

REFERENCE: SF-800076

PROJECT: BP13.R004

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY RUTHERFORD
 PROJECT DESCRIPTION REPLACE BRIDGE #76 ON
SR 1576 (EAST CHURCH ST.) OVER PUZZLE CREEK

SITE DESCRIPTION _____

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5-7	CROSS SECTIONS
8-13	BORE LOGS AND CORE LOGS
13-16	CORE PHOTOS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-800076	1	16

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. 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.

SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE. INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA AND BOREHOLE INFORMATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

CD JOHNSON
CJ COFFEY
JD WORLEY
CE STEWMAN

INVESTIGATED BY DMM
 DRAWN BY DMM
 CHECKED BY DCE
 SUBMITTED BY DCE
 DATE 1/31/2023



DocuSigned by:
D. Matt Mullen 03/15/2023
 1977378589764F3
 SIGNATURE DATE

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

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

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6										WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.										HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:										ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.									
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-2, A-3, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7 SYMBOL [Diagrams showing soil patterns for various groups] % PASSING #10, #40, #200 MATERIAL PASSING #40 LL, PI GROUP INDEX USUAL TYPES OF MAJOR MATERIALS GEN. RATING AS SUBGRADE										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										WEATHERING FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT (V SL.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. SLIGHT (SL.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. 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.																			
CONSISTENCY OR DENSENESS PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²) GENERALLY GRANULAR MATERIAL (NON-COHESSIVE) VERY LOOSE, MEDIUM DENSE, DENSE, VERY DENSE < 4, 4 TO 10, 10 TO 30, > 30 N/A GENERALLY SILT-CLAY MATERIAL (COHESIVE) VERY 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										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 DIP & DIP DIRECTION OF ROCK STRUCTURES SPT DMT VST PMT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD TEST BORING WITH CORE SPT N-VALUE																													
TEXTURE OR GRAIN SIZE U.S. STD. SIEVE SIZE OPENING (MM) 4, 10, 40, 60, 200, 270 4.75, 2.00, 0.42, 0.25, 0.075, 0.053 BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CS, 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										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																													
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT - SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE										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 UNIT WEIGHT DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO																													
PLASTICITY NON PLASTIC SLIGHTLY PLASTIC MODERATELY PLASTIC HIGHLY PLASTIC PLASTICITY INDEX (PI) 0-5, 6-15, 16-25, 26 OR MORE DRY STRENGTH VERY LOW, SLIGHT, MEDIUM, HIGH										EQUIPMENT USED ON SUBJECT PROJECT DRILL UNITS: CME-45C, 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, CASING w/ ADVANCER, TRICONE *STEEL TEETH, TRICONE *TUNG-CARB., CORE BIT HAMMER TYPE: AUTOMATIC, MANUAL CORE SIZE: B, H, N HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST																													
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.										ROCK HARDNESS VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY HARD CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY SOFT CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.																													
FRACTURE SPACING 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.										BENCH MARK: NA - ALL ELEVATIONS DERIVED FROM DTM ELEVATION: NA FEET NOTES:																													

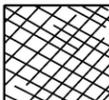
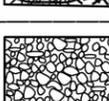
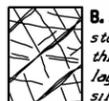
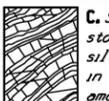
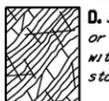
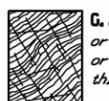
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

