

REFERENCE: BR-0033

PROJECT: 67033

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	67033	1	13

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

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1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4-6	CROSS SECTIONS
7-10	BORE LOGS & CORE REPORTS
11-13	CORE PHOTOGRAPHS

COUNTY MCDOWELL  
PROJECT DESCRIPTION REPLACE BRIDGE #84  
ON SR 1234 (PARKER PADGETT RD.) OVER I-40

SITE DESCRIPTION \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**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 1919 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

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

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

- NOTES:
- 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.
  - 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

DO CHEEK

CJ COFFEY

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INVESTIGATED BY DMM

DRAWN BY DMM

CHECKED BY JCK

SUBMITTED BY JCK

DATE 2/16/2021



DocuSigned by:  
D Matt Mullen 2/17/2021

18909BD3C 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**

<p align="center"><b>SOIL DESCRIPTION</b></p> <p>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, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>			<p align="center"><b>GRADATION</b></p> <p><u>WELL GRADED</u> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. <u>UNIFORMLY GRADED</u> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <u>GAP-GRADED</u> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.</p>			<p align="center"><b>ROCK DESCRIPTION</b></p> <p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>			<p align="center"><b>TERMS AND DEFINITIONS</b></p> <p><u>ALLUVIUM (ALLUV.)</u> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <u>AQUIFER</u> - A WATER BEARING FORMATION OR STRATA. <u>ARENACEOUS</u> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <u>ARGILLACEOUS</u> - 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. <u>ARTESIAN</u> - 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. <u>CALCAREOUS (CALC.)</u> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <u>COLLUVIUM</u> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <u>CORE RECOVERY (REC.)</u> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <u>DIP DIRECTION (DIP AZIMUTH)</u> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <u>FAULT</u> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <u>FISSILE</u> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <u>FLOAT</u> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. <u>FLOOD PLAIN (FP)</u> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <u>FORMATION (FM)</u> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <u>JOINT</u> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <u>LEDGE</u> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <u>LENS</u> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <u>MOTTLED (MOT.)</u> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <u>PERCHED WATER</u> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <u>RESIDUAL (RES.) SOIL</u> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <u>ROCK QUALITY DESIGNATION (ROD)</u> - 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. <u>SAPROLITE (SAP.)</u> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <u>SILL</u> - 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. <u>SLICKENSIDE</u> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <u>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</u> - 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. <u>STRATA CORE RECOVERY (SREC.)</u> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <u>STRATA ROCK QUALITY DESIGNATION (SROD)</u> - 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. <u>TOPSOIL (TS.)</u> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																																																																																																																																					
<p align="center"><b>SOIL LEGEND AND AASHTO CLASSIFICATION</b></p> <table border="1"> <tr> <th>GENERAL CLASS.</th> <th colspan="7">GRANULAR MATERIALS (<math>\leq 35\%</math> PASSING #200)</th> <th colspan="7">SILT-CLAY MATERIALS (<math>&gt; 35\%</math> PASSING #200)</th> <th colspan="7">ORGANIC MATERIALS</th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1</td><td>A-1-b</td><td>A-3</td><td>A-2</td><td>A-2-4</td><td>A-2-5</td><td>A-2-6</td><td>A-2-7</td><td>A-4</td><td>A-5</td><td>A-6</td><td>A-7</td><td>A-1, A-2</td><td>A-3</td><td>A-4, A-5</td><td>A-6, A-7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>SYMBOL</td> <td colspan="28">[Patterned symbols for soil classification]</td> </tr> <tr> <td>% PASSING #10 #40 #200</td> <td colspan="28">[Soil legend table with columns for sieve percentages]</td> </tr> <tr> <td>MATERIAL PASSING #40 LL PI</td> <td colspan="28">[Soil legend table with columns for liquid limit and plasticity index]</td> </tr> <tr> <td>GROUP INDEX</td> <td colspan="28">[Soil legend table with columns for group index]</td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td colspan="28">[Soil legend table with columns for material types]</td> </tr> <tr> <td>GEN. RATING AS SUBGRADE</td> <td colspan="28">[Soil legend table with columns for general rating]</td> </tr> </table>			GENERAL CLASS.	GRANULAR MATERIALS ( $\leq 35\%$ PASSING #200)							SILT-CLAY MATERIALS ( $> 35\%$ PASSING #200)							ORGANIC MATERIALS							GROUP CLASS.	A-1	A-1-b	A-3	A-2	A-2-4	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7																								SYMBOL	[Patterned symbols for soil classification]																												% PASSING #10 #40 #200	[Soil legend table with columns for sieve percentages]																												MATERIAL PASSING #40 LL PI	[Soil legend table with columns for liquid limit and plasticity index]																												GROUP INDEX	[Soil legend table with columns for group index]																												USUAL TYPES OF MAJOR MATERIALS	[Soil legend table with columns for material types]																												GEN. RATING AS SUBGRADE	[Soil legend table with columns for general rating]																												<p align="center"><b>ANGULARITY OF GRAINS</b></p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <u>ANGULAR</u>, <u>SUBANGULAR</u>, <u>SUBROUNDED</u>, OR <u>ROUNDED</u>.</p>			<p align="center"><b>MINERALOGICAL COMPOSITION</b></p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>			<p align="center"><b>COMPRESSIBILITY</b></p> <p>SLIGHTLY COMPRESSIBLE LL &lt; 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL &gt; 50</p>			<p align="center"><b>PERCENTAGE OF MATERIAL</b></p> <table border="1"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE 1 - 10%</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE 10 - 20%</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME 20 - 35%</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>&gt; 10%</td> <td>&gt; 20%</td> <td>HIGHLY 35% AND ABOVE</td> </tr> </table>			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
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<p align="center"><b>GROUND WATER</b></p> <p> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p> STATIC WATER LEVEL AFTER 24 HOURS</p> <p> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p> SPRING OR SEEP</p>			<p align="center"><b>WEATHERING</b></p> <p>FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i></p> <p>SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES &gt; 100 BPF</i></p> <p>VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</i></p> <p>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.</p>																																																																																																																																																																																																																																																																											
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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																																																																																																																																																																																																																																																																											
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MODERATELY CLOSE	1 TO 3 FEET																																																																																																																																																																																																																																																																													
CLOSE	0.16 TO 1 FOOT																																																																																																																																																																																																																																																																													
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VERY THINLY BEDDED	0.03 - 0.16 FEET																																																																																																																																																																																																																																																																													
THICKLY LAMINATED	0.008 - 0.03 FEET																																																																																																																																																																																																																																																																													
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<p align="center"><b>INDURATION</b></p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1"> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table>			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.	<p align="center"><b>NOTES:</b></p> <p align="right">BENCH MARK: BL-1</p> <p align="right">ELEVATION: 1369.96 FEET</p>																																																																																																																																																																																																																																																																			
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**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**

