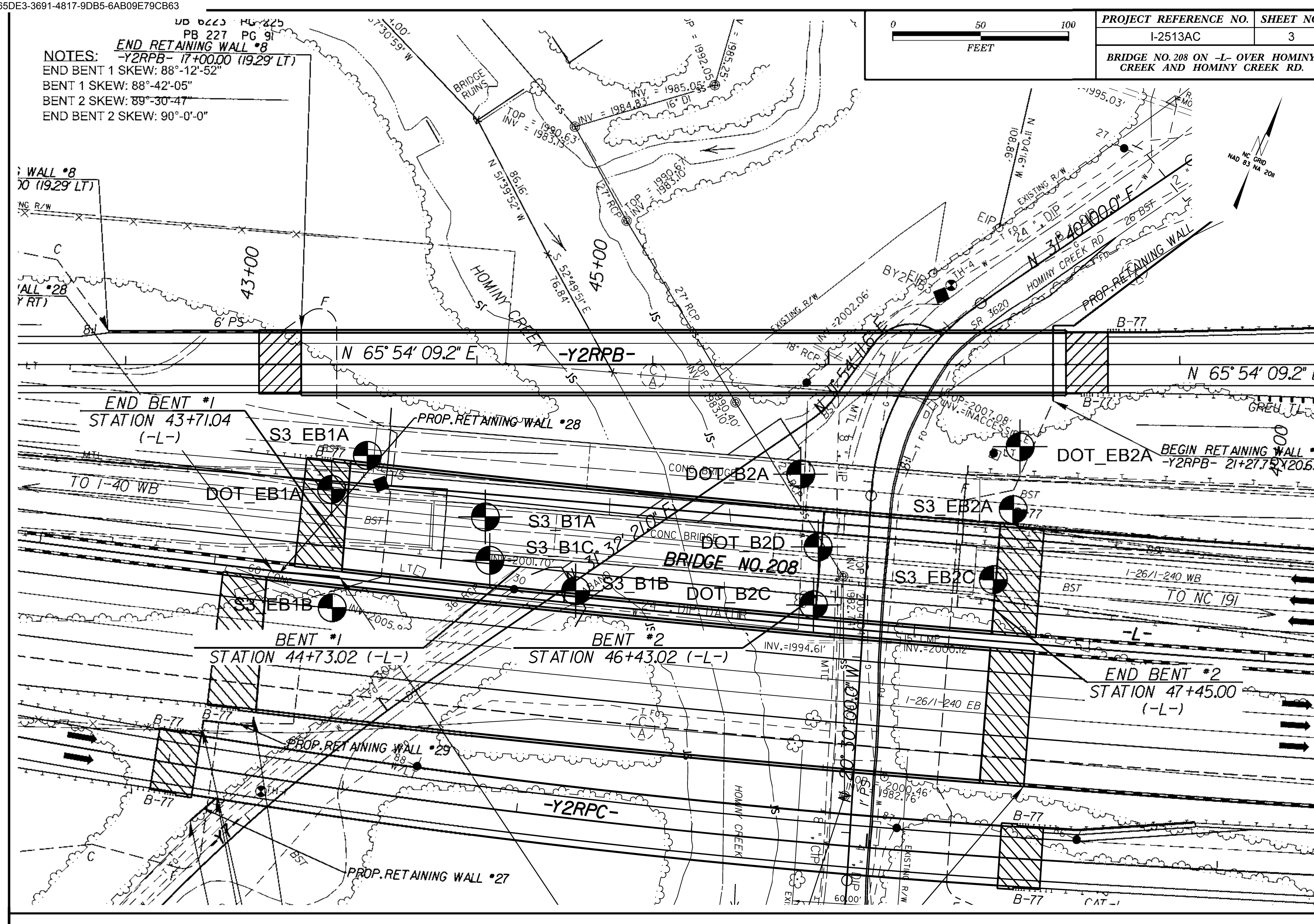
70	A			
60				
50	B	C	D	E
40				
30				F
20				
10		G	H	

DATE: 8-19-16

PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	3

BRIDGE NO. 208 ON –L– OVER HOMINY CREEK AND HOMINY CREEK RD.

NOTES:
END BENT 1 SKEW: 88°-12'-52"
BENT 1 SKEW: 88°-42'-05"
BENT 2 SKEW: 89°-30'-47"
END BENT 2 SKEW: 90°-0'-0"



PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	4

BRIDGE NO. 208 ON -L- OVER HOMINY CREEK AND HOMINY CREEK RD.

0 50 100
FEET
VE = 5:1

(A) **ROADWAY EMBANKMENT:** BROWN AND TAN-BROWN, MOIST, V. LOOSE TO MED. DENSE, SILTY SAND WITH TRACE GRAVEL AND ORGANICS
(B) **ROADWAY EMBANKMENT:** BROWN, MOIST, SOFT, SANDY SILT (A-4) AND SANDY SILTY CLAY (A-7) WITH TRACE GRAVEL
(C) **ALLUVIAL:** BROWN GRAY AND BLACK, MOIST TO WET, SILTY SAND (A-2-4) WITH TRACE GRAVEL
(D) **RESIDUAL:** BROWN AND RED, MOIST, LOOSE TO DENSE, SILTY SAND (A-2-4) WITH TRACE ROCK FRAGS.
(E) **WEATHERED ROCK:** BROWN AND GRAY, GNEISS
(F) **CRYSTALLINE ROCK:** BLACK WHITE BROWN AND GRAY, GNEISS AND METAMORPHOSED GRANITIC ROCK

DOT_EB1-A
43+61
50' LT

S3_B1-A
44+51
44' LT

RS-03

09/99

GSI = 55
REC. = 99%
ROD = 99%

BT

100/0.7
60/0.1

GSI = 55
REC. = 97%
ROD = 64%

GSI = 55
REC. = 100%
ROD = 100%

BT
FIAD

S3_EB2B
47+43
35' LT

EXISTING GROUND

DOT_B2-D
46+41
45' LT

60/0.0

SPT REF.
FIAD

GSI = 55
REC. = 97%
ROD = 84%

BT
FIAD

-L- (35.5' LT)

NOTES:
GROUNDLINE PROFILE TAKEN FROM FILES PROVIDED BY OTHERS DATED JUNE, 2023.
PROFILE DRAWN AT AN OFFSET OF 35.5 FEET LEFT OF CENTERLINE ALONG -L-
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.
END BENT 1 SKEW: 88°-12'-52"
BENT 1 SKEW: 88°-42'-05"
BENT 2 SKEW: 89°-30'-47"
END BENT 2 SKEW: 90°-0'-0"

2040 2035 2030 2025 2020 2015 2010 2005 2000 1995 1990 1985 1980 1975 1970 1965 1960 1955

42+00 43+00 44+00 45+00 46+00 47+00 48+00

PROJ. REFERENCE NO.	SHEET NO.
I-2513AC	5

(A) **ROADWAY EMBANKMENT:** BROWN, MOIST, V. LOOSE TO MED. DENSE, SILTY SAND (A-2-4) WITH TRACE GRAVEL AND ORGANICS

(B) **ROADWAY EMBANKMENT:** BROWN, MOIST, MED. STIFF TO STIFF, SANDY SILT (A-4) WITH TRACE GRAVEL AND ORGANICS

(C) **ALLUVIAL:** BROWN, MOIST TO WET, LOOSE, SILTY SAND (A-2-4) WITH TRACE GRAVEL AND WOOD FRAGS.

(D) **RESIDUAL:** BROWN AND TAN, MOIST, LOOSE TO V. DENSE, SILTY SAND (A-2-4) WITH TRACE MICA AND ROCK FRAGS.

(E) **WEATHERED ROCK:** BROWN AND TAN, GNEISS

(F) **CRYSTALLINE ROCK:** GRAY AND TAN, GNEISS

S3_EBIA
43+80
72' LT

DOT_EBI-A
43+61
50' LT

S3_EBIB
43+69
18' RT

EXISTING GROUND

SPT REF.
FIAD

SPT REF.
FIAD

BT

GSI = 55
REC. = 99%
RQD = 99%

NOTES:

GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA IN ELECTRONIC FILES RECEIVED FROM OTHERS DATED JUNE, 2023.

