

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-------|-----------------------------|-----------|--------------|
| N.C.  | 17BP.13.R.63                | 1         | 7            |

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

# **STRUCTURE SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 17BP.13.R.63 F.A. PROJ. N/A  
COUNTY MITCHELL  
PROJECT DESCRIPTION DIVISION 13 EXPRESS DESIGN BUILD  
BRIDGE REPLACEMENT  
  
SITE DESCRIPTION BRIDGE NO. 48 OVER CANE CREEK  
ON SR-1211 (CANE CREEK ROAD)

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| 4 - 7        | BORE LOG(S)        |

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SUBMITTED BY S&ME, INC.

DATE JULY, 2012

## **CAUTION NOTICE**

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

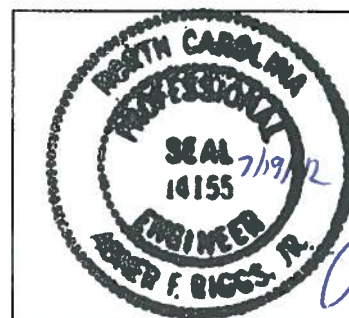
SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE. INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA, AND BOREHOLE INFORMATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS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

THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

DRAWN BY: B. RATTI



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

**SOIL DESCRIPTION**

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 (AASHTO T206, 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:

VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LENSES, MODERATE PLASTIC, A-7-6

**SOIL LEGEND AND AASHTO CLASSIFICATION**

| GENERAL CLASS.                 | GRANULAR MATERIALS<br>( ≤ 35% PASSING #200) |       |           |  |                                 |       |       |       |             |  |              |  | SILT-CLAY MATERIALS<br>( > 35% PASSING #200) |  |       |       |                 |  |                      |  | ORGANIC MATERIALS |  |  |  |
|--------------------------------|---------------------------------------------|-------|-----------|--|---------------------------------|-------|-------|-------|-------------|--|--------------|--|----------------------------------------------|--|-------|-------|-----------------|--|----------------------|--|-------------------|--|--|--|
| GROUP CLASS.                   | A-1                                         |       | A-3       |  | A-2                             |       |       |       | A-4         |  | A-5          |  | A-6                                          |  | A-7   |       | A-1, A-2<br>A-3 |  | A-4, A-5<br>A-6, A-7 |  |                   |  |  |  |
|                                | A-1-a                                       | A-1-b |           |  | A-2-4                           | A-2-5 | A-2-6 | A-2-7 |             |  |              |  |                                              |  | A-7-5 | A-7-6 |                 |  |                      |  |                   |  |  |  |
| SYMBOL                         |                                             |       |           |  |                                 |       |       |       |             |  |              |  |                                              |  |       |       |                 |  |                      |  |                   |  |  |  |
| % PASSING                      | # 10                                        |       | # 30      |  | # 50                            |       | # 60  |       | # 75        |  | # 100        |  | # 200                                        |  | # 400 |       | # 600           |  | # 1000               |  | # 2000            |  |  |  |
| LIQUID LIMIT                   | 50 MX                                       |       | 30 MX     |  | 50 MX                           |       | 51 MN |       | 35 MX       |  | 35 MX        |  | 35 MX                                        |  | 36 MN |       | 36 MN           |  | 36 MN                |  | 36 MN             |  |  |  |
| PLASTIC INDEX                  | 6 MX                                        |       | NP        |  | 10 MX                           |       | 10 MN |       | 11 MN       |  | 11 MN        |  | 11 MN                                        |  | 11 MN |       | 11 MN           |  | 11 MN                |  | 11 MN             |  |  |  |
| GROUP INDEX                    | 0                                           |       | 0         |  | 0                               |       | 4 MX  |       | 8 MX        |  | 12 MX        |  | 16 MX                                        |  | No MX |       |                 |  |                      |  |                   |  |  |  |
| USUAL TYPES OF MAJOR MATERIALS | STONE FRAGS, GRAVEL, AND SAND               |       | FINE SAND |  | SILTY OR CLAYEY GRAVEL AND SAND |       |       |       | SILTY SOILS |  | CLAYEY SOILS |  |                                              |  |       |       |                 |  |                      |  |                   |  |  |  |
| GENERAL RATING AS A SUBGRADE   | EXCELLENT TO GOOD                           |       |           |  |                                 |       |       |       |             |  |              |  | FAIR TO POOR                                 |  |       |       | FAIR TO POOR    |  | POOR                 |  | UNSATURABLE       |  |  |  |

