

REFERENCE: BR-0174

PROJECT: 67174

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY PENDER  
PROJECT DESCRIPTION BRIDGE NO. 37 ON -L- (NC 53)  
OVER ANGOLA CREEK AT STA. 19+84

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-------|-----------------------------|-----------|--------------|
| N.C.  | BR-0174                     | 1         | 10           |

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PERSONNEL

S.N. ZIMARINO

J.M. EDMONDSON

C.M. WALKER

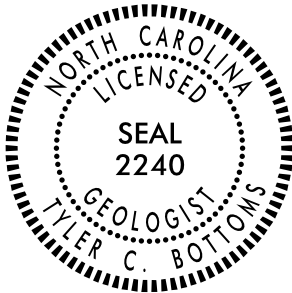
INVESTIGATED BY T.C. BOTTOMS

DRAWN BY S.N. ZIMARINO

CHECKED BY D.N. ARGENBRIGHT

SUBMITTED BY D.N. ARGENBRIGHT

DATE AUGUST 2024



DocuSigned by:  
Tyler Bottoms 12/12/2024  
48A2D3BD08CF4A6...  
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                                                                                                                                                                                                                                                                                                                                                                                                   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--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|
| 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> |  |  |  |  |  |  |  |  |  | WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.<br>UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.<br>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:<br><br>WEATHERED ROCK (WR)<br><br>CRYSTALLINE ROCK (ICR)<br><br>NON-CRYSTALLINE ROCK (NCR)<br><br>COASTAL PLAIN SEDIMENTARY ROCK (CPI) |  |  |  |  |  |  |  |  |  | ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.<br>AQUIFER - A WATER BEARING FORMATION OR STRATA.<br>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.<br>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.<br>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.<br>CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.<br>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.<br>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.<br>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.<br>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.<br>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.<br>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.<br>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.<br>FLOOD - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOOGED FROM PARENT MATERIAL.<br>FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.<br>FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.<br>JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.<br>LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.<br>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.<br>MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.<br>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.<br>RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.<br>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.<br>SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.<br>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.<br>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.<br>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.<br>STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.<br>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.<br>TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. |  |  |  |  |  |  |  |  |  |
| SOIL LEGEND AND AASHTO CLASSIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |  |  |  |  | MINERALOGICAL COMPOSITION                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |  |  |  | WEATHERING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                         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| GENERAL CLASS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |  |  |  | MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.                                                                                                                                                               |  |  |  |  |  |  |  |  |  | FRESH<br>VERY SLIGHT (V SLI.)<br>SLIGHT (SLI.)<br>MODERATE (MOD.)<br>MODERATELY SEVERE (MOD. SEV.)<br>SEVERE (SEV.)<br>VERY SEVERE (V SEV.)<br>COMPLETE                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |
| GROUP CLASS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | COMPRESSIBILITY                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  | ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.<br>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.                                                                                                                                                                                                                                                                                     |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |
| SYMBOL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |  |  |  | PERCENTAGE OF MATERIAL                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |  |  |  | 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.                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |
| %                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |  |  |  | GROUND WATER                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |  |  |  | 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.                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |
| MATERIAL PASSING #40 LL PI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |  |  |  | MISCELLANEOUS SYMBOLS                                                                                                                                                                                                                                                                             |  |  |  |  |  |  |  |  |  | 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>                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |
| GROUP INDEX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |  |  |  |  |  |  | ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION                                                                                                                                                                                                                                                     |  |  |  |  |  |  |  |  |  | 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>                                                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |
| USUAL TYPES OF MAJOR MATERIALS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |  |  |  | SOIL SYMBOL                                                                                                                                                                                                                                                                                       |  |  |  |  |  |  |  |  |  | VERY SEVERE (V SEV.)<br>COMPLETE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                       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| GEN. RATING AS SUBGRADE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  | ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT                                                                                                                                                                                                                                                |  |  |  |  |  |  |  |  |  | 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.                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |
| PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |  |  |  | INFERRED SOIL BOUNDARY                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |  |  |  |                  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| CONSISTENCY OR DENSENESS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |  |  |  |  |  | INFERRED ROCK LINE                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |  |  |  |                  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| PRIMARY SOIL TYPE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |  |  |  | ALLUVIAL SOIL BOUNDARY                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |  |  |  |                  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| COMPACTNESS OR CONSISTENCY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |  |  |  | RECOMMENDATION SYMBOLS                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |  |  |  |                  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| RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  | ABBREVIATIONS                                                                                                                                                                                                                                                                                     |  |  |  |  |  |  |  |  |  |                  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| RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |  |  |  |  |  | AR - AUGER REFUSAL<br>BT - BORING TERMINATED<br>CL - CLAY<br>CPT - CONE PENETRATION TEST<br>CSE - COARSE<br>DMT - DILATOMETER TEST<br>DPT - DYNAMIC PENETRATION TEST<br>e - VOID RATIO<br>F - FINE<br>FOSS. - FOSSILIFEROUS<br>FRAC. - FRACTURED, FRACTURES<br>FRAGS. - FRAGMENTS<br>HI. - HIGHLY |  |  |  |  |  |  |  |  |  | MED. - MEDIUM<br>MICA. - MICACEOUS<br>MOD. - MODERATELY<br>NP - NON PLASTIC<br>ORG. - ORGANIC<br>PMT - PRESSUREMETER TEST<br>SAP. - SAPROLITIC<br>SD. - SAND, SANDY<br>SL. - SILTY<br>SLI. - SLIGHTLY<br>TCR - TRICONE REFUSAL<br>w - MOISTURE CONTENT<br>V - VERY                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  | VST - VANE SHEAR TEST<br>WEA. - WEATHERED<br>γ <sub>u</sub> - UNIT WEIGHT<br>γ <sub>d</sub> - DRY UNIT WEIGHT<br><br>SAMPLE ABBREVIATIONS<br>S - BULK<br>SS - SPLIT SPOON<br>ST - SHELBY TUBE<br>RS - ROCK<br>RT - RECOMPACTED TRIAXIAL<br>CBR - CALIFORNIA BEARING RATIO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |  |  |  |
| TEXTURE OR GRAIN SIZE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |  |  |  |  | EQUIPMENT USED ON SUBJECT PROJECT                                                                                                                                                                                                                                                                 |  |  |  |  |  |  |  |  |  |                  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| U.S. STD. SIEVE SIZE OPENING (MM)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |  |  |  | DRILL UNITS:                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |  |  |  |                              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| BOULDER (BLDR.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |  |  |  | ADVANCING TOOLS:                                                                                                                                                                                                                                                                                  |  |  |  |  |  |  |  |  |  | HAMMER TYPE:     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| COBBLE (COB.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |  |  |  |  | CLAY BITS                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |  |  |  | AUTOMATIC        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| GRAVEL (GR.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |  |  |  | 6" CONTINUOUS FLIGHT AUGER                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  | MANUAL           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| COARSE SAND (CSE. SD.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |  |  |  | 8" HOLLOW AUGERS                                                                                                                                                                                                                                                                                  |  |  |  |  |  |  |  |  |  |                                      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| FINE SAND (F SD.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |  |  |  | HARD FACED FINGER BITS                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |  |  |  |                  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| SILT (SL.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |  |  |  | TUNG.-CARBIDE INSERTS                                                                                                                                                                                                                                                                             |  |  |  |  |  |  |  |  |  |                  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| CLAY (CL.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |  |  |  | CASING                                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |  |  |  |                  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| GRAIN SIZE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |  |  |  | TRICONE                                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |  |  |  |                  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| SOIL MOISTURE - CORRELATION OF TERMS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |  |  |  | CORE BIT                                                                                                                                                                                                                                                                                          |  |  |  |  |  |  |  |  |  |                  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| SOIL MOISTURE SCALE (ATTERBERG LIMITS)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |  |  |  | PORTABLE HOIST                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |  |  |  |                  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| FIELD MOISTURE DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |                  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| GUIDE FOR FIELD MOISTURE DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |                  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| LL - LIQUID LIMIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |                  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| PL - PLASTIC LIMIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |                  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| OM - OPTIMUM MOISTURE SHRINKAGE LIMIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |                  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| SLIGHTLY PLASTIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |                  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| MODERATELY PLASTIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |                  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| HIGHLY PLASTIC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |                  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| COLOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |                  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                                                                                                                                                                                                                                                                                                               |  |  |  |  |  |  |  |  |  |
| 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |  |  |  |  |  |                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |  |                                                                                                                                                            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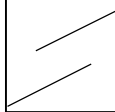
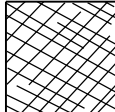
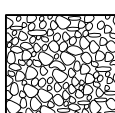
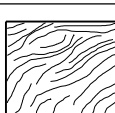
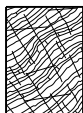
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