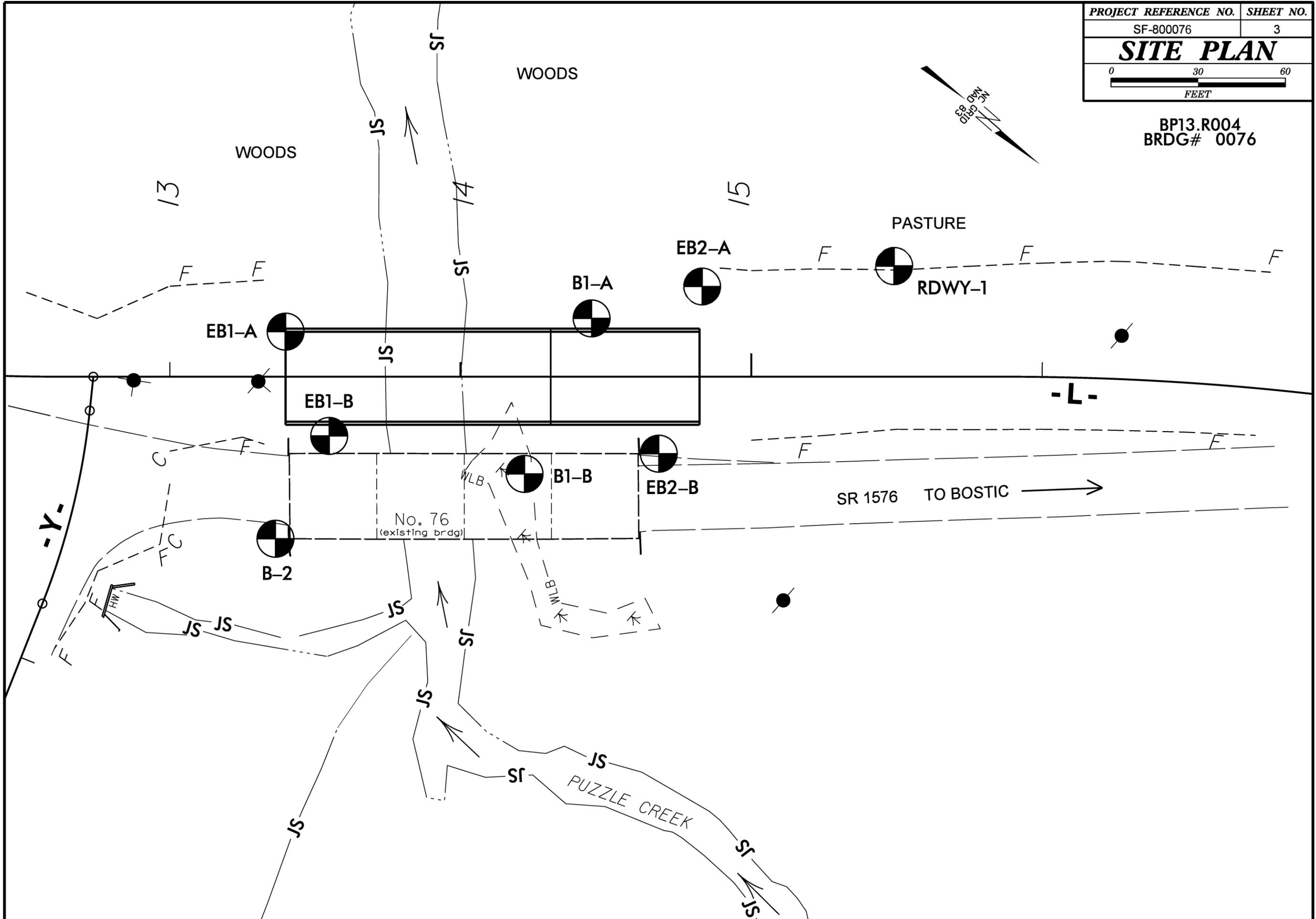
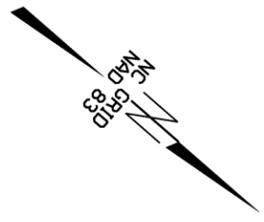
**SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES
 FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS**

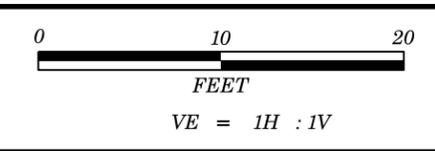
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

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

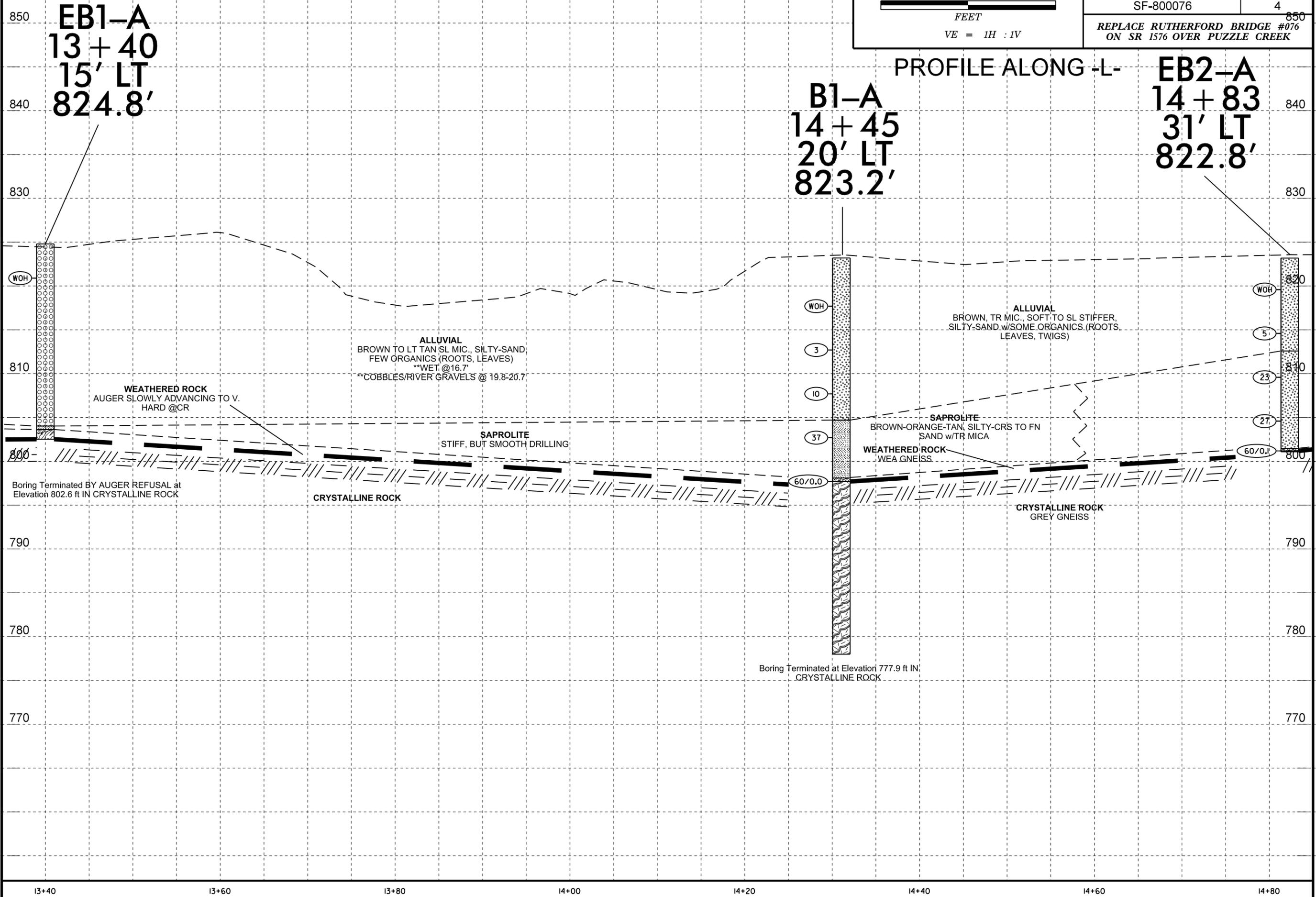
<p>GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)</p> <p>From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35.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