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

END BENT 1 SKEW: 88°-12'-52"

END BENT #1
43 + 71.04

-L-

PROJ. REFERENCE NO.	SHEET NO.
I-2513AC	6

(A) **ROADWAY EMBANKMENT:** BROWN, MOIST, SOFT, SANDY SILT (A-4) AND SILTY SANDY CLAY (A-7) WITH LITTLE GRAVEL

(B) **ROADWAY EMBANKMENT:** BROWN, MOIST, V. LOOSE TO MED. DENSE, SILTY SAND (A-2-4) WITH TRACE TO LITTLE GRAVEL

(C) **RESIDUAL:** RED AND BROWN, MOIST, MED. DENSE, SILTY SAND (A-2-4)

(D) **WEATHERED ROCK:** GRAY BROWN AND TAN, GNEISS

(E) **CRYSTALLINE ROCK:** GRAY BLACK WHITE AND TAN, GNEISS AND METAMORPHOSED GRANITIC ROCK

RS-03

S3_BI-A
44+51
44' LT

S3_BI-C
44+56
19' LT

S3_BI-B
45+06
7' LT

EXISTING GROUND

GSI = 55
REC. = 97%
RQD = 64%

GSI = 55
REC. = 100%
RQD = 100%

GSI = 55
REC. = 89%
RQD = 43%

GSI = 55
REC. = 94%
RQD = 79%

GSI = 55
REC. = 94%
RQD = 57%

BT FIAD

BT FIAD

BT FIAD

BENT #1
44+73.02

$-\mathit{L}-$

NOTES:

GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA IN ELECTRONIC FILES RECEIVED FROM OTHERS DATED JUNE, 2023.

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

BENT 1 SKEW: 88°-42'-05"

PROJ. REFERENCE NO.	SHEET NO.
I-2513AC	7

Ⓐ ROADWAY EMBANKMENT: BROWN, MOIST, V. LOOSE TO MED. DENSE, SILTY SAND (A-1-b, A-2-4) WITH GRAVEL AND BOULDERS

Ⓑ WEATHERED ROCK: GNEISS

Ⓒ CRYSTALLINE ROCK: GNEISS

DOT_B2-A
46+28
85' LT

DOT_B2-D
46+41
45' LT

EXISTING GROUND

DOT_B2-C
46+42
12' LT

4
4
100/0.5
07/99

GSI = 55
REC. = 96%
RQD = 94%

BT

1
3
6

GSI = 55
REC. = 97%
RQD = 81%

BT

27
07/99

GSI = 55
REC. = 99%
RQD = 98%

BT

NOTES:

GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA IN ELECTRONIC FILES RECEIVED FROM OTHERS DATED JUNE, 2023.

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

BENT 2 SKEW: 89°-30'-47"

BENT #2
46 + 43.02

$-\mathit{L}-$

PROJ. REFERENCE NO.	SHEET NO.
I-2513AC	8

(A) **ROADWAY EMBANKMENT:** BROWN AND TAN-BROWN, MOIST, V.LOOSE TO LOOSE, SILTY SAND (A-2-4) WITH TRACE GRAVEL

(B) **ROADWAY EMBANKMENT:** BROWN, MOIST, STIFF, SANDY SILT (A-4) WITH TRACE GRAVEL

(C) **RESIDUAL:** BROWN, MOIST, MED. DENSE TO V. DENSE, SILTY SAND (A-2-4) WITH ROCK FRAGS.

(D) **WEATHERED ROCK:** BROWN AND GRAY, GNEISS

(E) **CRYSTALLINE ROCK:** BROWN AND GRAY, GNEISS

DOT_EB2-A
47+52
112' LT

S3_EB2A
47+51
76' LT

EXISTING GROUND

S3_EB2B
47+43
35' LT

C 89 — 100 — 100/0.5 — 07/99

GSI = 55
REC. = 74%
RQD = 51%

FIAD

A 5 — 11 — 49 — 100/0.7 — 100/0.6 — 60/0.1

SPT REF.
FIAD

A 6 — 3 — 5 — 10 — 31 — 9 — 60/0.0

SPT REF.
FIAD

NOTES:

GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA IN ELECTRONIC FILES RECEIVED FROM OTHERS DATED JUNE, 2023.

INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.

END BENT 2 SKEW: 90°-0'-0"

END BENT #2
47 + 45.00

-L-

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** Goodnight, D.J.
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191			**GROUND WTR (ft)**
BORING NO. S3_EB1A	**STATION** 43+80	**OFFSET** 72 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,029.4 ft	**TOTAL DEPTH** 31.8 ft	**NORTHING** 679,112	**EASTING** 930,187	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Brewer, M.	**START DATE** 02/07/23	**COMP. DATE** 02/07/23	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2030										2,029.4 GROUND SURFACE	0.0
	2,027.7	1.7								2,028.3 **ROADWAY EMBANKMENT** ASPHALT (1 INCH) AND CONCRETE (12 INCHES)	1.1
	2,025.9	3.5	9	4	5	9				2,026.1 **ROADWAY EMBANKMENT** BROWN, STIFF, SANDY SILT (A-4) WITH LITTLE GRAVEL	3.3
2025			6	7	7	14				BROWN, MEDIUM DENSE TO LOOSE, SILTY SAND (A-2-4) WITH TRACE GRAVEL AND ORGANICS	
	2,023.4	6.0	1	5	4	9					
	2,020.9	8.5									
2020			2	3	5	8					
	2,015.9	13.5	2	2	3	5					
2015						7					
	2,010.9	18.5	2	3	4						
2010						7					
	2,005.9	23.5	3	4	3					2,007.4 BROWN, MEDIUM STIFF, SANDY SILT (A-4) WITH TRACE GRAVEL AND ORGANICS (WOOD FRAGMENTS)	22.0
2005											
	2,000.9	28.5	2	98/0.4		100/0.9				2,000.4 **WEATHERED ROCK** BROWN, GNEISS	29.0
2000										1,998.9	30.5
	1,997.6	31.8	60/0.0			60/0.0				1,997.6 **CRYSTALLINE ROCK** TAN AND GRAY, GNEISS	31.8
										Boring Terminated at Elevation 1,997.6 ft on CR: GNEISS	

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** I-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** Goodnight, D.J.
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191			**GROUND WTR (ft)**
BORING NO. S3_EB1B	**STATION** 43+69	**OFFSET** 18 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,014.3 ft	**TOTAL DEPTH** 17.3 ft	**NORTHING** 679,024	**EASTING** 930,204	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Odom, C.	**START DATE** 02/27/23	**COMP. DATE** 02/27/23	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2015										2,014.3 GROUND SURFACE	0.0
	2,013.3	1.0								**RESIDUAL** TAN-BROWN, LOOSE TO DENSE, SILTY SAND (A-2-4) WITH LITTLE MICA	
			4	4	5	9		M			
2010	2,010.3	4.0	4	8	9	17		M			
	2,008.3	6.0	6	10	9	19		M			
2005	2,005.3	9.0	7	17	16	33		M			
2000	2,000.3	14.0	6	20	36	56		M		1,998.3	16.0
	1,997.0	17.3	60/0.0			60/0.0				1,997.0 **WEATHERED ROCK** TAN BROWN AND GRAY, GNEISS	17.3
										Boring Terminated at Elevation 1,997.0 ft on CR: GNEISS	

