

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

# STRUCTURE SUBSURFACE INVESTIGATION

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 PROJECT DESCRIPTION BRIDGE No. 12 OVER COUNTRY LINE  
CREEK ON SR 1554 (YARBOROUGH MILL ROAD)

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**PROJECT: 38499.1.1 ID: B-4725**

PERSONNEL

J. Howard

D. White

O. Smith

R. Rahie

DRAWN BY


INVESTIGATED BY AMEC E&I, Inc.

CHECKED BY J. Howard

SUBMITTED BY B. Deobald

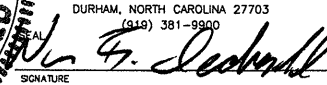
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NORTH CAROLINA  
LICENSED  
6-8-12  
SEAL  
1730  
GEOLOGIST  
WILLIAM BRIAN DEOBALD



AMEC E&I, Inc.  
4021 STIRRUP CREEK DRIVE, SUITE 100  
DURHAM, NORTH CAROLINA 27703  
(919) 381-9900

SIGNATURE



NC Engineering F-1253 NC Geology C-247

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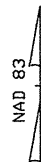
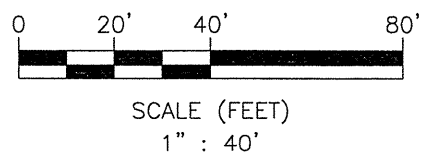
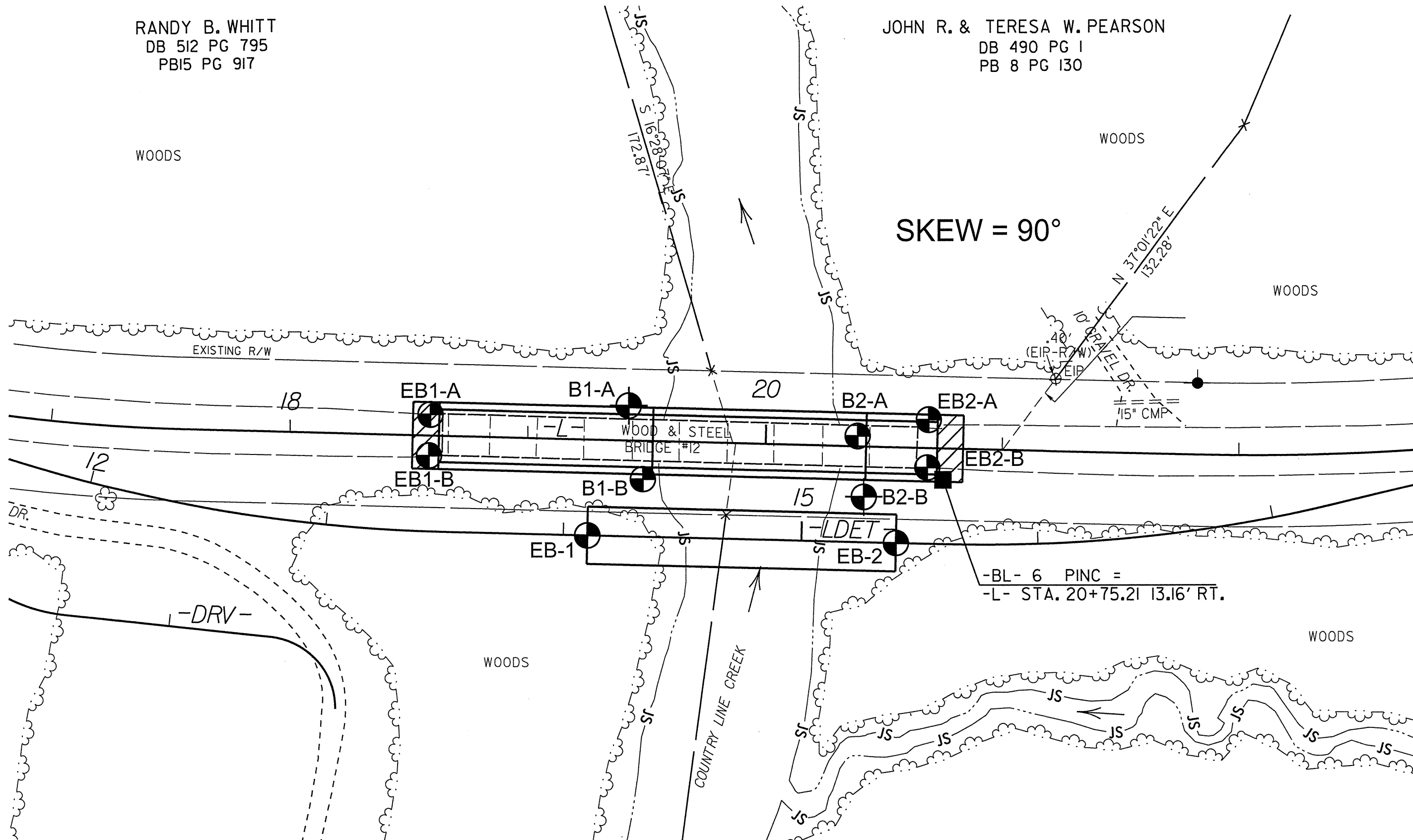
## SUBSURFACE INVESTIGATION

### SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

| SOIL DESCRIPTION  |  | GRADATION   |  | ROCK DESCRIPTION   |  | TERMS AND DEFINITIONS  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
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| <p>SOIL IS CONSIDERED TO BE THE 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 STANDARD PENETRATION TEST (ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:</p> <p style="text-align: center;"><i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>  |  | <p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)</p> <p>GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>   |  | <p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, 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.</p> <p>ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>  |  | <p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.</p> <p>AQUIFER - A WATER BEARING FORMATION OR STRATA.</p> <p>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p>ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.</p> <p>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.</p> <p>CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p>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.</p> <p>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p>FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.</p> <p>FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p>FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p>JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p>LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p>MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p>RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p>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.</p> <p>SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p>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.</p> <p>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN OR BPF OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.</p> <p>STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p>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.</p> <p>TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p> |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| SOIL LEGEND AND AASHTO CLASSIFICATION   |  | MINERALOGICAL COMPOSITION   |  | WEATHERING   |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>GENERAL CLASS.</th> <th colspan="7">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="7">SILT-CLAY MATERIALS (&gt; 35% PASSING #200)</th> <th colspan="3">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1</th><th>A-1-b</th><th>A-3</th><th colspan="2">A-2</th><th>A-4</th><th>A-5</th><th>A-6</th><th>A-7</th> <th>A-1, A-2</th><th>A-3</th><th>A-4, A-5</th><th>A-6, A-7</th><th colspan="3"></th> </tr> <tr> <th>SYMBOL</th> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> <td></td><td></td><td></td><td></td><td colspan="3"></td> </tr> <tr> <th>% PASSING</th> <td colspan="7"></td> <td colspan="7"></td> <td colspan="3"></td> </tr> <tr> <td># 10</td> <td colspan="7"></td> <td colspan="7"></td> <td colspan="3"></td> </tr> <tr> <td># 40</td> <td colspan="7"></td> <td colspan="7"></td> <td colspan="3"></td> </tr> <tr> <td># 200</td> <td colspan="7"></td> <td colspan="7"></td> <td colspan="3"></td> </tr> <tr> <th>LIQUID LIMIT</th> <td colspan="7"></td> <td colspan="7"></td> <td colspan="3"></td> </tr> <tr> <th>PLASTIC INDEX</th> <td colspan="7"></td> <td colspan="7"></td> <td colspan="3"></td> </tr> <tr> <th>GROUP INDEX</th> <td colspan="7"></td> <td colspan="7"></td> <td colspan="3"></td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td colspan="2">STONE FRAGS. GRAVEL AND SAND</td> <td>FINE SAND</td> <td colspan="2">SILTY OR CLAYEY GRAVEL AND SAND</td> <td colspan="2">SILT SOILS</td> <td colspan="2">CLAYEY SOILS</td> <td colspan="3">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> <td colspan="3">HIGHLY ORGANIC SOILS</td> </tr> <tr> <th>GEN. RATING AS A SUBGRADE</th> <td colspan="7">EXCELLENT TO GOOD</td> <td colspan="7">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td>UNSATISFACTORY</td> </tr> </table> <p style="text-align: center;">PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS &gt; LL - 30</p> |  | GENERAL CLASS.  | GRANULAR MATERIALS (≤ 35% PASSING #200)                          |  |  |  |   |  |             | SILT-CLAY MATERIALS (> 35% PASSING #200)                |  |  |   |   |                   |   | ORGANIC MATERIALS   |                  |  | GROUP CLASS.       | A-1             | A-1-b      | A-3            | A-2                |                  | A-4               | A-5                 | A-6               | A-7               | A-1, A-2     | A-3            | A-4, A-5         | A-6, A-7         |   |               |                 | SYMBOL   |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  | % PASSING |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | # 10 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | # 40 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | # 200 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | LIQUID LIMIT |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | PLASTIC INDEX |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | GROUP INDEX |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | USUAL TYPES OF MAJOR MATERIALS | STONE FRAGS. GRAVEL AND SAND |  | FINE SAND | SILTY OR CLAYEY GRAVEL AND SAND |  | SILT SOILS |  | CLAYEY SOILS |  | SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER |  |  | HIGHLY ORGANIC SOILS |  |  | GEN. RATING AS A SUBGRADE | EXCELLENT TO GOOD |  |  |  |  |  |  | FAIR TO POOR |  |  |  |  |  |  | FAIR TO POOR | POOR | UNSATISFACTORY | <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p>SLIGHTLY COMPRESSIBLE<br/>MODERATELY COMPRESSIBLE<br/>HIGHLY COMPRESSIBLE</p> <p>LIQUID LIMIT LESS THAN 31<br/>LIQUID LIMIT EQUAL TO 31-50<br/>LIQUID LIMIT GREATER THAN 50</p> |  | <p>WEATHERED ROCK (WR)</p> <p>CRYSTALLINE ROCK (CR)</p> <p>NON-CRYSTALLINE ROCK (NCR)</p> <p>COASTAL PLAIN SEDIMENTARY ROCK (CP)</p> |  | <p>FRESH<br/>VERY SLIGHT (V SL.)<br/>SLIGHT (SL.)<br/>MODERATE (MOD.)<br/>MODERATELY (MOD. SEV.)<br/>SEVERE (SEV.)<br/>VERY SEVERE (V SEV.)<br/>COMPLETE</p> |  | <p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.</p> <p>AQUIFER - A WATER BEARING FORMATION OR STRATA.</p> <p>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p>ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.</p> <p>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.</p> <p>CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p>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.</p> <p>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p>FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.</p> <p>FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p>FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p>JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p>LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p>MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p>RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p>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.</p> <p>SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p>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.</p> <p>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN OR BPF OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.</p> <p>STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p>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.</p> <p>TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p> |  |
| GENERAL CLASS.  | GRANULAR MATERIALS (≤ 35% PASSING #200)                          |   |  |  |  |  |   | SILT-CLAY MATERIALS (> 35% PASSING #200)       |             |   |  |  |   |   | ORGANIC MATERIALS |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| GROUP CLASS.  | A-1  | A-1-b   | A-3  | A-2  |  | A-4  | A-5   | A-6  | A-7         | A-1, A-2  | A-3  | A-4, A-5   | A-6, A-7  |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| SYMBOL  |  |   |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| % PASSING   |  |   |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| # 10  |  |   |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| # 40  |  |   |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| # 200   |  |   |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| LIQUID LIMIT  |  |   |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| PLASTIC INDEX   |  |   |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| GROUP INDEX   |  |   |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| USUAL TYPES OF MAJOR MATERIALS  | STONE FRAGS. GRAVEL AND SAND                                     |   | FINE SAND  | SILTY OR CLAYEY GRAVEL AND SAND  |  | SILT SOILS   |   | CLAYEY SOILS                                   |             | SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER |  |  | HIGHLY ORGANIC SOILS  |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| GEN. RATING AS A SUBGRADE   | EXCELLENT TO GOOD  |   |  |  |  |  |   | FAIR TO POOR                                   |             |   |  |  |   |   | FAIR TO POOR      | POOR  | UNSATISFACTORY  |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| CONSISTENCY OR DENSENESS  |  | GROUND WATER  |  | MISCELLANEOUS SYMBOLS  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT<sup>2</sup>)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESIVE)</td> <td>VERY LOOSE<br/>LOOSE<br/>MEDIUM DENSE<br/>DENSE<br/>VERY DENSE</td> <td>&lt; 4<br/>4 TO 10<br/>10 TO 30<br/>30 TO 50<br/>&gt; 50</td> <td>N/A</td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT<br/>SOFT<br/>MEDIUM STIFF<br/>STIFF<br/>VERY STIFF<br/>HARD</td> <td>&lt; 2<br/>2 TO 4<br/>4 TO 8<br/>8 TO 15<br/>15 TO 30<br/>&gt; 30</td> <td>&lt; 0.25<br/>0.25 TO 0.50<br/>0.5 TO 1.0<br/>1 TO 2<br/>2 TO 4<br/>&gt; 4</td> </tr> </table>   |  | PRIMARY SOIL TYPE   | COMPACTNESS OR CONSISTENCY                                       | RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)   | RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> ) | GENERALLY GRANULAR MATERIAL (NON-COHESIVE)   | VERY LOOSE<br>LOOSE<br>MEDIUM DENSE<br>DENSE<br>VERY DENSE          | < 4<br>4 TO 10<br>10 TO 30<br>30 TO 50<br>> 50 | N/A         | GENERALLY SILT-CLAY MATERIAL (COHESIVE)                 | VERY SOFT<br>SOFT<br>MEDIUM STIFF<br>STIFF<br>VERY STIFF<br>HARD | < 2<br>2 TO 4<br>4 TO 8<br>8 TO 15<br>15 TO 30<br>> 30 | < 0.25<br>0.25 TO 0.50<br>0.5 TO 1.0<br>1 TO 2<br>2 TO 4<br>> 4 | <p>WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p>STATIC WATER LEVEL AFTER 24 HOURS</p> <p>PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p>SPRING OR SEEP</p> |                   | <p>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</p> <p>SOIL SYMBOL</p> <p>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</p> <p>INFERRED SOIL BOUNDARY</p> <p>INFERRED ROCK LINE</p> <p>ALLUVIAL SOIL BOUNDARY</p> <p>DIP &amp; DIP DIRECTION OF ROCK STRUCTURES</p> <p>SPT DPT DMT TEST BORING</p> <p>AUGER BORING</p> <p>CORE BORING</p> <p>MONITORING WELL</p> <p>PIEZOMETER INSTALLATION</p> <p>SLOPE INDICATOR INSTALLATION</p> <p>CONE PENETROMETER TEST</p> <p>SOUNDING ROD</p> |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| PRIMARY SOIL TYPE   | COMPACTNESS OR CONSISTENCY                                       | RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)  | RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> ) |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| GENERALLY GRANULAR MATERIAL (NON-COHESIVE)  | VERY LOOSE<br>LOOSE<br>MEDIUM DENSE<br>DENSE<br>VERY DENSE       | < 4<br>4 TO 10<br>10 TO 30<br>30 TO 50<br>> 50  | N/A  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| GENERALLY SILT-CLAY MATERIAL (COHESIVE)   | VERY SOFT<br>SOFT<br>MEDIUM STIFF<br>STIFF<br>VERY STIFF<br>HARD | < 2<br>2 TO 4<br>4 TO 8<br>8 TO 15<br>15 TO 30<br>> 30  | < 0.25<br>0.25 TO 0.50<br>0.5 TO 1.0<br>1 TO 2<br>2 TO 4<br>> 4  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| TEXTURE OR GRAIN SIZE   |  | ABBREVIATIONS   |  | EQUIPMENT USED ON SUBJECT PROJECT  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. SIEVE SIZE (OPENING MM)</th> <th>4</th><th>10</th><th>40</th><th>60</th><th>200</th><th>270</th> </tr> <tr> <td></td> <td>4.76</td><td>2.00</td><td>0.42</td><td>0.25</td><td>0.075</td><td>0.053</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>BOULDER (BLDR.)</th> <th>COBBLE (COB.)</th> <th>GRAVEL (GR.)</th> <th>COARSE SAND (CSE. SD.)</th> <th>FINE SAND (F. SD.)</th> <th>SILT (SL.)</th> <th>CLAY (CL.)</th> </tr> <tr> <td>GRAIN SIZE MM</td> <td>305</td> <td>75</td> <td>2.0</td> <td>0.25</td> <td>0.05</td> <td>0.005</td> </tr> <tr> <td>IN.</td> <td>12</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>  |  | U.S. STD. SIEVE SIZE (OPENING MM)   | 4  | 10   | 40   | 60   | 200   | 270  |             | 4.76  | 2.00   | 0.42   | 0.25  | 0.075   | 0.053             | BOULDER (BLDR.)   | COBBLE (COB.)   | GRAVEL (GR.)     | COARSE SAND (CSE. SD.)   | FINE SAND (F. SD.) | SILT (SL.)      | CLAY (CL.) | GRAIN SIZE MM  | 305                | 75               | 2.0               | 0.25                | 0.05              | 0.005             | IN.          | 12             | 3                |                  |   |               |                 | <p>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/>HL - HIGHLY</p> <p>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. - SILT, SILTY<br/>SLI. - SLIGHTLY<br/>TCR - TRICONE REFUSAL<br/>w - MOISTURE CONTENT<br/>v - VERY</p> <p>VST - VANE SHEAR TEST<br/>WEA. - WEATHERED<br/>W - UNIT WEIGHT<br/>% - DRY UNIT WEIGHT</p> <p>S - BULK<br/>SS - SPLIT SPOON<br/>ST - SHELBY TUBE<br/>RS - ROCK<br/>RT - RECOMPACTED TRIAXIAL<br/>CBR - CALIFORNIA BEARING RATIO</p> |                | <p>DRILL UNITS:</p> <p><input type="checkbox"/> MOBILE B-<br/><input type="checkbox"/> BK-51<br/><input type="checkbox"/> CME-45C<br/><input checked="" type="checkbox"/> CME-55 LC<br/><input type="checkbox"/> PORTABLE HOIST</p> <p>ADVANCING TOOLS:</p> <p><input type="checkbox"/> CLAY BITS<br/><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER<br/><input type="checkbox"/> 8" HOLLOW AUGERS<br/><input type="checkbox"/> HARD FACED FINGER BITS<br/><input type="checkbox"/> TUNG.-CARBIDE INSERTS<br/><input checked="" type="checkbox"/> CASING w/ ADVANCER<br/><input checked="" type="checkbox"/> TRICONE 2 7/8" STEEL TEETH<br/><input type="checkbox"/> TRICONE " TUNG.-CARB.<br/><input checked="" type="checkbox"/> CORE BIT</p> <p>HAMMER TYPE:</p> <p><input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</p> <p>CORE SIZE:</p> <p><input type="checkbox"/> -B<br/><input checked="" type="checkbox"/> -N<br/><input type="checkbox"/> -H</p> <p>HAND TOOLS:</p> <p><input type="checkbox"/> POST HOLE DIGGER<br/><input type="checkbox"/> HAND AUGER<br/><input type="checkbox"/> SOUNDING ROD<br/><input type="checkbox"/> VANE SHEAR TEST</p> |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| U.S. STD. SIEVE SIZE (OPENING MM)   | 4  | 10  | 40   | 60   | 200  | 270  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
|   | 4.76   | 2.00  | 0.42   | 0.25   | 0.075  | 0.053  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| BOULDER (BLDR.)   | COBBLE (COB.)  | GRAVEL (GR.)  | COARSE SAND (CSE. SD.)   | FINE SAND (F. SD.)   | SILT (SL.)   | CLAY (CL.)   |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| GRAIN SIZE MM   | 305  | 75  | 2.0  | 0.25   | 0.05   | 0.005  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| IN.   | 12   | 3   |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| SOIL MOISTURE - CORRELATION OF TERMS  |  | ROCK HARDNESS   |  | FRACTURE SPACING   |  | BEDDING  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</th> <th>FIELD MOISTURE DESCRIPTION</th> <th>GUIDE FOR FIELD MOISTURE DESCRIPTION</th> </tr> <tr> <td>LL - LIQUID LIMIT</td> <td>- SATURATED - (SAT.)</td> <td>USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</td> </tr> <tr> <td>PL - PLASTIC LIMIT</td> <td>- WET - (W)</td> <td>SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</td> </tr> <tr> <td>OM - OPTIMUM MOISTURE</td> <td>- MOIST - (M)</td> <td>SOLID; AT OR NEAR OPTIMUM MOISTURE</td> </tr> <tr> <td>SL - SHRINKAGE LIMIT</td> <td>- DRY - (D)</td> <td>REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td> </tr> </table>   |  | SOIL MOISTURE SCALE (ATTERBERG LIMITS)  | FIELD MOISTURE DESCRIPTION                                       | GUIDE FOR FIELD MOISTURE DESCRIPTION   | LL - LIQUID LIMIT  | - SATURATED - (SAT.)   | USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE | PL - PLASTIC LIMIT                             | - WET - (W) | SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE   | OM - OPTIMUM MOISTURE  | - MOIST - (M)  | SOLID; AT OR NEAR OPTIMUM MOISTURE                              | SL - SHRINKAGE LIMIT  | - DRY - (D)       | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE  | <p>VERY HARD<br/>HARD<br/>MODERATELY HARD<br/>MEDIUM HARD<br/>SOFT<br/>VERY SOFT</p> <p>CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</p> <p>CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</p> <p>CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.</p> <p>CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</p> <p>CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.</p> <p>CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.</p> |                  | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> <td>VERY THICKLY BEDDED</td> <td>&gt; 4 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FEET</td> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td></td> <td></td> <td>THINLY LAMINATED</td> <td>&lt; 0.008 FEET</td> </tr> </table>   |                    | TERM            | SPACING    | TERM           | THICKNESS          | VERY WIDE        | MORE THAN 10 FEET | VERY THICKLY BEDDED | > 4 FEET          | WIDE              | 3 TO 10 FEET | THICKLY BEDDED | 1.5 - 4 FEET     | MODERATELY CLOSE | 1 TO 3 FEET   | THINLY BEDDED | 0.16 - 1.5 FEET | CLOSE  | 0.16 TO 1 FEET | VERY THINLY BEDDED   | 0.03 - 0.16 FEET | VERY CLOSE | LESS THAN 0.16 FEET | THICKLY LAMINATED | 0.008 - 0.03 FEET |  |  | THINLY LAMINATED | < 0.008 FEET | <p>BENCH MARK: BL-6 N. 999423 E. 1939342</p> <p>ELEVATION: 386.05 FT.</p> <p>NOTES:</p> <p>F.I.A.D. FILLED IMMEDIATELY AFTER DRILLING</p> <p>CT CORING TERMINATED</p> |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| SOIL MOISTURE SCALE (ATTERBERG LIMITS)  | FIELD MOISTURE DESCRIPTION                                       | GUIDE FOR FIELD MOISTURE DESCRIPTION  |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| LL - LIQUID LIMIT   | - SATURATED - (SAT.)   | USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE   |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| PL - PLASTIC LIMIT  | - WET - (W)  | SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE   |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| OM - OPTIMUM MOISTURE   | - MOIST - (M)  | SOLID; AT OR NEAR OPTIMUM MOISTURE  |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| SL - SHRINKAGE LIMIT  | - DRY - (D)  | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE  |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| TERM  | SPACING  | TERM  | THICKNESS  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| VERY WIDE   | MORE THAN 10 FEET  | VERY THICKLY BEDDED   | > 4 FEET   |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| WIDE  | 3 TO 10 FEET   | THICKLY BEDDED  | 1.5 - 4 FEET   |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| MODERATELY CLOSE  | 1 TO 3 FEET  | THINLY BEDDED   | 0.16 - 1.5 FEET  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| CLOSE   | 0.16 TO 1 FEET   | VERY THINLY BEDDED  | 0.03 - 0.16 FEET   |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| VERY CLOSE  | LESS THAN 0.16 FEET  | THICKLY LAMINATED   | 0.008 - 0.03 FEET  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
|   |  | THINLY LAMINATED  | < 0.008 FEET   |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| PLASTICITY  |  | INDURATION  |  | EQUIPMENT USED ON SUBJECT PROJECT  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NON-PLASTIC</th> <th>PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> <tr> <td>LOW PLASTICITY</td> <td>0-5</td> <td>VERY LOW</td> </tr> <tr> <td>MED. PLASTICITY</td> <td>6-15</td> <td>SLIGHT</td> </tr> <tr> <td>HIGH PLASTICITY</td> <td>16-25</td> <td>MEDIUM</td> </tr> <tr> <td></td> <td>26 OR MORE</td> <td>HIGH</td> </tr> </table>  |  | NON-PLASTIC   | PLASTICITY INDEX (PI)  | DRY STRENGTH   | LOW PLASTICITY   | 0-5  | VERY LOW  | MED. PLASTICITY                                | 6-15        | SLIGHT  | HIGH PLASTICITY  | 16-25  | MEDIUM  |   | 26 OR MORE        | HIGH  | <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>FRIABLE<br/>MODERATELY INDURATED<br/>INDURATED<br/>EXTREMELY INDURATED</p> <p>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>  |                  | <p>DRILL UNITS:</p> <p><input type="checkbox"/> MOBILE B-<br/><input type="checkbox"/> BK-51<br/><input type="checkbox"/> CME-45C<br/><input checked="" type="checkbox"/> CME-55 LC<br/><input type="checkbox"/> PORTABLE HOIST</p> <p>ADVANCING TOOLS:</p> <p><input type="checkbox"/> CLAY BITS<br/><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER<br/><input type="checkbox"/> 8" HOLLOW AUGERS<br/><input type="checkbox"/> HARD FACED FINGER BITS<br/><input type="checkbox"/> TUNG.-CARBIDE INSERTS<br/><input checked="" type="checkbox"/> CASING w/ ADVANCER<br/><input checked="" type="checkbox"/> TRICONE 2 7/8" STEEL TEETH<br/><input type="checkbox"/> TRICONE " TUNG.-CARB.<br/><input checked="" type="checkbox"/> CORE BIT</p> <p>HAMMER TYPE:</p> <p><input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</p> <p>CORE SIZE:</p> <p><input type="checkbox"/> -B<br/><input checked="" type="checkbox"/> -N<br/><input type="checkbox"/> -H</p> <p>HAND TOOLS:</p> <p><input type="checkbox"/> POST HOLE DIGGER<br/><input type="checkbox"/> HAND AUGER<br/><input type="checkbox"/> SOUNDING ROD<br/><input type="checkbox"/> VANE SHEAR TEST</p> |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| NON-PLASTIC   | PLASTICITY INDEX (PI)  | DRY STRENGTH  |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| LOW PLASTICITY  | 0-5  | VERY LOW  |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| MED. PLASTICITY   | 6-15   | SLIGHT  |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| HIGH PLASTICITY   | 16-25  | MEDIUM  |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
|   | 26 OR MORE   | HIGH  |  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| COLOR   |  | ROCK HARDNESS   |  | FRACTURE SPACING   |  | BEDDING  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| <p>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.</p>   |  | <p>VERY HARD<br/>HARD<br/>MODERATELY HARD<br/>MEDIUM HARD<br/>SOFT<br/>VERY SOFT</p> <p>CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</p> <p>CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</p> <p>CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.</p> <p>CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</p> <p>CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.</p> <p>CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.</p> |  | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> <td>VERY THICKLY BEDDED</td> <td>&gt; 4 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FEET</td> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td></td> <td></td> <td>THINLY LAMINATED</td> <td>&lt; 0.008 FEET</td> </tr> </table> |  | TERM   | SPACING   | TERM   | THICKNESS   | VERY WIDE   | MORE THAN 10 FEET  | VERY THICKLY BEDDED                                    | > 4 FEET  | WIDE  | 3 TO 10 FEET      | THICKLY BEDDED  | 1.5 - 4 FEET  | MODERATELY CLOSE | 1 TO 3 FEET  | THINLY BEDDED      | 0.16 - 1.5 FEET | CLOSE      | 0.16 TO 1 FEET | VERY THINLY BEDDED | 0.03 - 0.16 FEET | VERY CLOSE        | LESS THAN 0.16 FEET | THICKLY LAMINATED | 0.008 - 0.03 FEET |              |                | THINLY LAMINATED | < 0.008 FEET     | <p>BENCH MARK: BL-6 N. 999423 E. 1939342</p> <p>ELEVATION: 386.05 FT.</p> <p>NOTES:</p> <p>F.I.A.D. FILLED IMMEDIATELY AFTER DRILLING</p> <p>CT CORING TERMINATED</p> |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| TERM  | SPACING  | TERM  | THICKNESS  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| VERY WIDE   | MORE THAN 10 FEET  | VERY THICKLY BEDDED   | > 4 FEET   |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| WIDE  | 3 TO 10 FEET   | THICKLY BEDDED  | 1.5 - 4 FEET   |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| MODERATELY CLOSE  | 1 TO 3 FEET  | THINLY BEDDED   | 0.16 - 1.5 FEET  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| CLOSE   | 0.16 TO 1 FEET   | VERY THINLY BEDDED  | 0.03 - 0.16 FEET   |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
| VERY CLOSE  | LESS THAN 0.16 FEET  | THICKLY LAMINATED   | 0.008 - 0.03 FEET  |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |
|   |  | THINLY LAMINATED  | < 0.008 FEET   |  |  |  |   |  |             |   |  |  |   |   |                   |   |   |                  |  |                    |                 |            |                |                    |                  |                   |                     |                   |                   |              |                |                  |                  |   |               |                 |  |                |  |                  |            |                     |                   |                   |  |  |                  |              |   |  |  |  |  |           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                                |                              |  |           |                                 |  |            |  |              |  |   |  |  |                      |  |  |                           |                   |  |  |  |  |  |  |              |  |  |  |  |  |  |              |      |                |   |  |  |  |  |  |  |  |