PI OF A-7-5 SUBGROUP IS  $\leq LL - 30$ ; PI OF A-7-6 SUBGROUP IS  $> LL - 30$

**CONSISTENCY OR DENSENESS**

| 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**

| U.S. STD. SIEVE SIZE<br>OPENING (MM) | 4             | 10           | 40                     | 60                 | 200        | 270        |
|--------------------------------------|---------------|--------------|------------------------|--------------------|------------|------------|
|                                      | 4.75          | 2.00         | 0.42                   | 0.25               | 0.075      | 0.053      |
| BOULDER (BLDR.)                      | COBBLE (COB.) | GRAVEL (GR.) | COARSE SAND (CSE. SO.) | FINE SAND (F. SO.) | SILT (SL.) | CLAY (CL.) |
| GRAIN SIZE MM                        | 305           | 75           | 2.0                    | 0.25               | 0.05       | 0.005      |
| SIZE IN.                             | 12            | 3            |                        |                    |            |            |

**SOIL MOISTURE - CORRELATION OF TERMS**

| 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               |
| DM - OPTIMUM MOISTURE                  | - MOIST - (M)              | SOLID; AT OR NEAR OPTIMUM MOISTURE                                  |
| SL - SHRINKAGE LIMIT                   | - DRY - (D)                | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE                |

**PLASTICITY**

| NONPLASTIC      | 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**

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.

**GRADATION**

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)  
 GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

**ANGULARITY OF GRAINS**

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

**MINERALOGICAL COMPOSITION**

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

**COMPRESSIBILITY**

SLIGHTLY COMPRESSIBLE  
 MODERATELY COMPRESSIBLE  
 HIGHLY COMPRESSIBLE

LIQUID LIMIT LESS THAN 31  
 LIQUID LIMIT EQUAL TO 31-50  
 LIQUID LIMIT GREATER THAN 50

**PERCENTAGE OF MATERIAL**

| ORGANIC MATERIAL        | GRANULAR SOILS | SILT - CLAY SOILS | OTHER MATERIAL |
|-------------------------|----------------|-------------------|----------------|
| TRACE OF ORGANIC MATTER | 2 - 3%         | 3 - 5%            | TRACE          |
| LITTLE ORGANIC MATTER   | 3 - 5%         | 5 - 12%           | LITTLE         |
| MODERATELY ORGANIC      | 5 - 10%        | 12 - 20%          | SOME           |
| HIGHLY ORGANIC          | $> 10\%$       | $> 20\%$          | HIGHLY         |
|                         |                |                   | 35% AND ABOVE  |

**GROUND WATER**

WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING  
 STATIC WATER LEVEL AFTER 24 HOURS  
 PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA  
 SPRING OR SEEP

**MISCELLANEOUS SYMBOLS**

|  |                                                    |  |                              |  |                     |
|--|----------------------------------------------------|--|------------------------------|--|---------------------|
|  | ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION      |  | TEST BORING                  |  | TEST BORING W/ CORE |
|  | SOIL SYMBOL                                        |  | AUGER BORING                 |  | SPT N-VALUE         |
|  | ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT |  | CORE BORING                  |  | SPT REFUSAL         |
|  | INFERRED SOIL BOUNDARY                             |  | MONITORING WELL              |  |                     |
|  | INFERRED ROCK LINE                                 |  | PIEZOMETER INSTALLATION      |  |                     |
|  | ALLUVIAL SOIL BOUNDARY                             |  | SLOPE INDICATOR INSTALLATION |  |                     |
|  | DIP & DIP DIRECTION OF ROCK STRUCTURES             |  | CONE PENETROMETER TEST       |  |                     |
|  |                                                    |  | SOUNDING ROD                 |  |                     |

