

REFERENCE: BR-0036

PROJECT: 67036

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY NASH  
PROJECT DESCRIPTION BRIDGE NO. 41 ON NC 33  
OVER I-95

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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0036	1	16

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

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

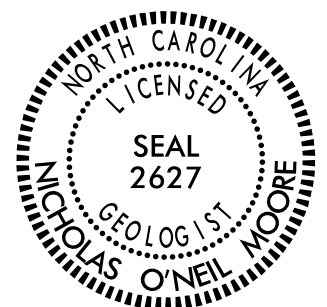
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT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

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

PERSONNEL

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 SUBMITTED BY N. T. ROBERSON  
 DATE SEPTEMBER 2019



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 8636AEA78 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										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 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										<b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. <b>UNIFORMLY GRADED</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.										<b>HARD ROCK</b> 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:										<b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA. <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <b>ARGILLACEOUS</b> - 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. <b>ARTESIAN</b> - 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. <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <b>ROCK QUALITY DESIGNATION (RQD)</b> - 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. <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <b>SILL</b> - 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. <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - 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. <b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <b>STRATA ROCK QUALITY DESIGNATION (SROD)</b> - 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. <b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.									
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b> GENERAL CLASS. GRANULAR MATERIALS (≤ 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS GROUP CLASS. A-1, A-1-b, 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 % PASSING #10 #40 #200 MATERIAL PASSING #40 LL PI GROUP INDEX USUAL TYPES OF MAJOR MATERIALS 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										<b>ANGULARITY OF GRAINS</b> THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED. <b>MINERALOGICAL COMPOSITION</b> MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE. <b>COMPRESSIBILITY</b> SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50 <b>PERCENTAGE OF MATERIAL</b> 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										<b>WEATHERED ROCK (WR)</b> <b>CRYSTALLINE ROCK (CR)</b> <b>NON-CRYSTALLINE ROCK (NCR)</b> <b>COASTAL PLAIN SEDIMENTARY ROCK (CP)</b> <b>WEATHERING</b> 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.																			
<b>CONSISTENCY OR DENSENESS</b> PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> ) GENERALLY GRANULAR MATERIAL (NON-COHESIVE) VERY LOOSE 4 TO 10 MEDIUM DENSE 10 TO 30 DENSE 30 TO 50 VERY DENSE > 50 GENERALLY SILT-CLAY MATERIAL (COHESIVE) VERY SOFT 2 TO 4 MEDIUM STIFF 4 TO 8 STIFF 8 TO 15 VERY STIFF 15 TO 30 HARD > 30										<b>MISCELLANEOUS SYMBOLS</b> 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 DMT 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										<b>RECOMMENDATION SYMBOLS</b> UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL																			
<b>TEXTURE OR GRAIN SIZE</b> U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 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										<b>ABBREVIATIONS</b> 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 w - UNIT WEIGHT w <sub>d</sub> - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO										<b>ROCK HARDNESS</b> 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 FINGERNAIL.																			
<b>SOIL MOISTURE - CORRELATION OF TERMS</b> SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION LL LIQUID LIMIT - SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE PLASTIC RANGE (PI) - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE 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										<b>EQUIPMENT USED ON SUBJECT PROJECT</b> 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										<b>FRACTURE SPACING</b> 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 <b>BEDDING</b> 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 FEET THINLY LAMINATED < 0.008 FEET <b>INDURATION</b> 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.																			
<b>PLASTICITY</b> 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										<b>COLOR</b> 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.										<b>NOTES:</b> BENCH MARK: BL-104 REBAR WITH CAP AT -L- STA. 22+28, 25' RT ELEVATION: 152.01 FEET																			

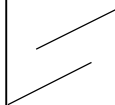
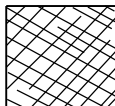
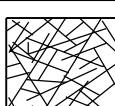