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

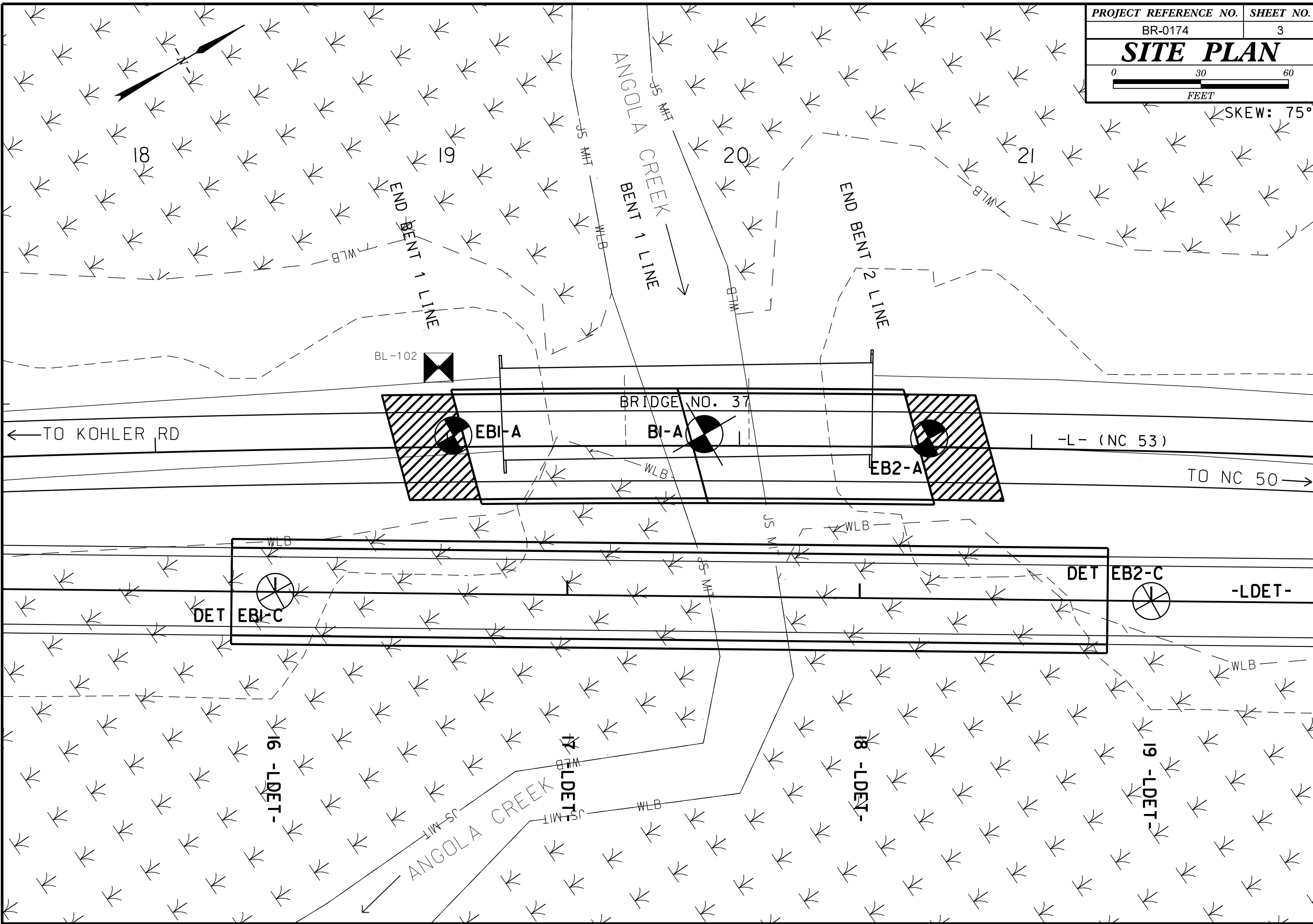
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