**ABBREVIATIONS**

|                                |                          |                                  |
|--------------------------------|--------------------------|----------------------------------|
| AR - AUGER REFUSAL             | MED. - MEDIUM            | VST - VANE SHEAR TEST            |
| BT - BORING TERMINATED         | MICA - MICACEOUS         | WEA. - WEATHERED                 |
| CL - CLAY                      | MOD. - MODERATELY        | W - UNIT WEIGHT                  |
| CPT - CONE PENETRATION TEST    | NP - NON PLASTIC         | W <sub>u</sub> - DRY UNIT WEIGHT |
| CSE - COARSE                   | ORG. - ORGANIC           |                                  |
| DMT - DILATOMETER TEST         | PMT - PRESSUREMETER TEST | <b>SAMPLE ABBREVIATIONS</b>      |
| DPT - DYNAMIC PENETRATION TEST | SAP. - SAPROLITIC        | S - BULK                         |
| • - VOID RATIO                 | SD. - SAND, SANDY        | SS - SPLIT SPOON                 |
| F - FINE                       | SL. - SILT, SILTY        | ST - SHELBY TUBE                 |
| FOSS. - FOSSILIFEROUS          | SLI. - SLIGHTLY          | RS - ROCK                        |
| FRAC. - FRACTURED, FRACTURES   | TCR - TRICONE REFUSAL    | RT - RECOMPACTED TRIAXIAL        |
| FRAGS. - FRAGMENTS             | w - MOISTURE CONTENT     | CBR - CALIFORNIA BEARING RATIO   |
| HL. - HIGHLY                   | V - VERY                 |                                  |

**EQUIPMENT USED ON SUBJECT PROJECT**

|                                             |                                                                                 |                                                                               |
|---------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| <b>DRILL UNITS:</b>                         | <b>ADVANCING TOOLS:</b>                                                         | <b>HAMMER TYPE:</b>                                                           |
| <input type="checkbox"/> MOBILE B -         | <input type="checkbox"/> CLAY BITS                                              | <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL |
| <input type="checkbox"/> BK-51              | <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER                             | <b>CORE SIZE:</b>                                                             |
| <input type="checkbox"/> CME-45C            | <input type="checkbox"/> 8" HOLLOW AUGERS                                       | <input type="checkbox"/> -B                                                   |
| <input type="checkbox"/> CME-55B            | <input type="checkbox"/> HARD FACED FINGER BITS                                 | <input type="checkbox"/> -N                                                   |
| <input type="checkbox"/> PORTABLE HOIST     | <input type="checkbox"/> TUNG.-CARBIDE INSERTS                                  | <input type="checkbox"/> -H                                                   |
| <input checked="" type="checkbox"/> CME-45B | <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER | <b>HAND TOOLS:</b>                                                            |
|                                             | <input type="checkbox"/> TRICONE <input type="checkbox"/> STEEL TEETH           | <input type="checkbox"/> POST HOLE DIGGER                                     |
|                                             | <input checked="" type="checkbox"/> TRICONE 2-1/8" TUNG.-CARB.                  | <input type="checkbox"/> HAND AUGER                                           |
|                                             | <input type="checkbox"/> CORE BIT                                               | <input type="checkbox"/> SOUNDING ROD                                         |
|                                             | <input checked="" type="checkbox"/> 3-1/4" HOLLOW AUGER                         | <input type="checkbox"/> VANE SHEAR TEST                                      |