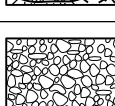

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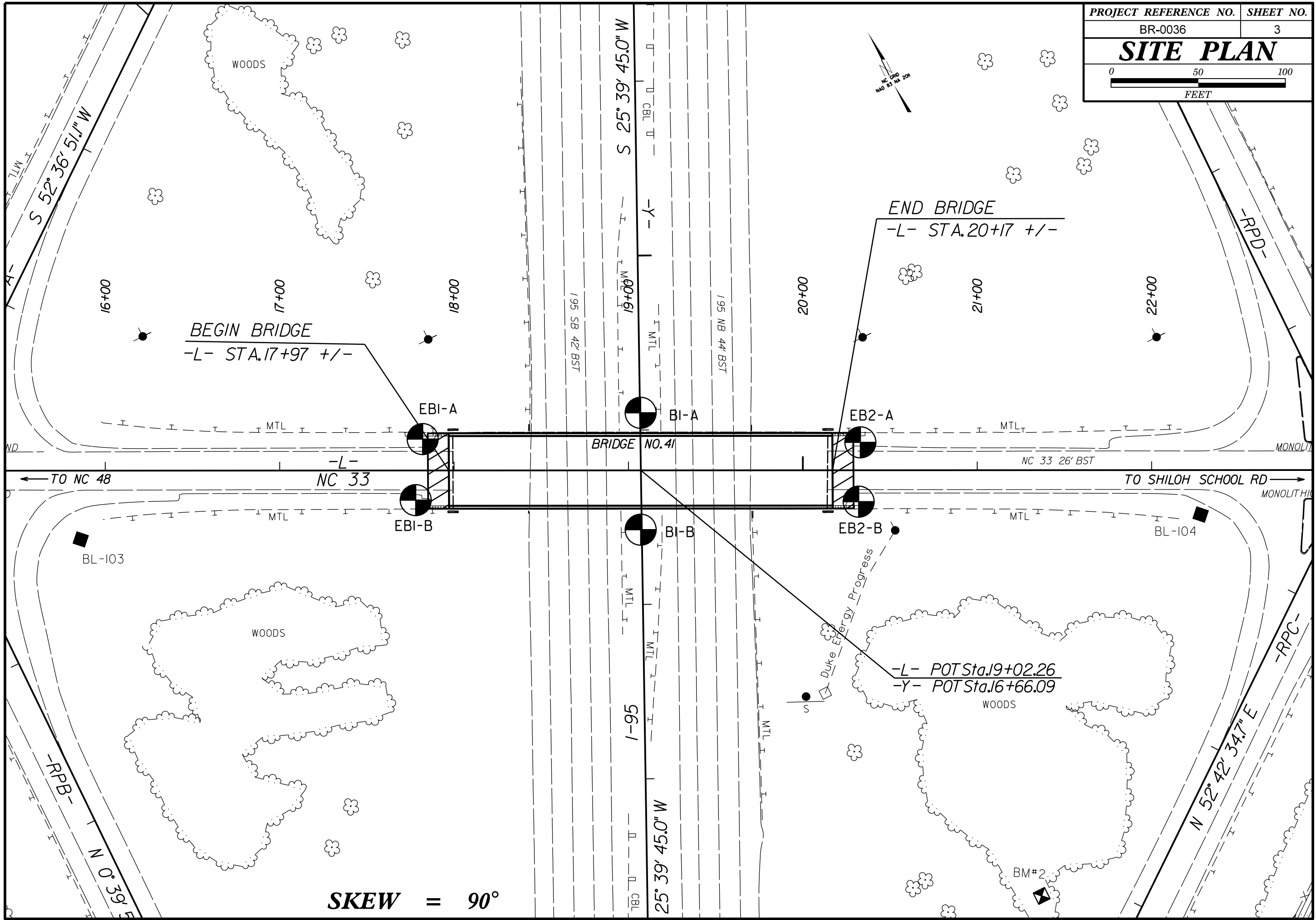
**SUBSURFACE INVESTIGATION**

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

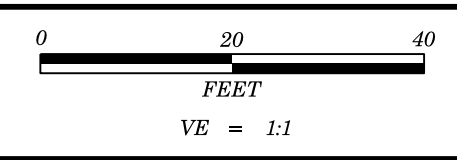
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