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

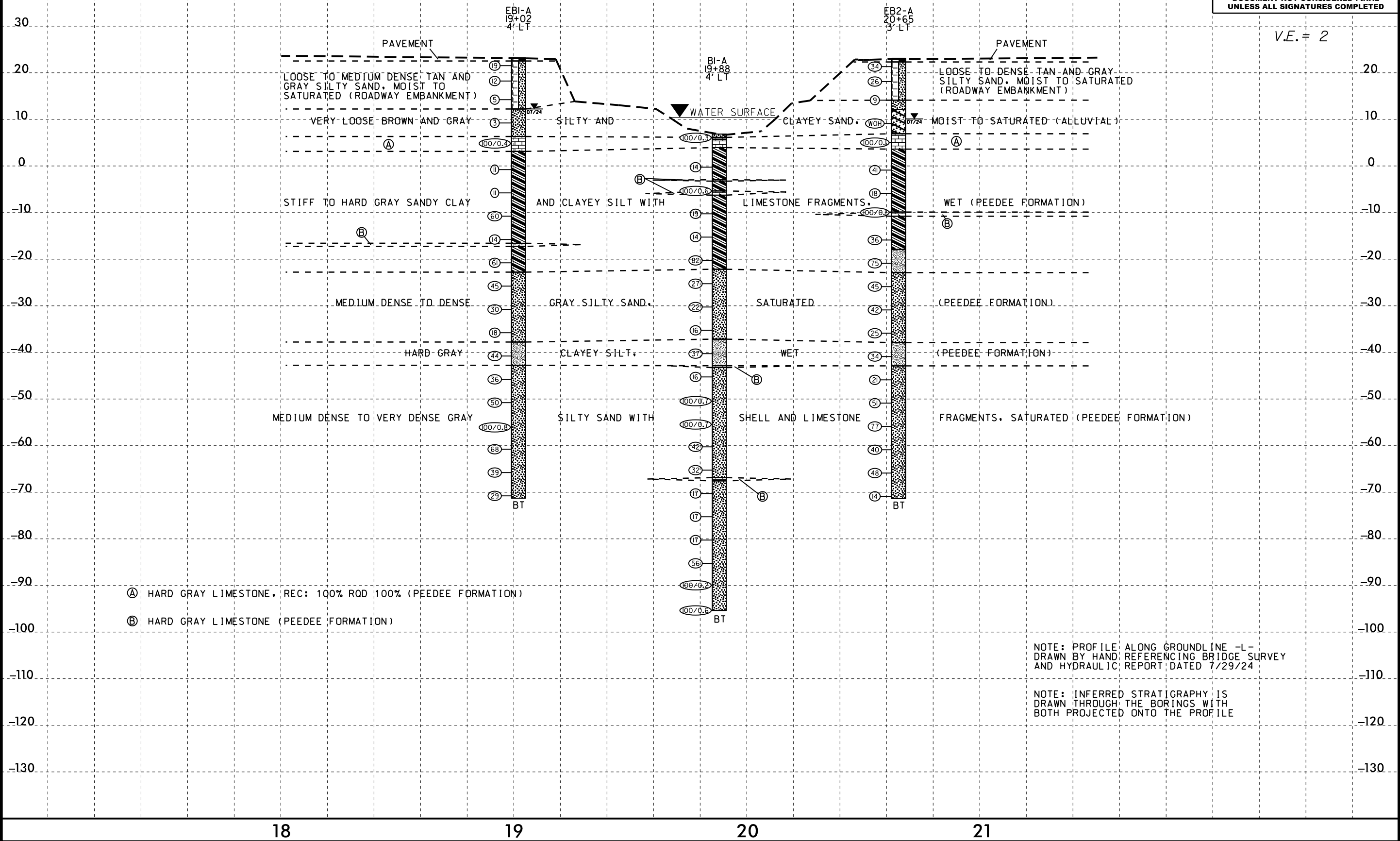
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| <div><div>GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)</div><div>From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a 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.</div></div> | <div>SURFACE CONDITIONS</div> <div>VERY GOOD<br/>Very rough, fresh unweathered surfaces</div> <div>GOOD<br/>Rough, slightly weathered, iron stained surfaces</div> <div>FAIR<br/>Smooth, moderately weathered and altered surfaces</div> <div>POOR<br/>Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments</div> <div>VERY POOR<br/>Slickensided, highly weathered surfaces with soft clay coatings or fillings</div> | <div>STRUCTURE</div> <div><div>INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities</div><div>BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets</div><div>VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets</div><div>BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity</div><div>DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces</div><div>LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes</div></div> | <div>DECREASING SURFACE QUALITY ➡</div> <div>90</div> <div>80</div> <div>70</div> <div>60</div> <div>50</div> <div>40</div> <div>30</div> <div>20</div> <div>10</div> <div>N/A</div> <div>N/A</div> | <div>GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)</div> <div>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.</div> | <div>SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)</div> <div>VERY GOOD - Very Rough, fresh unweathered surfaces</div> <div>GOOD - Rough, slightly weathered surfaces</div> <div>FAIR - Smooth, moderately weathered and altered surfaces</div> <div>POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments</div> <div>VERY POOR - Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings</div> | <div>COMPOSITION AND STRUCTURE</div> <div><div><b>A.</b> Thick bedded, very blocky sandstone<br/>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.</div><div><div><b>B.</b> Sandstone with thin inter-layers of siltstone</div><div><b>C.</b> Sandstone and siltstone in similar amounts</div><div><b>D.</b> Siltstone or silty shale with sandstone layers</div><div><b>E.</b> Weak siltstone or clayey shale with sandstone layers</div></div><div><div><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>.</div><div><b>F.</b> Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure</div></div><div><div><b>G.</b> Undisturbed silty or clayey shale with or without a few very thin sandstone layers</div><div><b>H.</b> Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces.</div></div></div> <div>➡ Means deformation after tectonic disturbance</div> | <div>70</div> <div>60</div> <div>50</div> <div>40</div> <div>30</div> <div>20</div> <div>10</div> |
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|                       |           |
|-----------------------|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| BR-0174               | 3         |
| SITE PLAN             |           |
| 0 30 60<br>FEET       |           |