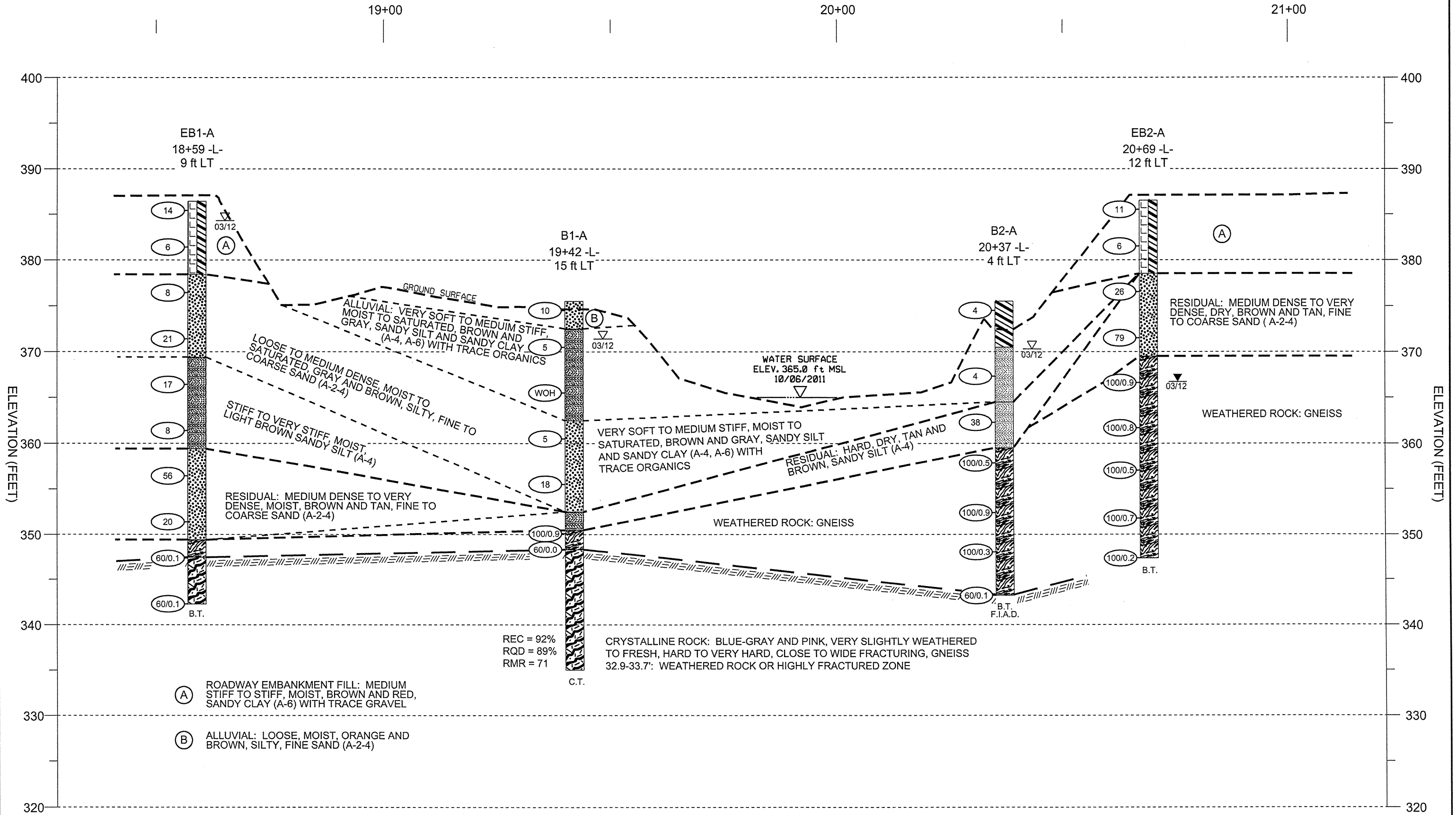
RANDY B. WHITT  
DB 512 PG 795  
PBI5 PG 917

JOHN R. & TERESA W. PEARSON  
DB 490 PG 1  
PB 8 PG 130



SITE PLAN  
BRIDGE NO. 12 OVER COUNTRY LINE CREEK ON  
SR 1554 (YARBOROUGH MILL ROAD)  
NCDOT PROJECT NO. 38499.1.1 (B-4725)  
F.A. No. BRZ-1554(4)  
CASWELL COUNTY, NORTH CAROLINA

|   |                   |                    |  |
|---|-------------------|--------------------|--|
| AMEC ENVIRONMENT AND INFRASTRUCTURE, INC.<br>DURHAM, NORTH CAROLINA |                   |                    |  |
| REVISIONS   | DRAWN: R.R.       | DATE: 06/08/12     |  |
|   | DFT CHECK: J.P.H. | JOB : 6468-12-1032 |  |
|   | ENG CHECK: W.B.D. | DWG: 1             |  |



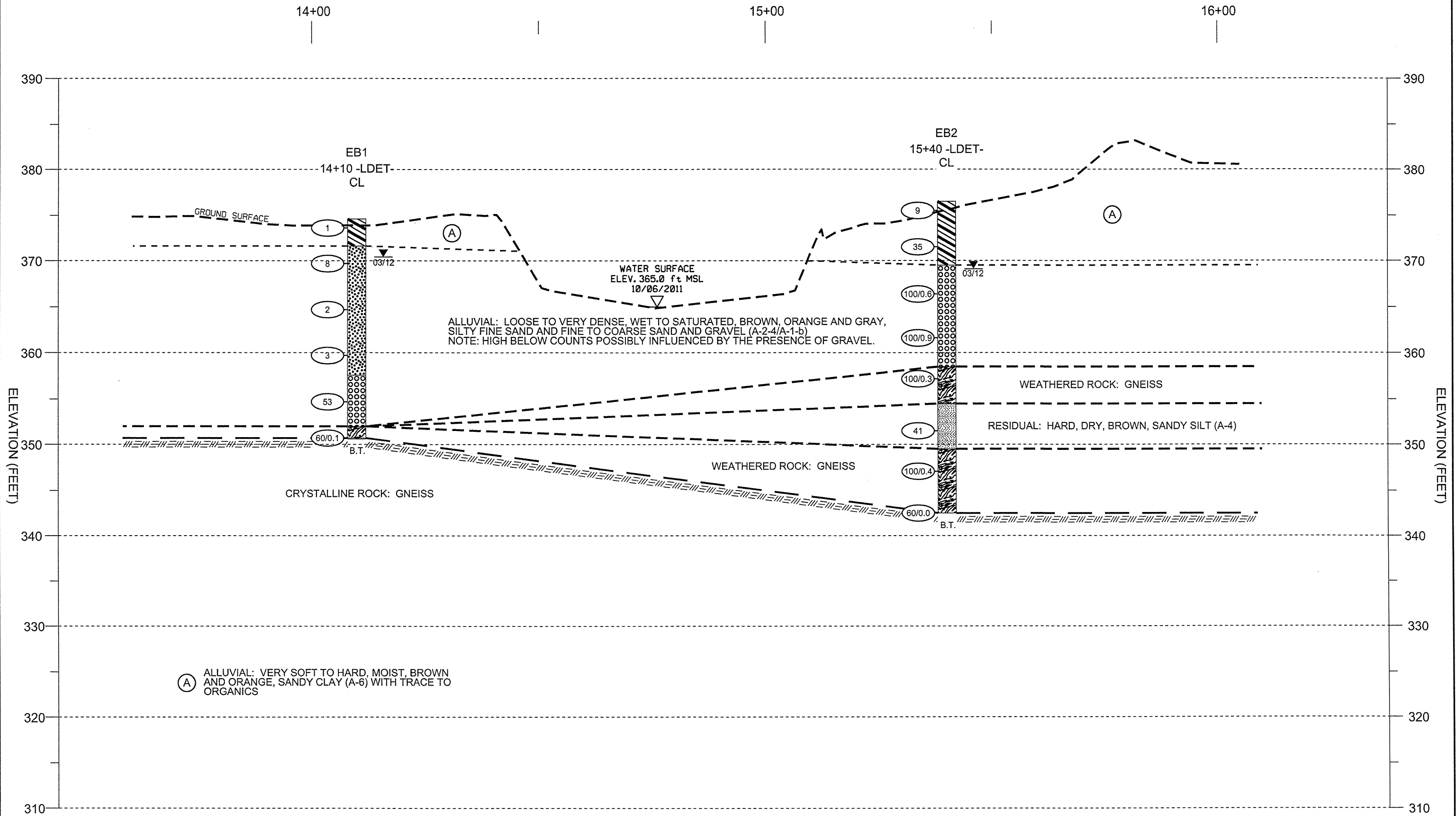
- GROUND LINE PROFILE AT CL OF -L- TAKEN FROM BRIDGE SURVEY & HYDRAULIC DESIGN REPORT DATED 12/30/11.  
- INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

PROFILE ALONG -L- CENTERLINE  
BRIDGE NO. 12 OVER COUNTRY LINE CREEK ON  
SR 1554 (YARBOROUGH MILL ROAD)  
NCDOT PROJECT NO. 38499.1.1 (B-4725)  
F.A. No. BRZ-1554(4)  
CASWELL COUNTRY, NORTH CAROLINA

AMEC ENVIRONMENT AND INFRASTRUCTURE, INC.  
DURHAM, NORTH CAROLINA

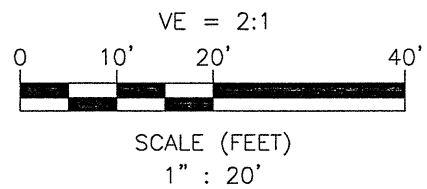
| REVISIONS | DRAWN:     | R.R.   | DATE:             |
|-----------|------------|--------|-------------------|
|           | DFT CHECK: | J.P.H. | 06/08/2012        |
|           | ENG CHECK: | W.B.D. | JOB: 6468-12-1032 |
|           |            |        | DWG: 2            |