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

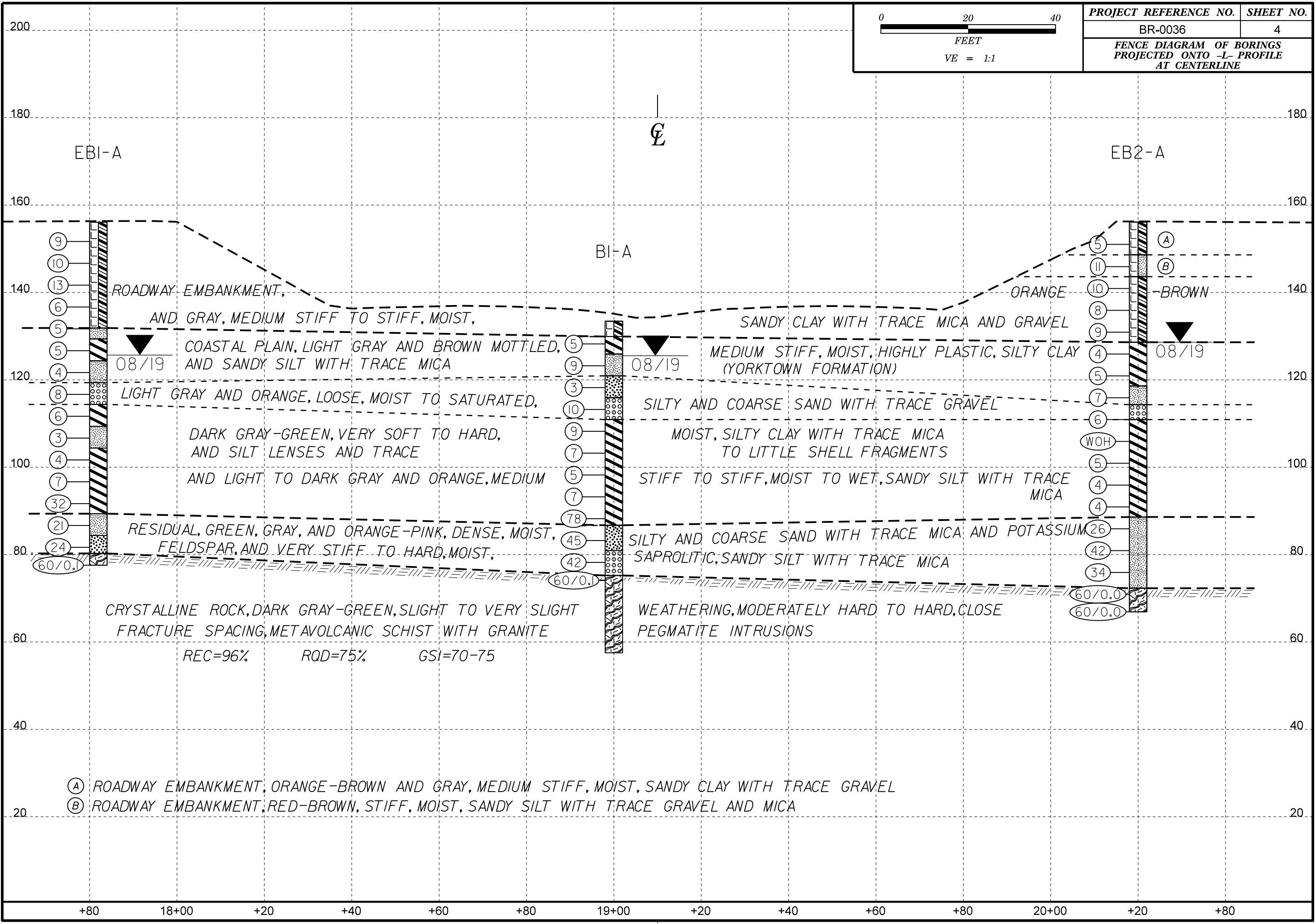
<p><b>GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)</b></p> <p>From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 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>DECREASING SURFACE QUALITY →</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>COMPOSITION AND STRUCTURE</b></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>DECREASING INTERLOCKING OF ROCK PIECES</b></p> <p>↓</p> <p>  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                 </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><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>B. Sandstone with thin inter-layers of siltstone</b></p> <p><b>C. Sandstone and siltstone in similar amounts</b></p> <p><b>D. Siltstone or silty shale with sandstone layers</b></p> <p><b>E. Weak siltstone or clayey shale with sandstone layers</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>	<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>