NCDOT BORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** SHELTON, T. P.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. DOT_EB1-A	**STATION** 43+61	**OFFSET** 50 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 2,029.4 ft	**TOTAL DEPTH** 53.4 ft	**NORTHING** 679,085	**EASTING** 930,176	**24 HR.** 31.0
DRILL RIG/HAMMER EFF./DATE CME 550		**DRILL METHOD** SPT Core Boring		**HAMMER TYPE** Automatic
DRILLER GOSNESS, W. A.	**START DATE** 09/09/99	**COMP. DATE** 09/09/99	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2030										2,029.4 GROUND SURFACE	0.0
										ROADWAY EMBANKMENT VERY LOOSE TO LOOSE, BROWN, SILTY SAND (A-2-4) WITH TRACE GRAVEL	
2025	2,024.4	5.0	3	2	2	4					
2020	2,019.5	9.8	1	2	3	5					
2015	2,014.3	15.1	1	2	2	4					
2010	2,009.3	20.0	2	3	2	5					
2005	2,004.4	24.9	1	1	1	2				2,002.3	27.1
2000	1,999.5	29.9	3	4	5	9				**ALLUVIAL** VERY LOOSE TO LOOSE, BROWN, GRAY, BLACK, SILTY FINE TO COARSE SAND (A-2-4), TRACE WOOD FRAGMENTS, TRACE GRAVEL	
1995	1,994.6	34.8	3	3	1	4				1,992.6	36.7
1990	1,989.3	40.0	7	9	17	26				**SAPROLITE** MEDIUM DENSE, BROWN, SITY FINE TO COARSE SAND (A-2-4), WITH ROCK FRAGMENTS	
1985										1,988.0	41.3
										1,987.5 **WEATHERED ROCK** MUSCOVITE/BIOTITE GNEISS	41.9
										1,985.8 **CRYSTALLINE ROCK** MUSCOVITE/BIOTITE GNEISS	43.6
1980										MUSCOVITE/BIOTITE GNEISS	
										1,980.9 MUSCOVITE/BIOTITE GNEISS	48.5
										1,976.0	53.4
										Boring Terminated at Elevation 1,976.0 ft IN MUSCOVITE/BIOTITE GNEISS	

PLEASE NOTE: This specific boring was completed in 1999. Core Photos are available from the Geotech Unit Asheville Field Office (AFO) if necessary. Photos are of an insufficient nature for professional evaluation. Please contact the AFO if necessary at dcelliott@ncdot.gov.

NCDOT BORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** SHELTON, T. P.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. DOT_EB1-A	**STATION** 43+61	**OFFSET** 50 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 2,029.4 ft	**TOTAL DEPTH** 53.4 ft	**NORTHING** 679,085	**EASTING** 930,176	**24 HR.** 31.0
DRILL RIG/HAMMER EFF./DATE CME 550		**DRILL METHOD** SPT Core Boring		**HAMMER TYPE** Automatic
DRILLER GOSNESS, W. A.	**START DATE** 09/09/99	**COMP. DATE** 09/09/99	**SURFACE WATER DEPTH** N/A	
CORE SIZE NXWL	**TOTAL RUN** 11.5 ft			

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	DESCRIPTION AND REMARKS ELEV. (ft)	DEPTH (ft)
1987.46											Begin Coring @ 41.9 ft	
	1,987.5	41.9	1.7		(1.7) 100%	(1.7) 100%		(0.5) 31%	(0.5) 31%		1,987.5 **CRYSTALLINE ROCK**	41.9
1985	1,985.8	43.6	4.9		(4.8) 98%	(4.8) 98%		(1.5) 30%	(1.5) 30%		1,985.8 FRESH, MEDIUM DARK GRAY, MUSCOVITE/BIOTITE GNEISS WITH GRANITE AND OCCASIONAL QUARTZ VEINS, FINE TO MEDIUM GRAINED	43.6
	1,980.9	48.5									GSI = 55	
1980			4.9		(4.9) 100%	(4.9) 100%		(1.5) 30%	(1.5) 30%		1,980.9 FRESH, MEDIUM DARK GRAY MUSCOVITE/BIOTITE GNEISS WTIH GARNETS AND OCCASIONAL QUARTZ VEINS, FINE TO MEDIUM GRAINED.	48.5
	1,976.0	53.4									GSI = 55	
											1,976.0 VERY SLIGHTLY WEATHERED TO FRESH, MEDIUM DARK GRAY MUSCOVITE/BIOTITE GNEISS WITH GARNETS. SLIGHTLY TO MODERATELY FOLDED. MEDIUM GRAINED WITH OCCASIONAL FELDSPAR PORPHYROBLASTS.	53.4
											GSI = 55	
											Boring Terminated at Elevation 1,976.0 ft IN MUSCOVITE/BIOTITE GNEISS	

PLEASE NOTE: This specific boring was completed in 1999. Core Photos are available from the Geotech Unit Asheville Field Office (AFO) if necessary. Photos are of an insufficient nature for professional evaluation. Please contact the AFO if necessary at dcelliott@ncdot.gov.

NCDOT CORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** Goodnight, D.J.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. S3_B1-A	**STATION** 44+51	**OFFSET** 44 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,004.9 ft	**TOTAL DEPTH** 40.8 ft	**NORTHING** 679,106	**EASTING** 930,263	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Brewer, M.	**START DATE** 02/10/23	**COMP. DATE** 02/10/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2005										2,004.9 GROUND SURFACE	0.0
	2,003.9	1.0								**ROADWAY EMBANKMENT** BROWN, MEDIUM DENSE, SILTY SAND (A-2-4) WITH TRACE GRAVEL AND BOULDERS	
	2,001.4	3.5	6	9	4	13		M		2,001.9	3.0
2000			2	1	1	2		M		BROWN, SOFT, SANDY SILT (A-4) WITH LITTLE GRAVEL	
	1,998.9	6.0								1,999.4	5.5
	1,996.4	8.5	3	4	6	10		M		BROWN, LOOSE TO MEDIUM DENSE, SILTY SAND (A-2-4) WITH TRACE GRAVEL AND ASPHALT DEBRIS	
1995			1	1	1	2		M		1,996.9	8.0
										BROWN, SOFT, SANDY SILTY CLAY (A-7) WITH LITTLE GRAVEL	
	1,991.4	13.5								1,993.4	11.5
1990			21	16	5	21		M		BROWN, MEDIUM DENSE, SILTY SAND (A-2-4) WITH TRACE GRAVEL	
										1,987.9	17.0
	1,986.4	18.5								**RESIDUAL** RED AND BROWN, MEDIUM DENSE, SILTY SAND (A-2-4)	
1985			6	44/0.2		100/0.7				1,985.9	19.0
	1,984.0	20.9	60/0.1			60/0.1				**WEATHERED ROCK** BROWN AND GRAY GNEISS	
										1,983.9	21.0
1980										**CRYSTALLINE ROCK** WHITE GRAY AND BLACK, BIOTITE GNEISS	
1975											
1970							RS-03			1,971.1 GRAY AND WHITE, METAMORPHOSED GRANITIC ROCK	33.8
1965										1,964.1 Boring Terminated at Elevation 1,964.1 ft in CR: GNEISS	40.8

NCDOT BORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

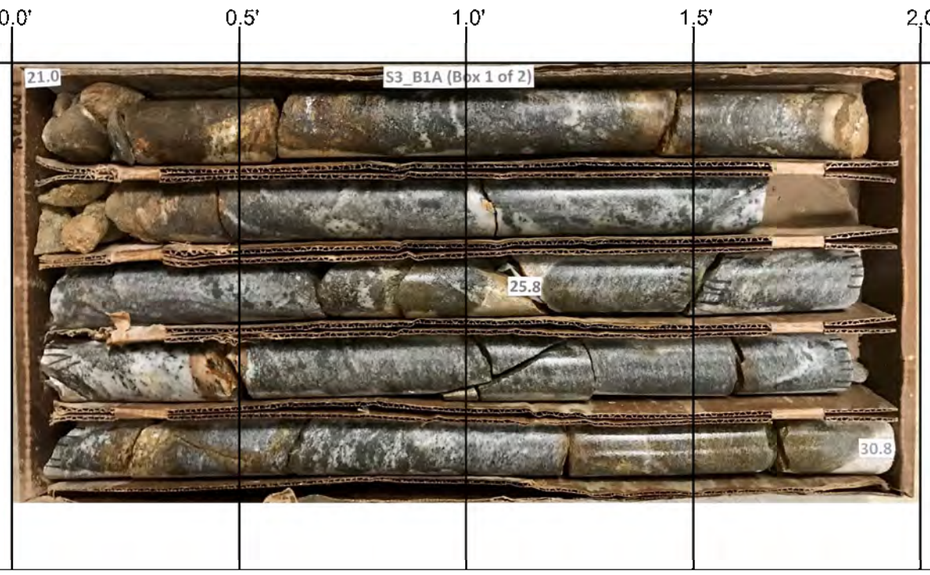
GEOTECHNICAL BORING REPORT
CORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** Goodnight, D.J.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. S3_B1-A	**STATION** 44+51	**OFFSET** 44 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,004.9 ft	**TOTAL DEPTH** 40.8 ft	**NORTHING** 679,106	**EASTING** 930,263	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Brewer, M.	**START DATE** 02/10/23	**COMP. DATE** 02/10/23	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ	**TOTAL RUN** 19.8 ft			