SKEW: 75°



PROFILE THROUGH BORINGS PROJECTED ALONG -L-



NOTE: PROFILE ALONG GROUNDLINE -L-  
DRAWN BY HAND, REFERENCING BRIDGE SURVEY  
AND HYDRAULIC REPORT DATED 7/29/24

NOTE: INFERRED STRATIGRAPHY IS  
DRAWN THROUGH THE BORINGS WITH  
BOTH PROJECTED ONTO THE PROFILE

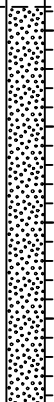
NCDOT BORE DOUBLE BR0174\_GEO\_BRDG.GPJ NC\_DOT.GDT 8/7/24

|                                                                    |                 |            |                     |       |       |                         |    |    |                           |     |           |             |                                                                           |
|--------------------------------------------------------------------|-----------------|------------|---------------------|-------|-------|-------------------------|----|----|---------------------------|-----|-----------|-------------|---------------------------------------------------------------------------|
| WBS 67174.1.1                                                      |                 |            | TIP BR-0174         |       |       | COUNTY PENDER           |    |    | GEOLOGIST Zimarino, S. N. |     |           |             |                                                                           |
| SITE DESCRIPTION BRIDGE NO. 37 ON -L- (NC 53) OVER ANGOLA CREEK    |                 |            |                     |       |       |                         |    |    | GROUND WTR (ft)           |     |           |             |                                                                           |
| BORING NO. EB1-A                                                   |                 |            | STATION 19+02       |       |       | OFFSET 4 ft LT          |    |    | ALIGNMENT -L-             |     |           | 0 HR. N/A   |                                                                           |
| COLLAR ELEV. 23.2 ft                                               |                 |            | TOTAL DEPTH 94.5 ft |       |       | NORTHING 332,331        |    |    | EASTING 2,380,400         |     |           | 24 HR. 11.0 |                                                                           |
| DRILL RIG/HAMMER EFF./DATE GFO0075 CME-45C 90% 11/21/2022          |                 |            |                     |       |       | DRILL METHOD Mud Rotary |    |    | HAMMER TYPE Automatic     |     |           |             |                                                                           |
| DRILLER Walker, C. M.                                              |                 |            | START DATE 07/23/24 |       |       | COMP. DATE 07/23/24     |    |    | 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 | MOI       |             |                                                                           |
| -55                                                                |                 |            | 28                  | 38    | 62    | Match Line              |    |    |                           |     |           |             |                                                                           |
| -60                                                                | -59.8           | 83.0       | 22                  | 29    | 39    | 100/0.8                 |    |    |                           |     |           |             | GRAY SILTY SAND WITH SHELL AND LIMESTONE FRAGMENTS, SATURATED (continued) |
| -65                                                                | -64.8           | 88.0       | 10                  | 12    | 27    | 68                      |    |    |                           |     |           |             |                                                                           |
| -70                                                                | -69.8           | 93.0       | 11                  | 15    | 14    | 39                      |    |    |                           |     |           |             |                                                                           |
|                                                                    |                 |            |                     |       |       | 29                      |    |    |                           |     |           |             | -71.3 94.5                                                                |
| Boring Terminated at Elevation -71.3 ft in Medium Dense Silty Sand |                 |            |                     |       |       |                         |    |    |                           |     |           |             |                                                                           |