BP13.R004
BRDG# 0076

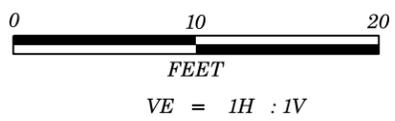




PROJECT REFERENCE NO.	SHEET NO.
SF-800076	4
REPLACE RUTHERFORD BRIDGE #076 ON SR 1576 OVER PUZZLE CREEK	

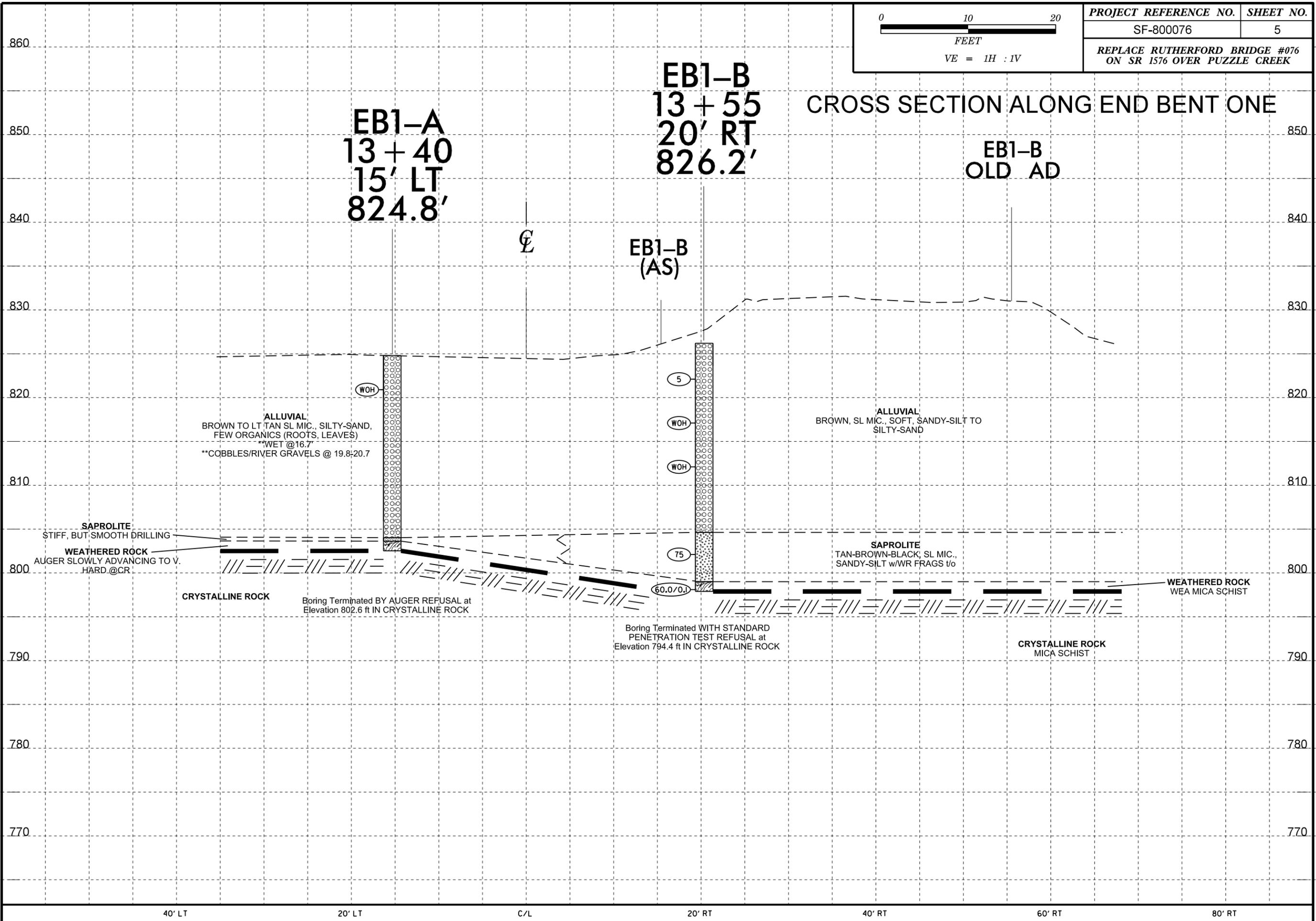


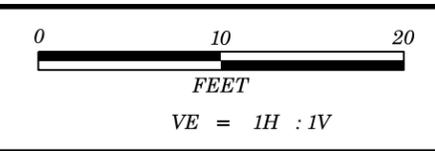
13+40 13+60 13+80 14+00 14+20 14+40 14+60 14+80