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	DESCRIPTION AND REMARKS ELEV. (ft)	DEPTH (ft)
1983.94											Begin Coring @ 21.0 ft	
	1,983.9	21.0	4.8	1/0.8 4:20/1.0 2:24/1.0 2:53/1.0 3:40/1.0	(4.7) 98%	(3.6) 75%		(12.4) 97%	(8.2) 64%		1,983.9 **CRYSTALLINE ROCK** WHITE GRAY AND BLACK, MODERATE TO SLIGHT WEATHERING, HARD TO VERY HARD, CLOSE FRACTURE SPACING, BIOTITE GNEISS	21.0
1980											GSI = 55	
	1,979.1	25.8	5.0	2:06/1.0 2:38/1.0 2:37/1.0 2:44/1.0 3:44/1.0	(4.8) 96%	(4.1) 82%						
1975												
	1,974.1	30.8	5.0	2:35/1.0 7:07/1.0 3:16/1.0 4:10/1.0 4:05/1.0	(4.9) 98%	(3.1) 62%					1,971.1	33.8
1970								(7.0)	(7.0)		GRAY AND WHITE, FRESH TO VERY SLIGHT WEATHERING, HARD TO VERY HARD, CLOSE TO MEDIUM-CLOSE FRACTURE SPACING, METAMORPHOSED GRANITIC ROCK	
	1,969.1	35.8					RS-03	100%	100%		GSI = 55	
			5.0	3:47/1.0 4:25/1.0 3:52/1.0 6:39/1.0 5:49/1.0	(5.0) 100%	(4.4) 88%						
1965												
	1,964.1	40.8									1,964.1 Boring Terminated at Elevation 1,964.1 ft in CR: GNEISS	40.8

NCDOT CORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

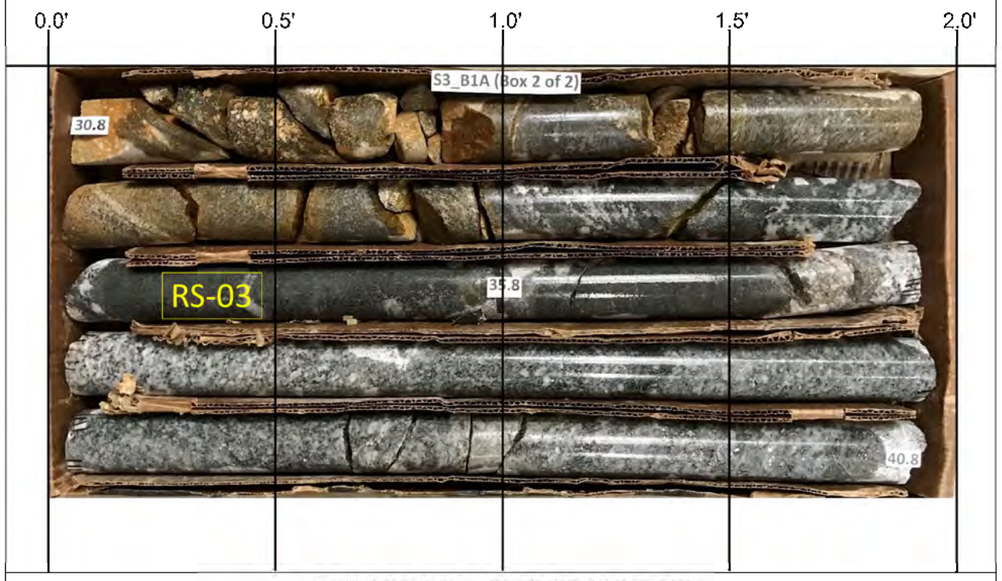
BORING S3_B1A, -L- STA. 44+51, 44' LT



BOX 1 OF 2, 21.0 FEET TO 30.8 FEET

GSI = 55

BORING S3_B1A, -L- STA. 44+51, 44' LT



BOX 2 OF 2, 30.8 FEET TO 40.8 FEET

GSI = 55

0 0.25' 0.5'

FEET

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ROCK CORE PHOTOGRAPHS

BRIDGE ON -L- OVER HOMINY CREEK AND SR 3620
BETWEEN I-40 WB AND NC 191
BUNCOMBE COUNTY, NC
WBS: 34165 | TIP: I-2513AC
FALCON PROJECT NO. G22009.01

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** Goodnight, D.J.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. S3_B1-B	**STATION** 45+06	**OFFSET** 7 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 2,005.9 ft	**TOTAL DEPTH** 46.7 ft	**NORTHING** 679,089	**EASTING** 930,327	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Odom, C.	**START DATE** 01/31/23	**COMP. DATE** 02/06/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2010											
2005	2,004.9	1.0	3	3	2	5		M		2,005.9 GROUND SURFACE	0.0
	2,002.4	3.5	2	1	2	3		M		**ROADWAY EMBANKMENT** BROWN, LOOSE TO VERY LOOSE, SILTY SAND (A-2-4) WITH LITTLE GRAVEL	
2000	1,999.9	6.0	2	WOH	1	1		M			
	1,997.4	8.5	1	WOH	1	1		M			
1995	1,992.4	13.5	4	3	4	7		M			
1990	1,987.4	18.5	3	2	3	5		M		1,985.4 WEATHERED ROCK TAN AND GRAY, GNEISS	20.5
1985	1,984.3	21.6	60/0.1			60/0.1		M		1,984.3 **CRYSTALLINE ROCK** GRAY AND BLACK, GNEISS	21.6
1980											
1975											
1970											
1965											
1960										1,959.2	46.7
										Boring Terminated at Elevation 1,959.2 ft in CR: GNEISS	

NCDOT BORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** Goodnight, D.J.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. S3_B1-B	**STATION** 45+06	**OFFSET** 7 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 2,005.9 ft	**TOTAL DEPTH** 46.7 ft	**NORTHING** 679,089	**EASTING** 930,327	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Odom, C.	**START DATE** 01/31/23	**COMP. DATE** 02/06/23	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ	**TOTAL RUN** 25.0 ft			

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	DESCRIPTION AND REMARKS ELEV. (ft)	DEPTH (ft)
1984.15											Begin Coring @ 21.7 ft	
	1,984.2	21.7	5.0	3:41/1.0 3:29/1.0 5:08/1.0 3:01/1.0 5:14/1.0	(4.5) 90%	(2.2) 44%		(23.4) 94%	(14.2) 57%		**CRYSTALLINE ROCK** GRAY AND BLACK, MODERATE TO SLIGHT WEATHERING, MODERATE HARD TO HARD, WITH CLOSE TO MODERATE-CLOSE FRACTURE SPACING, BIOTITE GNEISS	
1980	1,979.2	26.7	5.0	2:36/1.0 2:29/1.0 3:38/1.0 4:18/1.0 4:23/1.0	(4.2) 84%	(2.8) 56%					GSI = 55	
1975	1,974.2	31.7	5.0	3:11/1.0 2:51/1.0 2:20/1.0 1:53/1.0 2:33/1.0	(4.8) 96%	(3.2) 64%						
1970	1,969.2	36.7	5.0	3:11/1.0 3:16/1.0 2:57/1.0 2:10/1.0 2:47/1.0	(4.9) 98%	(2.3) 46%						
1965	1,964.2	41.7	5.0	3:30/1.0 3:58/1.0 3:26/1.0 2:33/1.0 2:40/1.0	(5.0) 100%	(3.7) 74%						
1960	1,959.2	46.7									1,959.2	46.7
											Boring Terminated at Elevation 1,959.2 ft in CR: GNEISS	

