REFERENCE: BP11.R013

PROJECT: N/A

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP11.R013	1	11

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY *WILKES*

PROJECT DESCRIPTION *REPLACE BRIDGE NO. 280 ON SR 1952 (OAK RIDGE CHURCH RD) OVER CAMP BRANCH*

CONTENTS

CAUTION NOTICE

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PERSONNEL

S. MELECOSKY

J. WINGO

B. FLOWERS

INVESTIGATED BY *S&ME, INC.*

DRAWN BY *J. SWARTLEY*

CHECKED BY *J. DAILY*

SUBMITTED BY *J. DAILY*

DATE *JANUARY 2025*

Prepared in the Office of:

S&ME

3201 SPRING FOREST ROAD
RALEIGH, NC 27616
(919) 872-2660

NORTH CAROLINA PROFESSIONAL SEAL 045672 ENGINEER THOMAS J. DAILY

DocuSigned by:
Thomas J. Daily
F29CA6BB83F449F...

1/31/2025

SIGNATURE DATE

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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 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
MATERIAL PASSING #40 LL PI	— 6 MX		— NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
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		
	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PLASTIC RANGE (PI)		
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR 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
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, DPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT
- 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
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [X] CME-55
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [ ] W/ ADVANCER
- [X] TRICONE 2 15/16" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [ ] 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: BM #1 - 8" SPIKE IN ROOT OF 24" POPLAR

ELEVATION: 1115.62 FEET

NOTES:

FIAD - FILLED IMMEDIATELY AFTER DRILLING

DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
BP11.R013	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 ⇨

	VERY GOOD	GOOD	FAIR	POOR	VERY POOR
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

	VERY GOOD	GOOD	FAIR	POOR	VERY POOR
70		A			
60					
50		B	C	D	E
40					
30				F	
20					
10			G	H	

DATE: 8-19-16

PROJECT REFERENCE NO.	SHEET NO.
BP11.R013	3

SITE PLAN

0 40 80
FEET

SKEW = 90 DEGREES

PT Sta. 13+37.51

N 21° 10' 16.5" W

PC Sta. 13+91.60

END BENT 1 LINE

END BENT 2 LINE

13+00

15+00

NAD 83

CAMP BRANCH

120" CMP

WOLF BRANCH

EB1-A

EB2-A

BRIDGE 280

EB1-B

EB2-B

BL-4

BL-5

18" CMP

OAK RIDGE CHURCH RD

TO ROCK CREEK RD

EXISTING RIGHT OF WAY

60.00'

24" CMP

GR

BM #1

BM #1 8" SPIKE IN ROOT OF 24" POPLAR

PC Sta. 10+65.30

N 52° 21' 50.8" W

CAMP BRANCH

TO TRAPHILL RD

EXISTING RIGHT OF WAY

18" CMP

EXISTING RIGHT OF WAY

.00 09

15 BLK BUS

0	50	100
FEET		

VE = 5:1

PROJECT REFERENCE NO.	SHEET NO.
BP11.R013	4

PROFILE PROJECTED ALONG CENTER LINE OF -L-

Ⓐ **ROADWAY EMBANKMENT**
SOFT TO MEDIUM STIFF, GRAY BROWN, SILT AND SANDY SILT, MOIST TO WET, TRACE MICA, SOME GRAVEL, A-4

Ⓑ **ROADWAY EMBANKMENT**
VERY LOOSE TO LOOSE, BROWN, SILTY SAND, MOIST TO WET, FINE TO COARSE, WITH MICA, FEW ROCK FRAGMENTS, A-2-4