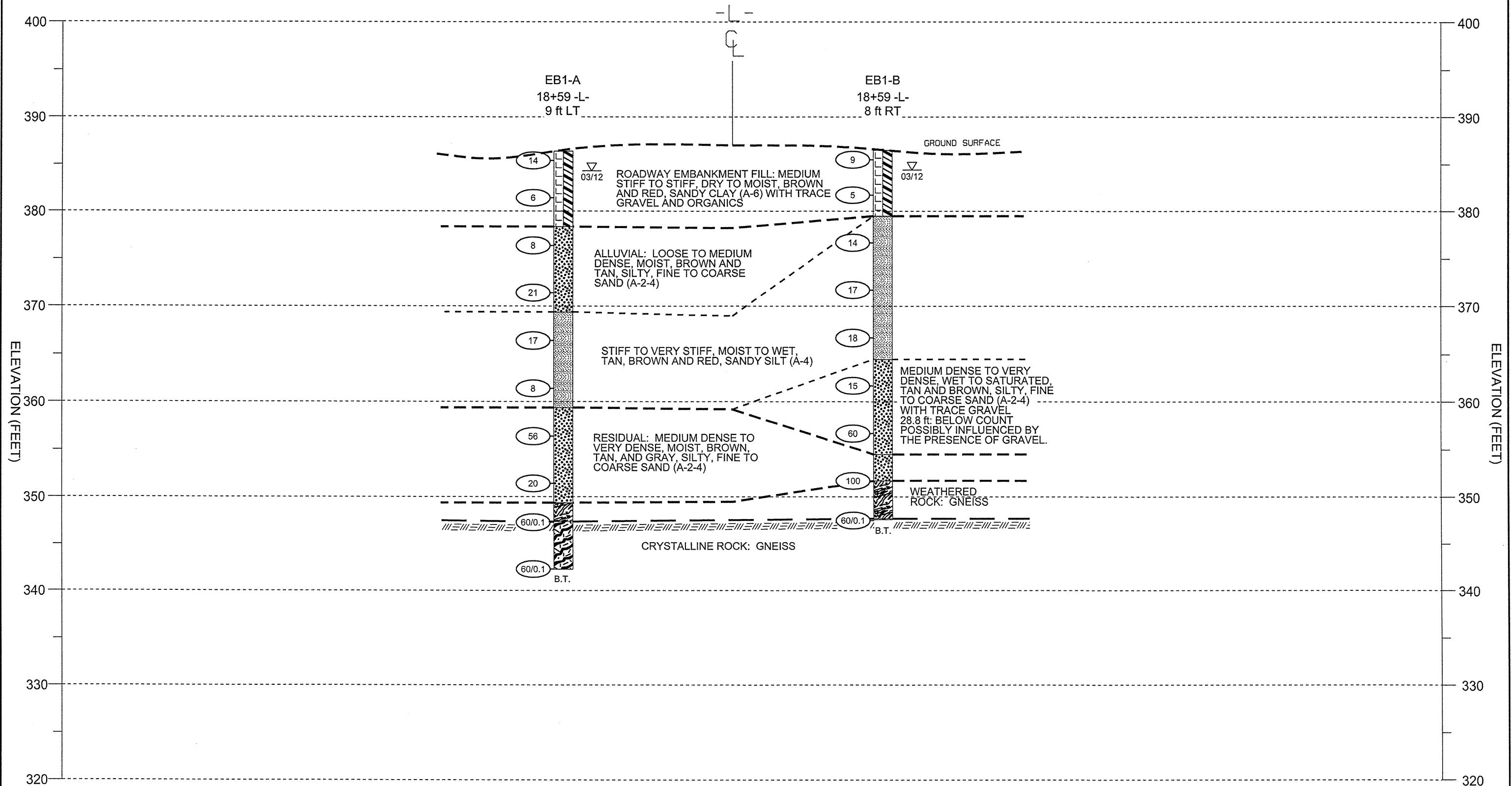
(A) ALLUVIAL: VERY SOFT TO HARD, MOIST, BROWN AND ORANGE, SANDY CLAY (A-6) WITH TRACE TO ORGANICS

- GROUND LINE PROFILE AT CL OF -LDET-TAKEN FROM BRIDGE SURVEY & HYDRAULIC DESIGN REPORT DATED 12/30/11.  
 - INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

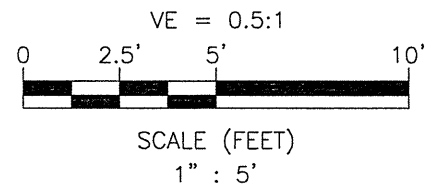


PROFILE ALONG -LDET- CENTERLINE  
 BRIDGE NO. 12 OVER COUNTRY LINE CREEK ON  
 SR 1554 (YARBOROUGH MILL ROAD)  
 NCDOT PROJECT NO. 38499.1.1 (B-4725)  
 F.A. No. BRZ-1554(4)  
 CASWELL COUNTRY, NORTH CAROLINA

|   |                   |                   |  |
|---|-------------------|-------------------|--|
| AMEC ENVIRONMENT AND INFRASTRUCTURE, INC.<br>DURHAM, NORTH CAROLINA |                   |                   |  |
| REVISIONS   | DRAWN: R.R.       | DATE: 06/08/2012  |  |
|   | DFT CHECK: J.P.H. | JOB: 6468-12-1032 |  |
|   | ENG CHECK: W.B.D. | DWG: 3            |  |

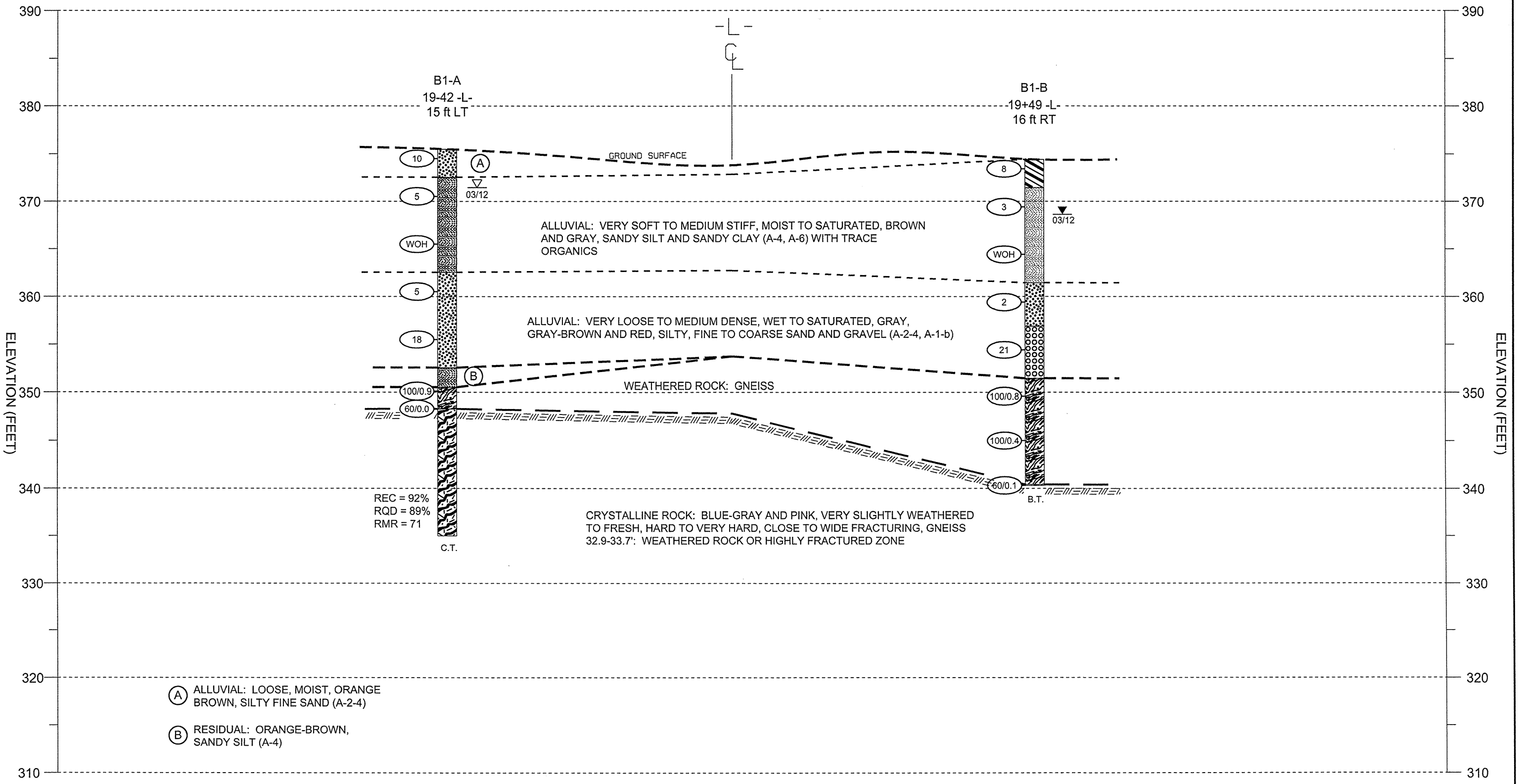


- GROUND LINE CROSS SECTION SURVEYED BY AMEC ALONG THE LOCATION OF THE BENT ON 3/13/12.  
 - INFERRED STRATIGRAPHY IS DRAWN AT THE CROSS SECTION WITH BORINGS PROJECTED ONTO THE CROSS SECTION.

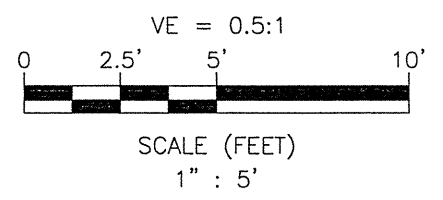


CROSS SECTION ALONG END BENT 1  
 BRIDGE NO. 12 OVER COUNTRY LINE CREEK ON  
 SR 1554 (YARBOROUGH MILL ROAD)  
 NCDOT PROJECT NO. 38499.1.1 (B-4725)  
 F.A. No. BRZ-1554(4)  
 CASWELL COUNTRY, NORTH CAROLINA

|   |                   |                   |  |
|---|-------------------|-------------------|--|
| AMEC ENVIRONMENT AND INFRASTRUCTURE, INC.<br>DURHAM, NORTH CAROLINA |                   |                   |  |
| REVISIONS   | DRAWN: R.R.       | DATE: 06/08/2012  |  |
|   | DFT CHECK: J.P.H. | JOB: 6468-12-1032 |  |
|   | ENG CHECK: W.B.D. | DWG: 4            |  |

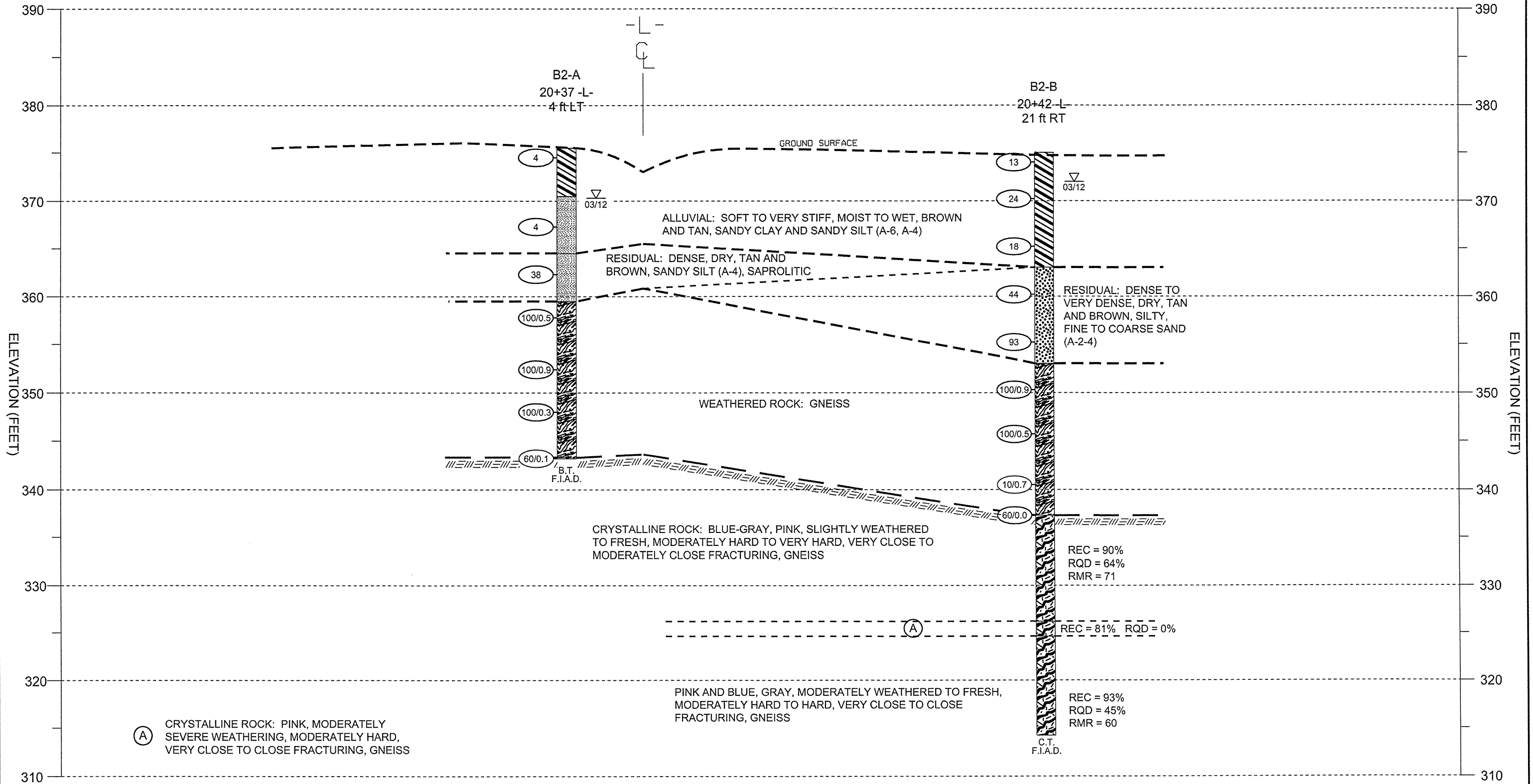


- GROUND LINE CROSS SECTION SURVEYED BY AMEC ALONG THE LOCATION OF THE BENT ON 3/13/12.  
- INFERRED STRATIGRAPHY IS DRAWN AT THE CROSS SECTION WITH BORINGS PROJECTED ONTO THE CROSS SECTION.