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

| ROCK DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                  | TERMS AND DEFINITIONS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| <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. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p> |                                                                                                                                                                                                                                                                                                                                                                  | <p><b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.</p> <p><b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.</p> <p><b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p><b>ARGILLACEOUS</b> - 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><b>ARTESIAN</b> - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.</p> <p><b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p><b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p><b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p><b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p><b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p><b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p><b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p><b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p><b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOOGED FROM PARENT MATERIAL.</p> <p><b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p><b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p><b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p><b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p><b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p><b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p><b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p><b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p><b>ROCK QUALITY DESIGNATION (RQD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p><b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p><b>SILL</b> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.</p> <p><b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p><b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.</p> <p><b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p><b>STRATA ROCK QUALITY DESIGNATION (SRQD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.</p> <p><b>TOPSOIL (TS)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p> |                   |
| <p><b>WEATHERED ROCK (WR)</b></p> <p><b>CRYSTALLINE ROCK (CR)</b></p> <p><b>NON-CRYSTALLINE ROCK (NCRI)</b></p> <p><b>COASTAL PLAIN SEDIMENTARY ROCK (CP)</b></p>                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                  | <p><b>NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES &gt; 100 BLOWS PER FOOT IF TESTED.</b></p> <p><b>FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</b></p> <p><b>FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.</b></p> <p><b>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |
| WEATHERING                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| FRESH                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| VERY SLIGHT (V SL.)                                                                                                                                                                                                                                                                                                                                                                                                                                                    | ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| SLIGHT (SL.)                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH, OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| MODERATE (MOD.)                                                                                                                                                                                                                                                                                                                                                                                                                                                        | SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS, IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| MODERATELY SEVERE (MOD. SEV.)                                                                                                                                                                                                                                                                                                                                                                                                                                          | ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KADINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <b>IF TESTED, WOULD YIELD SPT REFUSAL.</b>                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| SEVERE (SEV.)                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KADINIZED TO SOME EXTENT, SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <b>IF TESTED, YIELDS SPT N VALUES &gt; 100 BPF.</b>                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| VERY SEVERE (V SEV.)                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <b>IF TESTED, YIELDS SPT N VALUES &lt; 100 BPF.</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| COMPLETE                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| ROCK HARDNESS                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| VERY HARD                                                                                                                                                                                                                                                                                                                                                                                                                                                              | CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| HARD                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| MODERATELY HARD                                                                                                                                                                                                                                                                                                                                                                                                                                                        | CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| MEDIUM HARD                                                                                                                                                                                                                                                                                                                                                                                                                                                            | CAN BE GROUDED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT, CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| SOFT                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | CAN BE GROUDED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| VERY SOFT                                                                                                                                                                                                                                                                                                                                                                                                                                                              | CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY FINGER NAIL.                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| FRACTURE SPACING                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                  | BEDDING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |
| 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      |
| INDURATION                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| FRIABLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                | RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| MODERATELY INDURATED                                                                                                                                                                                                                                                                                                                                                                                                                                                   | GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| INDURATED                                                                                                                                                                                                                                                                                                                                                                                                                                                              | GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |
| EXTREMELY INDURATED                                                                                                                                                                                                                                                                                                                                                                                                                                                    | SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |

NOTES:

**BM - BENCH MARK**

BENCH MARK: REFERENCE 'G' MARKED ON BRIDGE DECK IN S.E. CORNER

ELEVATION: 100.00 FT.



0 40 80  
 FEET

SCALE: 1" = 40'

DATE: JULY 2012

DRAWN BY: BTR

PROJECT NO:  
 1051-12-065A



**S&ME**  
 WWW.SMEINC.COM

NC ENGINEER LICENSE #F-0176  
 3201 SPRING FOREST RD, RALEIGH, NC 27616

# **BORING LOCATION MAP**

BRIDGE NO. 48  
 OVER CANE CREEK ON SR-1211  
 STATE PROJ NO. 17BP.13.R.63  
 MITCHELL COUNTY, NORTH CAROLINA

FIGURE NO.

