

REFERENCE: SF-650015

PROJECT: 17BP.1.R.90

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY NORTHAMPTON  
PROJECT DESCRIPTION BRIDGE NO. 15 ON -L-  
(SR 1505) OVER WILDCAT SWAMP AT STA. 15+57

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| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
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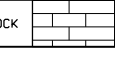
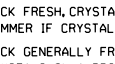
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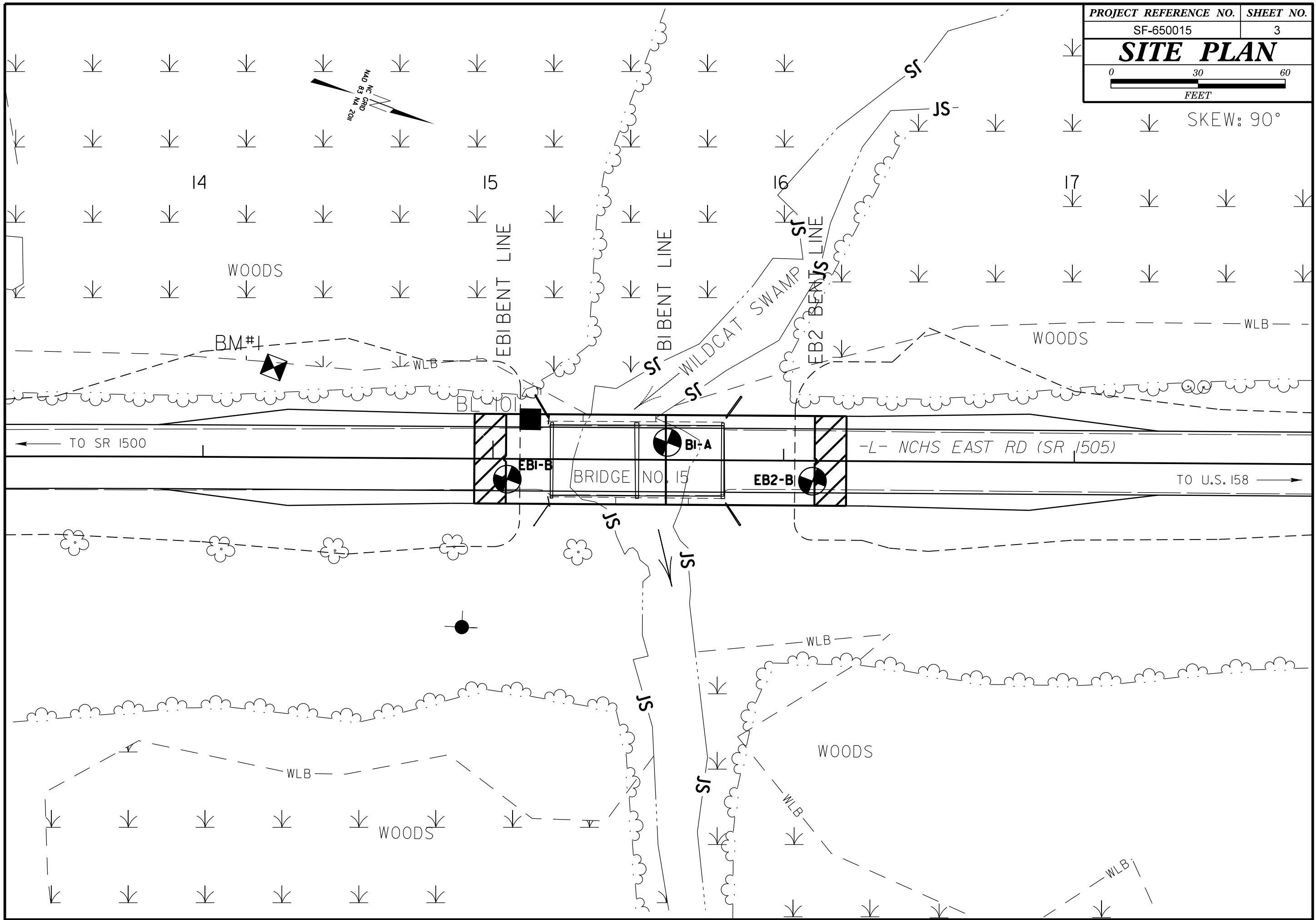
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**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
**GEOTECHNICAL ENGINEERING UNIT**  
**SUBSURFACE INVESTIGATION**  
**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