PROJECT REFERENCE NO.	SHEET NO.
SF-800076	5
REPLACE RUTHERFORD BRIDGE #076 ON SR 1576 OVER PUZZLE CREEK	

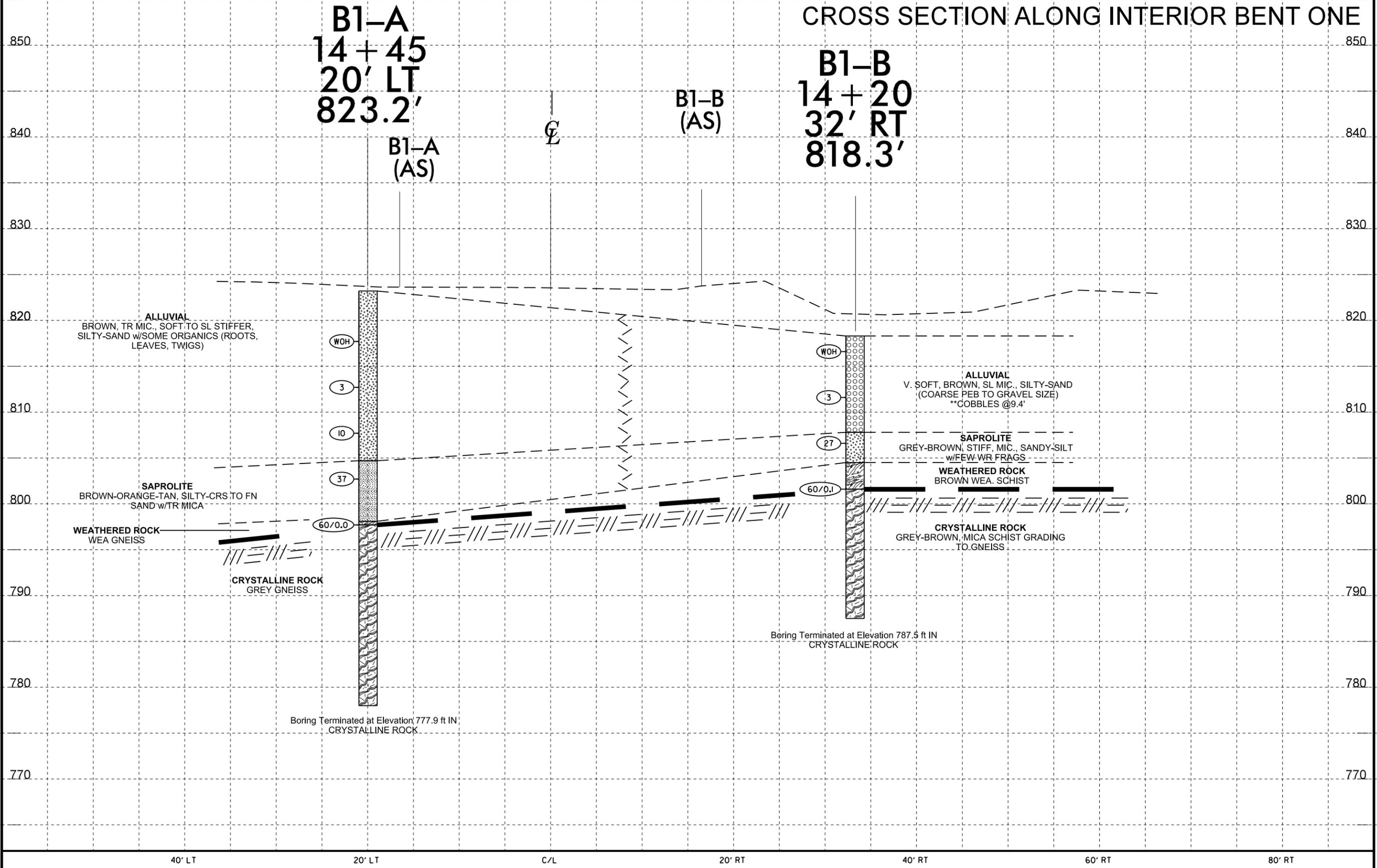
CROSS SECTION ALONG END BENT ONE