EB1-A
13+38
9' LT
-L-

EB2-B
13+88
1' RT
-L-

ROADWAY EMBANKMENT
PAVEMENT

ROADWAY EMBANKMENT
PAVEMENT

EXISTING GROUND

PROPOSED GRADE

BRIDGE NO. 280

ALLUVIAL
VERY LOOSE TO MEDIUM DENSE, BROWN, SILTY SAND, WET, FINE TO MEDIUM, TRACE MICA, A-2-4

ALLUVIAL
LOOSE, BROWN, SILTY SAND, WET, FINE TO MEDIUM, WITH MICA, ROCK FRAGMENTS, A-2-4

ALLUVIAL
VERY LOOSE, GRAY, SANDY GRAVEL, WET, FINE TO COARSE, A-1-a

NWS 4-11-2023
EL = 1105.7

07/23

07/23

BT
07/23

NON-CRYSTALLINE ROCK
SCHIST

WEATHERED ROCK
SCHIST

REC = 100%
RQD = 90%
GSI =

BT
07/23

NOTE: EXISTING GROUND SURFACE PROFILE OF -L- CENTERLINE TAKEN FROM ELECTRONIC TIN FILE 'bp11.r013_ls_tin.tin' DATED 09/8/22. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

1160 1150 1140 1130 1120 1110 1100 1090