| SOIL DESCRIPTION  |  |  |  |  |  |  |  |  |  | GRADATION   |  |  |  |  |  |  |  |  |  | ROCK DESCRIPTION   |  |  |  |  |  |  |  |  |  | TERMS AND DEFINITIONS   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (ASTM T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i> |  |  |  |  |  |  |  |  |  | <b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.<br><b>UNIFORMLY GRADED</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.<br><b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.  |  |  |  |  |  |  |  |  |  | <b>HARD ROCK</b> IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:   |  |  |  |  |  |  |  |  |  | <b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.<br><b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.<br><b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.<br><b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.<br><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.<br><b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.<br><b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.<br><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.<br><b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.<br><b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.<br><b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.<br><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.<br><b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.<br><b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.<br><b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.<br><b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.<br><b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.<br><b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.<br><b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.<br><b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.<br><b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.<br><b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.<br><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.<br><b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.<br><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.<br><b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.<br><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.<br><b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.<br><b>STRATA ROCK QUALITY DESIGNATION (SROD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.<br><b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>SOIL LEGEND AND AASHTO CLASSIFICATION</b>  |  |  |  |  |  |  |  |  |  | <b>ANGULARITY OF GRAINS</b><br>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <b>ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</b>   |  |  |  |  |  |  |  |  |  | <b>WEATHERED ROCK (WR)</b><br> NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>MINERALOGICAL COMPOSITION</b><br>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.   |  |  |  |  |  |  |  |  |  | <b>CRYSTALLINE ROCK (CR)</b><br> FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>COMPRESSION</b><br>SLIGHTLY COMPRESSIBLE LL < 31<br>MODERATELY COMPRESSIBLE LL = 31 - 50<br>HIGHLY COMPRESSIBLE LL > 50  |  |  |  |  |  |  |  |  |  | <b>NON-CRYSTALLINE ROCK (NCR)</b><br> 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>PERCENTAGE OF MATERIAL</b>   |  |  |  |  |  |  |  |  |  | <b>COASTAL PLAIN SEDIMENTARY ROCK (CPS)</b><br> COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>GROUND WATER</b>   |  |  |  |  |  |  |  |  |  | <b>WEATHERING</b>   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING<br>STATIC WATER LEVEL AFTER 24 HOURS<br>PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA<br>SPRING OR SEEP  |  |  |  |  |  |  |  |  |  | <b>FRESH</b> ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.<br><b>VERY SLIGHT (V SLI.)</b> 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.<br><b>SLIGHT (SLI.)</b> 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.<br><b>MODERATE (MOD.)</b> 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.<br><b>MODERATELY SEVERE (MOD. SEV.)</b> ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i><br><b>SEVERE (SEV.)</b> ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES &gt; 100 BPF</i><br><b>VERY SEVERE (V SEV.)