**SKEW = 90°**

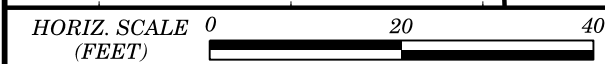


PROJECT REFERENCE NO.	SHEET NO.
BR-0036	4
FENCE DIAGRAM OF BORINGS PROJECTED ONTO -L- PROFILE AT CENTERLINE	



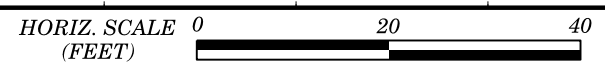
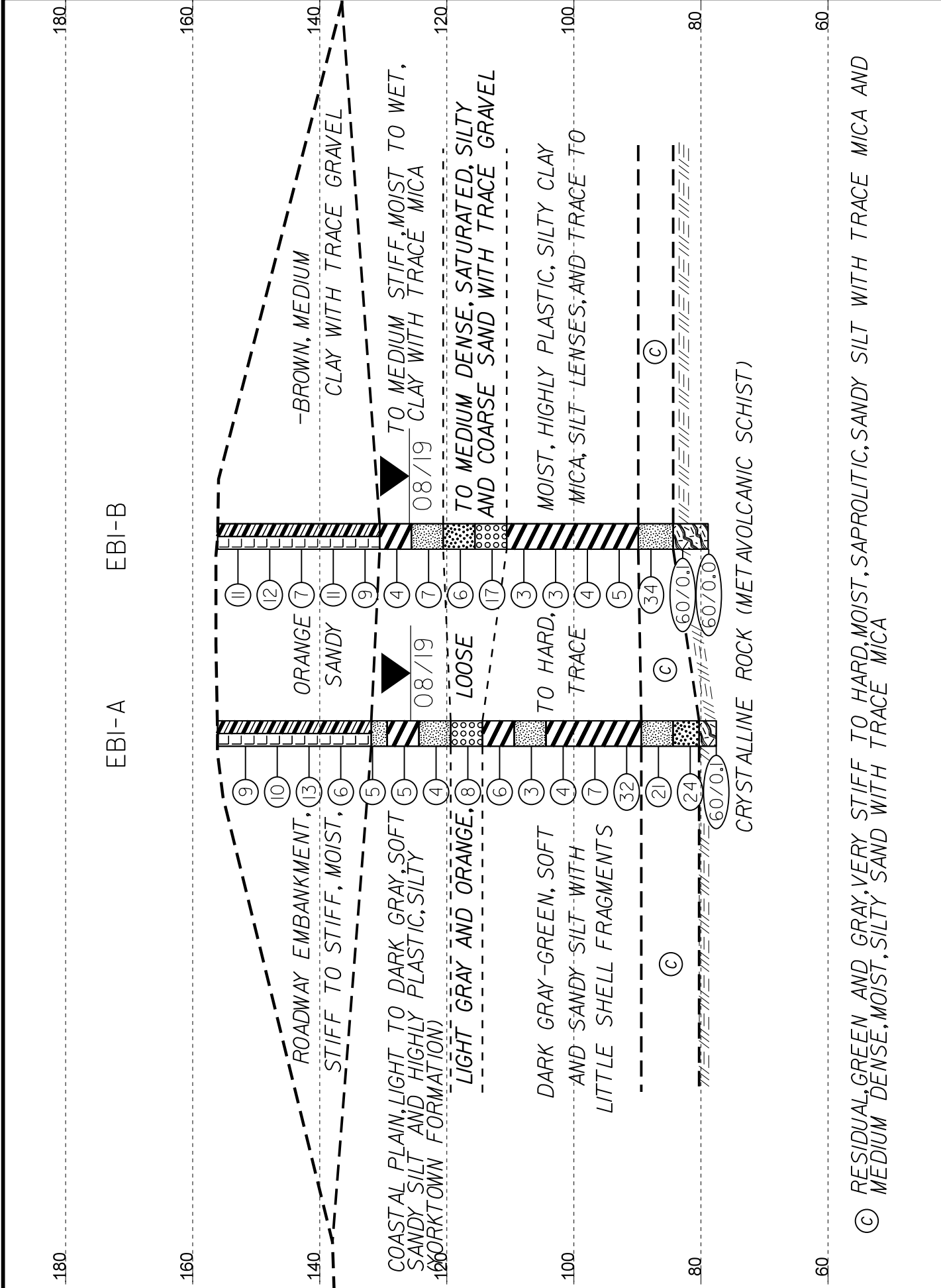
- Ⓐ ROADWAY EMBANKMENT, ORANGE-BROWN AND GRAY, MEDIUM STIFF, MOIST, SANDY CLAY WITH TRACE GRAVEL
- Ⓑ ROADWAY EMBANKMENT, RED-BROWN, STIFF, MOIST, SANDY SILT WITH TRACE GRAVEL AND MICA

+80      18+00      +20      +40      +60      +80      19+00      +20      +40      +60      +80      20+00      +20      +80