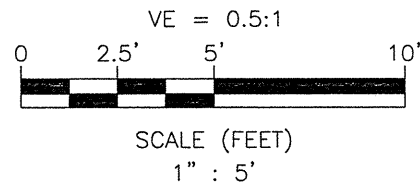
CROSS SECTION ALONG BENT 1  
BRIDGE NO. 12 OVER COUNTRY LINE CREEK ON  
SR 1554 (YARBOROUGH MILL ROAD)  
NCDOT PROJECT NO. 38499.1.1 (B-4725)  
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|   |                   |                   |  |
|---|-------------------|-------------------|--|
| AMEC ENVIRONMENT AND INFRASTRUCTURE, INC.<br>DURHAM, NORTH CAROLINA |                   |                   |  |
| REVISIONS   | DRAWN: R.R.       | DATE: 06/08/2012  |  |
|   | DFT CHECK: J.P.H. | JOB: 6468-12-1032 |  |
|   | ENG CHECK: W.B.D. | DWG: 5            |  |



(A) CRYSTALLINE ROCK: PINK, MODERATELY SEVERE WEATHERING, MODERATELY HARD, VERY CLOSE TO CLOSE FRACTURING, GNEISS

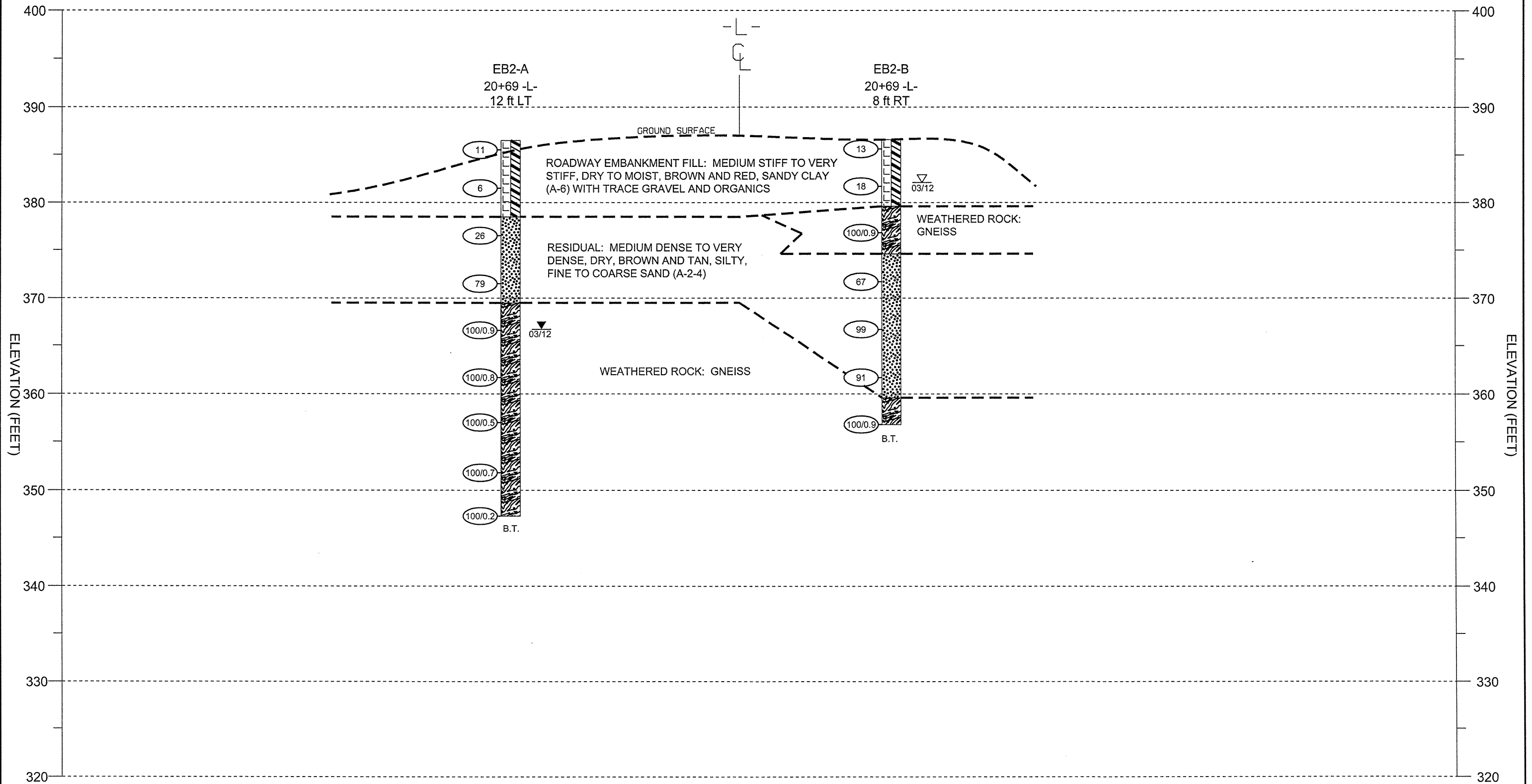
- GROUND LINE CROSS SECTION SURVEYED BY AMEC ALONG THE LOCATION OF THE BENT ON 3/13/12.  
 - INFERRED STRATIGRAPHY IS DRAWN AT THE CROSS SECTION WITH BORINGS PROJECTED ONTO THE CROSS SECTION.



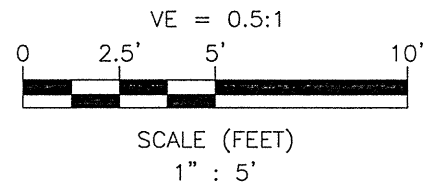
CROSS SECTION ALONG BENT 2  
 BRIDGE NO. 12 OVER COUNTRY LINE CREEK ON  
 SR 1554 (YARBOROUGH MILL ROAD)  
 NCDOT PROJECT NO. 38499.1.1 (B-4725)  
 F.A. No. BRZ-1554(4)  
 CASWELL COUNTRY, NORTH CAROLINA

AMEC ENVIRONMENT AND INFRASTRUCTURE, INC.  
 DURHAM, NORTH CAROLINA

| REVISIONS | DRAWN:     | R.R.   | DATE:             |
|-----------|------------|--------|-------------------|
|           | J.P.H.     |        | 06/08/2012        |
|           | DFT CHECK: | J.P.H. | JOB: 6468-12-1032 |
|           | ENG CHECK: | W.B.D. | DWG: 6            |



- GROUND LINE CROSS SECTION SURVEYED BY AMEC ALONG THE LOCATION OF THE BENT ON 3/13/12.  
 - INFERRED STRATIGRAPHY IS DRAWN AT THE CROSS SECTION WITH BORINGS PROJECTED ONTO THE CROSS SECTION.



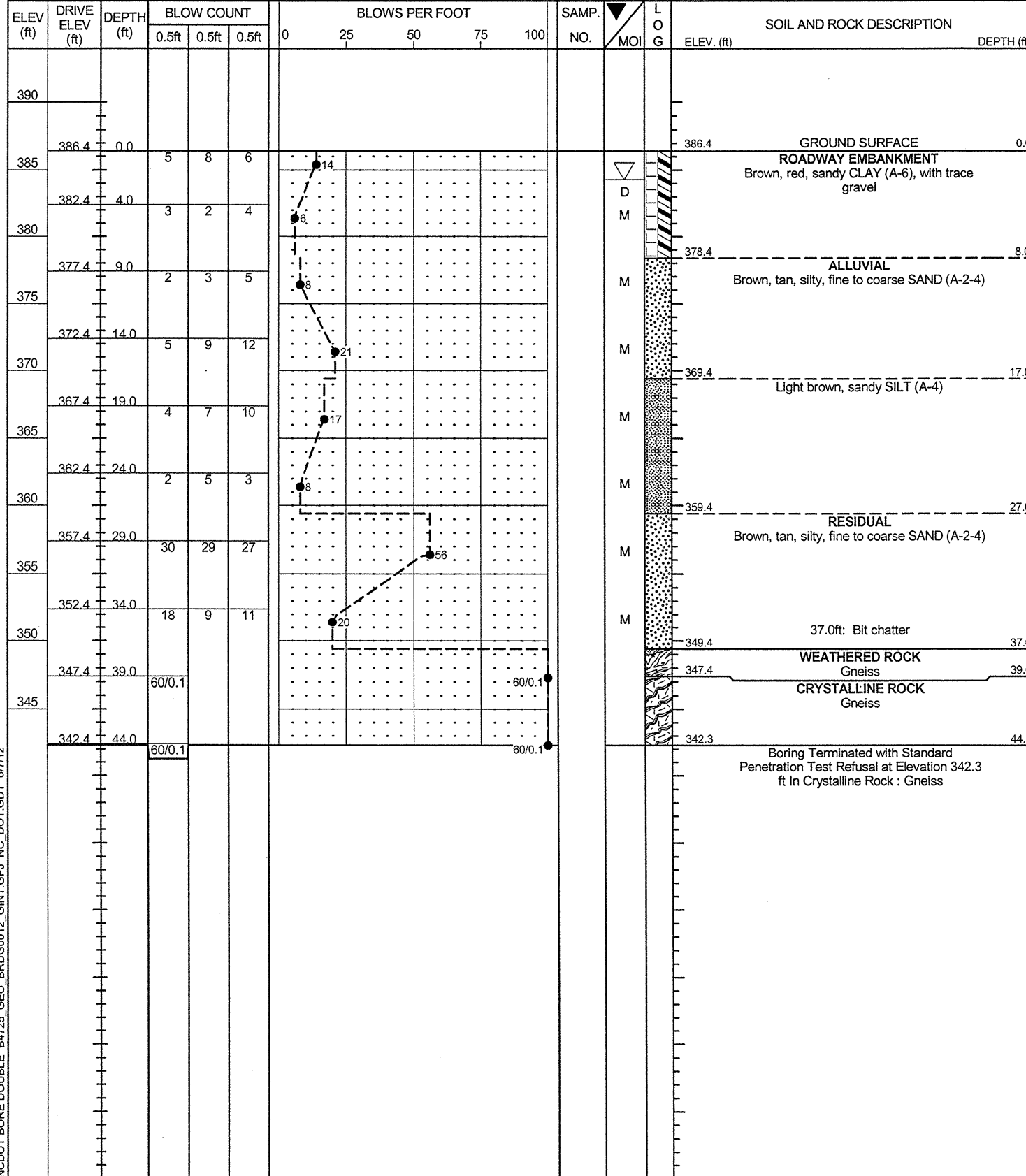
CROSS SECTION ALONG END BENT 2  
 BRIDGE NO. 12 OVER COUNTRY LINE CREEK ON  
 SR 1554 (YARBOROUGH MILL ROAD)  
 NCDOT PROJECT NO. 38499.1.1 (B-4725)  
 F.A. No. BRZ-1554(4)  
 CASWELL COUNTRY, NORTH CAROLINA

|   |                   |                   |  |
|---|-------------------|-------------------|--|
| AMEC ENVIRONMENT AND INFRASTRUCTURE, INC.<br>DURHAM, NORTH CAROLINA |                   |                   |  |
| REVISIONS   | DRAWN: R.R.       | DATE: 06/08/2012  |  |
|   | DFT CHECK: J.P.H. | JOB: 6468-12-1032 |  |
|   | ENG CHECK: W.B.D. | DWG: 7            |  |

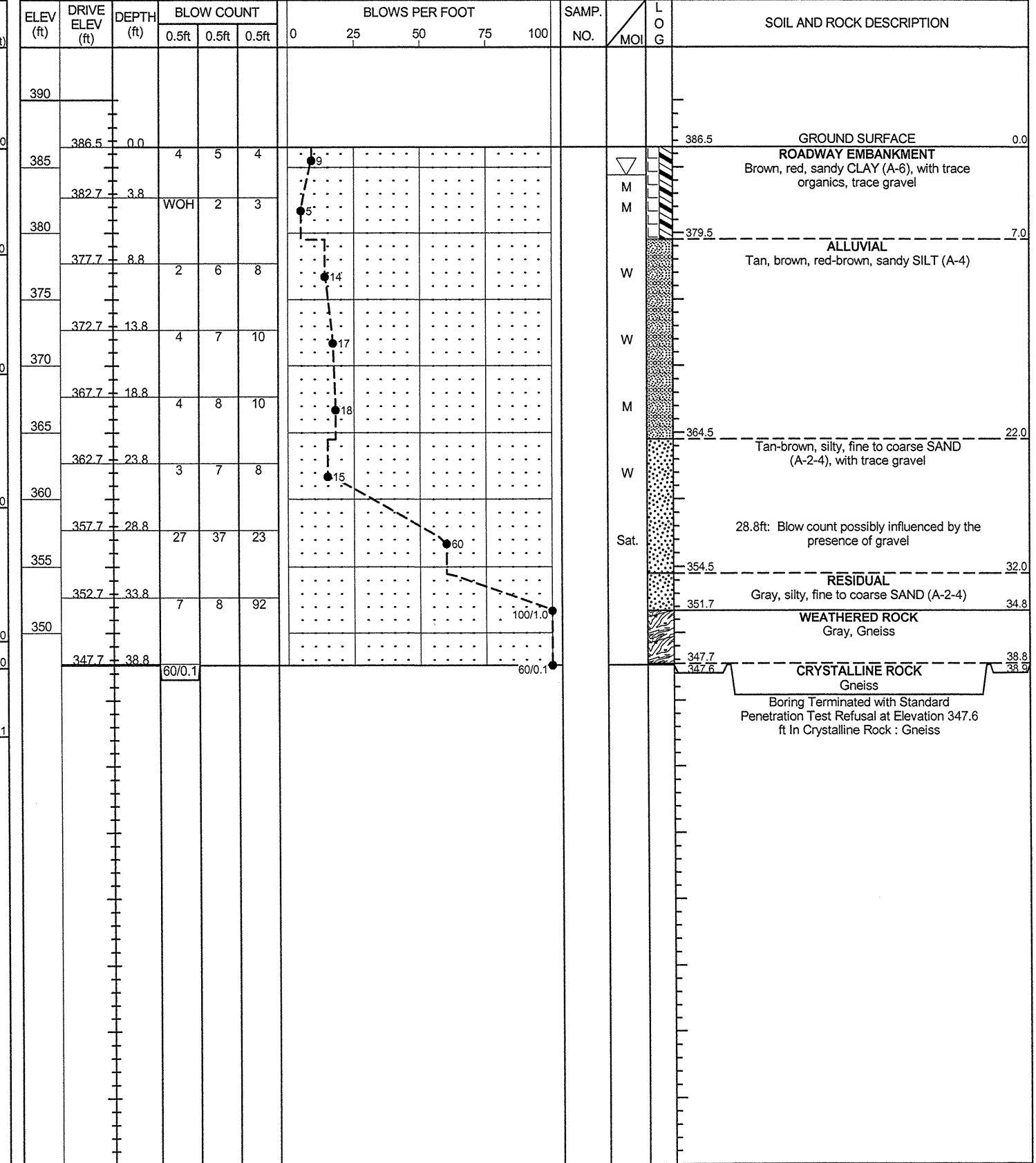


**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

|  |                     |                         |                         |
|--|---------------------|-------------------------|-------------------------|
| WBS 38499.1.1  | TIP B-4725          | COUNTY CASWELL          | GEOLOGIST Howard, J.    |
| SITE DESCRIPTION Bridge No. 12 Over Country Line Creek on SR 1554 (Yarborough Mill Road) |                     |                         | GROUND WTR (ft)         |
| BORING NO. EB1-A   | STATION 18+59       | OFFSET 9 ft LT          | ALIGNMENT -L-           |
| COLLAR ELEV. 386.4 ft  | TOTAL DEPTH 44.1 ft | NORTHING 999,450        | EASTING 1,939,126       |
| DRILL RIG/HAMMER EFF./DATE MAC1145 CME-55LC 88% 03/01/2011                               |                     | DRILL METHOD Mud Rotary | HAMMER TYPE Automatic   |
| DRILLER White, D.  | START DATE 03/06/12 | COMP. DATE 03/06/12     | SURFACE WATER DEPTH N/A |