NCDOT BORE DOUBLE BR0174\_GEO\_BRDG.GPJ NC\_DOT.GDT 8/9/24

[illegible]

NC DOT CORE DOUBLE BR0174 GEO\_BRDG.GPJ NC\_DOT.GDT 8/7/24

|                                                                 |                     |               |             |                           |                          |                  |              |                             |                  |                                                                                     |                                                                              |                           |  |  |  |            |  |  |  |  |  |  |
|-----------------------------------------------------------------|---------------------|---------------|-------------|---------------------------|--------------------------|------------------|--------------|-----------------------------|------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------|---------------------------|--|--|--|------------|--|--|--|--|--|--|
| WBS 67174.1.1                                                   |                     |               |             | TIP BR-0174               |                          |                  |              | COUNTY PENDER               |                  |                                                                                     |                                                                              | GEOLOGIST Zimarino, S. N. |  |  |  |            |  |  |  |  |  |  |
| SITE DESCRIPTION BRIDGE NO. 37 ON -L- (NC 53) OVER ANGOLA CREEK |                     |               |             |                           |                          |                  |              |                             |                  |                                                                                     |                                                                              | GROUND WTR (ft)           |  |  |  |            |  |  |  |  |  |  |
| BORING NO. B1-A                                                 |                     |               |             | STATION 19+88             |                          |                  |              | OFFSET 4 ft LT              |                  |                                                                                     |                                                                              | ALIGNMENT -L-             |  |  |  | 0 HR. N/A  |  |  |  |  |  |  |
| COLLAR ELEV. 7.4 ft                                             |                     |               |             | TOTAL DEPTH 102.2 ft      |                          |                  |              | NORTHING 332,197            |                  |                                                                                     |                                                                              | EASTING 2,380,307         |  |  |  | 24 HR. N/A |  |  |  |  |  |  |
| DRILL RIG/HAMMER EFF./DATE GFO0075 QVE-45C 90% 11/21/2022       |                     |               |             |                           |                          |                  |              | DRILL METHOD Mud Rotary     |                  |                                                                                     |                                                                              | HAMMER TYPE Automatic     |  |  |  |            |  |  |  |  |  |  |
| DRILLER Walker, C. M.                                           |                     |               |             | START DATE 07/25/24       |                          |                  |              | COMP. DATE 07/29/24         |                  |                                                                                     |                                                                              | SURFACE WATER DEPTH 3.0ft |  |  |  |            |  |  |  |  |  |  |
| CORE SIZE NW-Q                                                  |                     |               |             | TOTAL RUN 1.8 ft          |                          |                  |              |                             |                  |                                                                                     |                                                                              |                           |  |  |  |            |  |  |  |  |  |  |
| ELEV<br>(ft)                                                    | RUN<br>ELEV<br>(ft) | DEPTH<br>(ft) | RUN<br>(ft) | DRILL<br>RATE<br>(Min/ft) | RUN<br>REC.<br>(ft)<br>% | RQD<br>(ft)<br>% | SAMP.<br>NO. | STRATA<br>REC.<br>(ft)<br>% | RQD<br>(ft)<br>% | L<br>O<br>G                                                                         | DESCRIPTION AND REMARKS                                                      |                           |  |  |  |            |  |  |  |  |  |  |
| -73.74<br>-75                                                   |                     |               |             | N=17                      |                          |                  |              |                             |                  |  | Begin Coring @ 81.1 ft<br>GRAY SILTY SAND, SATURATED (continued)             |                           |  |  |  |            |  |  |  |  |  |  |
| -80                                                             |                     |               |             | N=17                      |                          |                  |              |                             |                  |                                                                                     |                                                                              |                           |  |  |  |            |  |  |  |  |  |  |
| -85                                                             |                     |               |             | N=56                      |                          |                  |              |                             |                  |                                                                                     |                                                                              |                           |  |  |  |            |  |  |  |  |  |  |
| -90                                                             |                     |               |             | N=100/0.2                 |                          |                  |              |                             |                  |                                                                                     |                                                                              |                           |  |  |  |            |  |  |  |  |  |  |
|                                                                 |                     |               |             | N=100/0.6                 |                          |                  |              |                             |                  |                                                                                     |                                                                              |                           |  |  |  |            |  |  |  |  |  |  |
|                                                                 |                     |               |             |                           |                          |                  |              |                             |                  |                                                                                     | -94.8 Boring Terminated at Elevation -94.8 ft in Very Dense Silty Sand 102.2 |                           |  |  |  |            |  |  |  |  |  |  |