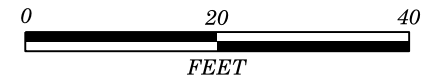
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

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

<p><b>GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)</b></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><b>STRUCTURE</b></p>	<p><b>SURFACE CONDITIONS</b></p>	<p><b>VERY GOOD</b> Very rough, fresh unweathered surfaces</p>	<p><b>GOOD</b> Rough, slightly weathered, iron stained surfaces</p>	<p><b>FAIR</b> Smooth, moderately weathered and altered surfaces</p>	<p><b>POOR</b> Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments</p>	<p><b>VERY POOR</b> Slickensided, highly weathered surfaces with soft clay coatings or fillings</p>	<p><b>GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)</b></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><b>SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)</b></p> <p><b>VERY GOOD</b> - Very Rough, fresh unweathered surfaces</p> <p><b>GOOD</b> - Rough, slightly weathered surfaces</p> <p><b>FAIR</b> - Smooth, moderately weathered and altered surfaces</p> <p><b>POOR</b> - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments</p> <p><b>VERY POOR</b> - Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings</p>						
<p><b>STRUCTURE</b></p>	<p><b>DECREASING SURFACE QUALITY</b> →</p>						<p><b>COMPOSITION AND STRUCTURE</b></p>						
<p> <b>INTACT OR MASSIVE</b> - intact rock specimens or massive in situ rock with few widely spaced discontinuities</p>	<p>↑</p> <p><b>DECREASING INTERLOCKING OF ROCK PIECES</b></p> <p>↓</p>	90	80	70	60	50	40	30	20	10	N/A	N/A	<p> <b>A. Thick bedded, very blocky sandstone</b> 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>BLOCKY</b> - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets</p>													<p> <b>B. Sandstone with thin inter-layers of siltstone</b></p>
<p> <b>VERY BLOCKY</b> - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets</p>													<p> <b>C. Sandstone and siltstone in similar amounts</b></p>
<p> <b>BLOCKY/DISTURBED/SEAMY</b> - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity</p>													<p> <b>D. Siltstone or silty shale with sandstone layers</b></p>
<p> <b>DISINTEGRATED</b> - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces</p>													<p> <b>E. Weak siltstone or clayey shale with sandstone layers</b></p>
<p> <b>LAMINATED/SHEARED</b> - Lack of blockiness due to close spacing of weak schistosity or shear planes</p>													<p><b>C, D, E, and G</b> - 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 <b>F</b> and <b>H</b>.</p>
													<p> <b>F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure</b></p>
													<p> <b>G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers</b></p>
													<p> <b>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.</b></p>
													<p>→ Means deformation after tectonic disturbance</p>

15

16



PROJECT REFERENCE NO. SHEET NO.

BR-0033

3

REPLACE MCDOWELL 0084  
ON SR 1234 OVER I-40

SKEW: APPROX. 12.4 DEG.

67033



BEGIN BRIDGE  
-L- STA. 15 + 15 +/-

END BRIDGE  
-L- STA. 17 + 24 +/-

← TO SR 1240

SR 1234 PARKER PADGETT RD 24' BST

TO SR 1246 →

EB1-A  
-L-STA 15 + 00.1  
44.2' LT  
1387.5'

B1-A  
-L-STA 16 + 16.8  
24' LT  
1370.5'

EB2-A  
-L-STA 17 + 29.6  
24' LT  
1389.4'

-L-

SKEW: 102.4 DEG.

EB1-B  
-L-STA 15 + 08.8  
20.3' RT  
1368.8'

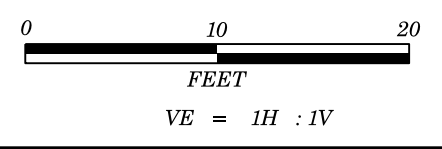
B1-B  
-L-STA 16 + 06.2  
24' RT  
1369.8'

EB2-B  
-L-STA 17 + 18.9  
23.7' RT  
1375.4'