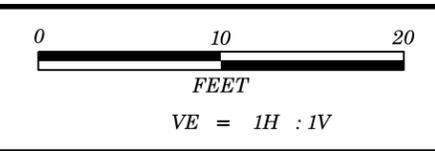




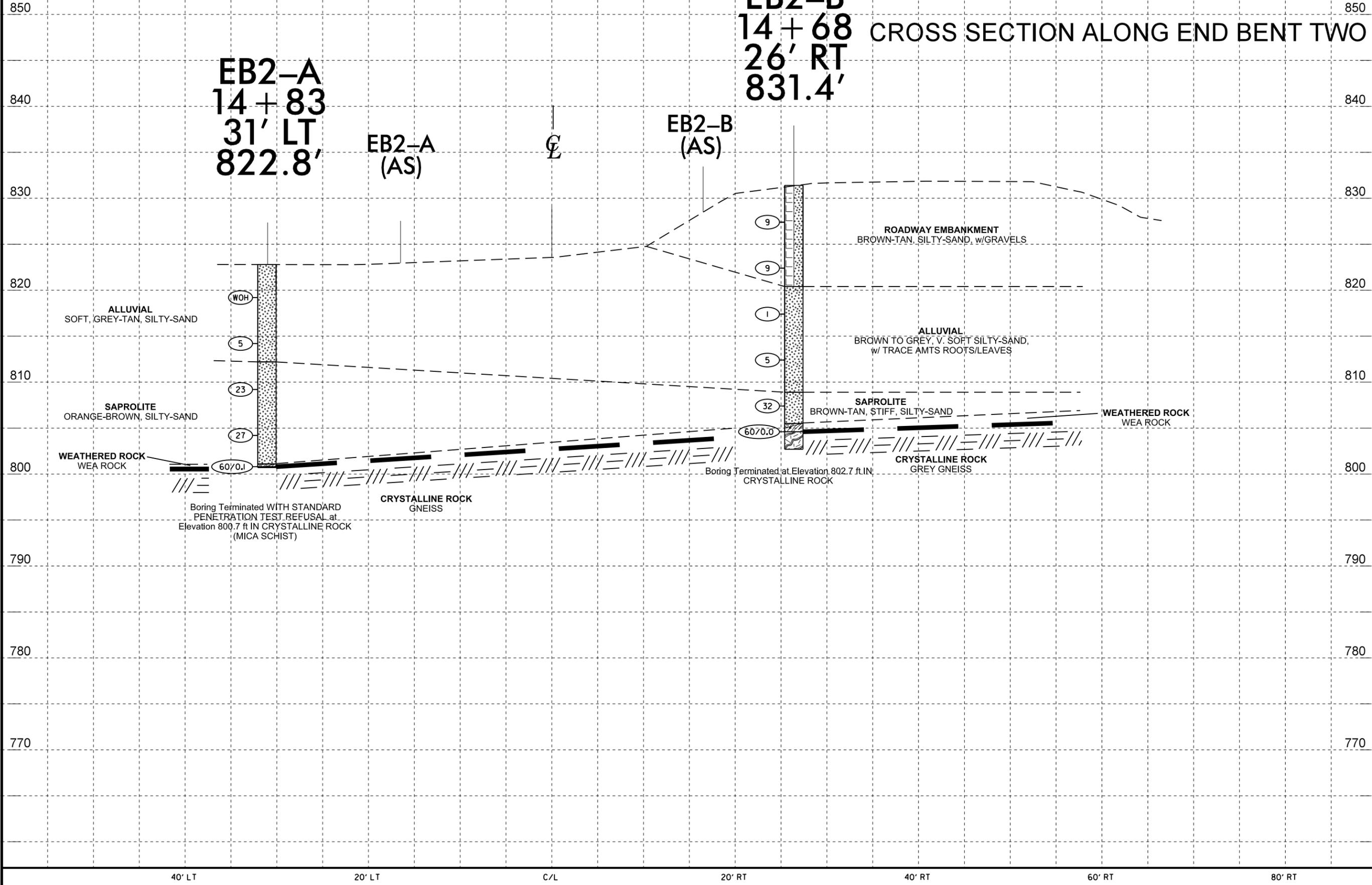
PROJECT REFERENCE NO.	SHEET NO.
SF-800076	6
REPLACE RUTHERFORD BRIDGE #076 ON SR 1576 OVER PUZZLE CREEK	