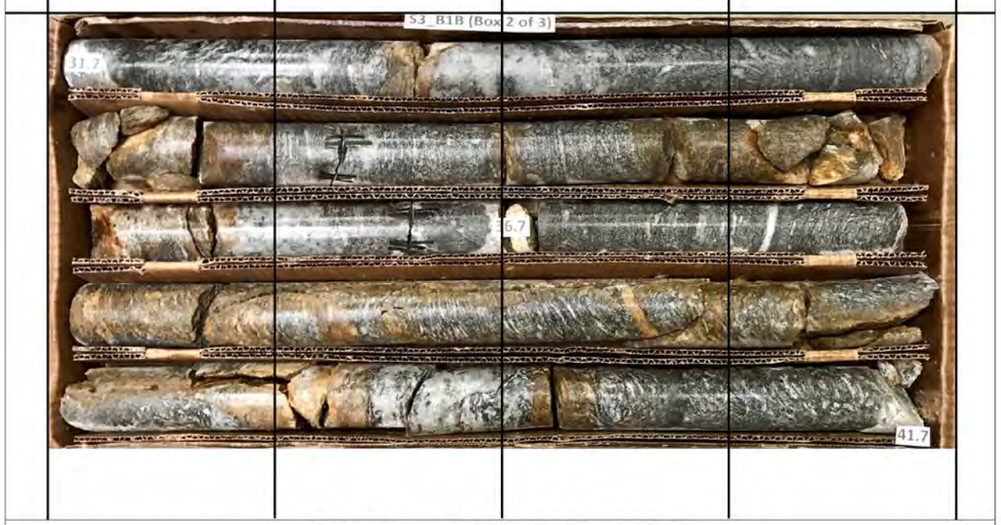
NCDOT CORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

BORING S3_B1B, -L- STA. 45+06, 7' LT

BOX 1 OF 3, 21.7 FEET TO 31.7 FEET

GSI = 55

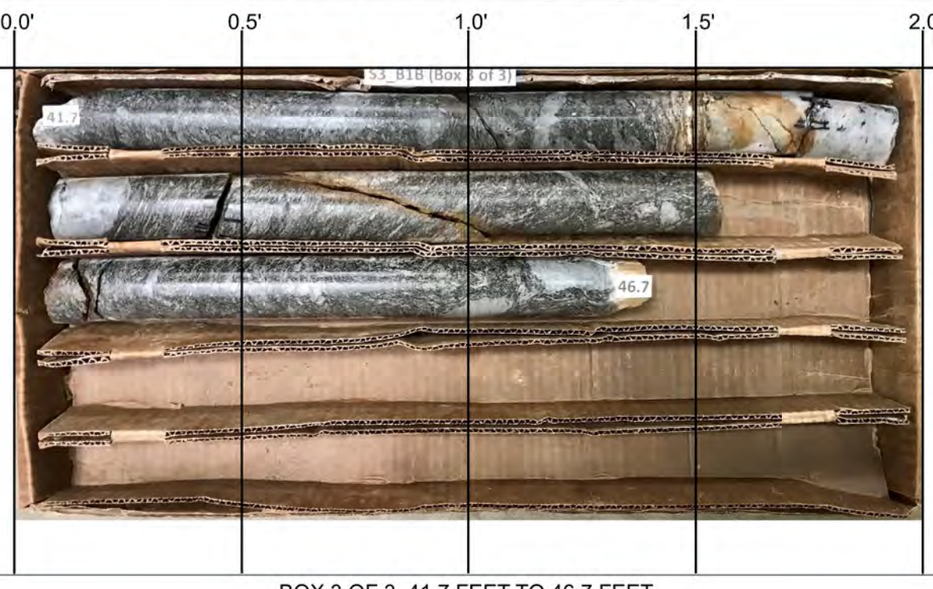
BORING S3_B1B, -L- STA. 45+06, 7' LT



BOX 2 OF 3, 31.7 FEET TO 41.7 FEET

GSI = 55

BORING S3_B1B, -L- STA. 45+06, 7' LT



BOX 3 OF 3, 41.7 FEET TO 46.7 FEET

GSI = 55

0 0.25' 0.5'
FEET

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ROCK CORE PHOTOGRAPHS

BRIDGE ON -L- OVER HOMINY CREEK AND SR 3620
BETWEEN I-40 WB AND NC 191
BUNCOMBE COUNTY, NC
WBS: 34165 | TIP: I-2513AC
FALCON PROJECT NO. G22009.01

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** Goodnight, D.J.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. S3_B1-C	**STATION** 44+56	**OFFSET** 19 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,005.5 ft	**TOTAL DEPTH** 39.8 ft	**NORTHING** 679,085	**EASTING** 930,275	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Brewer, M.	**START DATE** 02/09/23	**COMP. DATE** 02/09/23	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2010											
2005										2,005.5 GROUND SURFACE	0.0
	2,004.5	1.0	1	1	1	2		M		**ROADWAY EMBANKMENT** BROWN, VERY LOOSE, SILTY SAND (A-2-4) WITH TRACE GRAVEL	
	2,001.5	4.0	2	5	5	10		M			
2000	1,999.5	6.0	4	5	2	7		M		1,997.5	8.0
	1,997.0	8.5								**WEATHERED ROCK**	
	1,995.7	9.8	57 60/0.0	43/0.3		100/0.8 60/0.0				1,995.7 GRAY AND BROWN, GNEISS	9.8
1995										**CRYSTALLINE ROCK** GRAY AND WHITE, GNEISS	
1990											
1985										1,984.5 GRAY AND BLACK, BIOTITE GNEISS	21.0
1980											
1975											
1970										1,965.7	39.8
										Boring Terminated at Elevation 1,965.7 ft in CR: GNEISS	

NCDOT BORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** Goodnight, D.J.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. S3_B1-C	**STATION** 44+56	**OFFSET** 19 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 2,005.5 ft	**TOTAL DEPTH** 39.8 ft	**NORTHING** 679,085	**EASTING** 930,275	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER Brewer, M.	**START DATE** 02/09/23	**COMP. DATE** 02/09/23	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ	**TOTAL RUN** 30.0 ft			

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	DESCRIPTION AND REMARKS ELEV. (ft)	DEPTH (ft)
1995.72											Begin Coring @ 9.8 ft	
1995	1,995.7	9.8	5.0	5:29/1.0 4:09/1.0 2:56/1.0 4:11/1.0 4:39/1.0	(4.0) 80%	(2.8) 56%		(10.0) 89%	(4.8) 43%		1,995.7 **CRYSTALLINE ROCK** GRAY AND WHITE, MODERATELY WEATHERED, MODERATELY HARD TO HARD, WITH MAN-MADE INJECTED CEMENTED SAND INTERMITTENT WITHIN JOINTS AND FRACTURES, GNEISS	9.8
	1,990.7	14.8									GSI = 55	
1990			5.0	3:50/1.0 3:15/1.0 3:15/1.0 4:30/1.0 4:16/1.0	(4.8) 96%	(1.5) 30%						
	1,985.7	19.8									1,984.5	21.0
1985			5.0	3:17/1.0 2:35/1.0 3:54/1.0 4:01/1.0 4:30/1.0	(4.9) 98%	(3.6) 72%		(17.6) 94%	(14.9) 79%		GRAY AND BLACK, MODERATE TO SLIGHT WEATHERING, HARD TO VERY HARD, CLOSE TO MODERATE-CLOSE FRACTURE SPACING, BIOTITE GNEISS	
	1,980.7	24.8									GSI = 55	
1980			5.0	4:07/1.0 4:24/1.0 3:53/1.0 3:22/1.0 4:50/1.0	(4.7) 94%	(3.2) 64%						
	1,975.7	29.8										
1975			5.0	3:17/1.0 2:47/1.0 2:24/1.0 4:58/1.0 5:11/1.0	(4.2) 84%	(3.6) 72%						
	1,970.7	34.8										
1970			5.0	3:28/1.0 2:44/1.0 3:35/1.0 4:24/1.0 5:01/1.0	(5.0) 100%	(5.0) 100%						
	1,965.7	39.8									1,965.7	39.8
											Boring Terminated at Elevation 1,965.7 ft in CR: GNEISS	

NCDOT CORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

BORING S3_B1C, -L- STA. 44+56, 19' LT

BOX 1 OF 3, 9.8 FEET TO 19.8 FEET

GSI = 55

BORING S3_B1C, -L- STA. 44+56, 19' LT

BOX 2 OF 3, 19.8 FEET TO 29.8 FEET

GSI = 55

BORING S3_B1C, -L- STA. 44+56, 19' LT

BOX 3 OF 3, 29.8 FEET TO 39.8 FEET

GSI = 55

0 0.25' 0.5'
FEET

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ROCK CORE PHOTOGRAPHS

BRIDGE ON -L- OVER HOMINY CREEK AND SR 3620
BETWEEN I-40 WB AND NC 191
BUNCOMBE COUNTY, NC
WBS: 34165 | TIP: I-2513AC
FALCON PROJECT NO. G22009.01