|  |                     |                         |                         |
|--|---------------------|-------------------------|-------------------------|
| WBS 38499.1.1  | TIP B-4725          | COUNTY CASWELL          | GEOLOGIST Howard, J.    |
| SITE DESCRIPTION Bridge No. 12 Over Country Line Creek on SR 1554 (Yarborough Mill Road) |                     |                         | GROUND WTR (ft)         |
| BORING NO. EB1-B   | STATION 18+59       | OFFSET 8 ft RT          | ALIGNMENT -L-           |
| COLLAR ELEV. 386.5 ft  | TOTAL DEPTH 38.9 ft | NORTHING 999,433        | EASTING 1,939,125       |
| DRILL RIG/HAMMER EFF./DATE MAC1145 CME-55LC 88% 03/01/2011                               |                     | DRILL METHOD Mud Rotary | HAMMER TYPE Automatic   |
| DRILLER White, D.  | START DATE 03/06/12 | COMP. DATE 03/06/12     | SURFACE WATER DEPTH N/A |



NCDOT BORE DOUBLE B4725\_GEO\_BRD0012\_GINT.GPJ NC\_DOT.GDT 6/7/12



| WBS 38499.1.1   |                 | TIP B-4725          |            | COUNTY CASWELL          |        | GEOLOGIST Howard, J.    |                 |    |    |           |       |                           |  |      |
|---|-----------------|---------------------|------------|-------------------------|--------|-------------------------|-----------------|----|----|-----------|-------|---------------------------|--|------|
| SITE DESCRIPTION Bridge No. 12 Over Country Line Creek on SR 1554 (Yarborough Mill Road)          |                 |                     |            |                         |        |                         | GROUND WTR (ft) |    |    |           |       |                           |  |      |
| BORING NO. B1-A   |                 | STATION 19+42       |            | OFFSET 15 ft LT         |        | ALIGNMENT -L-           |                 |    |    |           |       |                           |  |      |
| COLLAR ELEV. 375.5 ft   |                 | TOTAL DEPTH 40.5 ft |            | NORTHING 999,454        |        | EASTING 1,939,209       |                 |    |    |           |       |                           |  |      |
| DRILL RIG/HAMMER EFF./DATE MAC1145 CME-55LC 88% 03/01/2011  |                 |                     |            | DRILL METHOD Mud Rotary |        | HAMMER TYPE Automatic   |                 |    |    |           |       |                           |  |      |
| DRILLER White, D.   |                 | START DATE 03/02/12 |            | COMP. DATE 03/02/12     |        | SURFACE WATER DEPTH N/A |                 |    |    |           |       |                           |  |      |
| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT |                         |        | BLOWS PER FOOT          |                 |    |    | SAMP. NO. | L O G | SOIL AND ROCK DESCRIPTION | DEPTH (ft)   |      |
|   |                 |                     | 0.5ft      | 0.5ft                   | 0.5ft  | 0                       | 25              | 50 | 75 |           |       |                           |  | 100  |
| 380   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           |  |      |
| 375   | 375.5           | 0.0                 |            |                         |        |                         |                 |    |    |           |       | 375.5                     | GROUND SURFACE                                       | 0.0  |
|   |                 |                     | 2          | 5                       | 5      |                         |                 |    |    |           |       |                           | ALLUVIAL   |      |
|   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           | Orange, brown, silty, fine SAND (A-2-4)              |      |
| 370   | 371.5           | 4.0                 | 3          | 3                       | 2      |                         |                 |    |    |           |       |                           | Brown, gray, sandy SILT (A-4)                        | 3.0  |
|   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           |  |      |
| 365   | 366.5           | 9.0                 | WOH        | WOH                     | WOH    |                         |                 |    |    |           |       |                           |  |      |
|   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           |  |      |
| 360   | 361.5           | 14.0                | 3          | 2                       | 3      |                         |                 |    |    |           |       |                           | Gray, gray-brown, silty, fine to coarse SAND (A-2-4) | 13.0 |
|   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           |  |      |
| 355   | 356.5           | 19.0                | 2          | 7                       | 11     |                         |                 |    |    |           |       |                           | 19.0ft: Little gravel                                |      |
|   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           |  |      |
| 350   | 351.5           | 24.0                | 6          | 12                      | 88/0.4 |                         |                 |    |    |           |       |                           | RESIDUAL   | 23.0 |
|   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           | Orange-brown, sandy SILT (A-4)                       | 25.0 |
|   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           | WEATHERED ROCK                                       |      |
|   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           | Orange, brown, Gneiss                                |      |
|   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           | CRYSTALLINE ROCK                                     |      |
|   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           | Blue-gray, pink Gneiss                               |      |
| 345   | 348.3           | 27.2                | 60/0.0     |                         |        |                         |                 |    |    |           |       |                           |  |      |
|   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           |  |      |
| 340   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           |  |      |
|   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           |  |      |
| 335   |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           |  |      |
| Boring Terminated at Elevation 335.0 ft in Crystalline Rock : Gneiss                              |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           |  |      |
| Note: 0.2' of rock cored from 40.3-40.5' was not recovered and left in the boring at termination. |                 |                     |            |                         |        |                         |                 |    |    |           |       |                           |  |      |

| WBS 38499.1.1   |               | TIP B-4725          |          | COUNTY CASWELL   |               | GEOLOGIST Howard, J.    |                 |               |               |       |   |            |
|---|---------------|---------------------|----------|--|---------------|-------------------------|-----------------|---------------|---------------|-------|---|------------|
| SITE DESCRIPTION Bridge No. 12 Over Country Line Creek on SR 1554 (Yarborough Mill Road)          |               |                     |          |  |               |                         | GROUND WTR (ft) |               |               |       |   |            |
| BORING NO. B1-A   |               | STATION 19+42       |          | OFFSET 15 ft LT  |               | ALIGNMENT -L-           |                 |               |               |       |   |            |
| COLLAR ELEV. 375.5 ft   |               | TOTAL DEPTH 40.5 ft |          | NORTHING 999,454   |               | EASTING 1,939,209       |                 |               |               |       |   |            |
| DRILL RIG/HAMMER EFF./DATE MAC1145 CME-55LC 88% 03/01/2011  |               |                     |          | DRILL METHOD Mud Rotary  |               | HAMMER TYPE Automatic   |                 |               |               |       |   |            |
| DRILLER White, D.   |               | START DATE 03/02/12 |          | COMP. DATE 03/02/12  |               | SURFACE WATER DEPTH N/A |                 |               |               |       |   |            |
| ELEV (ft)   | RUN ELEV (ft) | DEPTH (ft)          | RUN (ft) | DRILL RATE (Min/ft)  | RUN           |                         | SAMP. NO.       | STRATA        |               | L O G | DESCRIPTION AND REMARKS   | DEPTH (ft) |
|   |               |                     |          |  | REC. (ft) %   | RQD (ft) %              |                 | REC. (ft) %   | RQD (ft) %    |       |   |            |
| 348.3   |               |                     |          |  |               |                         |                 |               |               |       | Begin Coring @ 27.2 ft  |            |
|   | 348.3         | 27.2                | 3.3      | N=60/0.0<br>4:45<br>2:45<br>2:30<br>3:15<br>3:30<br>2:30<br>3:15<br>2:15 | (3.3)<br>100% | (3.0)<br>91%            |                 | (12.3)<br>92% | (11.9)<br>89% |       | CRYSTALLINE ROCK  | 27.2       |
| 345   | 345.0         | 30.5                | 5.0      | 0:45/0.3   | (4.2)<br>84%  | (4.1)<br>82%            |                 |               |               |       | Blue-gray and pink, very slightly weathered to fresh, hard to very hard, close to wide fracturing, Gneiss |            |
|   |               |                     |          |  |               |                         |                 |               |               |       | 3 joints at 10°<br>2 joints at 20°<br>1 joint at 40°  |            |
| 340   | 340.0         | 35.5                | 5.0      | 3:30<br>3:00<br>2:45<br>3:00<br>2:15                                     | (4.8)<br>96%  | (4.8)<br>96%            | RS-1            |               |               |       | 32.9 - 33.7ft: Loss of circulation; weathered rock and/or highly fractured zone                           |            |
|   |               |                     |          |  |               |                         |                 |               |               |       | R1=7, R2=17, R3=20, R4=20, R5=7<br>RMR=71<br>Rock Type=E  |            |
| 335   | 335.0         | 40.5                |          |  |               |                         |                 |               |               |       | Boring Terminated at Elevation 335.0 ft in Crystalline Rock : Gneiss                                      | 40.5       |
| Note: 0.2' of rock cored from 40.3-40.5' was not recovered and left in the boring at termination. |               |                     |          |  |               |                         |                 |               |               |       |   |            |

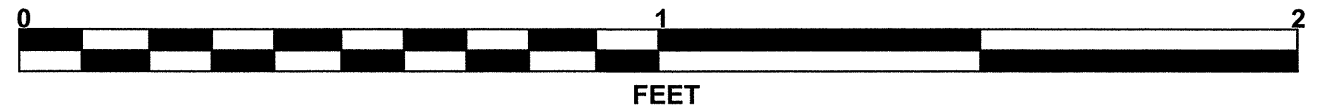
NCDOT BORE SINGLE B4725 GEO BRDG0012\_GINT.GPJ NC\_DOT.GDT 6/7/12

NCDOT CORE SINGLE B4725 GEO BRDG0012\_GINT.GPJ NC\_DOT.GDT 6/7/12

# CORE PHOTOGRAPHS

## B1-A

BOXES 1 & 2: 27.2 - 40.5 FEET



FEET



**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

| WBS 38499.1.1  |                 | TIP B-4725          |            | COUNTY CASWELL          |       | GEOLOGIST Howard, J.    |                 |    |    |     |           |         |       |                           |            |   |      |
|--|-----------------|---------------------|------------|-------------------------|-------|-------------------------|-----------------|----|----|-----|-----------|---------|-------|---------------------------|------------|---|------|
| SITE DESCRIPTION Bridge No. 12 Over Country Line Creek on SR 1554 (Yarborough Mill Road) |                 |                     |            |                         |       |                         | GROUND WTR (ft) |    |    |     |           |         |       |                           |            |   |      |
| BORING NO. B1-B  |                 | STATION 19+49       |            | OFFSET 16 ft RT         |       | ALIGNMENT -L-           |                 |    |    |     |           |         |       |                           |            |   |      |
| COLLAR ELEV. 374.4 ft  |                 | TOTAL DEPTH 34.1 ft |            | NORTHING 999,423        |       | EASTING 1,939,215       |                 |    |    |     |           |         |       |                           |            |   |      |
| DRILL RIG/HAMMER EFF./DATE MAC1145 CME-55LC 88% 03/01/2011                               |                 |                     |            | DRILL METHOD Mud Rotary |       | HAMMER TYPE Automatic   |                 |    |    |     |           |         |       |                           |            |   |      |
| DRILLER White, D.  |                 | START DATE 03/01/12 |            | COMP. DATE 03/01/12     |       | SURFACE WATER DEPTH N/A |                 |    |    |     |           |         |       |                           |            |   |      |
| ELEV (ft)  | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT |                         |       | BLOWS PER FOOT          |                 |    |    |     | SAMP. NO. | LOG MOI | LOG G | SOIL AND ROCK DESCRIPTION | DEPTH (ft) |   |      |
|  |                 |                     | 0.5ft      | 0.5ft                   | 0.5ft | 0                       | 25              | 50 | 75 | 100 |           |         |       |                           |            |   |      |
| 375  | 374.4           | 0.0                 |            |                         |       |                         |                 |    |    |     |           |         |       |                           | 374.4      | GROUND SURFACE  | 0.0  |
|  |                 |                     | 3          | 4                       | 4     |                         |                 |    |    |     |           |         |       |                           | 371.4      | ALLUVIAL<br>Brown, sandy CLAY (A-6), with trace organics  | 3.0  |
| 370  | 370.4           | 4.0                 | 2          | 1                       | 2     |                         |                 |    |    |     |           |         |       |                           |            | Brown, gray, sandy SILT (A-4)   |      |
| 365  | 365.4           | 9.0                 | WOH        | WOH                     | WOH   |                         |                 |    |    |     |           |         |       |                           |            |   |      |
| 360  | 360.4           | 14.0                | 1          | 1                       | 1     |                         |                 |    |    |     |           |         |       |                           |            | Gray, silty, fine SAND (A-2-4)  | 13.0 |
| 355  | 355.4           | 19.0                | 2          | 2                       | 19    |                         |                 |    |    |     |           |         |       |                           |            | 17.5ft: Bit chatter<br>Red-brown, gray, gravelly, fine to coarse SAND (A-1-b)                               | 17.5 |
| 350  | 350.4           | 24.0                | 56         | 44                      | 0.3   |                         |                 |    |    |     |           |         |       |                           |            | WEATHERED ROCK<br>Red-brown, Gneiss   | 23.0 |
| 345  | 345.4           | 29.0                | 100        | 0.4                     |       |                         |                 |    |    |     |           |         |       |                           |            |   |      |
|  | 340.4           | 34.0                | 60         | 0.1                     |       |                         |                 |    |    |     |           |         |       |                           |            | CRYSTALLINE ROCK<br>Gneiss  | 34.0 |
|  |                 |                     |            |                         |       |                         |                 |    |    |     |           |         |       |                           |            | Boring Terminated with Standard Penetration Test Refusal at Elevation 340.3 ft In Crystalline Rock : Gneiss |      |