CROSS SECTION ALONG INTERIOR BENT ONE





PROJECT REFERENCE NO.	SHEET NO.
SF-800076	7
REPLACE RUTHERFORD BRIDGE #076 ON SR 1576 OVER PUZZLE CREEK	



GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT BORE LOG

WBS BP13.R004.1		TIP SF-800076		COUNTY RUTHERFORD		GEOLOGIST Johnson, C. D.										
SITE DESCRIPTION REPLACE BRIDGE #76 ON EAST CHURCH ST (SR-1576) OVER PUZZLE CREEK							GROUND WTR (ft)									
BORING NO. EB1-A		STATION 13+40		OFFSET 15 ft LT		ALIGNMENT L										
COLLAR ELEV. 824.8 ft		TOTAL DEPTH 22.2 ft		NORTHING 596,360		EASTING 1,157,264										
DRILL RIG/HAMMER EFF./DATE AFC8963 CME-550X 83% 04/11/2022				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Coffey, Jr., C.		START DATE 01/24/23		COMP. DATE 01/24/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
825														824.8	GROUND SURFACE	0.0
820	820.9	3.9	2	WOH	WOH										ALLUVIAL BROWN TO LT TAN SL MIC., SILTY-SAND, FEW ORGANICS (ROOTS, LEAVES) **WET @16.7' **COBBLES/RIVER GRAVELS @ 19.8-20.7	
815			WOH	**	**										**SEE NOTES RIGHT FOR LACK OF BLOWCOUNTS	
810			**	**	**											
805																
														804.1	SAPROLITE	20.7
														803.7	WEATHERED ROCK	21.1
														802.6	CRYSTALLINE ROCK	22.2
															Boring Terminated BY AUGER REFUSAL at Elevation 802.6 ft IN CRYSTALLINE ROCK	
															**GEU NOTE: DRILLER APPLIED SIGNIFICANT DOWN PRESSURE @ 21.1' to REFUSAL @ 22.2' IN ATTEMPT TO CONFIRM C.R.	

WBS BP13.R004.1		TIP SF-800076		COUNTY RUTHERFORD		GEOLOGIST Johnson, C. D.										
SITE DESCRIPTION REPLACE BRIDGE #76 ON EAST CHURCH ST (SR-1576) OVER PUZZLE CREEK							GROUND WTR (ft)									
BORING NO. EB1-B		STATION 13+55		OFFSET 20 ft RT		ALIGNMENT L										
COLLAR ELEV. 822.6 ft		TOTAL DEPTH 28.2 ft		NORTHING 596,464		EASTING 1,157,130										
DRILL RIG/HAMMER EFF./DATE AFC8963 CME-550X 83% 04/11/2022				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Coffey, Jr., C.		START DATE 01/20/23		COMP. DATE 01/20/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
825														822.6	GROUND SURFACE	0.0
820															ALLUVIAL BROWN, SL MIC., SOFT, SANDY-SILT TO SILTY-SAND	
815																
810																
805																
800																
795																
														801.1	SAPROLITE	21.5
														795.5	WEATHERED ROCK	27.1
														794.4	CRYSTALLINE ROCK	28.2
															Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 794.4 ft IN CRYSTALLINE ROCK	

NCDOT BORE DOUBLE_SF800076_GEO_BP13.R004.1_RUTHERFORD_BH.GPJ_NC_DOT.GDT 2/2/23

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS BP13.R004.1		TIP SF-800076		COUNTY RUTHERFORD		GEOLOGIST Johnson, C. D.								
SITE DESCRIPTION REPLACE BRIDGE #76 ON EAST CHURCH ST (SR-1576) OVER PUZZLE CREEK							GROUND WTR (ft)							
BORING NO. B1-B		STATION 14+20		OFFSET 32 ft RT		ALIGNMENT L								
COLLAR ELEV. 818.3 ft		TOTAL DEPTH 30.8 ft		NORTHING 596,454		EASTING 1,157,248								
DRILL RIG/HAMMER EFF./DATE AFO6963 CME-550X 83% 04/11/2022				DRILL METHOD NW Casing WSPT & Core		HAMMER TYPE Automatic								
DRILLER Coffey, Jr., C.		START DATE 01/18/23		COMP. DATE 01/18/23		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
820														818.3 GROUND SURFACE 0.0
815	816.6	1.7	WOH	WOH	WOH									ALLUVIAL V. SOFT, BROWN, SL MIC., SILTY-SAND (COARSE PEB TO GRAVEL SIZE) **COBBLES @9.4'
810	811.6	6.7	2	1	2									
805	806.6	11.7	15	18	9									807.8 SAPROLITE 10.5 GREY-BROWN, STIFF, MIC., SANDY-SILT w/FEW WR FRAGS
800	801.6	16.7	60/0.1											804.5 WEATHERED ROCK 13.8 BROWN WEA. SCHIST
795														801.6 CRYSTALLINE ROCK 16.7 GREY-BROWN, MICA SCHIST GRADING TO GNEISS
790														787.5 Boring Terminated at Elevation 787.5 ft IN CRYSTALLINE ROCK 30.8
**GEU NOTE: BORING OFFSET DUT TO UTILITIES IN AREA														