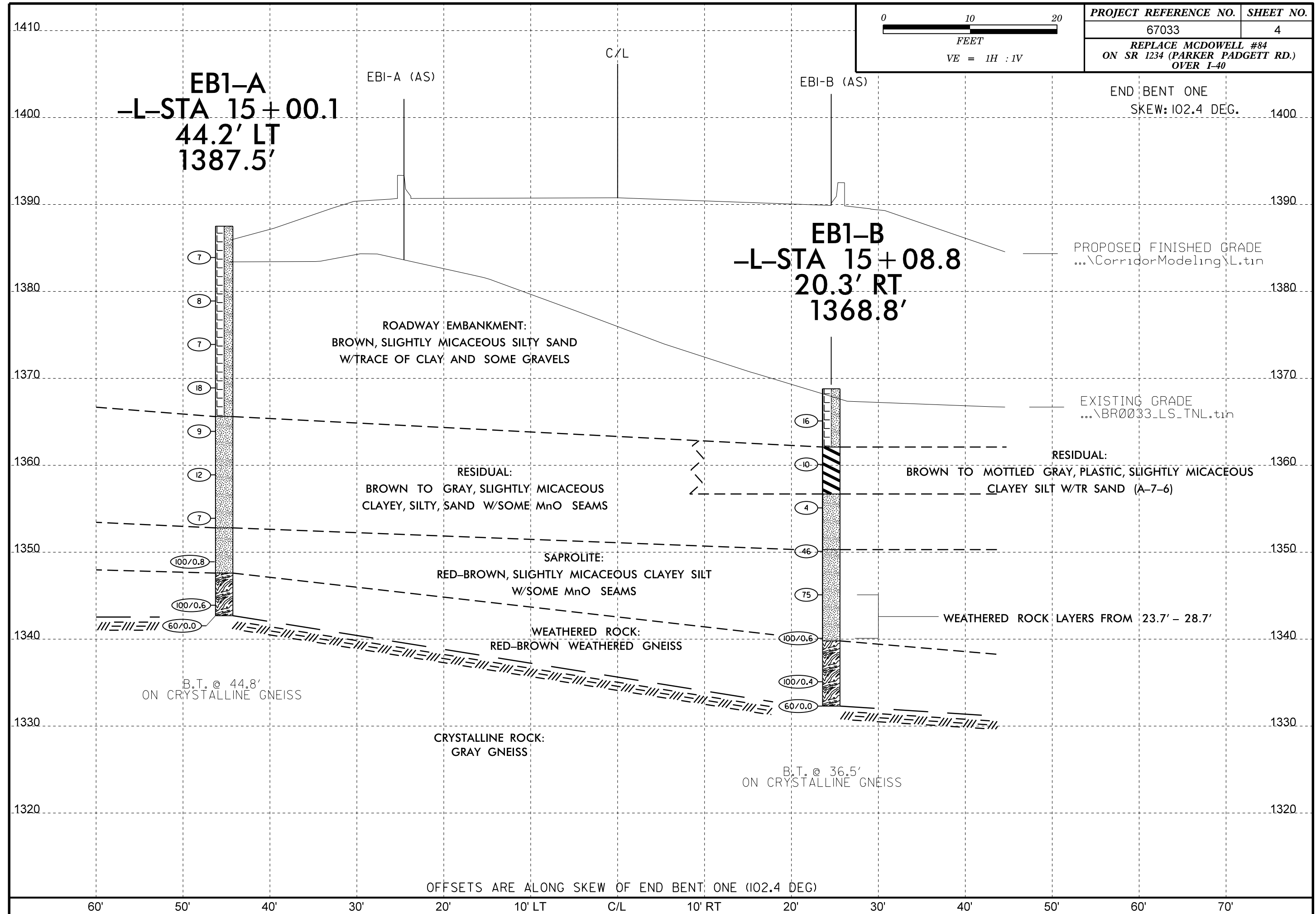
BL-1

I-40 EB  
TO MARION

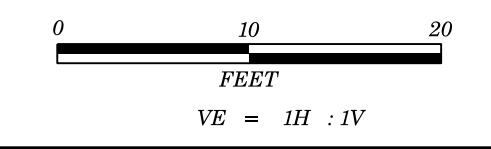
I-40 WB  
TO ASHEVILLE



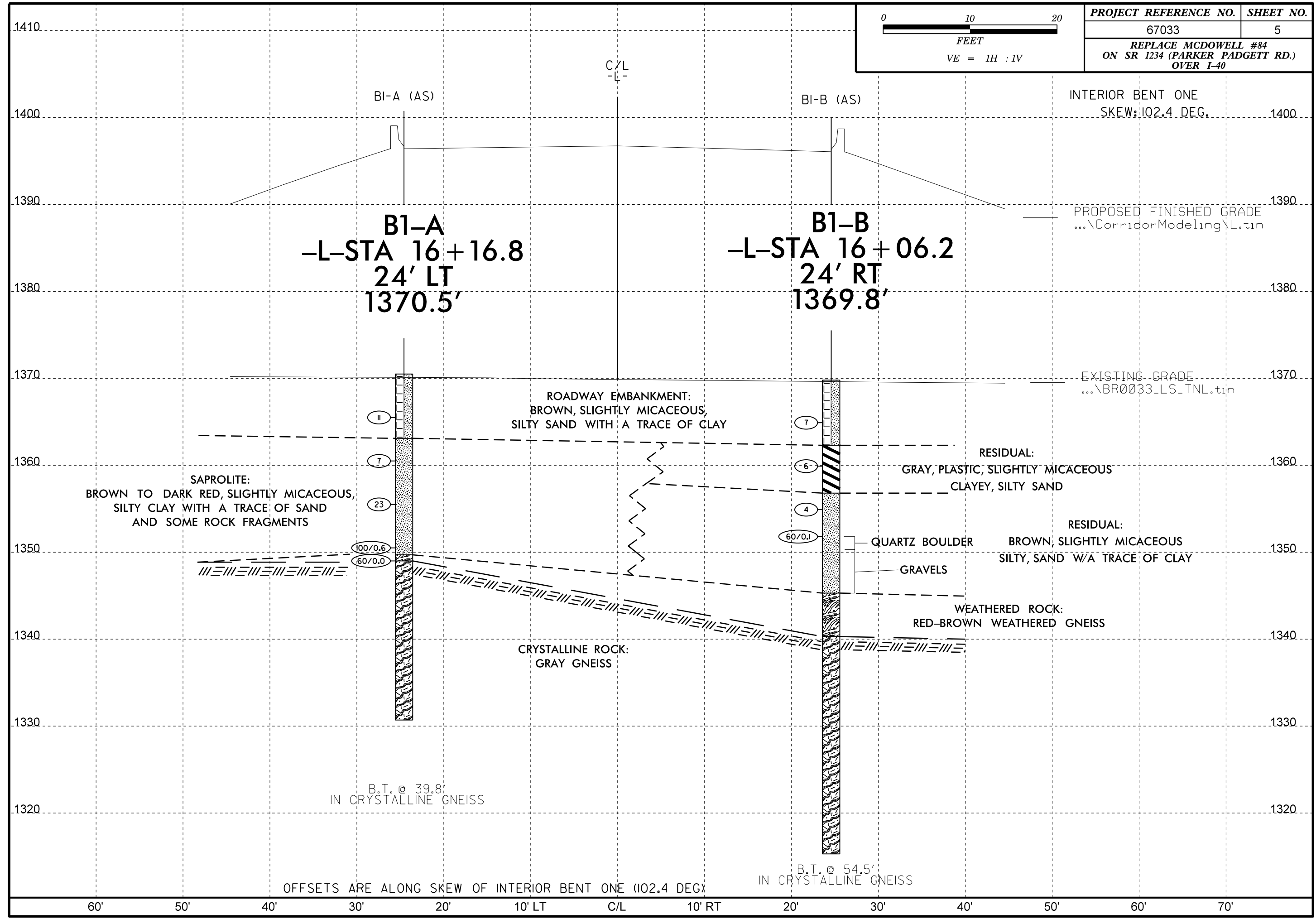
PROJECT REFERENCE NO.	SHEET NO.
67033	4
REPLACE MCDOWELL #84 ON SR 1234 (PARKER PADGETT RD.) OVER I-40	