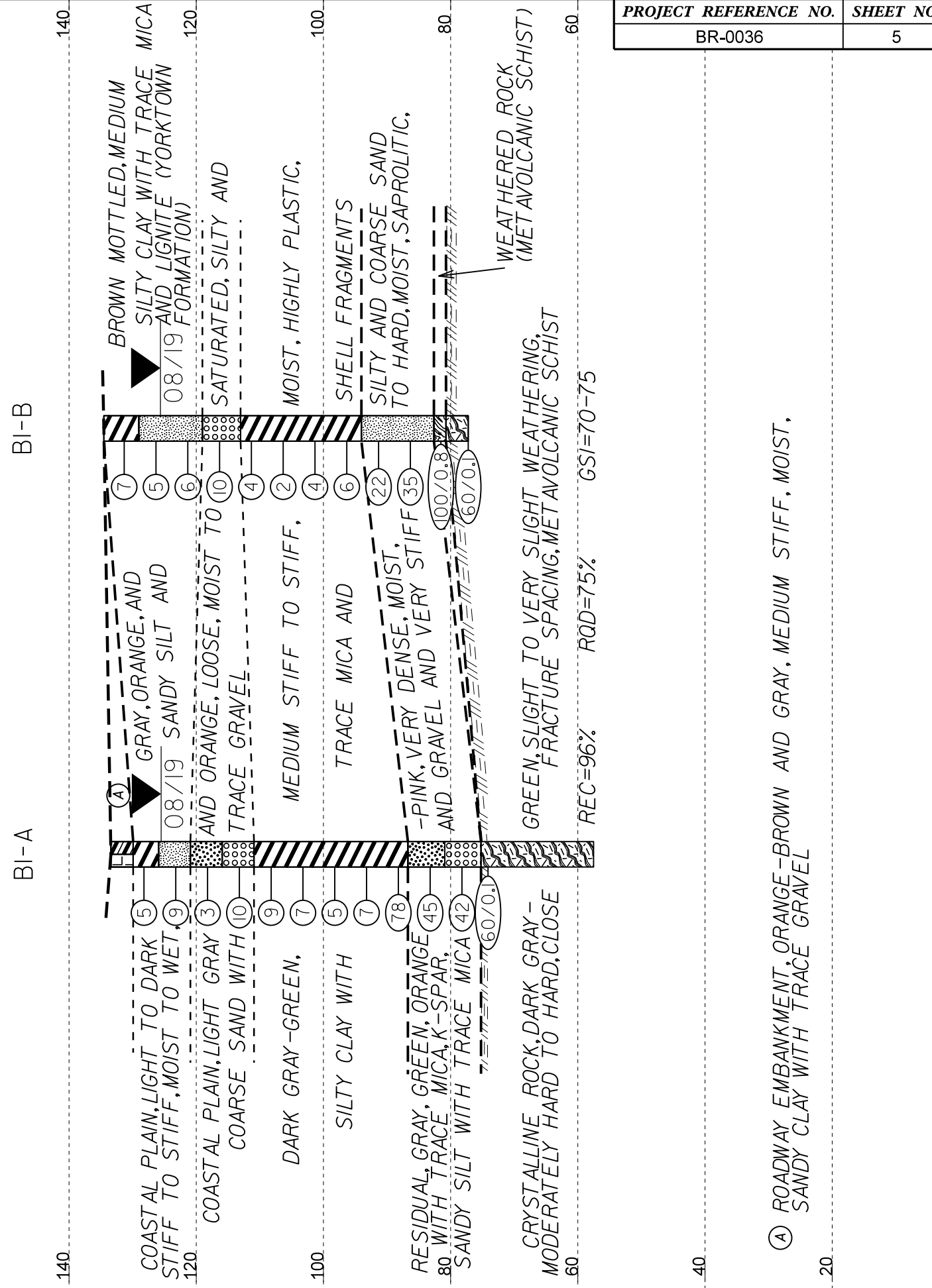
VE = 1:1

CROSS SECTION THROUGH EBI

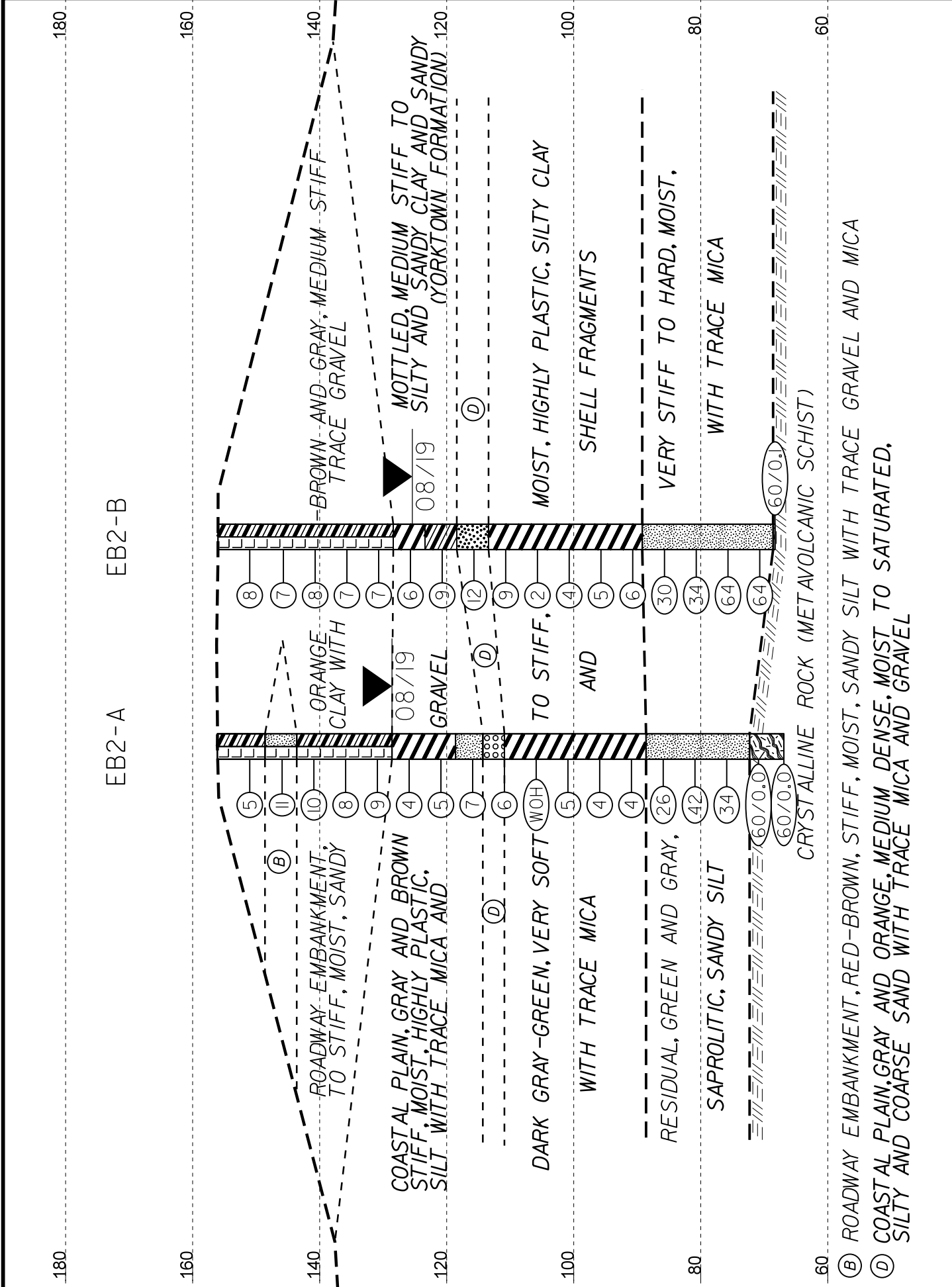


VE = 1:1

CROSS SECTION THROUGH BI



PROJECT REFERENCE NO.	SHEET NO.
BR-0036	5



CROSS SECTION THROUGH EB2









# GEOTECHNICAL BORING REPORT CORE LOG

<b>WBS</b> 67036.1.1		<b>TIP</b> BR-0036		<b>COUNTY</b> NASH		<b>GEOLOGIST</b> Moore, N. O.					
<b>SITE DESCRIPTION</b> BR. NO. 41 ON NC-33 OVER I-95							<b>GROUND WTR (ft)</b>				
<b>BORING NO.</b> B1-A		<b>STATION</b> 19+07		<b>OFFSET</b> 33 ft LT		<b>ALIGNMENT</b> -L-					
<b>COLLAR ELEV.</b> 133.4 ft		<b>TOTAL DEPTH</b> 75.9 ft		<b>NORTHING</b> 867,223		<b>EASTING</b> 2,355,743					
<b>DRILL RIGHAMMER EFF/DATE</b> RFC0074 CME-55 80% 03/08/2019				<b>DRILL METHOD</b> Mud Rotary		<b>HAMMER TYPE</b> Automatic					
<b>DRILLER</b> Pinter, D. G.		<b>START DATE</b> 08/13/19		<b>COMP. DATE</b> 08/13/19		<b>SURFACE WATER DEPTH</b> N/A					