WBS BP13.R004.1		TIP SF-800076		COUNTY RUTHERFORD		GEOLOGIST Johnson, C. D.					
SITE DESCRIPTION REPLACE BRIDGE #76 ON EAST CHURCH ST (SR-1576) OVER PUZZLE CREEK							GROUND WTR (ft)				
BORING NO. B1-B		STATION 14+20		OFFSET 32 ft RT		ALIGNMENT L					
COLLAR ELEV. 818.3 ft		TOTAL DEPTH 30.8 ft		NORTHING 596,454		EASTING 1,157,248					
DRILL RIG/HAMMER EFF./DATE AFO6963 CME-550X 83% 04/11/2022				DRILL METHOD NW Casing WSPT & Core		HAMMER TYPE Automatic					
DRILLER Coffey, Jr., C.		START DATE 01/18/23		COMP. DATE 01/18/23		SURFACE WATER DEPTH N/A					
CORE SIZE NWNX			TOTAL RUN 14.1 ft								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	RQD (ft) %	LOG	DESCRIPTION AND REMARKS
801.6	801.6	16.7	4.1	2:17/1.1 N=60/0.1	(4.1) 100%	(3.4) 83%					Continued from previous page
800	797.5	20.8	5.0	2:17/1.1 2:10/1.0 2:27/1.0 2:34/1.0	(5.0) 100%	(4.4) 88%					801.6 CRYSTALLINE ROCK 16.7
795	792.5	25.8	5.0	2:15/1.0 1:27/1.0 1:54/1.0 2:06/1.0 3:22/1.0	(5.0) 100%	(5.0) 100%					
790	787.5	30.8	5.0	4:31/1.0 3:10/1.0 5:44/1.0 5:59/1.0 7:56/1.0	(5.0) 100%	(5.0) 100%					Boring Terminated at Elevation 787.5 ft IN CRYSTALLINE ROCK 30.8

GEOTECHNICAL BORING REPORT

BORE LOG

WBS BP13.R004.1		TIP SF-800076		COUNTY RUTHERFORD		GEOLOGIST Mullen, D. M.										
SITE DESCRIPTION REPLACE BRIDGE #76 ON EAST CHURCH ST (SR-1576) OVER PUZZLE CREEK							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 14+83		OFFSET 31 ft LT		ALIGNMENT L										
COLLAR ELEV. 822.8 ft		TOTAL DEPTH 22.1 ft		NORTHING 596,458		EASTING 11,571,559										
DRILL RIG/HAMMER EFF./DATE AFC8963 CME-550X 83% 04/11/2022				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Coffey, Jr., C.		START DATE 01/09/23		COMP. DATE 01/09/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
825														822.8	0.0	GROUND SURFACE
820	819.2	3.6	WOH	WOH	WOH	.....	.....	.....	.....			W				ALLUVIAL SOFT, GREY-TAN, SILTY-SAND
815	814.2	8.6	WOH	1	4	.....	.....	.....	.....			W		812.2	10.6	SAPROLITE ORANGE-BROWN, SILTY-SAND
810	809.2	13.6	5	5	18	.....	.....	.....	.....			W				
805	804.2	18.6	5	15	12	.....	.....	.....	.....			M				
	800.8	22.0	60/0.1			.....	.....	.....	.....					801.1	21.7	WEATHERED ROCK WEA ROCK
														800.8	22.0	CRYSTALLINE ROCK GNEISS
														800.7	22.1	Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 800.7 ft IN CRYSTALLINE ROCK (MICA SCHIST)

**GEU NOTE: BORING
OFFSET DUE TO HEAVY
UTILITIES IN AREA

NCDOT BORE DOUBLE_SF800076_GEO_BP13.R004.1_RUTHERFORD_BH.GPJ_NC_DOT.GDT 2/2/23

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT CORE LOG

WBS BP13.R004.1		TIP SF-800076		COUNTY RUTHERFORD		GEOLOGIST Elliott, D. C.									
SITE DESCRIPTION REPLACE BRIDGE #76 ON EAST CHURCH ST (SR-1576) OVER PUZZLE CREEK							GROUND WTR (ft)								
BORING NO. EB2-B (10/13/09)		STATION 14+68		OFFSET 26 ft RT		ALIGNMENT L									
COLLAR ELEV. 831.4 ft		TOTAL DEPTH 28.7 ft		NORTHING 596,485		EASTING 1,157,212									
DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 83% 04/11/2022				DRILL METHOD NW Casing WSPT & Core		HAMMER TYPE Automatic									
DRILLER Coffey, Jr., C.		START DATE 10/13/09		COMP. DATE 10/13/09		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
835															
															831.4
															830
		827.4	4.0	1	4	5									
		825													
		822.4	9.0	2	4	5									
		820													820.4
		817.4	14.0	WOH		1									
		815													
		812.4	19.0	1	2	3									
		810													
		807.4	24.0	3	8	24									
		805	804.6	26.8	60/0/0										804.6
															802.7

WBS BP13.R004.1		TIP SF-800076		COUNTY RUTHERFORD		GEOLOGIST Elliott, D. C.					
SITE DESCRIPTION REPLACE BRIDGE #76 ON EAST CHURCH ST (SR-1576) OVER PUZZLE CREEK							GROUND WTR (ft)				
BORING NO. EB2-B		STATION 14+68		OFFSET 26 ft RT		ALIGNMENT L					
COLLAR ELEV. 831.4 ft		TOTAL DEPTH 28.7 ft		NORTHING 596,485		EASTING 1,157,212					
DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 83% 04/11/2022				DRILL METHOD NW Casing WSPT & Core		HAMMER TYPE Automatic					
DRILLER Coffey, Jr., C.		START DATE 10/13/09		COMP. DATE 10/13/09		SURFACE WATER DEPTH N/A					
CORE SIZE NWNX			TOTAL RUN 1.9 ft								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	RQD (ft) %	LOG	DESCRIPTION AND REMARKS
804.62											Continued from previous page
	804.6	26.8	1.9	N=60/0.0	(1.5)	(0.8)					804.6
	802.7	28.7			79%	42%					802.7
											Boring Terminated at Elevation 802.7 ft IN CRYSTALLINE ROCK