</b> ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</i><br><b>COMPLETE</b> ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE. |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>MISCELLANEOUS SYMBOLS</b>  |  |  |  |  |  |  |  |  |  | <b>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</b><br><b>SOIL SYMBOL</b><br><b>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</b><br><b>INFERRED SOIL BOUNDARY</b><br><b>INFERRED ROCK LINE</b><br><b>ALLUVIAL SOIL BOUNDARY</b>  |  |  |  |  |  |  |  |  |  | <b>DIP &amp; DIP DIRECTION OF ROCK STRUCTURES</b><br><b>SPT DMT VST PMT TEST BORING</b><br><b>AUGER BORING</b><br><b>CORE BORING</b><br><b>MONITORING WELL</b><br><b>PIEZOMETER INSTALLATION</b><br><b>SLOPE INDICATOR INSTALLATION</b><br><b>CONE PENETROMETER TEST</b><br><b>SOUNDING ROD</b><br><b>TEST BORING WITH CORE</b><br><b>SPT N-VALUE</b>  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>CONSISTENCY OR DENSENESS</b>   |  |  |  |  |  |  |  |  |  | <b>RECOMMENDATION SYMBOLS</b>   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PRIMARY SOIL TYPE, COMPACTNESS OR CONSISTENCY, RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE), RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )   |  |  |  |  |  |  |  |  |  | <b>UNDERCUT</b><br><b>SHALLOW UNDERCUT</b><br><b>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</b><br><b>UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</b>  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>TEXTURE OR GRAIN SIZE</b>  |  |  |  |  |  |  |  |  |  | <b>ABBREVIATIONS</b>  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| U.S. STD. SIEVE SIZE OPENING (MM), BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CS, SD.), FINE SAND (F SD.), SILT (SL.), CLAY (CL.)   |  |  |  |  |  |  |  |  |  | <b>AR - AUGER REFUSAL</b><br><b>BT - BORING TERMINATED</b><br><b>CL - CLAY</b><br><b>CPT - CONE PENETRATION TEST</b><br><b>CSE - COARSE</b><br><b>DMT - DILATOMETER TEST</b><br><b>DPT - DYNAMIC PENETRATION TEST</b><br><b>e - VOID RATIO</b><br><b>F - FINE</b><br><b>FOSS. - FOSSILIFEROUS</b><br><b>FRAC. - FRACTURED, FRACTURES</b><br><b>FRAGS. - FRAGMENTS</b><br><b>HI. - HIGHLY</b>  |  |  |  |  |  |  |  |  |  | <b>VST - VANE SHEAR TEST</b><br><b>WEA. - WEATHERED</b><br><b>W - UNIT WEIGHT</b><br><b>W<sub>d</sub> - DRY UNIT WEIGHT</b><br><b>SAMPLE ABBREVIATIONS</b><br><b>S - BULK</b><br><b>SS - SPLIT SPOON</b><br><b>ST - SHELBY TUBE</b><br><b>RS - ROCK</b><br><b>RT - RECOMPACTED TRIAXIAL</b><br><b>CBR - CALIFORNIA BEARING RATIO</b>   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>SOIL MOISTURE - CORRELATION OF TERMS</b>   |  |  |  |  |  |  |  |  |  | <b>EQUIPMENT USED ON SUBJECT PROJECT</b>  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SOIL MOISTURE SCALE (ATTERBERG LIMITS), FIELD MOISTURE DESCRIPTION, GUIDE FOR FIELD MOISTURE DESCRIPTION  |  |  |  |  |  |  |  |  |  | <b>DRILL UNITS:</b><br><input checked="" type="checkbox"/> CME-45C<br><input type="checkbox"/> CME-55<br><input type="checkbox"/> CME-550<br><input type="checkbox"/> VANE SHEAR TEST<br><input type="checkbox"/> PORTABLE HOIST  |  |  |  |  |  |  |  |  |  | <b>ADVANCING TOOLS:</b><br><input type="checkbox"/> CLAY BITS<br><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER<br><input type="checkbox"/> 8" HOLLOW AUGERS<br><input type="checkbox"/> HARD FACED FINGER BITS<br><input type="checkbox"/> TUNG-CARBIDE INSERTS<br><input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER<br><input checked="" type="checkbox"/> TRICONE 2 1/8" STEEL TEETH<br><input type="checkbox"/> TRICONE " TUNG-CARB.<br><input type="checkbox"/> CORE BIT |  |  |  |  |  |  |  |  |  | <b>HAMMER TYPE:</b><br><input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL<br><b>CORE SIZE:</b><br><input type="checkbox"/> -B <input type="checkbox"/> -H <input type="checkbox"/> -N<br><b>HAND TOOLS:</b><br><input type="checkbox"/> POST HOLE DIGGER<br><input type="checkbox"/> HAND AUGER<br><input type="checkbox"/> SOUNDING ROD<br><input type="checkbox"/> VANE SHEAR TEST   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>PLASTICITY</b>   |  |  |  |  |  |  |  |  |  | <b>FRACTURE SPACING</b>   |  |  |  |  |  |  |  |  |  | <b>BEDDING</b>   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PLASTICITY INDEX (PI), DRY STRENGTH   |  |  |  |  |  |  |  |  |  | TERM, SPACING, THICKNESS  |  |  |  |  |  |  |  |  |  | TERM, THICKNESS  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| NON PLASTIC, SLIGHTLY PLASTIC, MODERATELY PLASTIC, HIGHLY PLASTIC   |  |  |  |  |  |  |  |  |  | VERY WIDE, WIDE, MODERATELY CLOSE, CLOSE, VERY CLOSE  |  |  |  |  |  |  |  |  |  | VERY THICKLY BEDDED, THICKLY BEDDED, THINLY BEDDED, VERY THINLY BEDDED, THICKLY LAMINATED, THINLY LAMINATED  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>COLOR</b>  |  |  |  |  |  |  |  |  |  | <b>INDURATION</b>   |  |  |  |  |  |  |  |  |  | <b>NOTES:</b>  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.  |  |  |  |  |  |  |  |  |  | FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.   |  |  |  |  |  |  |  |  |  | <b>BENCH MARK: BL-101</b><br><b>N: 2493103.8276</b><br><b>E: 982043.2127</b> ELEVATION: 95.79 FEET   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   |  |  |  |  |  |  |  |  |  | <b>FRIABLE</b> RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.   |  |  |  |  |  |  |  |  |  | <b>MODERATELY INDURATED</b> GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   |  |  |  |  |  |  |  |  |  | <b>INDURATED</b> GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.   |  |  |  |  |  |  |  |  |  | <b>EXTREMELY INDURATED</b> SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