NCDOT BORE DOUBLE BR0174\_GEO\_BRDG.GPJ NC\_DOT.GDT 8/7/24

[illegible]

NCDOT BORE DOUBLE BR0174\_GEO\_BRDG.GPJ NC\_DOT.GDT 8/7/24

|                                                                 |                 |            |            |                     |       |                                                         |    |                         |    |     |           |                           |                                                         |                           |                                                                  |            |  |
|-----------------------------------------------------------------|-----------------|------------|------------|---------------------|-------|---------------------------------------------------------|----|-------------------------|----|-----|-----------|---------------------------|---------------------------------------------------------|---------------------------|------------------------------------------------------------------|------------|--|
| WBS 67174.1.1                                                   |                 |            |            | TIP BR-0174         |       |                                                         |    | COUNTY PENDER           |    |     |           | GEOLOGIST Zimarino, S. N. |                                                         |                           |                                                                  |            |  |
| SITE DESCRIPTION BRIDGE NO. 37 ON -L- (NC 53) OVER ANGOLA CREEK |                 |            |            |                     |       |                                                         |    |                         |    |     |           | GROUND WTR (ft)           |                                                         |                           |                                                                  |            |  |
| BORING NO. DET EB2-C                                            |                 |            |            | STATION 19+00       |       |                                                         |    | OFFSET CL               |    |     |           | ALIGNMENT -LDET-          |                                                         |                           |                                                                  | 0 HR. N/A  |  |
| COLLAR ELEV. 15.2 ft                                            |                 |            |            | TOTAL DEPTH 6.4 ft  |       |                                                         |    | NORTHING 332,362        |    |     |           | EASTING 2,380,489         |                                                         |                           |                                                                  | 24 HR. 1.8 |  |
| DRILL RIGHAMMER EFF./DATE N/A                                   |                 |            |            |                     |       |                                                         |    | DRILL METHOD Hand Auger |    |     |           | HAMMER TYPE N/A           |                                                         |                           |                                                                  |            |  |
| DRILLER N/A                                                     |                 |            |            | START DATE 08/01/24 |       |                                                         |    | COMP. DATE 08/01/24     |    |     |           | SURFACE WATER DEPTH 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 |           |                           |                                                         |                           |                                                                  |            |  |
| 20                                                              |                 |            |            |                     |       |                                                         |    |                         |    |     |           |                           |                                                         |                           |                                                                  |            |  |
| 15                                                              |                 |            |            |                     |       |                                                         |    |                         |    |     |           |                           |                                                         | 15.2                      | GROUND SURFACE 0.0                                               |            |  |
| 10                                                              |                 |            |            |                     |       | <div><div></div><div></div><div></div><div></div></div> |    |                         |    |     |           |                           | <div><div></div><div></div><div></div><div></div></div> |                           | ALLUVIAL<br>LOOSE GRAY AND TAN SILTY SAND,<br>MOIST TO SATURATED |            |  |
|                                                                 |                 |            |            |                     |       |                                                         |    |                         |    |     |           |                           |                                                         | 8.8                       | Boring Terminated at Elevation 8.8 ft on<br>Hard Limestone 6.4   |            |  |

CORE PHOTOGRAPH  
B1-A  
1.1' TO 2.9'  
BOX 1 OF 1

SHEET 10  
67174.1.1  
BR-0174  
BRIDGE NO. 37