OFFSETS ARE ALONG SKEW OF END BENT ONE (102.4 DEG)



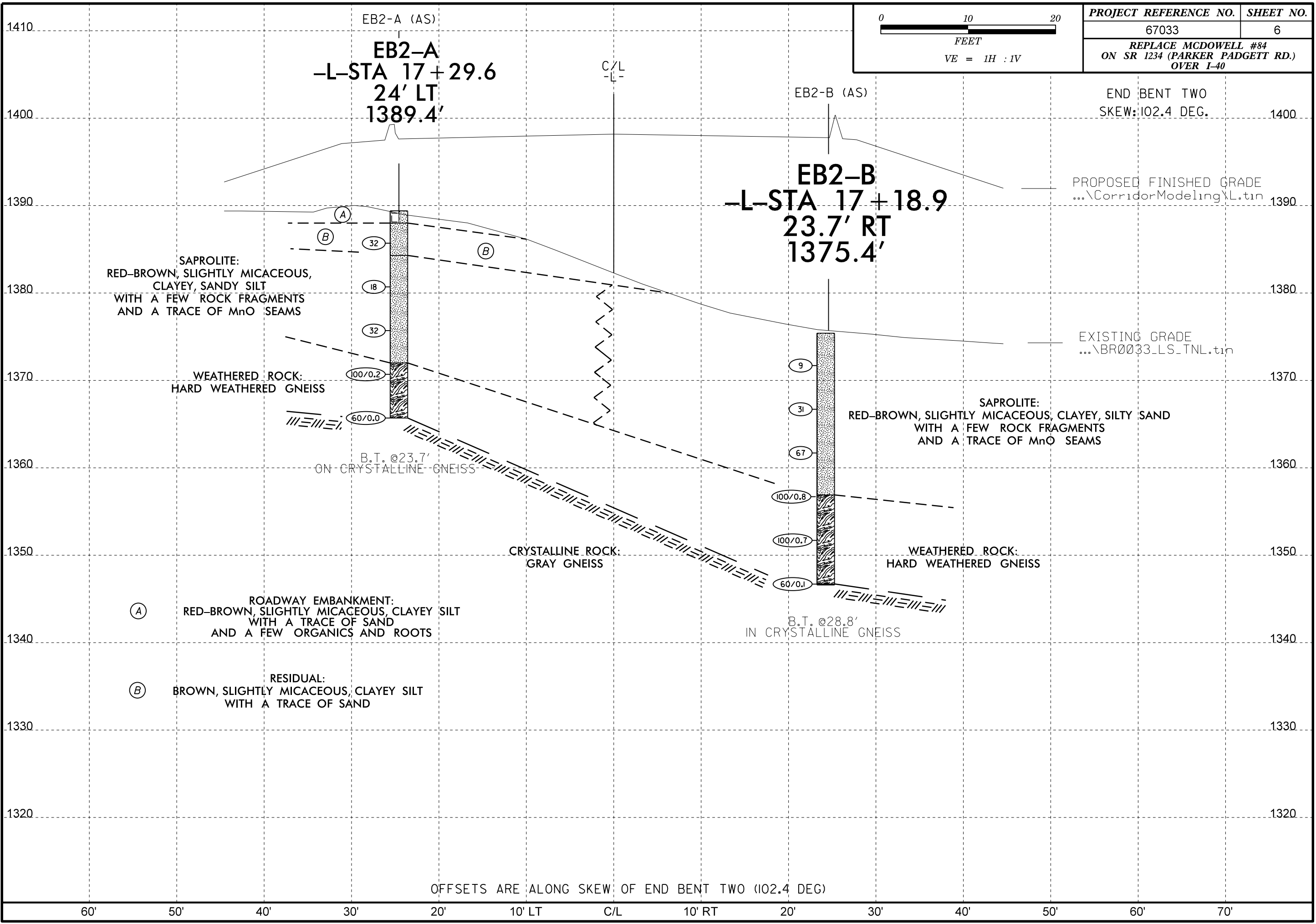
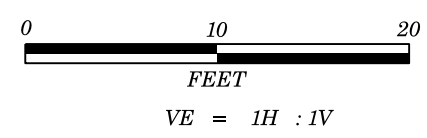
PROJECT REFERENCE NO.	SHEET NO.
67033	5
REPLACE MCDOWELL #84 ON SR 1234 (PARKER PADGETT RD.) OVER I-40	



1410  
1400  
1390  
1380  
1370  
1360  
1350  
1340  
1330  
1320

1400  
1390  
1380  
1370  
1360  
1350  
1340  
1330  
1320

60' 50' 40' 30' 20' 10' LT C/L 10' RT 20' 30' 40' 50' 60' 70'



# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 67033.1.1		TIP BR-0033		COUNTY McDOWELL		GEOLOGIST Johnson, C. D.									
SITE DESCRIPTION REPLACE BRIDGE 84 ON SR-1234 OVER I-40							GROUND WTR (ft)								
BORING NO. EB1-A		STATION 15+00		OFFSET 44 ft LT		ALIGNMENT L									
COLLAR ELEV. 1,387.5 ft		TOTAL DEPTH 44.8 ft		NORTHING 702,131		EASTING 1,065,920									
DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER Cheek, D. O.		START DATE 12/09/20		COMP. DATE 12/09/20		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
1390														1,387.5	0.0
1385	1,383.9	3.6	4	3	4							M	ROADWAY EMBANKMENT BROWN, SL MIC, SILTY SAND w/TR CLAY & SOME GRVLS		
1380	1,378.9	8.6	3	4	4							M			
1375	1,373.9	13.6	1	3	4							M			
1370	1,368.9	18.6	5	11	7							M			
1365	1,363.9	23.6	3	4	5							M	RESIDUAL BROWN-RED TO LT GREY, SL MIC, CLAYEY SILTY SAND w/FEW PEBLS T/O	21.9	
1360	1,358.9	28.6	2	5	7							M			
1355	1,353.9	33.6	WOH	3	4							M			
1350	1,348.9	38.6	23	30	70/0.3							M	SAPROLITE RED-BROWN, SL MIC, CLAYEY-SILT w/SOME MnO SEAMS	34.7	
1345	1,343.9	43.6											WEATHERED ROCK RED-BROWN WEA GNEISS	39.9	
	1,342.7	44.8	9	91/0.1									CRYSTALLINE ROCK DARK GREY GNEISS Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,342.7 ft ON CRYSTALLINE ROCK (GNEISS)	44.8	

WBS 67033.1.1		TIP BR-0033		COUNTY McDOWELL		GEOLOGIST Johnson, C. D.									
SITE DESCRIPTION REPLACE BRIDGE 84 ON SR-1234 OVER I-40							GROUND WTR (ft)								
BORING NO. EB1-B		STATION 15+09		OFFSET 20 ft RT		ALIGNMENT L									
COLLAR ELEV. 1,368.8 ft		TOTAL DEPTH 36.5 ft		NORTHING 702,153		EASTING 1,065,981									
DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER Cheek, D. O.		START DATE 12/08/20		COMP. DATE 12/08/20		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
1370														1,368.8	0.0
1365	1,365.1	3.7	3	9	7							M	ROADWAY EMBANKMENT BROWN, SANDY SILT w/TR CLAY, SOME GRVLS/RK FRAGS		
1360	1,360.1	8.7	3	4	6							SS-SS-1	RESIDUAL BROWN TO MOTTLED GREY, PLASTIC, SL MIC, CLAYEY-SILT w/TR SAND (A-7-6)	6.7	
1355	1,355.1	13.7	2	2	2							SS-SS-2	RESIDUAL GREY, SL MIC, SANDY SILT w/TR CL, SOME PEBLS	12.1	
1350	1,350.1	18.7	2	18	28							M	SAPROLITE BROWN-RED, SL MIC, SANDY SILT w/TR CLAY, FEW RK FRAGS IN/OUT WR LAYERS @23.7-28.7'	18.5	
1345	1,345.1	23.7	24	37	38							W			
1340	1,340.1	28.7	88	12/0.1									WEATHERED ROCK BROWN WEA GNEISS	29.0	
1335	1,335.1	33.7	100/0.4												
	1,332.3	36.5	60/0.0										CRYSTALLINE ROCK DARK GREY GNEISS Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,332.3 ft ON CRYSTALLINE ROCK (GNEISS)	36.5	

NCDOT BORE DOUBLE BR0033\_67033.1.1\_MCDOWELL\_BRDG84.GPJ\_NC\_DOT.GDT 12/21/20



# GEOTECHNICAL BORING REPORT BORE LOG

# GEOTECHNICAL BORING REPORT CORE LOG

WBS 67033.1.1		TIP BR-0033		COUNTY McDOWELL		GEOLOGIST Johnson, C. D.									
SITE DESCRIPTION REPLACE BRIDGE 84 ON SR-1234 OVER I-40							GROUND WTR (ft)								
BORING NO. B1-A		STATION 16+17		OFFSET 24 ft LT		ALIGNMENT L									
COLLAR ELEV. 1,370.5 ft		TOTAL DEPTH 39.8 ft		NORTHING 702,248		EASTING 1,065,913									
DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019			DRILL METHOD NW Casing W/SPT & Core			HAMMER TYPE Automatic									
DRILLER Cheek, D. O.		START DATE 12/15/20		COMP. DATE 12/15/20		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
1375															
1370														1,370.5	0.0
1365	1,365.5	5.0	3	4	7									1,363.1	7.4
1360	1,360.5	10.0	2	3	4										
1355	1,355.5	15.0	6	6	17										
1350	1,350.5	20.0	11	52	48/0.1									1,349.7	20.8
1345	1,349.0	21.5	60/0.0											1,349.0	21.5
1340															
1335														1,330.7	39.8
Boring Terminated at Elevation 1,330.7 ft IN CRYSTALLINE ROCK (GNEISS)															

WBS 67033.1.1		TIP BR-0033		COUNTY McDOWELL		GEOLOGIST Johnson, C. D.					
SITE DESCRIPTION REPLACE BRIDGE 84 ON SR-1234 OVER I-40							GROUND WTR (ft)				
BORING NO. B1-A		STATION 16+17		OFFSET 24 ft LT		ALIGNMENT L					
COLLAR ELEV. 1,370.5 ft		TOTAL DEPTH 39.8 ft		NORTHING 702,248		EASTING 1,065,913					
DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019			DRILL METHOD NW Casing W/SPT & Core			HAMMER TYPE Automatic					
DRILLER Cheek, D. O.		START DATE 12/15/20		COMP. DATE 12/15/20		SURFACE WATER DEPTH N/A					
CORE SIZE NXWL			TOTAL RUN 18.3 ft								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)	REC. (%)	RQD (%)			
1349	1,349.0	21.5	3.3	N=60/0.0 1:38/1.0 1:59/1.0 1:45/1.3	(2.9)	(1.3)				1,349.0	21.5
1345	1,345.7	24.8	5.0	1:14/1.0 1:42/1.0 1:09/1.0 1:31/1.0 1:43/1.0	(4.6)	39%	40-50				
1340	1,340.7	29.8	5.0	1:22/1.0 1:12/1.0 1:10/1.0 1:07/1.0	(5.0)	60%	30-70				
1335	1,335.7	34.8	5.0	1:38/1.0 1:22/1.0 1:08/1.0 1:15/1.0 1:46/1.0	(5.0)	96%	80-90				
Boring Terminated at Elevation 1,330.7 ft IN CRYSTALLINE ROCK (GNEISS)											