11+00 12+00 13+00 14+00 15+00 16+00 17+00

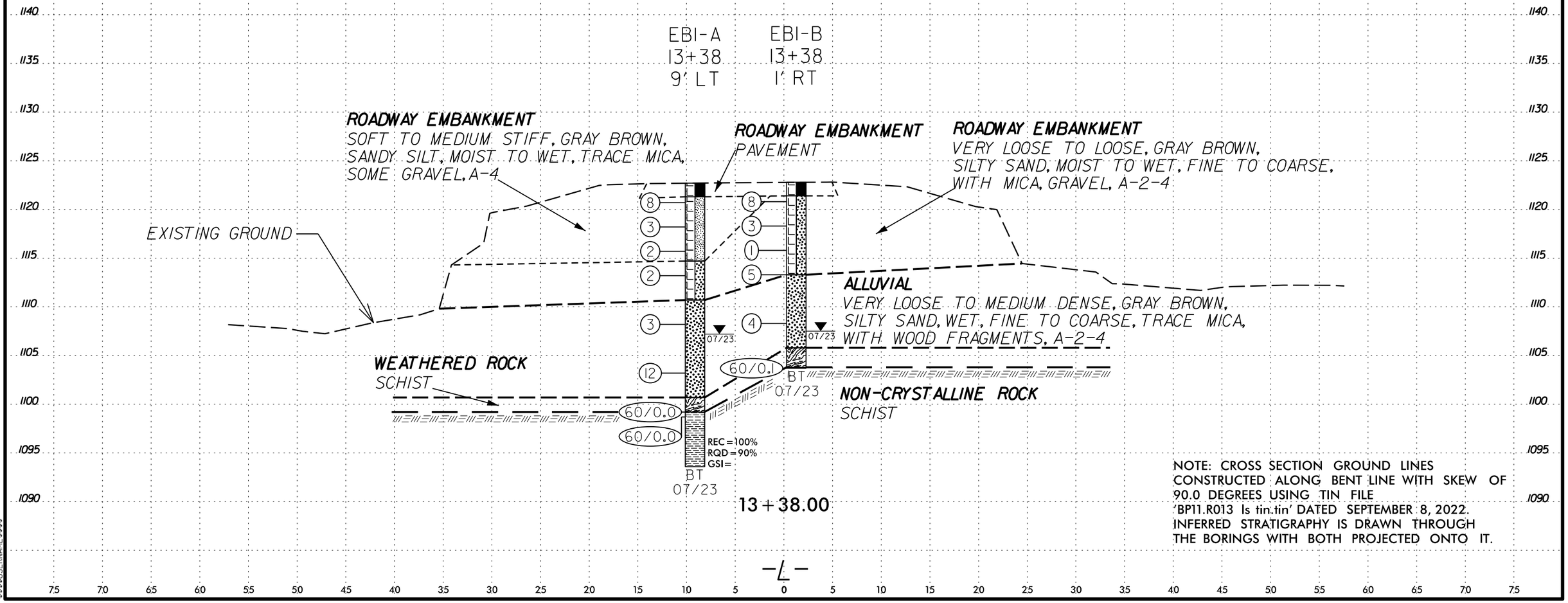
6/23/16

UNITS = FEET

PROJ. REFERENCE NO.	SHEET NO.
BP11.R013	5

BRIDGE NO. 280

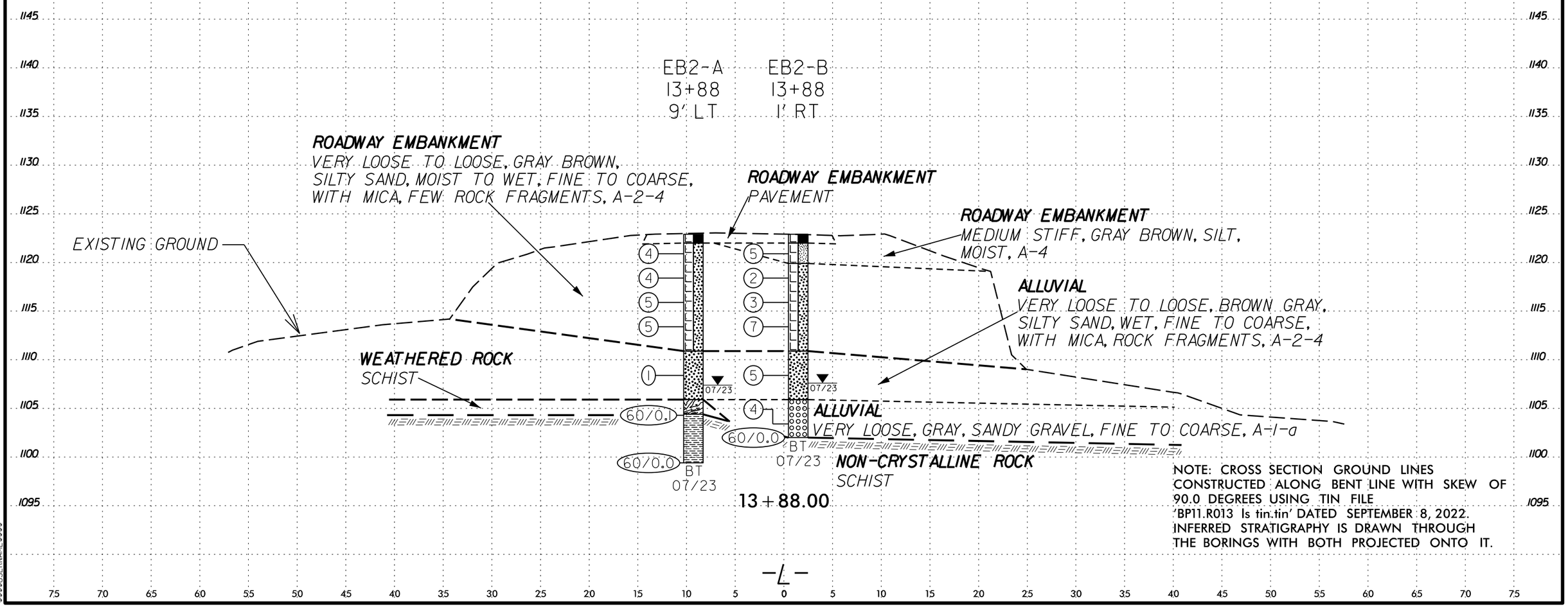
CROSS–SECTION ALONG END BENT 1



NOTE: CROSS SECTION GROUND LINES CONSTRUCTED ALONG BENT LINE WITH SKEW OF 90.0 DEGREES USING TIN FILE 'BP11.R013 ls tin.tin' DATED SEPTEMBER 8, 2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO IT.

$$$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

CROSS–SECTION ALONG END BENT 2



NOTE: CROSS SECTION GROUND LINES CONSTRUCTED ALONG BENT LINE WITH SKEW OF 90.0 DEGREES USING TIN FILE 'BP11.R013 ls tin.tin' DATED SEPTEMBER 8, 2022. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO IT.

GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP11.R013	**TIP** N/A	**COUNTY** WILKES	**GEOLOGIST** Melecosky, S.	
SITE DESCRIPTION Replace Bridge No. 280 on SR 1952 (-L-) over Camp Branch				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 13+38	**OFFSET** 9 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 1,122.7 ft	**TOTAL DEPTH** 29.1 ft	**NORTHING** 922,324	**EASTING** 1,382,449	**24 HR.** 15.5
DRILL RIG/HAMMER EFF./DATE SME8245 CME-55 85% 08/02/2022		**DRILL METHOD** Mud Rotary w/ NQ Core	**HAMMER TYPE** Automatic	
DRILLER Wingo, J.	**START DATE** 07/24/23	**COMP. DATE** 07/24/23	**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)
1125										
	1,122.7	0.0								GROUND SURFACE
	1,121.7	1.0	6	4	4	8		M		**ROADWAY EMBANKMENT** 1,121.3 — 1.4 ASPHALT: 0.7' CRUSHED STONE: 0.7'
1120	1,119.2	3.5	1	2	1	3		W		SOFT TO MEDIUM STIFF, GRAY BROWN, SANDY SILT, MOIST TO WET, TRACE MICA, SOME GRAVEL, A-4
	1,116.7	6.0	1	1	1	2		W		
1115	1,114.2	8.5	1	1	1	2		W		1,114.7 — 8.0 VERY LOOSE, BROWN, SILTY SAND, FINE TO MEDIUM, TRACE MICA, A-2-4
1110	1,109.2	13.5	1	1	2	3				1,110.7 — 12.0 **ALLUVIAL** VERY LOOSE TO MEDIUM DENSE, BROWN, SILTY SAND, FINE TO MEDIUM, TRACE MICA, A-2-4
1105	1,104.2	18.5	1	5	7	12		W		
1100	1,099.2	23.5								1,100.7 — 22.0 **WEATHERED ROCK** SCHIST
	1,098.7	24.0	60/0.0			60/0.0				1,099.2 — 23.5 1,098.6 — 24.1 **NON-CRYSTALLINE ROCK** HARD, GRAY, SCHIST, FRESH TO SLIGHTLY WEATHERED, CLOSE FRACTURE SPACING
1095			60/0.0			60/0.0				1,093.6 — 29.1 Boring Terminated at Elevation 1,093.6 ft in Non-Crystalline Rock (Schist)