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** SHELTON, T. P.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. DOT_B2-A	**STATION** 46+28	**OFFSET** 85 ft LT	**ALIGNMENT** -L-	**0 HR.** 13.2
COLLAR ELEV. 2,000.5 ft	**TOTAL DEPTH** 33.6 ft	**NORTHING** 679,202	**EASTING** 930,416	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME 550		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER GOSNESS, W. A.	**START DATE** 07/14/99	**COMP. DATE** 07/14/99	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2005											
2000										2,000.5 GROUND SURFACE	0.0
										ROADWAY EMBANKMENT VERY LOOSE TO LOOSE, BROWN, SILTY SAND (A-1-b) WITH GRAVEL	
1995	1,995.4	5.1	2	2	2	4					
1990	1,990.4	10.1	2	2	2	4				1,986.9	13.6
1985	1,985.4	15.1	100/0.5			100/0.5				**WEATHERED ROCK** (MUSCOVITE/BIOTITE GNEISS) 1,984.5	16.0
										CRYSTALLINE ROCK (MUSCOVITE/BIOTITE GNEISS) 1,981.6	18.9
1980										**CRYSTALLINE ROCK** (MUSCOVITE/BIOTITE GNEISS) 1,976.7	23.8
1975										**CRYSTALLINE ROCK** (MUSCOVITE/BIOTITE GNEISS) 1,971.8	28.7
1970										**CRYSTALLINE ROCK** (MUSCOVITE/BIOTITE GNEISS) 1,966.9	33.6
										Boring Terminated at Elevation 1,966.9 ft IN MUSCOVITE/BIOTITE GNEISS	
										PLEASE NOTE: This specific boring was completed in 1999. Core Photos are available from the Geotech Unit Asheville Field Office (AFO) if necessary. Photos are of an insufficient nature for professional evaluation. Please contact the AFO if necessary at dcelliott@ncdot.gov.	

NCDOT BORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** SHELTON, T. P.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. DOT_B2-A	**STATION** 46+28	**OFFSET** 85 ft LT	**ALIGNMENT** -L-	**0 HR.** 13.2
COLLAR ELEV. 2,000.5 ft	**TOTAL DEPTH** 33.6 ft	**NORTHING** 679,202	**EASTING** 930,416	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME 550		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER GOSNESS, W. A.	**START DATE** 07/14/99	**COMP. DATE** 07/14/99	**SURFACE WATER DEPTH** N/A	
CORE SIZE NXWL	**TOTAL RUN** 17.6 ft			

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	DESCRIPTION AND REMARKS ELEV. (ft)	DEPTH (ft)
1984.54											Begin Coring @ 16.0 ft	
	1,984.5	16.0	2.9		(2.5) 86%	(2.1) 72%		(2.5) 86%	(2.1) 72%		1,984.5 **CRYSTALLINE ROCK** GRAY, MUSCOVITE/BIOTITE GNEISS, SLIGHTLY WEATHERED WITH OCCASIONAL PYRITE ALONG FOLIATION SURFACES. MEDIUM GRAINED AND LAMINAR.	16.0
	1,981.6	18.9									GSI = 55	
1980			4.9		(4.9) 100%	(4.9) 100%		(4.9) 100%	(4.9) 100%		1,981.6 **CRYSTALLINE ROCK** GRAY TO LIGHT GRAY, FRESH MUSCOVITE/BIOTITE GNEISS, GRADING TO GRANULITE. FINE TO MEDIUM GRAINED WITH TRACE PYRITE.	18.9
	1,976.7	23.8									GSI = 55	
1975			4.9		(4.8) 98%	(4.8) 98%		(4.8) 98%	(4.8) 98%		1,976.7 **CRYSTALLINE ROCK** INTERLAYERS OF GRAY GRANULITE AND MEDIUM TO DARK GRAY, MUSCOVITE/BIOTITE GNEISS. VERY SLIGHTLY WEATHERED TO FRESH. OCCASIONAL PYRITE AND MANGANESE. ON FOLIATION SURFACES WITH TRACE EPIDOTE. SLIGHTLY TO MODERATELY FOLDED.	23.8
	1,971.8	28.7									GSI = 55	
1970			4.9		(4.7) 96%	(4.7) 96%		(4.7) 96%	(4.7) 96%		1,971.8 **CRYSTALLINE ROCK** MEDIUM TO DARK GRAY, MUSCOVITE/BIOTITE GNEISS WITH INTERLAYERS GRAY GRANULITE, FRESH, SLIGHTLY FOLDED WITH TRACE PYRITE AND EPIDOTE ALONG FOLIATION SURFACES.	28.7
	1,966.9	33.6									GSI = 55	
											1,966.9 Boring Terminated at Elevation 1,966.9 ft IN MUSCOVITE/BIOTITE GNEISS	33.6
											PLEASE NOTE: This specific boring was completed in 1999. Core Photos are available from the Geotech Unit Asheville Field Office (AFO) if necessary. Photos are of an insufficient nature for professional evaluation. Please contact the AFO if necessary at dcelliott@ncdot.gov.	

NCDOT CORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** SHELTON, T. P.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. DOT_B2-D	**STATION** 46+41	**OFFSET** 45 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 2,002.1 ft	**TOTAL DEPTH** 39.2 ft	**NORTHING** 679,168	**EASTING** 930,442	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME 550		**DRILL METHOD** SPT Core Boring		**HAMMER TYPE** Automatic
DRILLER GOSNESS, W. A.	**START DATE** 07/08/99	**COMP. DATE** 07/08/99	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2005										2,002.1 GROUND SURFACE	0.0
										ROADWAY EMBANKMENT VERY LOOSE TO LOOSE, BROWN, SILTY SAND (A-2-4) WITH GRAVEL AND BOULDER FROM 7.0 TO 7.7'	
2000	1,997.4	4.7	1	0	1	1					
1995	1,992.5	9.6	1	1	2	3					
1990	1,987.4	14.7	8	4	2	6					
1985										1,984.7	17.4
										1,983.7 **WEATHERED ROCK** (MUSCOVITE/BIOTITE GNEISS)	18.4
1980										1,982.4 **CRYSTALLINE ROCK** (MUSCOVITE/BIOTITE GNEISS)	19.7
										CRYSTALLINE ROCK (MUSCOVITE/BIOTITE GNEISS)	
1975										1,977.5 **CRYSTALLINE ROCK** (MUSCOVITE/BIOTITE GNEISS)	24.6
										1,972.6 **CRYSTALLINE ROCK** (MUSCOVITE/BIOTITE GNEISS)	29.5
1970										1,967.7 **CRYSTALLINE ROCK** (MUSCOVITE/BIOTITE GNEISS)	34.4
1965										1,962.9	39.2

Boring Terminated at Elevation 1,962.9 ft IN MUSCOVITE/BIOTITE GNEISS

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NCDOT BORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** SHELTON, T. P.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. DOT_B2-D	**STATION** 46+41	**OFFSET** 45 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 2,002.1 ft	**TOTAL DEPTH** 39.2 ft	**NORTHING** 679,168	**EASTING** 930,442	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME 550		**DRILL METHOD** SPT Core Boring		**HAMMER TYPE** Automatic
DRILLER GOSNESS, W. A.	**START DATE** 07/08/99	**COMP. DATE** 07/08/99	**SURFACE WATER DEPTH** N/A	
CORE SIZE NXWL	**TOTAL RUN** 20.8 ft			