**3**





# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

SHEET 4

|                                                           |  |  |                     |  |  |                          |  |  |                         |                 |  |
|-----------------------------------------------------------|--|--|---------------------|--|--|--------------------------|--|--|-------------------------|-----------------|--|
| WBS 17BP.13.R.63                                          |  |  | TIP 17BP.13.R.63    |  |  | COUNTY MITCHELL          |  |  | GEOLOGIST Brandsen, J.  |                 |  |
| SITE DESCRIPTION Bridge No. 48 over Cane Creek on SR-1211 |  |  |                     |  |  |                          |  |  |                         | GROUND WTR (ft) |  |
| BORING NO. EB1-A                                          |  |  | STATION N/A         |  |  | OFFSET N/A               |  |  | ALIGNMENT N/A           |                 |  |
| COLLAR ELEV. 99.8 ft                                      |  |  | TOTAL DEPTH 33.5 ft |  |  | NORTHING 842,671         |  |  | EASTING 1,089,127       |                 |  |
| DRILL RIG/HAMMER EFF./DATE SME CME-45B 77% 6/29/12        |  |  |                     |  |  | DRILL METHOD H.S. Augers |  |  | HAMMER TYPE Automatic   |                 |  |
| DRILLER Hardee, S.                                        |  |  | START DATE 05/08/12 |  |  | COMP. DATE 05/08/12      |  |  | 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 |           |     |                           |            |                                                                                                            |
| 100       |                 |            |            |       |        |                |    |    |    |     |           |     |                           |            |                                                                                                            |
|           | 98.8            | 1.0        | 3          | 1     | 2      |                |    |    |    |     |           |     |                           | 99.8       | GROUND SURFACE                                                                                             |
|           | 96.3            | 3.5        | 27         | 28    | 22     |                |    |    |    |     |           |     |                           |            | ROADWAY EMBANKMENT                                                                                         |
| 95        |                 |            |            |       |        |                |    |    |    |     |           |     |                           |            | Gray Silty Fine SAND with Some Rock Fragments                                                              |
|           | 91.3            | 8.5        | 9          | 12    | 12     |                |    |    |    |     |           |     |                           | 93.8       | RESIDUAL                                                                                                   |
| 90        |                 |            |            |       |        |                |    |    |    |     |           |     |                           |            | Tan-Gray-White Silty Fine SAND with Trace of Clay                                                          |
|           | 86.3            | 13.5       | 3          | 4     | 11     |                |    |    |    |     |           |     |                           |            |                                                                                                            |
| 85        |                 |            |            |       |        |                |    |    |    |     |           |     |                           |            |                                                                                                            |
|           | 81.3            | 18.5       | 7          | 8     | 10     |                |    |    |    |     |           |     |                           |            |                                                                                                            |
| 80        |                 |            |            |       |        |                |    |    |    |     |           |     |                           |            |                                                                                                            |
|           | 76.3            | 23.5       | 8          | 12    | 12     |                |    |    |    |     |           |     |                           |            |                                                                                                            |
| 75        |                 |            |            |       |        |                |    |    |    |     |           |     |                           |            |                                                                                                            |
|           | 71.3            | 28.5       | 27         | 63    | 37/0.2 |                |    |    |    |     |           |     |                           |            |                                                                                                            |
| 70        |                 |            |            |       |        |                |    |    |    |     |           |     |                           |            |                                                                                                            |
|           | 66.3            | 33.5       | 60/0.0     |       |        |                |    |    |    |     |           |     |                           | 70.8       | WEATHERED ROCK                                                                                             |
|           |                 |            |            |       |        |                |    |    |    |     |           |     |                           |            | (Gneiss)                                                                                                   |
|           |                 |            |            |       |        |                |    |    |    |     |           |     |                           | 66.3       |                                                                                                            |
|           |                 |            |            |       |        |                |    |    |    |     |           |     |                           |            | Boring Terminated with Standard Penetration Test Refusal at Elevation 66.3 ft on Crystalline Rock (Gneiss) |
|           |                 |            |            |       |        |                |    |    |    |     |           |     |                           |            | 1) Advanced 3-1/4" HSA to 33.5 Feet.                                                                       |