| WBS 38499.1.1  |                 | TIP B-4725          |            | COUNTY CASWELL          |       | GEOLOGIST Howard, J.    |                 |    |    |     |           |         |       |                           |            |       |   |      |
|--|-----------------|---------------------|------------|-------------------------|-------|-------------------------|-----------------|----|----|-----|-----------|---------|-------|---------------------------|------------|-------|---|------|
| SITE DESCRIPTION Bridge No. 12 Over Country Line Creek on SR 1554 (Yarborough Mill Road) |                 |                     |            |                         |       |                         | GROUND WTR (ft) |    |    |     |           |         |       |                           |            |       |   |      |
| BORING NO. B2-A  |                 | STATION 20+37       |            | OFFSET 4 ft LT          |       | ALIGNMENT -L-           |                 |    |    |     |           |         |       |                           |            |       |   |      |
| COLLAR ELEV. 375.5 ft  |                 | TOTAL DEPTH 32.3 ft |            | NORTHING 999,442        |       | EASTING 1,939,306       |                 |    |    |     |           |         |       |                           |            |       |   |      |
| DRILL RIG/HAMMER EFF./DATE MAC1145 CME-55LC 88% 03/01/2011                               |                 |                     |            | DRILL METHOD Mud Rotary |       | HAMMER TYPE Automatic   |                 |    |    |     |           |         |       |                           |            |       |   |      |
| DRILLER White, D.  |                 | START DATE 03/14/12 |            | COMP. DATE 03/14/12     |       | SURFACE WATER DEPTH N/A |                 |    |    |     |           |         |       |                           |            |       |   |      |
| ELEV (ft)  | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT |                         |       | BLOWS PER FOOT          |                 |    |    |     | SAMP. NO. | LOG MOI | LOG G | SOIL AND ROCK DESCRIPTION | DEPTH (ft) |       |   |      |
|  |                 |                     | 0.5ft      | 0.5ft                   | 0.5ft | 0                       | 25              | 50 | 75 | 100 |           |         |       |                           |            |       |   |      |
| 380  |                 |                     |            |                         |       |                         |                 |    |    |     |           |         |       |                           |            |       |   |      |
| 375  | 375.5           | 0.0                 | 2          | 3                       | 1     |                         |                 |    |    |     |           |         |       |                           |            | 375.5 | GROUND SURFACE  | 0.0  |
|  |                 |                     |            |                         |       |                         |                 |    |    |     |           |         |       |                           |            |       | ALLUVIAL<br>Brown, sandy CLAY (A-6), with trace organics  |      |
| 370  |                 |                     |            |                         |       |                         |                 |    |    |     |           |         |       |                           |            |       | Tan, sandy SILT (A-4)   | 5.0  |
| 365  | 368.3           | 7.2                 | 2          | 2                       | 2     |                         |                 |    |    |     |           |         |       |                           |            |       |   |      |
| 360  | 363.3           | 12.2                | 16         | 17                      | 21    |                         |                 |    |    |     |           |         |       |                           |            |       | RESIDUAL<br>Tan, brown, sandy SILT (A-4), saprolitic  | 11.0 |
| 355  | 358.3           | 17.2                | 100        | 0.5                     |       |                         |                 |    |    |     |           |         |       |                           |            |       | WEATHERED ROCK<br>Brown, tan, Gneiss  | 16.0 |
| 350  | 353.3           | 22.2                | 36         | 64                      | 0.4   |                         |                 |    |    |     |           |         |       |                           |            |       |   |      |
| 345  | 348.3           | 27.2                | 100        | 0.3                     |       |                         |                 |    |    |     |           |         |       |                           |            |       |   |      |
|  | 343.3           | 32.2                | 60         | 0.1                     |       |                         |                 |    |    |     |           |         |       |                           |            |       | CRYSTALLINE ROCK<br>Gneiss  | 32.2 |
|  |                 |                     |            |                         |       |                         |                 |    |    |     |           |         |       |                           |            |       | Boring Terminated with Standard Penetration Test Refusal at Elevation 343.2 ft In Crystalline Rock : Gneiss |      |

NCDOT BORE DOUBLE B4725\_GEO\_BRD0012\_GINT.GPJ NC\_DOT.GDT 6/7/12

|  |                     |                         |                         |
|--|---------------------|-------------------------|-------------------------|
| WBS 38499.1.1  | TIP B-4725          | COUNTY CASWELL          | GEOLOGIST Howard, J.    |
| SITE DESCRIPTION Bridge No. 12 Over Country Line Creek on SR 1554 (Yarborough Mill Road) |                     |                         | GROUND WTR (ft)         |
| BORING NO. B2-B  | STATION 20+42       | OFFSET 21 ft RT         | ALIGNMENT -L-           |
| COLLAR ELEV. 375.0 ft  | TOTAL DEPTH 60.8 ft | NORTHING 999,416        | EASTING 1,939,308       |
| DRILL RIG/HAMMER EFF./DATE MAC1145 CME-55LC 88% 03/01/2011                               |                     | DRILL METHOD Mud Rotary | HAMMER TYPE Automatic   |
| DRILLER White, D.  | START DATE 03/07/12 | COMP. DATE 03/07/12     | SURFACE WATER DEPTH N/A |

|  |                     |                         |                         |
|--|---------------------|-------------------------|-------------------------|
| WBS 38499.1.1  | TIP B-4725          | COUNTY CASWELL          | GEOLOGIST Howard, J.    |
| SITE DESCRIPTION Bridge No. 12 Over Country Line Creek on SR 1554 (Yarborough Mill Road) |                     |                         | GROUND WTR (ft)         |
| BORING NO. B2-B  | STATION 20+42       | OFFSET 21 ft RT         | ALIGNMENT -L-           |
| COLLAR ELEV. 375.0 ft  | TOTAL DEPTH 60.8 ft | NORTHING 999,416        | EASTING 1,939,308       |
| DRILL RIG/HAMMER EFF./DATE MAC1145 CME-55LC 88% 03/01/2011                               |                     | DRILL METHOD Mud Rotary | HAMMER TYPE Automatic   |
| DRILLER White, D.  | START DATE 03/07/12 | COMP. DATE 03/07/12     | SURFACE WATER DEPTH N/A |

| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT |         |        | BLOWS PER FOOT |    |    |    |     | SAMP. NO. | LOG | SOIL AND ROCK DESCRIPTION  | DEPTH (ft) |
|-----------|-----------------|------------|------------|---------|--------|----------------|----|----|----|-----|-----------|-----|--|------------|
|           |                 |            | 0.5ft      | 0.5ft   | 0.5ft  | 0              | 25 | 50 | 75 | 100 |           |     |  |            |
| 375       | 375.0           | 0.0        | WOH        | 3       | 10     |                |    |    |    |     |           | M   | GROUND SURFACE   | 0.0        |
| 370       | 371.2           | 3.8        |            | 9       | 12     |                |    |    |    |     |           | M   | ALLUVIAL<br>Tan, sandy, silty CLAY (A-6), with trace organics        |            |
| 365       | 366.2           | 8.8        |            | 9       | 8      |                |    |    |    |     |           | M   |  |            |
| 360       | 361.2           | 13.8       |            | 17      | 22     |                |    |    |    |     |           | D   | RESIDUAL<br>Tan, brown, silty, fine to coarse SAND (A-2-4)           | 12.0       |
| 355       | 356.2           | 18.8       |            | 35      | 41     |                |    |    |    |     |           | D   |  |            |
| 350       | 351.2           | 23.8       |            | 43      | 57/0.4 |                |    |    |    |     |           |     | WEATHERED ROCK<br>Brown, Gneiss                                      | 22.0       |
| 345       | 346.2           | 28.8       |            | 100/0.5 |        |                |    |    |    |     |           |     |  |            |
| 340       | 341.2           | 33.8       |            | 50      | 50/0.2 |                |    |    |    |     |           |     |  |            |
| 335       | 337.3           | 37.7       |            | 60/0.0  |        |                |    |    |    |     |           |     | CRYSTALLINE ROCK<br>Blue-gray, pink Gneiss                           | 37.7       |
| 330       |                 |            |            |         |        |                |    |    |    |     |           |     |  |            |
| 325       |                 |            |            |         |        |                |    |    |    |     |           |     | Pink, Gneiss   | 48.8       |
| 320       |                 |            |            |         |        |                |    |    |    |     |           |     | Pink and blue-gray Gneiss  | 50.4       |
| 315       |                 |            |            |         |        |                |    |    |    |     |           |     |  |            |
|           |                 |            |            |         |        |                |    |    |    |     |           |     | Boring Terminated at Elevation 314.2 ft In Crystalline Rock : Gneiss | 60.8       |

| ELEV (ft) | RUN ELEV (ft) | DEPTH (ft) | RUN (ft) | DRILL RATE (Min/ft)                  | RUN      |         | SAMP. NO. | STRATA       |              | LOG | DESCRIPTION AND REMARKS  | DEPTH (ft) |
|-----------|---------------|------------|----------|--------------------------------------|----------|---------|-----------|--------------|--------------|-----|--|------------|
|           |               |            |          |                                      | REC. (%) | RQD (%) |           | REC. (%)     | RQD (%)      |     |  |            |
| 337.3     | 337.3         | 37.7       | 3.1      | N=60/0.0<br>2:45<br>3:15<br>5:00/1.1 | (2.0)    | (1.3)   |           | (10.0)       | (7.1)        |     | Begin Coring @ 37.7 ft   |            |
| 335       | 334.2         | 40.8       | 5.0      | 3:45<br>3:45<br>3:45<br>4:00         | (4.9)    | (4.2)   | RS-2      |              |              |     | CRYSTALLINE ROCK<br>Blue-gray, pink, slightly weathered to fresh, moderately hard to very hard, very close to moderately close fracturing, Gneiss<br>16 joints at 10°-20°<br>2 joints at 30°<br>R1=7, R2=17, R3=20, R4=20, R5=7<br>RMR=71<br>Rock Type=E | 37.7       |
| 330       | 329.2         | 45.8       | 5.0      | 3:45<br>2:45<br>8:00<br>4:30<br>2:45 | (4.4)    | (1.6)   |           |              |              |     |  |            |
| 325       | 324.2         | 50.8       | 5.0      | 3:00<br>3:00<br>3:00<br>2:30         | (4.7)    | (2.5)   |           | (1.3)<br>81% | (0.0)<br>0%  |     | Pink, moderately severe weathering, moderately hard, very close to close fracturing, Gneiss  | 48.8       |
| 320       | 319.2         | 55.8       | 5.0      | 3:00<br>3:00<br>3:15<br>3:00<br>4:00 | (5.0)    | (2.2)   | RS-3      | (9.7)<br>93% | (4.7)<br>45% |     | Pink and Blue-gray, moderately weathered to fresh, moderately hard to hard, very close to close fracturing, Gneiss<br>2 joints at 20°<br>3 joints at 45°<br>3 joints at 80°<br>R1=15, R2=8, R3=10, R4=20, R5=7<br>RMR=60<br>Rock Type=E                  | 50.4       |
| 315       | 314.2         | 60.8       |          |                                      |          |         |           |              |              |     | Boring Terminated at Elevation 314.2 ft In Crystalline Rock : Gneiss   | 60.8       |

NCDOT BORE SINGLE B4725\_GEO\_BRDGG0012\_GINT.GPJ NC\_DOT.GDT 6/7/12

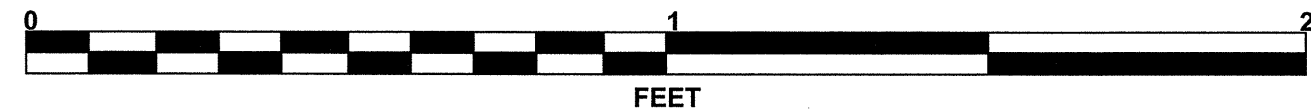
NCDOT CORE SINGLE B4725\_GEO\_BRDGG0012\_GINT.GPJ NC\_DOT.GDT 6/7/12