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	DESCRIPTION AND REMARKS ELEV. (ft)	DEPTH (ft)
1983.73											Begin Coring @ 18.4 ft	
	1,983.7	18.4	1.3		(1.1) 85%	(1.1) 85%		(1.1) 85%	(1.1) 85%		1,983.7 **CRYSTALLINE ROCK**	18.4
	1,982.4	19.7									1,982.4 MEDIUM DARK GRAY, VERY SLIGHTLY WEATHERED MUSCOVITE/BIOTITE GNEISS. SLIGHTLY FOLDED, FINE TO MEDIUM GRAIN WITH OCCASIONAL FELDSPAR PORPHYOBLASTS. ABUNDANT IRON STAINS, TRACE PYRITE.	19.7
1980			4.9		(4.9) 100%	(3.7) 76%		(4.9) 100%	(3.7) 76%			
	1,977.5	24.6									1,977.5 GSI = 55	24.6
			4.9		(4.8) 98%	(4.6) 94%		(4.8) 98%	(4.6) 94%		**CRYSTALLINE ROCK**
1975											GRAY TO MEDIUM DARK GRAY, VERY SLIGHTLY WEATHERED MUSCOVITE/BIOTITE GNEISS. FINE TO MEDIUM GRAINED, GRADING TO GRANULITE IN PLACES.	
	1,972.6	29.5									1,972.6 GSI = 55	29.5
			4.9		(4.7) 96%	(2.9) 59%		(4.7) 96%	(2.9) 59%		**CRYSTALLINE ROCK**
1970											MEDIUM DARK GRAY, SLIGHTLY WEATHERED MUSCOVITE/BIOTITE GNEISS WITH GRANULITE IN PLACES.	
	1,967.7	34.4									1,967.7 GSI = 55	34.4
			4.8		(4.7) 98%	(4.6) 96%		(4.7) 98%	(4.6) 96%		**CRYSTALLINE ROCK**
1965											MEDIUM DARK GRAY, SLIGHTLY WEATHERED MUSCOVITE/BIOTITE GNEISS WITH GRANULITE. FINE TO MEDIUM GRAIN. SLIGHTLY FOLDED WITH PYRITE AND MANGANESE. ALONG FOLDS (ASSOCIATED WITH AMPHIBOLES AND BIOTITE LAYERS)	
	1,962.9	39.2									1,962.9 GSI = 55	39.2
											CRYSTALLINE ROCK MEDIUM DARK GRAY TO GRAY, VERY SLIGHTLY WEATHERED TO FRESH MUSCOVITE/ BIOTITE GNEISS WITH GRANULITE INTERLAYERS. LAMINAR TO SLIGHTLY FOLDED, FINE TO MEDIUM, OCCASIONAL COARSE GRAINED. GSI = 55	

Boring Terminated at Elevation 1,962.9 ft IN MUSCOVITE/BIOTITE GNEISS

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NCDOT CORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** SHELTON, T. P.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. DOT_B2-C	**STATION** 46+42	**OFFSET** 12 ft LT	**ALIGNMENT** -L-	**0 HR.** 19.0
COLLAR ELEV. 2,002.2 ft	**TOTAL DEPTH** 38.1 ft	**NORTHING** 679,137	**EASTING** 930,453	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME 550		**DRILL METHOD** SPT Core Boring		**HAMMER TYPE** Automatic
DRILLER GOSNESS, W. A.	**START DATE** 07/08/99	**COMP. DATE** 07/08/99	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2005											
										2,002.2 GROUND SURFACE	0.0
2000										**ROADWAY EMBANKMENT** MEDIUM DENSE, BROWN, SILTY SAND (A-2-4) WITH GRAVEL AND ABUNDANT BOULDERS	
1995											
1990											
	1,987.8	14.4	10	13	14	27					
1985											
										1,981.4	20.8
1980										**CRYSTALLINE ROCK** (GRANULITE)	
										1,978.6	23.6
1975										**CRYSTALLINE ROCK** (GRANULITE)	
										1,973.8	28.4
1970										**CRYSTALLINE ROCK** (GRANULITE)	
										1,968.9	33.3
1965										**CRYSTALLINE ROCK** (MUSCOVITE/BIOTITE GNEISS)	
										1,964.1	38.1
										Boring Terminated at Elevation 1,964.1 ft IN MUSCOVITE/BIOTITE GNEISS	

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NCDOT BORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** SHELTON, T. P.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. DOT_B2-C	**STATION** 46+42	**OFFSET** 12 ft LT	**ALIGNMENT** -L-	**0 HR.** 19.0
COLLAR ELEV. 2,002.2 ft	**TOTAL DEPTH** 38.1 ft	**NORTHING** 679,137	**EASTING** 930,453	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE CME 550		**DRILL METHOD** SPT Core Boring		**HAMMER TYPE** Automatic
DRILLER GOSNESS, W. A.	**START DATE** 07/08/99	**COMP. DATE** 07/08/99	**SURFACE WATER DEPTH** N/A	
CORE SIZE NXWL	**TOTAL RUN** 17.3 ft			

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	DESCRIPTION AND REMARKS ELEV. (ft)	DEPTH (ft)
1981.44											Begin Coring @ 20.8 ft	
1980	1,981.4	20.8	2.8		(2.7) 96%	(2.5) 89%		(2.7) 96%	(2.5) 89%		1,981.4	20.8
	1,978.6	23.6	4.8		(4.8) 100%	(4.8) 100%		(4.9) 102%	(4.9) 102%		**CRYSTALLINE ROCK** LIGHT TO MEDIUM GRAY, SLIGHTLY WEATHERED GRANULITE WITH BIOTITE, MEDIUM GRAINED.	
1975	1,973.8	28.4	4.9		(4.7) 96%	(4.7) 96%		(4.7) 96%	(4.7) 96%		1,978.6 GSI = 55	23.6
1970	1,968.9	33.3	4.8		(4.8) 100%	(4.8) 100%		(4.8) 100%	(4.8) 100%		**CRYSTALLINE ROCK** LIGHT GRAY TO MEDIUM DARK GRAY, VERY SLIGHTLY WEATHERED TO FRESH, GRANULITE AND MUSCOVITE/BIOTITE GNEISS. SLIGHTLY FOLDED, FINE TO MEDIUM GRAINED WITH TRACE PYRITE IN BIOTITE/RICH LAMINAE.	
1965	1,964.1	38.1									1,973.8 GSI = 55	28.4
											1,968.9 **CRYSTALLINE ROCK** MEDIUM GRAY, FINE TO MEDIUM GRAIN, FRESH GRANULITE GRADING TO MUSCOVITE/BIOTITE GNEISS. SLIGHTLY FOLDED WITH TRACE PYRITE AND GARNETS.	33.3
											1,964.1 GSI = 55	38.1
											CRYSTALLINE ROCK FRESH, MEDIUM DARK GRAY BIOTITE/MUSCOVITE GNEISS WITH GRANULITE INTERLAYERS. TRACE PYRITE ASSOCIATED WITH BIOTITE ALONG FOLIATION. MODERATELY TO HIGHLY FOLDED, PREDOMINATELY MEDIUM GRAINED WITH FINE GRAINED INTERLAYERS.	
											GSI = 55	
											Boring Terminated at Elevation 1,964.1 ft IN MUSCOVITE/BIOTITE GNEISS	

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NCDOT CORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** SHELTON, T. P.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. DOT_EB2-A	**STATION** 47+52	**OFFSET** 112 ft LT	**ALIGNMENT** -L-	**0 HR.** 8.5
COLLAR ELEV. 2,037.7 ft	**TOTAL DEPTH** 28.7 ft	**NORTHING** 679,267	**EASTING** 930,524	**24 HR.** 19.3
DRILL RIG/HAMMER EFF./DATE CME 550		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER GOSNESS, W. A.	**START DATE** 06/30/99	**COMP. DATE** 06/30/99	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2040										2,037.7 GROUND SURFACE	0.0
2035	2,033.7	4.0	29	50	39	89				**SAPROLITE** VERY DENSE, BROWN, SILTY SAND (A-2-4) WITH TRACE WEATHERED ROCK FRAGMENTS	
										2,031.3	6.4
2030	2,028.7	9.0	12	13	87	100/1.0				**WEATHERED ROCK** (MUSCOVITE/BIOTITE GNEISS)	
2025	2,023.7	14.0	100/0.5			100/0.5				2,021.7	16.0
2020										**CRYSTALLINE ROCK** (MUSCOVITE/BIOTITE GNEISS)	
										2,018.8	18.9
2015										**CRYSTALLINE ROCK** (MUSCOVITE/BIOTITE GNEISS)	
										2,013.9	23.8
2010										**CRYSTALLINE ROCK** (BIOTITE/MUSCOVITE GNEISS)	
										2,009.0	28.7
										Boring Terminated at Elevation 2,009.0 ft IN BIOTITE/MUSCOVITE GNEISS	