| WBS 17BP.13.R.63                                          |                       |               |            | TIP 17BP.13.R.63    |        |                |    | COUNTY MITCHELL          |    |     |              | GEOLOGIST Brandsen, J.  |                           |            |                                                                                                                                                        |
|-----------------------------------------------------------|-----------------------|---------------|------------|---------------------|--------|----------------|----|--------------------------|----|-----|--------------|-------------------------|---------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| SITE DESCRIPTION Bridge No. 48 over Cane Creek on SR-1211 |                       |               |            |                     |        |                |    |                          |    |     |              | GROUND WTR (ft)         |                           |            |                                                                                                                                                        |
| BORING NO. EB1-B                                          |                       |               |            | STATION N/A         |        |                |    | OFFSET N/A               |    |     |              | ALIGNMENT N/A           |                           |            |                                                                                                                                                        |
| COLLAR ELEV. 98.9 ft                                      |                       |               |            | TOTAL DEPTH 36.1 ft |        |                |    | NORTHING 842,660         |    |     |              | EASTING 1,089,142       |                           |            |                                                                                                                                                        |
| DRILL RIG/HAMMER EFF./DATE SME CME-45B 77% 6/29/12        |                       |               |            |                     |        |                |    | DRILL METHOD H.S. Augers |    |     |              | HAMMER TYPE Automatic   |                           |            |                                                                                                                                                        |
| DRILLER Hardee, S.                                        |                       |               |            | START DATE 05/10/12 |        |                |    | COMP. DATE 05/10/12      |    |     |              | SURFACE WATER DEPTH N/A |                           |            |                                                                                                                                                        |
| ELEV<br>(ft)                                              | DRIVE<br>ELEV<br>(ft) | DEPTH<br>(ft) | BLOW COUNT |                     |        | BLOWS PER FOOT |    |                          |    |     | SAMP.<br>NO. | LOG                     | SOIL AND ROCK DESCRIPTION |            |                                                                                                                                                        |
|                                                           |                       |               | 0.5ft      | 0.5ft               | 0.5ft  | 0              | 25 | 50                       | 75 | 100 |              |                         | ELEV. (ft)                | DEPTH (ft) |                                                                                                                                                        |
| 100                                                       |                       |               |            |                     |        |                |    |                          |    |     |              |                         |                           |            |                                                                                                                                                        |
|                                                           | 97.9                  | 1.0           | 3          | 10                  | 12     |                |    |                          |    |     |              |                         |                           |            | PAVEMENT<br>Asphalt and CABC Stone                                                                                                                     |
| 95                                                        | 95.4                  | 3.5           | 12         | 10                  | 9      |                |    |                          |    |     |              |                         |                           |            | ROADWAY EMBANKMENT<br>Tan-Brown-Gray Silty Fine SAND with Some Gravel                                                                                  |
| 90                                                        | 90.4                  | 8.5           | 34         | 10                  | 4      |                |    |                          |    |     |              |                         |                           |            |                                                                                                                                                        |
| 85                                                        | 85.4                  | 13.5          | 4          | 5                   | 4      |                |    |                          |    |     |              |                         |                           |            | RESIDUAL<br>Tan-Gray-Brown Silty Fine SAND with Some Rock Fragments                                                                                    |
| 80                                                        | 80.4                  | 18.5          | 2          | 4                   | 9      |                |    |                          |    |     |              |                         |                           |            |                                                                                                                                                        |
| 75                                                        | 75.4                  | 23.5          | 12         | 20                  | 21     |                |    |                          |    |     |              |                         |                           |            |                                                                                                                                                        |
| 70                                                        | 70.4                  | 28.5          | 25         | 52                  | 48/0.4 |                |    |                          |    |     |              |                         |                           |            | WEATHERED ROCK<br>(Gneiss)                                                                                                                             |
| 65                                                        | 65.4                  | 33.5          |            |                     |        |                |    |                          |    |     |              |                         |                           |            |                                                                                                                                                        |
|                                                           | 62.8                  | 36.1          |            |                     |        |                |    |                          |    |     |              |                         |                           |            | Boring Terminated with Standard Penetration Test Refusal at Elevation 62.8 ft on Crystalline Rock (Gneiss)<br><br>1) Advanced 3-1/4" HSA to 36.1 Feet. |





# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

SHEET 7

|                                                           |  |  |                     |  |  |                          |  |  |                         |  |  |
|-----------------------------------------------------------|--|--|---------------------|--|--|--------------------------|--|--|-------------------------|--|--|
| WBS 17BP.13.R.63                                          |  |  | TIP 17BP.13.R.63    |  |  | COUNTY MITCHELL          |  |  | GEOLOGIST Brandsen, J.  |  |  |
| SITE DESCRIPTION Bridge No. 48 over Cane Creek on SR-1211 |  |  |                     |  |  |                          |  |  | GROUND WTR (ft)         |  |  |
| BORING NO. EB2-B                                          |  |  | STATION N/A         |  |  | OFFSET N/A               |  |  | ALIGNMENT N/A           |  |  |
| COLLAR ELEV. 97.3 ft                                      |  |  | TOTAL DEPTH 31.2 ft |  |  | NORTHING 842,710         |  |  | EASTING 1,089,172       |  |  |
| DRILL RIG/HAMMER EFF./DATE SME CME-45B 77% 6/29/12        |  |  |                     |  |  | DRILL METHOD Wash Boring |  |  | HAMMER TYPE Automatic   |  |  |
| DRILLER Hardee, S.                                        |  |  | START DATE 05/10/12 |  |  | COMP. DATE 05/10/12      |  |  | SURFACE WATER DEPTH N/A |  |  |

| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT |       |        | BLOWS PER FOOT |    |    |    |     | SAMP. NO. | LOG | SOIL AND ROCK DESCRIPTION                                                                                                                                                                                                                                 |            |  |
|-----------|-----------------|------------|------------|-------|--------|----------------|----|----|----|-----|-----------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--|
|           |                 |            | 0.5ft      | 0.5ft | 0.5ft  | 0              | 25 | 50 | 75 | 100 |           |     | ELEV. (ft)                                                                                                                                                                                                                                                | DEPTH (ft) |  |
| 100       |                 |            |            |       |        |                |    |    |    |     |           |     |                                                                                                                                                                                                                                                           |            |  |
| 95        | 96.3            | 1.0        | 5          | 5     | 11     |                |    |    |    |     |           | M   | PAVEMENT                                                                                                                                                                                                                                                  | 0.0        |  |
|           | 93.8            | 3.5        | 20         | 13    | 10     |                |    |    |    |     |           | M   | Asphalt and CABC Stone                                                                                                                                                                                                                                    | 6.5        |  |
| 90        |                 |            |            |       |        |                |    |    |    |     |           |     | ROADWAY EMBANKMENT                                                                                                                                                                                                                                        |            |  |
|           | 88.8            | 8.5        | 13         | 5     | 17     |                |    |    |    |     |           | M   | Tan-Gray Silty Fine SAND with Some Rock Fragments                                                                                                                                                                                                         |            |  |
| 85        |                 |            |            |       |        |                |    |    |    |     |           |     |                                                                                                                                                                                                                                                           |            |  |
|           | 83.8            | 13.5       | 3          | 4     | 4      |                |    |    |    |     |           | M   | RESIDUAL                                                                                                                                                                                                                                                  | 11.0       |  |
| 80        |                 |            |            |       |        |                |    |    |    |     |           |     | Tan-Gray Silty Fine SAND with Some Mica                                                                                                                                                                                                                   |            |  |
|           | 78.8            | 18.5       | 18         | 16    | 16     |                |    |    |    |     |           | M   |                                                                                                                                                                                                                                                           |            |  |
| 75        |                 |            |            |       |        |                |    |    |    |     |           |     |                                                                                                                                                                                                                                                           |            |  |
|           | 73.8            | 23.5       | 10         | 28    | 42     |                |    |    |    |     |           | M   |                                                                                                                                                                                                                                                           |            |  |
| 70        |                 |            |            |       |        |                |    |    |    |     |           |     |                                                                                                                                                                                                                                                           |            |  |
|           | 68.8            | 28.5       | 68         | 73    | 27/0.2 |                |    |    |    |     |           |     | WEATHERED ROCK                                                                                                                                                                                                                                            | 27.0       |  |
|           | 66.1            | 31.2       | 60/0.0     |       |        |                |    |    |    |     |           |     | (Gneiss)                                                                                                                                                                                                                                                  | 31.2       |  |
|           |                 |            |            |       |        |                |    |    |    |     |           |     | Boring Terminated with Standard Penetration Test Refusal at Elevation 66.1 ft on Crystalline Rock (Gneiss)                                                                                                                                                |            |  |
|           |                 |            |            |       |        |                |    |    |    |     |           |     | 1) Advanced 3-1/4" HSA to 8.5 feet.<br>2) Advanced NW Casing to 8.5 feet<br>3) Advanced 2-15/16" Tricone to 31.2.<br>4) Creek Water Used as Drilling Fluid.<br>5) Some Drilling Fluid Loss was Observed.<br>6) Approximate Drilling Fluid Density 62.4PCF |            |  |