GEOTECHNICAL BORING REPORT
CORE LOG

WBS BP11.R013	**TIP** N/A	**COUNTY** WILKES	**GEOLOGIST** Melecosky, S.	
SITE DESCRIPTION Replace Bridge No. 280 on SR 1952 (-L-) over Camp Branch				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 13+38	**OFFSET** 9 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 1,122.7 ft	**TOTAL DEPTH** 29.1 ft	**NORTHING** 922,324	**EASTING** 1,382,449	**24 HR.** 15.5
DRILL RIG/HAMMER EFF./DATE SME8245 CME-55 85% 08/02/2022		**DRILL METHOD** Mud Rotary w/ NQ Core	**HAMMER TYPE** Automatic	
DRILLER Wingo, J.	**START DATE** 07/24/23	**COMP. DATE** 07/24/23	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ	**TOTAL RUN** 5.0 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)
1098.59											Begin Coring @ 24.1 ft
	1,098.6	24.1	5.0	0:43/1.0 0:15/1.0 0:55/1.0 1:18/1.0 1:39/1.0	(5.0) 100%	(4.5) 90%		(5.0) 100%	(4.5) 90%		1,098.6 — **NON-CRYSTALLINE ROCK** — 24.1 HARD, GRAY, SCHIST, FRESH TO SLIGHTLY WEATHERED, CLOSE FRACTURE SPACING
1095	1,093.6	29.1									1,093.6 — 29.1 Boring Terminated at Elevation 1,093.6 ft in Non-Crystalline Rock (Schist)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS BP11.R013	**TIP** N/A	**COUNTY** WILKES	**GEOLOGIST** Melecosky, S.	
SITE DESCRIPTION Replace Bridge No. 280 on SR 1952 (-L-) over Camp Branch				**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 13+38	**OFFSET** 1 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 1,122.8 ft	**TOTAL DEPTH** 19.1 ft	**NORTHING** 922,327	**EASTING** 1,382,459	**24 HR.** 15.3
DRILL RIG/HAMMER EFF./DATE SME8245 CME-55 85% 08/02/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Wingo, J.	**START DATE** 07/25/23	**COMP. DATE** 07/25/23	**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)
1125										1,122.8 GROUND SURFACE	0.0
	1,121.8	1.0	8	4	4	8		M		1,121.4 **ROADWAY EMBANKMENT** ASPHALT: 0.7' CRUSHED STONE: 0.7'	1.4
1120	1,119.3	3.5	1	2	1	3		M		VERY LOOSE TO LOOSE, GRAY BROWN, SILTY SAND, FINE TO COARSE, WITH MICA, GRAVEL, A-2-4	
	1,116.8	6.0	1	0	1	1		M			
1115	1,114.3	8.5	1	3	2	5		M		1,113.3 **ALLUVIAL** VERY LOOSE TO LOOSE, GRAY BROWN, SILTY SAND, FINE TO COARSE, WITH WOOD FRAGMENTS, A-2-4	9.5
1110	1,109.3	13.5	7	2	2	4				1,105.8 **WEATHERED ROCK** SCHIST	17.0
1105	1,104.3	18.5	2	60/0.1		60/0.1				1,103.8 **NON-CRYSTALLINE ROCK** SCHIST	19.0
										1,103.7 Boring Terminated with Standard Penetration Test Refusal at Elevation 1,103.7 ft in Non-Crystalline Rock (Schist)	19.1

WBS BP11.R013	**TIP** N/A	**COUNTY** WILKES	**GEOLOGIST** Melecosky, S.	
SITE DESCRIPTION Replace Bridge No. 280 on SR 1952 (-L-) over Camp Branch				**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 13+88	**OFFSET** 9 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 1,122.9 ft	**TOTAL DEPTH** 23.5 ft	**NORTHING** 922,370	**EASTING** 1,382,431	**24 HR.** 15.5
DRILL RIG/HAMMER EFF./DATE SME8245 CME-55 85% 08/02/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Wingo, J.	**START DATE** 07/25/23	**COMP. DATE** 07/25/23	**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
1125										1,122.9 GROUND SURFACE 0.0
	1,121.9	1.0	1	2	2	4		M		1,122.0 **ROADWAY EMBANKMENT** 0.9 ASPHALT: 0.6' CRUSHED STONE: 0.3'
1120	1,119.4	3.5	1	2	2	4		M		VERY LOOSE TO LOOSE, GRAY BROWN, SILTY SAND, FINE TO MEDIUM, WITH MICA, ROCK FRAGMENTS, A-2-4
	1,116.9	6.0	1	2	3	5		M		
1115	1,114.4	8.5	1	2	3	5		M		1,110.9 12.0 **ALLUVIAL** VERY LOOSE, BROWN GRAY, SILTY SAND, FINE TO COARSE, WITH ROCK FRAGMENTS, A-2-4
1110	1,109.4	13.5	1	0	1	1				1,105.9 17.0
1105	1,104.4	18.5	60/0.1			60/0.1				1,104.4 **WEATHERED ROCK** SCHIST 18.5 **NON-CRYSTALLINE ROCK** SCHIST
1100	1,099.4	23.5	60/0.0			60/0.0				1,099.4 23.5 Boring Terminated with Standard Penetration Test Refusal at Elevation 1,099.4 ft in Non-Crystalline Rock (Schist)