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NCDOT BORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** SHELTON, T. P.	
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191				**GROUND WTR (ft)**
BORING NO. DOT_EB2-A	**STATION** 47+52	**OFFSET** 112 ft LT	**ALIGNMENT** -L-	**0 HR.** 8.5
COLLAR ELEV. 2,037.7 ft	**TOTAL DEPTH** 28.7 ft	**NORTHING** 679,267	**EASTING** 930,524	**24 HR.** 19.3
DRILL RIG/HAMMER EFF./DATE CME 550		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic	
DRILLER GOSNESS, W. A.	**START DATE** 06/30/99	**COMP. DATE** 06/30/99	**SURFACE WATER DEPTH** N/A	
CORE SIZE NXWL	**TOTAL RUN** 12.7 ft			

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	DESCRIPTION AND REMARKS ELEV. (ft)	DEPTH (ft)
2021.72											Begin Coring @ 16.0 ft	
2020	2,021.7	16.0	2.9		(1.5) 52%	(0.5) 17%		(1.5) 52%	(0.5) 17%		2,021.7 **CRYSTALLINE ROCK** BROWN-GRAY, MODERATELY SEVERE WEATHERED MUSCOVITE/BIOTITE GNEISS.	16.0
	2,018.8	18.9	4.9		(3.1) 63%	(1.8) 37%		(3.1) 63%	(1.8) 37%		2,018.8 GSI = 55 **CRYSTALLINE ROCK** BROWN-GRAY, MODERATELY SEVERE WEATHERED MUSCOVITE/BIOTITE GNEISS TO 22.6'. FROM 22.6'. SLIGHTLY WEATHERED, GRAY MUSCOVITE/BIOTITE GNEISS.	18.9
2015	2,013.9	23.8	4.9		(4.8) 98%	(4.2) 86%		(4.8) 98%	(4.2) 86%		2,013.9 GSI = 55 **CRYSTALLINE ROCK** GRAY, VERY SLIGHTLY WEATHERED TO FRESH BIOTITE/MUSCOVITE GNEISS. WEATHERED ZONE AT 27.1 TO 27.3'. BRECCIATED APPEARANCE AT 27.9 TO 28.7' WITH OCCASIONAL SCHISTOSE ZONES. TRACE PYRITE.	23.8
2010	2,009.0	28.7									2,009.0 GSI = 55 Boring Terminated at Elevation 2,009.0 ft IN BIOTITE/MUSCOVITE GNEISS	28.7

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NCDOT CORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** Goodnight, D.J.
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191			**GROUND WTR (ft)**
BORING NO. S3_EB2A	**STATION** 47+51	**OFFSET** 76 ft LT	**ALIGNMENT** -L- — **0 HR.** Dry
COLLAR ELEV. 2,033.4 ft	**TOTAL DEPTH** 16.6 ft	**NORTHING** 679,233	**EASTING** 930,535 — **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022	**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Brewer, M.	**START DATE** 02/07/23	**COMP. DATE** 02/07/23	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2035										2,033.4 GROUND SURFACE	0.0
	2,031.9	1.5	4	2	3	5		M		2,032.1 **ROADWAY EMBANKMENT** ASPHALT (0.1 FT) AND CONCRETE (1.2 FT)	1.3
2030	2,029.9	3.5	2	3	8	11		M		2,030.4 BROWN, LOOSE, SILTY SAND (A-2-4) WITH LITTLE GRAVEL	3.0
	2,027.4	6.0	15	19	30	49		M		2,027.9 BROWN, STIFF, SANDY SILT (A-4) WITH LITTLE GRAVEL	5.5
2025	2,024.9	8.5	41	59/0.2		100/0.7				2,025.4 **RESIDUAL** BROWN, DENSE, SILTY SAND (A-2-4) WITH TRACE ROCK FRAGMENTS	8.0
2020	2,019.9	13.5	6	60	40/0.1	100/0.6				**WEATHERED ROCK** BROWN, GNEISS	
	2,016.9	16.5	60/0.1			60/0.1				2,018.4	15.0
										2,016.8 **CRYSTALLINE ROCK** BROWN AND GRAY, GNEISS	16.6
										Boring Terminated at Elevation 2,016.8 ft in CR: GNEISS	

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** 1-2513AC	**COUNTY** BUNCOMBE	**GEOLOGIST** Goodnight, D.J.
SITE DESCRIPTION Bridge No. 208 on -L- over Hominy Creek and SR 3620 Between I-40 WB and NC 191			**GROUND WTR (ft)**
BORING NO. S3_EB2B	**STATION** 47+43	**OFFSET** 35 ft LT	**ALIGNMENT** -L- — **0 HR.** Dry
COLLAR ELEV. 2,032.9 ft	**TOTAL DEPTH** 20.9 ft	**NORTHING** 679,192	**EASTING** 930,541 — **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022	**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Brewer, M.	**START DATE** 02/07/23	**COMP. DATE** 02/07/23	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2035										2,032.9 GROUND SURFACE	0.0
	2,031.4	1.5	1	2	4	6		M		2,031.0 **ROADWAY EMBANKMENT** ASPHALT (0.05 FT) AND CONCRETE (1.5 FT)	1.9
2030	2,029.4	3.5	2	1	2	3		M		BROWN TO TAN-BROWN, LOOSE, SILTY SAND (A-2-4) WITH LITTLE GRAVEL	
	2,026.9	6.0	2	2	3	5		M			
2025	2,024.4	8.5	7	3	7	10		M		2,024.2 **RESIDUAL** BROWN, LOOSE TO DENSE, SILTY SAND (A-2-4) WITH TRACE ROCK FRAGMENTS	8.7
2020	2,019.4	13.5	10	14	17	31		M			
2015	2,014.4	18.5	8	4	5	9		M		2,012.6	20.3
	2,012.0	20.9	60/0.0			60/0.0		M		2,012.0 **WEATHERED ROCK** BROWN AND GRAY, GNEISS	20.9
										Boring Terminated at Elevation 2,012.0 ft on CR: GNEISS	

NCDOT BORE SINGLE I-1213AC_GEO_COMBINED.GPJ NC_DOT.GDT 9/20/24

PROJECT REFERENCE NO.	SHEET NO.
I–2513AC	22

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

APPENDIX A
LABORATORY RESULTS

REFERENCE: I–2513AC

PROJECT: 34165

FALCON ENGINEERING, INC.
1210 TRINITY ROAD, SUITE 110
CARY, NC 27513

PHONE: 919.871.0800
www.falconengineers.com

UNCONFINED COMPRESSIVE STRENGTH OF ROCK
ASTM D7012

Project No.: G22009.01	**Tested By:** C. Sullivan	**Test Date:** 2023-19-12
Project Name: I-2513AA-AC		
Boring ID: S3-B1-A	**Sample ID:** RS-03	**Sample Depth:** 34.9-35.3 ft
Sample Description: Gray Granitic Rock		

Initial Specimen Measurements

Diameter: 1.860 in L/D: 2.44
Area: 2.717 in^2
Length: 4.53 in
Weight: 549.7 g
Unit Weight: 170.1 pcf

LOAD TEST DATA

Deflection Reading (in)	Load Reading (lb)	Strain (%)	Stress (psi)
0.000	0	0.000	0
0.005	900	0.110	330
0.010	5500	0.221	2020
0.015	13700	0.331	5040
0.020	21400	0.442	7880
0.025	29300	0.552	10780
0.030	38400	0.662	14130
0.035	47250	0.773	17390
0.038	51700	0.839	19030

Strain Rate: %/min

Failure Mode:

Remarks:

Note: Uniaxial compressive strength was determined in general accordance with ASTM D7012-14 Method C. Deflection, Strain, and Young's modulus (E) data is provided for reference only and is not intended to be in accordance with ASTM D7012-14 Method D as deflection and strain is not measured in accordance with that procedure. Young's Modulus is calculated using this data to determine the secant modulus at each data interval per Figure 2 (C) in ASTM D 7012-14.