**GEU NOTE: BORING FROM
PDEA OCT. 2009:
FORMERLY "B-1"

GEOTECHNICAL BORING REPORT BORE LOG

GEOTECHNICAL BORING REPORT BORE LOG

WBS BP13.R004.1		TIP SF-800076		COUNTY RUTHERFORD		GEOLOGIST Elliott, D. C.								
SITE DESCRIPTION REPLACE BRIDGE #76 ON EAST CHURCH ST (SR-1576) OVER PUZZLE CREEK							GROUND WTR (ft)							
BORING NO. B-2 (10/13/09)		STATION 13+36		OFFSET 55 ft RT		ALIGNMENT L								
COLLAR ELEV. 831.1 ft		TOTAL DEPTH 25.0 ft		NORTHING 596,404		EASTING 1,157,320								
DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 83% 04/11/2022		DRILL METHOD NW Casing w/ SPT		HAMMER TYPE Automatic										
DRILLER Coffey, Jr., C.		START DATE 10/13/09		COMP. DATE 10/13/09		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
835														
830														831.1 GROUND SURFACE 0.0
														ROADWAY EMBANKMENT BROWN-TAN, SILTY-SAND w/GRAVELS
825	827.1	4.0	2	1	3									
														823.2 ALLUVIAL BROWN, SILTY-SAND w/SOME ROOTS, WOOD, LEAVES 7.9
820	822.1	9.0	2	2	7									
815	817.1	14.0	1	2	1									
810	812.1	19.0	WOH	1	1									810.1 SAPROLITE 21.0
														808.1 BROWN STIFF SAPROLITE 23.0
	807.1	24.0												807.1 WEATHERED ROCK 24.0
	806.1	25.0												806.1 WEA GNEISS/SCHIST 25.0
														CRYSTALLINE ROCK GNEISS
														Boring Terminated at Elevation 806.1 ft IN CRYSTALLINE ROCK
														**GEU NOTE: BORING FROM PDEA DATED OCT. 2009

NCDOT BORE DOUBLE SF800076_GEO_BP13.R004.1_RUTHERFORD_BH.GPJ_NC_DOT.GDT_2/2/23

WBS BP13.R004.1		TIP SF-800076		COUNTY RUTHERFORD		GEOLOGIST Johnson, C. D.								
SITE DESCRIPTION REPLACE BRIDGE #76 ON EAST CHURCH ST (SR-1576) OVER PUZZLE CREEK							GROUND WTR (ft)							
BORING NO. RDWY-1		STATION 15+49		OFFSET 38 ft LT		ALIGNMENT L								
COLLAR ELEV. 823.3 ft		TOTAL DEPTH 20.1 ft		NORTHING 596,504		EASTING 1,157,110								
DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 83% 04/11/2022		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Coffey, Jr., C.		START DATE 01/05/23		COMP. DATE 01/05/23		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
825														823.3 GROUND SURFACE 0.0
														ALLUVIAL TAN-BROWN, SOFT, WET, SL MIC., SILTY-SAND
820	819.7	3.6	4	2	1									817.2 RESIDUAL TAN-BROWN, SL MIC., STIFF SILTY-CRS TO FN SAND w/FEW QUARTZ FRAGS T/O 6.1
815	814.7	8.6	10	12	8									811.3 SAPROLITE SOFT TO STIFF @17.4', BROWN TO GREY, SL MIC., SILTY-SAND 12.0
810	809.7	13.6	WOH	2	2									803.2 Boring Terminated at Elevation 803.2 ft IN SAPROLITE 20.1
805	804.7	18.6	17	32	56									
														**GEU NOTE: RDWY BORING TO CONFIRM SOIL TYPES FOR PROPOSED RDWY EMBANKMENT NEAR BRDG -- LAB RESULTS AVAILABLE UPON REQUEST

CORE PHOTOGRAPHS

B1-A

BOX 1 OF 2: 26.1 - 35.3 FEET



FEET

GEOLOGICAL STRENGTH INDEX: GSI
26.1' - 30.3': (30-40); 30.3' - 35.3': (40-50)

B1-A

BOX 2 OF 2: 35.3 - 45.3 FEET



FEET

GEOLOGICAL STRENGTH INDEX: GSI
35.3' - 37.3': (30-40); 37.3' - 41.3': (50-60); 41.3' - 45.3': (30-40)

CORE PHOTOGRAPHS

B1-B

BOX 1 OF 2: 16.7 - 25.8 FEET



FEET
GEOLOGICAL STRENGTH INDEX: GSI
16.7' - 25.8': (35-45)

B1-B

BOX 2 OF 2: 25.8 - 30.8 FEET



FEET
GEOLOGICAL STRENGTH INDEX: GSI
25.8' - 30.8': (60-70)

CORE PHOTOGRAPHS

EB2-B

BOX 1 OF 1: 26.8 - 28.7 FEET



FEET

GEOLOGICAL STRENGTH INDEX: GSI

26.8' - 28.7': (65-75)