GEOTECHNICAL BORING REPORT
BORE LOG

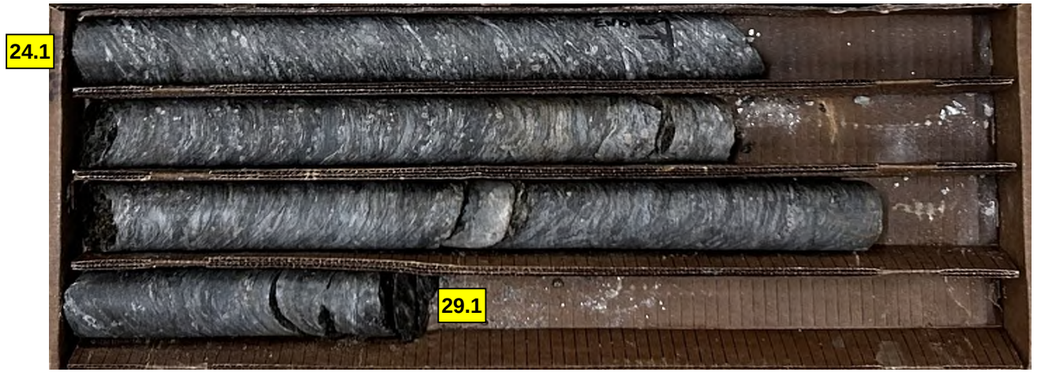
WBS BP11.R013	**TIP** N/A	**COUNTY** WILKES	**GEOLOGIST** Melecosky, S.	
SITE DESCRIPTION Replace Bridge No. 280 on SR 1952 (-L-) over Camp Branch				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 13+88	**OFFSET** 1 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 1,122.9 ft	**TOTAL DEPTH** 20.9 ft	**NORTHING** 922,374	**EASTING** 1,382,441	**24 HR.** 15.3
DRILL RIG/HAMMER EFF./DATE SME8245 CME-55 85% 08/02/2022		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Wingo, J.	**START DATE** 07/25/23	**COMP. DATE** 07/25/23	**SURFACE WATER DEPTH** N/A	

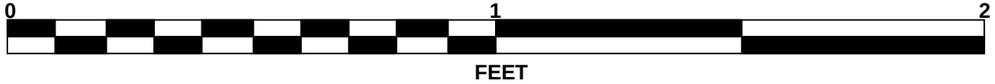
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
1125											
										1,122.9 GROUND SURFACE	0.0
	1,121.9	1.0	4	3	2	5		M		1,122.0 **ROADWAY EMBANKMENT**	0.9
1120	1,119.4	3.5	2	1	1	2		M		1,119.9 ASPHALT: 0.6' CRUSHED STONE: 0.3'	3.0
	1,116.9	6.0	1	2	1	3		M		MEDIUM STIFF, GRAY BROWN, SILT, A-4 VERY LOOSE TO LOOSE, BROWN, SILTY SAND, FINE TO COARSE, WITH MICA, FEW ROCK FRAGMENTS, A-2-4	
1115	1,114.4	8.5	9	5	2	7		M			
1110	1,109.4	13.5	2	3	2	5				1,110.9 **ALLUVIAL** LOOSE, BROWN, SILTY SAND, WITH MICA, ROCK FRAGMENTS, A-2-4	12.0
1105	1,104.4	18.5	2	2	2	4		W		1,105.9 VERY LOOSE, GRAY, SANDY GRAVEL, FINE TO COARSE, A-1-a	17.0
	1,102.0	20.9	60/0.0			60/0.0				1,102.0 **NON-CRYSTALLINE ROCK** SCHIST Boring Terminated with Standard Penetration Test Refusal at Elevation 1,102.0 ft on Non-Crystalline Rock (Schist)	20.9

CORE PHOTOGRAPHS

EB1-A

BOX 1: 24.1 - 29.1 FEET





SITE PHOTOGRAPH

Bridge No. 280 on –L– (SR 1952) over Camp Branch

Looking North towards End Bent 2