<b>CORE SIZE</b> N		<b>TOTAL RUN</b> 16.6 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %			
74.12	74.1	59.3	1.6	0:43/0.6	(1.6)	(0.8)	(5.2)	(3.8)		Begin Coring @ 59.3 ft DARK GRAY-GREEN, VERY SLIGHT WEATHERING TO FRESH, MODERATELY HARD TO HARD, CLOSE FRACTURE SPACING, METAVOLCANIC SCHIST WITH GRANITE PEGMATITE INTRUSIONS FROM 63.4'-65.9' AND 67.8'-71.2'  REC=96% RQD=75% GSI=70-75	59.3
	72.5	60.9		2:44/1.0	100%	50%	31%	23%			
70			5.0	2:00/1.0 2:04/1.0 2:06/1.0	(4.8)	(3.1)					
	67.5	65.9		2:17/1.0 2:46/1.0	96%	62%					
65			5.0	2:16/1.0 2:42/1.0 3:37/1.0	(4.9)	(4.5)					
	62.5	70.9		7:36/1.0 8:42/1.0	98%	90%					
60			5.0	1:57/1.0 1:56/1.0 1:49/1.0	(4.7)	(4.1)					
	57.5	75.9		1:28/1.0 1:33/1.0	94%	82%					75.9
										Boring Terminated at Elevation 57.5 ft IN CRYSTALLINE ROCK (METAVOLCANIC SCHIST)	