NCDOT BORE DOUBLE BR0033\_67033.1.1\_MCDOWELL\_BRDG84.GPJ NC\_DOT.GDT 12/21/20

# GEOTECHNICAL BORING REPORT BORE LOG

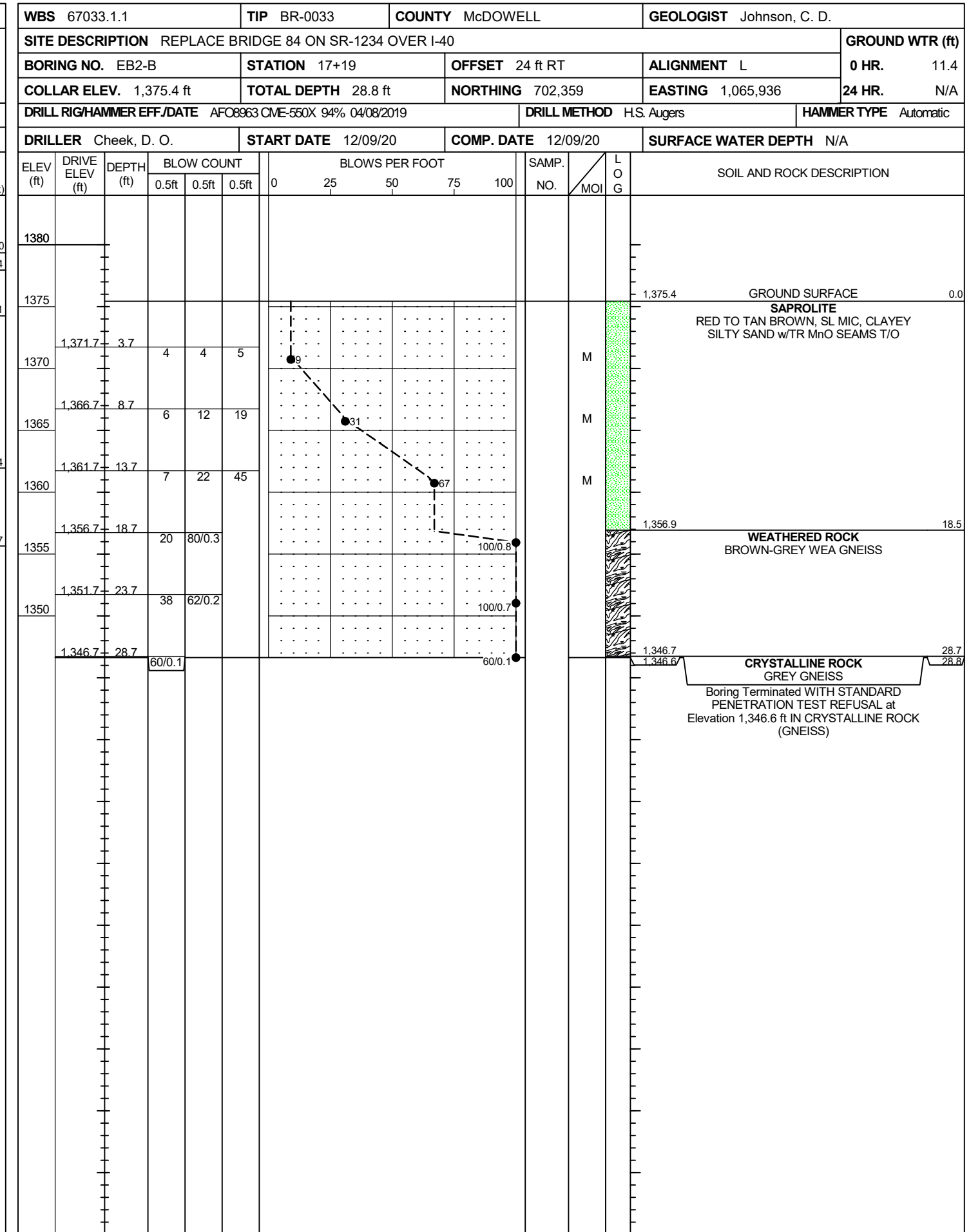
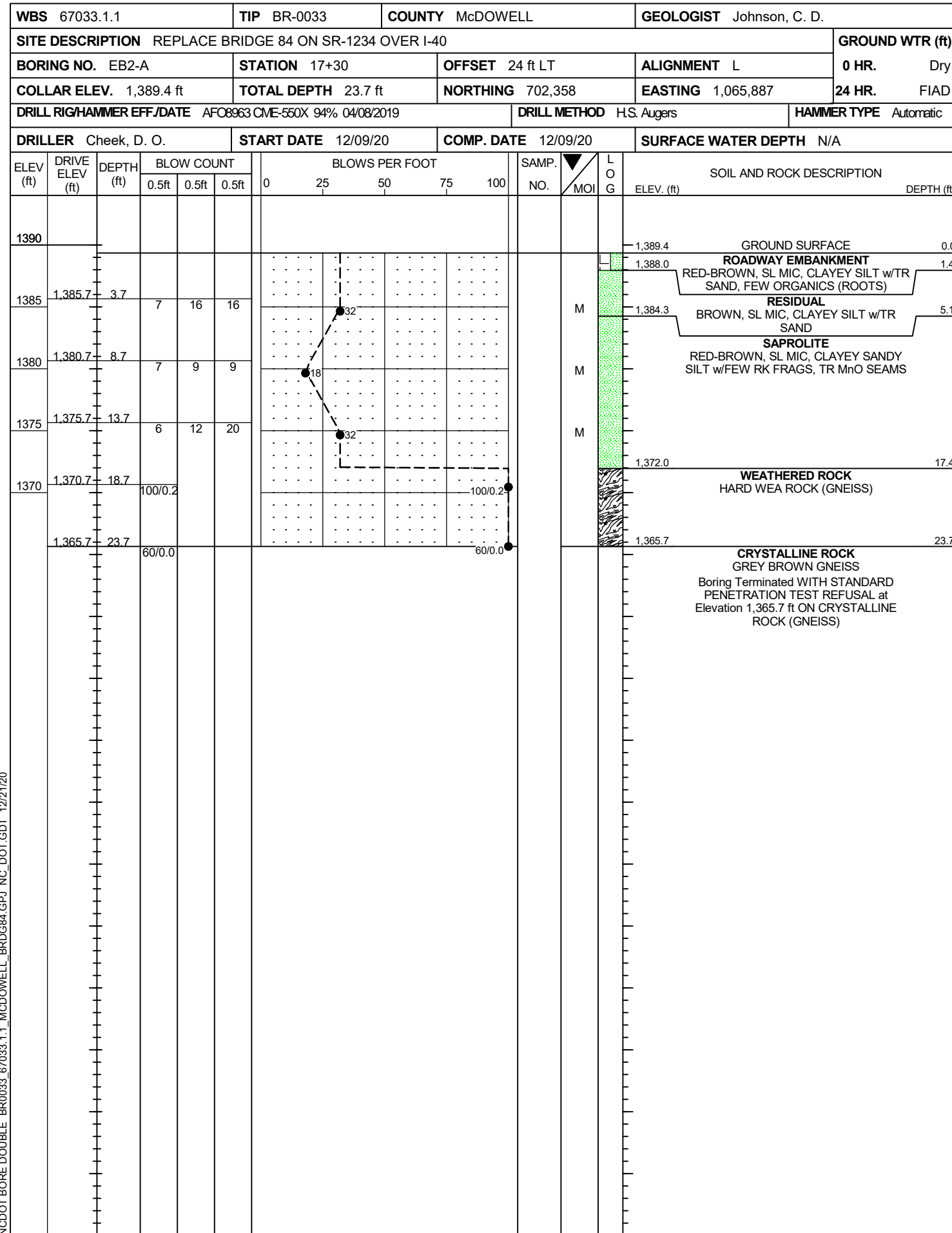
# GEOTECHNICAL BORING REPORT CORE LOG