# CORE PHOTOGRAPHS

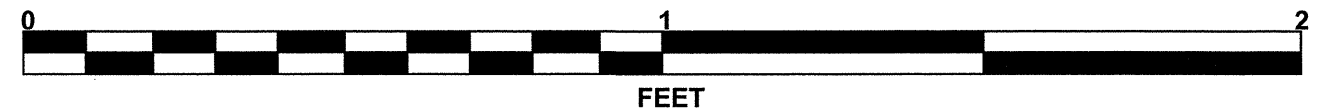
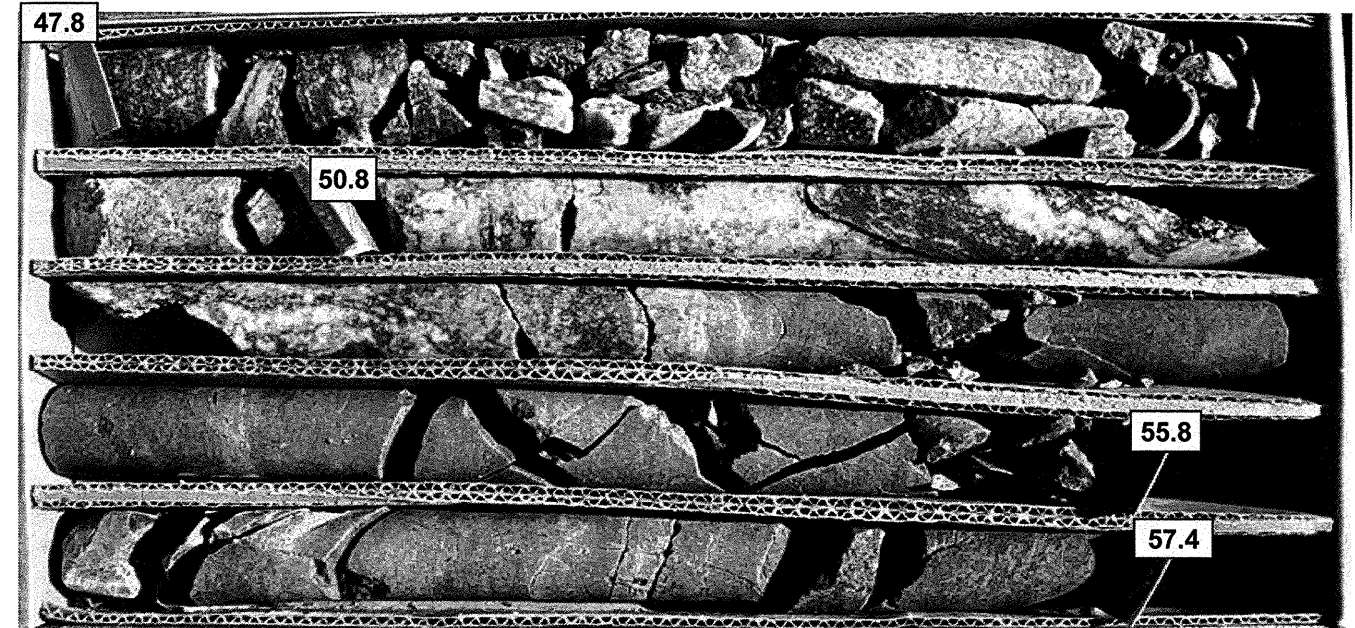
## B2-B

BOX 1: 37.7 - 47.8 FEET



## B2-B

BOXES 2 & 3: 47.8 - 60.8 FEET



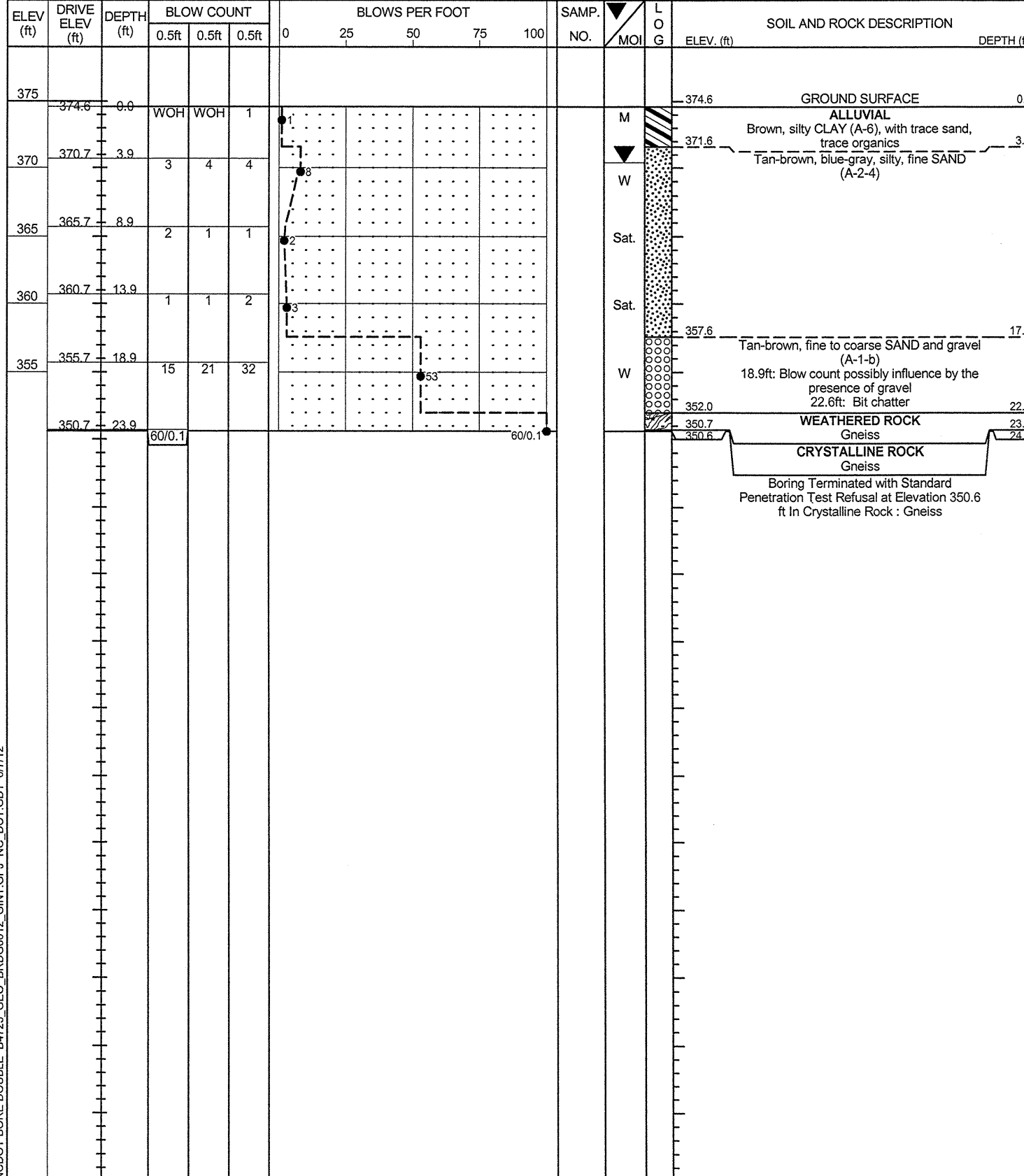




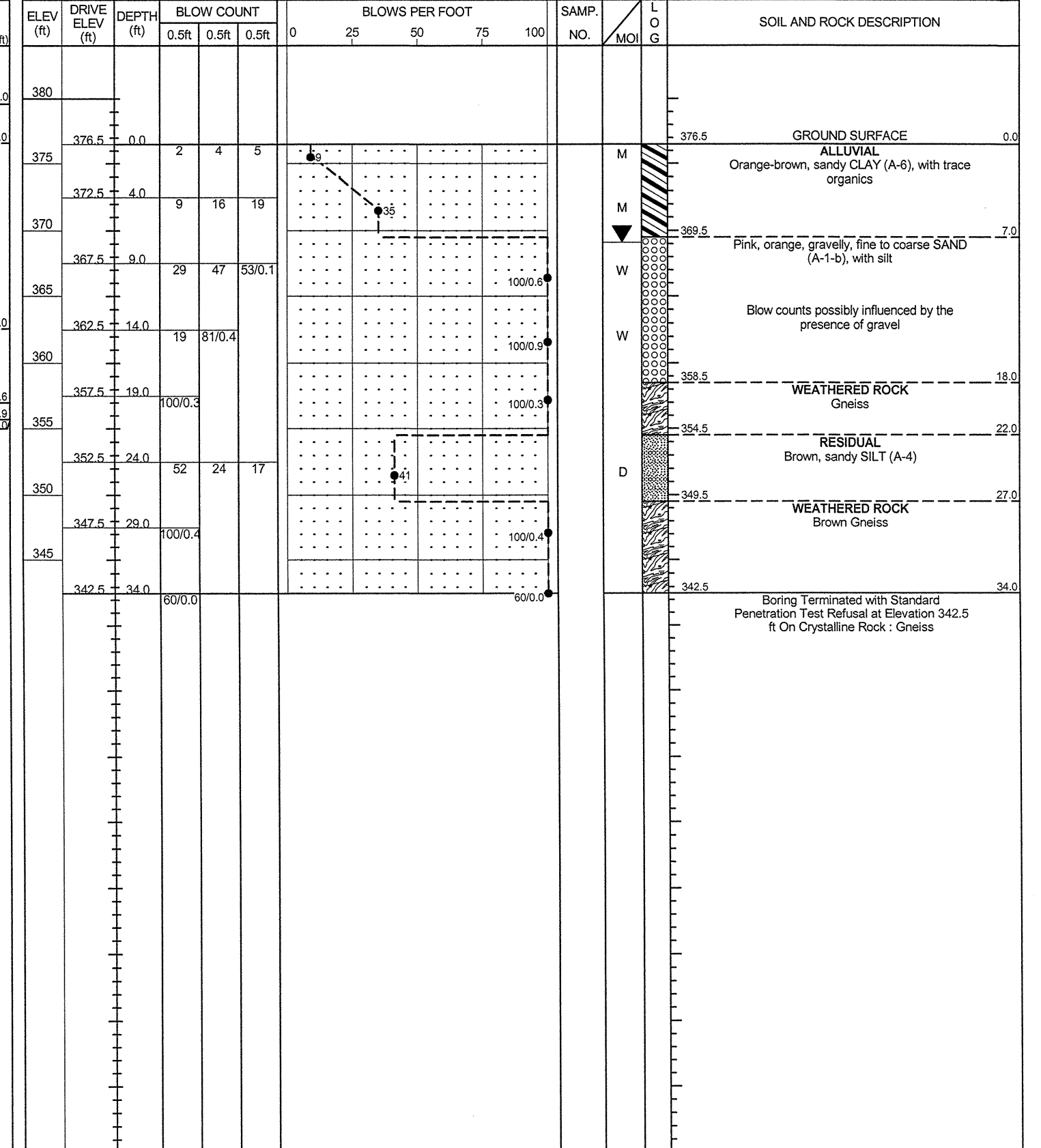


**NCDOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

|  |                     |                         |                         |
|--|---------------------|-------------------------|-------------------------|
| WBS 38499.1.1  | TIP B-4725          | COUNTY CASWELL          | GEOLOGIST Howard, J.    |
| SITE DESCRIPTION Bridge No. 12 Over Country Line Creek on SR 1554 (Yarborough Mill Road) |                     |                         | GROUND WTR (ft)         |
| BORING NO. EB1   | STATION 14+10       | OFFSET CL               | ALIGNMENT -LDET-        |
| COLLAR ELEV. 374.6 ft  | TOTAL DEPTH 24.0 ft | NORTHING 999,400        | EASTING 1,939,192       |
| DRILL RIG/HAMMER EFF./DATE MAC1145 CME-55LC 88% 03/01/2011                               |                     | DRILL METHOD Mud Rotary | HAMMER TYPE Automatic   |
| DRILLER White, D.  | START DATE 03/01/12 | COMP. DATE 03/01/12     | SURFACE WATER DEPTH N/A |



|  |                     |                         |                         |
|--|---------------------|-------------------------|-------------------------|
| WBS 38499.1.1  | TIP B-4725          | COUNTY CASWELL          | GEOLOGIST Howard, J.    |
| SITE DESCRIPTION Bridge No. 12 Over Country Line Creek on SR 1554 (Yarborough Mill Road) |                     |                         | GROUND WTR (ft)         |
| BORING NO. EB2   | STATION 15+40       | OFFSET CL               | ALIGNMENT -LDET-        |
| COLLAR ELEV. 376.5 ft  | TOTAL DEPTH 34.0 ft | NORTHING 999,397        | EASTING 1,939,322       |
| DRILL RIG/HAMMER EFF./DATE MAC1145 CME-55LC 88% 03/01/2011                               |                     | DRILL METHOD Mud Rotary | HAMMER TYPE Automatic   |
| DRILLER White, D.  | START DATE 03/05/12 | COMP. DATE 03/05/12     | SURFACE WATER DEPTH N/A |



NCDOT BORE DOUBLE B4725\_GEO\_BRD0012\_GINT.GPJ NC\_DOT.GDT 6/7/12

| <b>ROCK TEST RESULTS</b> |        |         |            |                |                 |                                     |                  |
|--------------------------|--------|---------|------------|----------------|-----------------|-------------------------------------|------------------|
| SAMPLE NO.               | OFFSET | STATION | BORING NO. | DEPTH INTERVAL | UNIT WT. lbs/cf | UNCONFINED COMPRESSIVE STRENGTH KSI | ROCK MASS RATING |
| RS-1                     | 15 LT  | 19+42   | B1-A       | 34.7-35.50     | 167.6           | 8.18                                | 71               |
| RS-2                     | 21 RT  | 20+42   | B2-B       | 42.40-43.10    | 169.0           | 12.87                               | 71               |
| RS-3                     | 21 RT  | 20+42   | B2-B       | 58.80-59.40    | 164.5           | 62.40                               | 60               |



*Looking down station from EB2-A*



*EB1 on -LDET- looking toward existing bridge*



*Looking down station from EB2-B*



*EB2 looking down station along -LDET-*