NCDOT CORE DOUBLE BR0036\_GEO\_BH.GPJ NC\_DOT.GDT 9/10/19

# GEOTECHNICAL BORING REPORT BORE LOG

<b>WBS</b> 67036.1.1		<b>TIP</b> BR-0036		<b>COUNTY</b> NASH		<b>GEOLOGIST</b> Moore, N. O.	
<b>SITE DESCRIPTION</b> BR. NO. 41 ON NC-33 OVER I-95							<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> B1-B		<b>STATION</b> 19+07		<b>OFFSET</b> 34 ft RT		<b>ALIGNMENT</b> -L-	
<b>COLLAR ELEV.</b> 134.5 ft		<b>TOTAL DEPTH</b> 57.3 ft		<b>NORTHING</b> 867,163		<b>EASTING</b> 2,355,713	
<b>DRILL RIGHAMMER EFF/DATE</b> RFC0074 CME-55 80% 03/08/2019				<b>DRILL METHOD</b> Mud Rotary		<b>HAMMER TYPE</b> Automatic	
<b>DRILLER</b> Pinter, D. G.		<b>START DATE</b> 08/12/19		<b>COMP. DATE</b> 08/12/19		<b>SURFACE WATER DEPTH</b> N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
135															134.5	GROUND SURFACE	0.0
130	132.3	2.2	3	4	3								M		129.0	<b>COASTAL PLAIN</b> GRAY, SILTY CLAY WITH TRACE MICA AND LIGNITE (YORKTOWN FORMATION)	5.5
125	127.3	7.2	2	2	3								M		119.0	LIGHT GRAY, SANDY SILT WITH TRACE MICA AND CLAY LENSES	15.5
120	122.3	12.2	2	3	3								M		119.0	LIGHT GRAY, COARSE SAND WITH TRACE GRAVEL	15.5
115	117.3	17.2	3	6	4								Sat.		113.0	DARK GRAY-GREEN, HIGHLY PLASTIC, SILTY CLAY WITH TRACE MICA	21.5
110	112.3	22.2	WOH	2	2								M				
105	107.3	27.2	1	1	1								M				
100	102.3	32.2	1	2	2								M				
95	97.3	37.2	2	2	4								M				
90	92.3	42.2	4	9	13								M		94.0	<b>RESIDUAL</b> GRAY AND GREEN, SAPROLITIC, SANDY SILT WITH TRACE MICA	40.5
85	87.3	47.2	11	16	19								M				
80	82.3	52.2	73	270.3									M		82.6	<b>WEATHERED ROCK</b> (METAVOLCANIC SCHIST)	51.9
															80.7	<b>CRYSTALLINE ROCK</b> (METAVOLCANIC SCHIST)	53.8
	77.3	57.2	60/0.1												77.2	Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 77.2 ft IN CRYSTALLINE ROCK (METAVOLCANIC SCHIST)	57.3

NCDOT BORE DOUBLE BR0036\_GEO\_BH.GPJ NC\_DOT.GDT 9/16/19

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 67036.1.1		TIP BR-0036		COUNTY NASH		GEOLOGIST Moore, N. O.									
SITE DESCRIPTION BR. NO. 41 ON NC-33 OVER I-95							GROUND WTR (ft)								
BORING NO. EB2-A		STATION 20+33		OFFSET 16 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 156.1 ft		TOTAL DEPTH 89.2 ft		NORTHING 867,151		EASTING 2,355,848									
DRILL RIGHAMMER EFF./DATE RFO0074 CME-55 80% 03/08/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Pinter, D. G.		START DATE 08/07/19		COMP. DATE 08/07/19		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					
160															
155															
150	152.0	4.1	2	3	2								M	ROADWAY EMBANKMENT ORANGE-BROWN, SANDY CLAY WITH TRACE GRAVEL	156.1
145	146.9	9.2	4	4	7								M	RED-BROWN, SANDY SILT WITH TRACE GRAVEL AND MICA	148.6
140	141.9	14.2	3	3	7								M	ORANGE-BROWN AND GRAY, SANDY CLAY WITH TRACE GRAVEL AND MICA	143.6
135	136.9	19.2	2	4	4								M		
130	131.9	24.2	3	4	5								M		
125	126.9	29.2	1	2	2								M	COASTAL PLAIN GRAY AND BROWN MOTTLED, SILTY CLAY WITH TRACE MICA (YORKTOWN FORMATION)	128.6
120	121.9	34.2	1	2	3								M		
115	116.9	39.2	4	3	4								M	LIGHT GRAY AND ORANGE, SANDY SILT WITH TRACE GRAVEL	118.6
110	111.9	44.2	6	3	3								M	GRAY, COARSE SAND	114.3
105	106.9	49.2	WOH	WOH	WOH								Sat.	DARK GRAY-GREEN, HIGHLY PLASTIC, SILTY CLAY WITH TRACE MICA AND SHELL FRAGMENTS	110.9
100	101.9	54.2	WOH	2	3								M		
95	96.9	59.2	1	2	2								M		
90	91.9	64.2	3	2	2								M		
85	86.9	69.2	7	11	15								M	RESIDUAL GRAY AND GREEN, SAPROLITIC, SANDY SILT WITH TRACE MICA	88.6
80	81.9	74.2	8	18	24								M		