WBS 67033.1.1		TIP BR-0033		COUNTY McDOWELL		GEOLOGIST Johnson, C. D.						
SITE DESCRIPTION REPLACE BRIDGE 84 ON SR-1234 OVER I-40							GROUND WTR (ft)					
BORING NO. B1-B		STATION 16+06		OFFSET 24 ft RT		ALIGNMENT L						
COLLAR ELEV. 1,369.8 ft		TOTAL DEPTH 54.5 ft		NORTHING 702,249		EASTING 1,065,962						
DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic								
DRILLER Cheek, D. O.		START DATE 12/15/15		COMP. DATE 12/15/20		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			
1370												1,369.8 GROUND SURFACE 0.0
												ROADWAY EMBANKMENT BROWN, SL MIC, SILTY SAND w/TR CL
1365	1,364.9	4.9	3	3	4							1,362.3 7.5
1360	1,359.9	9.9	WOH		3	3						RESIDUAL GREY, PLASTIC, SL MIC, CLAYEY SILTY SAND
1355	1,354.9	14.9	2	2	2							1,356.8 13.0
	1,351.8	18.0	60/0.1									RESIDUAL BROWN, SL MIC, SILTY SAND w/TR CL V. HARD BLDR @18.0'
1350												1,345.3 24.5
1345												WEATHERED ROCK HIGHLY WEA GNEISS
1340												1,340.3 29.5
1335												CRYSTALLINE ROCK GREY GNEISS
1330												
1325												
1320												1,315.3 54.5
												Boring Terminated at Elevation 1,315.3 ft IN CRYSTALLINE ROCK (GNEISS)

WBS 67033.1.1		TIP BR-0033		COUNTY McDOWELL		GEOLOGIST Johnson, C. D.			
SITE DESCRIPTION REPLACE BRIDGE 84 ON SR-1234 OVER I-40							GROUND WTR (ft)		
BORING NO. B1-B		STATION 16+06		OFFSET 24 ft RT		ALIGNMENT L			
COLLAR ELEV. 1,369.8 ft		TOTAL DEPTH 54.5 ft		NORTHING 702,249		EASTING 1,065,962			
DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019		DRILL METHOD NW Casing W/SPT & Core		HAMMER TYPE Automatic					
DRILLER Cheek, D. O.		START DATE 12/15/15		COMP. DATE 12/15/20		SURFACE WATER DEPTH N/A			
CORE SIZE NXWL			TOTAL RUN 36.5 ft					LOG	DESCRIPTION AND REMARKS
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RQD (ft) %	SAMP. NO.		
1351.8	1,351.8	18.0	1.5	N=60/0.1	(1.0)	(0.0)			Begin Coring @ 18.0 ft
1350	1,350.3	19.5	5.0		(1.0)	0%			RESIDUAL (continued)
1345	1,345.3	24.5	5.0	1:22/1.0 1:15/1.0 1:20/1.0 1:14/1.0 1:32/1.0	(2.1)	0%			WEATHERED ROCK
1340	1,340.3	29.5	5.0	1:19/1.0 1:49/1.0 0:46/1.0 1:04/1.0 1:03/1.0	(4.4)	58%			CRYSTALLINE ROCK
1335	1,335.3	34.5	5.0	1:12/1.0 1:08/1.0 1:51/1.0 1:11/1.0 1:30/1.0	(4.5)	60%			
1330	1,330.3	39.5	5.0	1:20/1.0 0:48/1.0 1:09/1.0 0:58/1.0 1:36/1.0	(5.1)	98%			
1325	1,325.3	44.5	5.0	1:06/1.0 0:51/1.0 0:53/1.0 0:47/1.0 1:15/1.0	(5.0)	100%			
1320	1,320.3	49.5	5.0	0/1.0 0/1.0 0/1.0 0/1.0	(5.1)	92%			
	1,315.3	54.5				90%			Boring Terminated at Elevation 1,315.3 ft IN CRYSTALLINE ROCK (GNEISS)