WBS 67036.1.1		TIP BR-0036		COUNTY NASH		GEOLOGIST Moore, N. O.									
SITE DESCRIPTION BR. NO. 41 ON NC-33 OVER I-95							GROUND WTR (ft)								
BORING NO. EB2-A		STATION 20+33		OFFSET 16 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 156.1 ft		TOTAL DEPTH 89.2 ft		NORTHING 867,151		EASTING 2,355,848									
DRILL RIGHAMMER EFF./DATE RFO0074 CME-55 80% 03/08/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Pinter, D. G.		START DATE 08/07/19		COMP. DATE 08/07/19		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					
80															
75	76.9	79.2	10	15	19								M	RESIDUAL GRAY AND GREEN, SAPROLITIC, SANDY SILT WITH TRACE MICA (continued)	72.3
70	71.9	84.2	60/0.0											CRYSTALLINE ROCK (METAVOLCANIC SCHIST)	83.8
	66.9	89.2	60/0.0											Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 66.9 ft IN CRYSTALLINE ROCK (METAVOLCANIC SCHIST)	89.2

NCDOT BORE DOUBLE BR0036 GEO BH.GPJ NC DOT.GDT 9/16/19

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 67036.1.1		TIP BR-0036		COUNTY NASH		GEOLOGIST Moore, N. O.									
SITE DESCRIPTION BR. NO. 41 ON NC-33 OVER I-95							GROUND WTR (ft)								
BORING NO. EB2-B		STATION 20+32		OFFSET 18 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 156.0 ft		TOTAL DEPTH 87.7 ft		NORTHING 867,121		EASTING 2,355,832									
DRILL RIGHAMMER EFF./DATE RFO0074 CME-55 80% 03/08/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Pinter, D. G.		START DATE 08/05/19		COMP. DATE 08/05/19		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					
160															
155															
150	152.0	4.0	3	3	5										
145	146.7	9.3	3	4	3										
140	141.7	14.3	4	4	4										
135	136.7	19.3	2	4	3										
130	131.7	24.3	3	4	3										
125	126.7	29.3	2	3	3										
120	121.7	34.3	3	4	5										
115	116.7	39.3	3	4	8										
110	111.7	44.3	2	4	5										
105	106.7	49.3	WOH	WOH	2										
100	101.7	54.3	WOH	2	2										
95	96.7	59.3	1	2	3										
90	91.7	64.3	2	3	3										
85	86.7	69.3	6	14	16										
80	81.7	74.3	7	14	20										

WBS 67036.1.1		TIP BR-0036		COUNTY NASH		GEOLOGIST Moore, N. O.									
SITE DESCRIPTION BR. NO. 41 ON NC-33 OVER I-95							GROUND WTR (ft)								
BORING NO. EB2-B		STATION 20+32		OFFSET 18 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 156.0 ft		TOTAL DEPTH 87.7 ft		NORTHING 867,121		EASTING 2,355,832									
DRILL RIGHAMMER EFF./DATE RFO0074 CME-55 80% 03/08/2019		DRILL METHOD Mud Rotary		HAMMER TYPE Automatic											
DRILLER Pinter, D. G.		START DATE 08/05/19		COMP. DATE 08/05/19		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					
80															
75	76.7	79.3	15	27	37										
70	71.7	84.3	18	28	36										
	68.4	87.6	60/0.1											60/0.1	

Match Line

**RESIDUAL**  
GRAY AND GREEN, SAPROLITIC, SANDY SILT WITH TRACE MICA (continued)

**CRYSTALLINE ROCK**  
(METAVOLCANIC SCHIST)  
Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 68.3 ft IN CRYSTALLINE ROCK (METAVOLCANIC SCHIST)

NCDOT BORE DOUBLE BR0036\_GEO\_BH.GPJ NC\_DOT.GDT 9/16/19

# CORE PHOTOGRAPHS

**B1-A**  
BOX 1 & 2: 59.3 - 75.9 FEET





# SITE PHOTOGRAPH

Bridge No. 41 on -L- (NC 33) over I-95



Looking Southwest towards End Bent 1



**PROJ. NO. - 67036.1.1**  
**ID NO. - BR-0036**  
**COUNTY - NASH**

**BI-A**

<b>ROCK TEST RESULTS</b>											
SAMPLE NO.	DIAMETER IN	SPECIMEN HEIGHT IN	AREA IN <sup>2</sup>	H/D RATIO	WEIGHT IBF	UNIT WEIGHT IBF/FT <sup>3</sup>	ULTIMATE IBF	ULTIMATE KSI	ULTIMATE CORRECTED KSI	40% ULT. LOAD IBF	SEC MOD @ 40% MPSI
RS-1	1.87	3.73	2.75	1.99	0.97	163.6	37800	13.760	13.76	15120	10.45
RS-2	1.87	3.75	2.75	2.01	0.95	159.4	33000	12.000	12.01	13190	4.45