# GEOTECHNICAL BORING REPORT

## BORE LOG



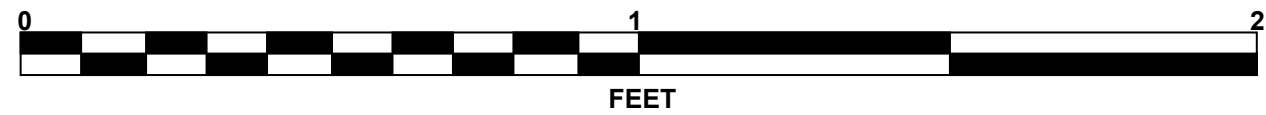
NCDOT BORE DOUBLE BR0033\_67033.1.1\_MCDOWELL\_BRDG84.GPJ NC\_DOT.GDT 12/21/20



# CORE PHOTOGRAPHS

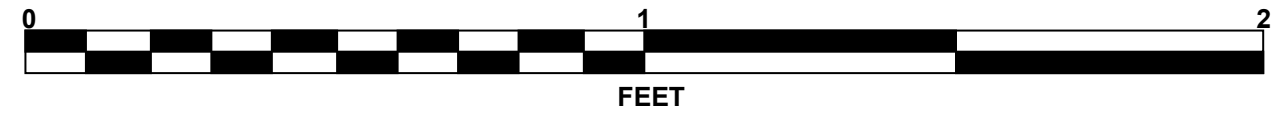
## B1-A

BOX 1 OF 2: 21.5 - 31.6 FEET  
21.5' - 27.5' GSI: 40 - 70  
27.5' - 31.6' GSI: 80 - 90



## B1-A

BOX 2 OF 2: 31.6 - 39.8 FEET  
GSI: 85 - 90

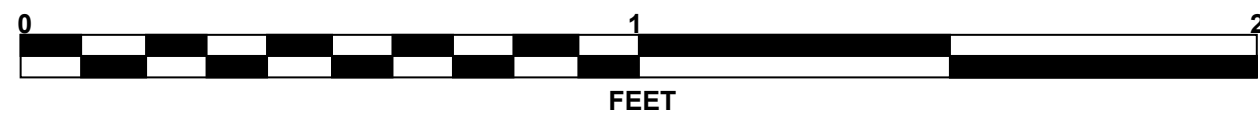
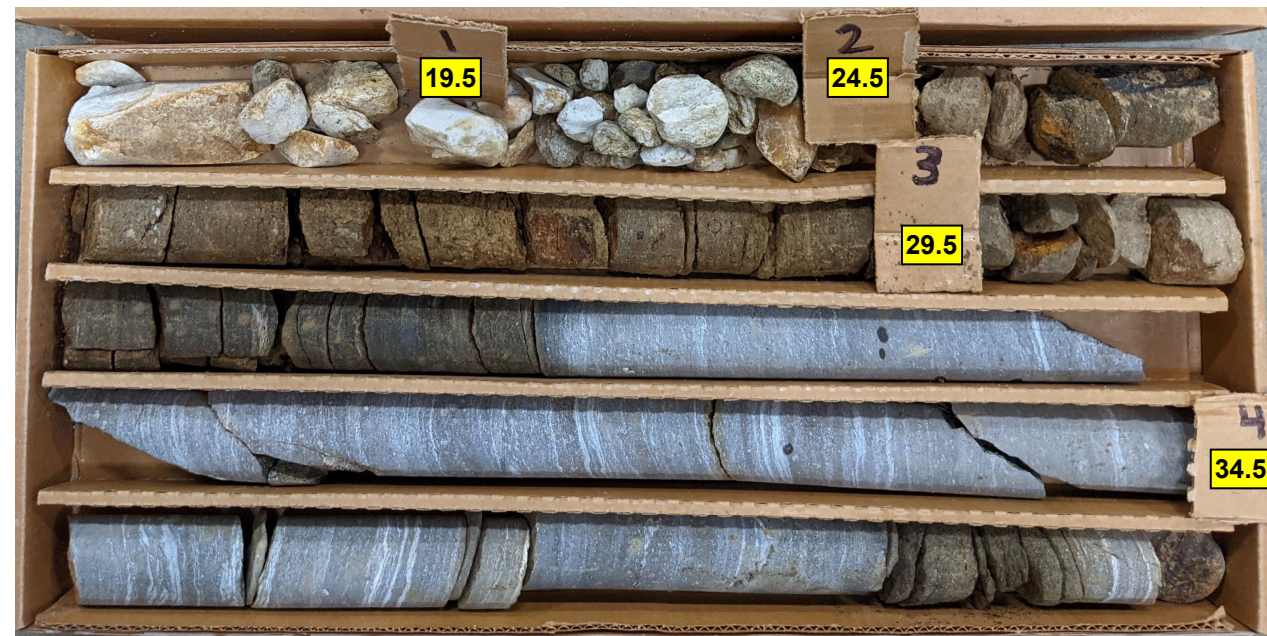




# CORE PHOTOGRAPHS

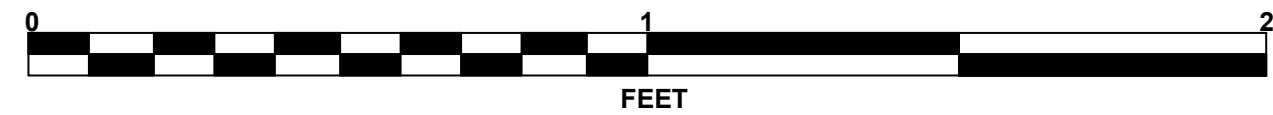
## B1-B

BOX 1 OF 3: 18.0 - 36.5 FEET  
18' - 24.5' GSI: 0  
24.5' - 31' GSI: 25 - 30  
31' - 36.5' GSI: 50 - 75



## B1-B

BOX 2 OF 3: 36.5 - 45.5 FEET  
36.5' - 39.5' GSI 50 - 75  
39.5' - 45.5' GSI 80 - 85





# CORE PHOTOGRAPHS

## B1-B

BOX 3 OF 3: 45.5 - 54.5 FEET  
GSI: 80 - 85