|                       |           |
|-----------------------|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| SF-650015             | 3         |
| <b>SITE PLAN</b>      |           |
|                       |           |
| FEET                  |           |

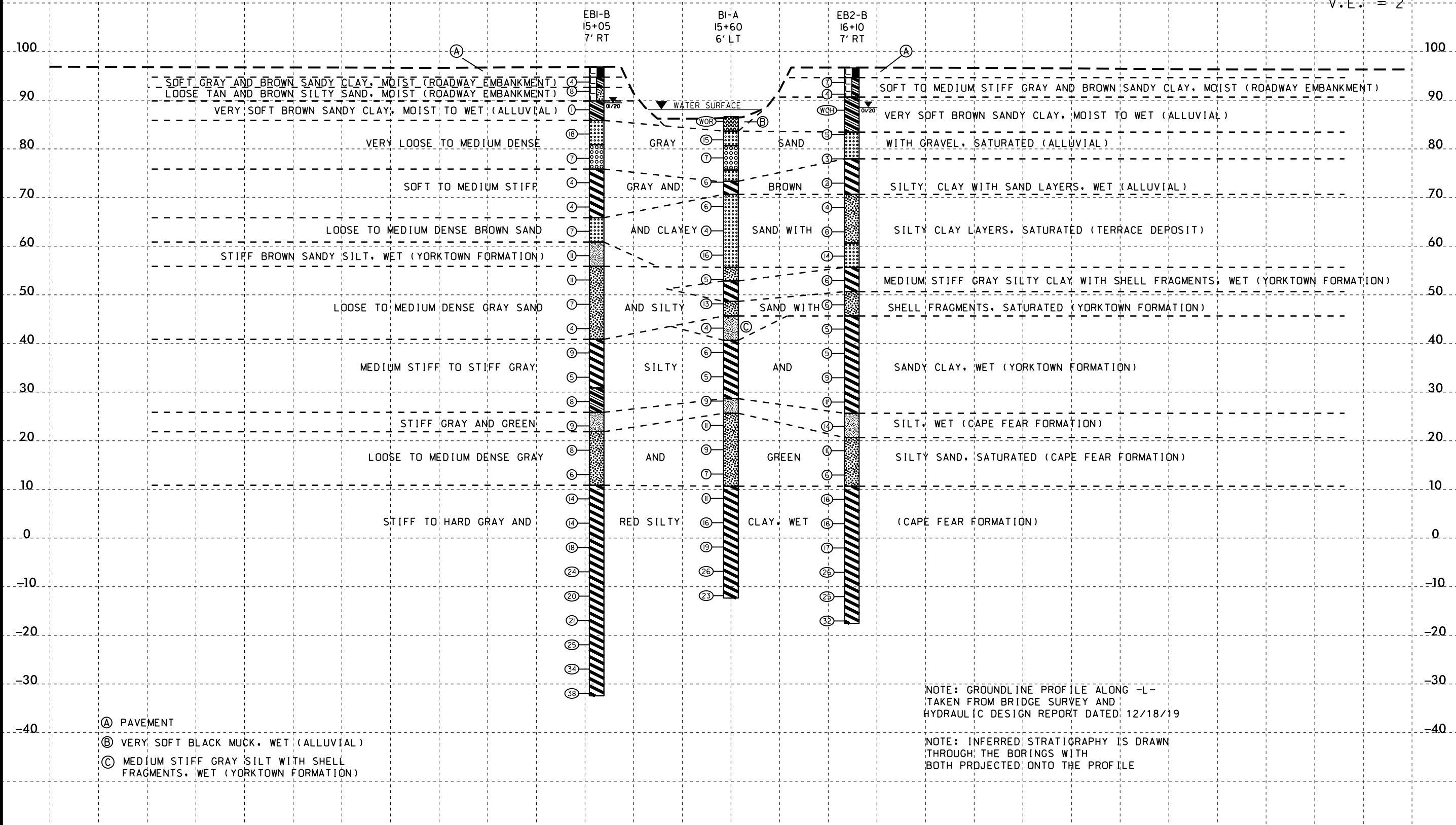
SKEW: 90°



5/14/99

|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br><i>SF-650015</i>                               | SHEET NO.<br>4      |
| ROADWAY DESIGN ENGINEER   | HYDRAULICS ENGINEER |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION               |                     |
| <b>DOCUMENT NOT CONSIDERED FINAL</b><br>UNLESS ALL SIGNATURES COMPLETED |                     |

# PROFILE THROUGH BORINGS PROJECTED ALONG -L-



V.E. = 2

- (A) PAVEMENT
- (B) VERY SOFT BLACK MUCK, WET (ALLUVIAL)
- (C) MEDIUM STIFF GRAY SILT WITH SHELL FRAGMENTS, WET (YORKTOWN FORMATION)

NOTE: GROUNDLINE PROFILE ALONG -L- TAKEN FROM BRIDGE SURVEY AND HYDRAULIC DESIGN REPORT DATED 12/18/19

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

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# GEOTECHNICAL BORING REPORT

## BORE LOG

|  |  |                      |                         |                     |  |                              |                 |
|--|--|----------------------|-------------------------|---------------------|--|------------------------------|-----------------|
| WBS 17BP.1.R.90  |  | TIP SF-650015        |                         | COUNTY NORTHAMPTON  |  | GEOLOGIST Argenbright, D. N. |                 |
| SITE DESCRIPTION BRIDGE NO. 15 ON -L- (SR 1505) OVER WILDCAT SWAMP |  |                      |                         |                     |  |                              | GROUND WTR (ft) |
| BORING NO. EB2-B   |  | STATION 16+10        |                         | OFFSET 7 ft RT      |  | ALIGNMENT -L-                |                 |
| COLLAR ELEV. 96.6 ft   |  | TOTAL DEPTH 114.2 ft |                         | NORTHING 982,142    |  | EASTING 2,493,089            |                 |
| DRILL RIGHAMMER EFF./DATE GFC0075 CME-45C 89%/08/19/2019           |  |                      | DRILL METHOD Mud Rotary |                     |  | HAMMER TYPE Automatic        |                 |
| DRILLER Smith, R. E.   |  | START DATE 01/09/20  |                         | COMP. DATE 01/09/20 |  | SURFACE WATER DEPTH N/A      |                 |

| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT |       |       | BLOWS PER FOOT |    |    |    |     | SAMP. NO. | LOG | SOIL AND ROCK DESCRIPTION | DEPTH (ft) |   |
|-----------|-----------------|------------|------------|-------|-------|----------------|----|----|----|-----|-----------|-----|---------------------------|------------|---|
|           |                 |            | 0.5ft      | 0.5ft | 0.5ft | 0              | 25 | 50 | 75 | 100 |           |     |                           |            |   |
| 100       |                 |            |            |       |       |                |    |    |    |     |           |     |                           |            |   |
| 95        | 94.6            | 2.0        | 1          | 3     | 4     |                |    |    |    |     |           |     |                           |            | 96.6 GROUND SURFACE 0.0   |
|           | 92.2            | 4.4        | 3          | 2     | 2     |                |    |    |    |     |           |     |                           |            | 94.6 PAVEMENT 2.0   |
| 90        | 88.9            | 7.7        | WOH        | WOH   | WOH   |                |    |    |    |     |           |     |                           |            | 90.6 ROADWAY EMBANKMENT 6.0   |
|           |                 |            |            |       |       |                |    |    |    |     |           |     |                           |            | GRAY AND BROWN SANDY CLAY, MOIST  |
| 85        | 83.9            | 12.7       | 2          | 2     | 3     |                |    |    |    |     |           |     |                           |            | ALLUVIAL BROWN SANDY CLAY, MOIST TO WET 6.0                                     |
| 80        | 78.9            | 17.7       | 2          | 2     | 1     |                |    |    |    |     |           |     |                           |            | 83.4 GRAY AND BROWN SAND, SATURATED 13.2  |
| 75        | 73.9            | 22.7       | 3          | 1     | 1     |                |    |    |    |     |           |     |                           |            | 77.9 GRAY SILTY CLAY WITH SAND LAYERS, WET 18.7                                 |
| 70        | 68.9            | 27.7       | 1          | 1     | 3     |                |    |    |    |     |           |     |                           |            | 70.6 COASTAL PLAIN 26.0   |
| 65        | 63.9            | 32.7       | 2          | 3     | 3     |                |    |    |    |     |           |     |                           |            | BROWN CLAYEY AND SILTY SAND WITH SILTY CLAY LAYERS, SATURATED (TERRACE DEPOSIT) |
| 60        | 58.9            | 37.7       | 6          | 5     | 9     |                |    |    |    |     |           |     |                           |            | 60.6 36.0   |
| 55        | 53.9            | 42.7       | 3          | 3     | 3     |                |    |    |    |     |           |     |                           |            | 55.6 COASTAL PLAIN 41.0   |
| 50        | 48.9            | 47.7       | 2          | 3     | 3     |                |    |    |    |     |           |     |                           |            | GRAY SILTY CLAY, WET (YORKTOWN FORMATION)                                       |
| 45        | 43.9            | 52.7       | 2          | 2     | 3     |                |    |    |    |     |           |     |                           |            | 50.6 GRAY SILTY SAND, SATURATED 46.0  |
| 40        | 38.9            | 57.7       | 2          | 3     | 2     |                |    |    |    |     |           |     |                           |            | 45.6 GRAY SILTY CLAY, WET 51.0  |
| 35        | 33.9            | 62.7       | 2          | 3     | 2     |                |    |    |    |     |           |     |                           |            |   |
| 30        | 28.9            | 67.7       | 4          | 6     | 5     |                |    |    |    |     |           |     |                           |            |   |
| 25        | 23.9            | 72.7       | 5          | 7     | 7     |                |    |    |    |     |           |     |                           |            | 25.6 COASTAL PLAIN 71.0   |
| 20        |                 |            |            |       |       |                |    |    |    |     |           |     |                           |            | GRAY AND GREEN SANDY SILT, WET (CAPE FEAR FORMATION) 76.0                       |

|  |  |                      |                         |                     |  |                              |                 |
|--|--|----------------------|-------------------------|---------------------|--|------------------------------|-----------------|
| WBS 17BP.1.R.90  |  | TIP SF-650015        |                         | COUNTY NORTHAMPTON  |  | GEOLOGIST Argenbright, D. N. |                 |
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| DRILLER Smith, R. E.   |  | START DATE 01/09/20  |                         | COMP. DATE 01/09/20 |  | SURFACE WATER DEPTH N/A      |                 |

| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT |       |       | BLOWS PER FOOT |    |    |    |     | SAMP. NO. | LOG | SOIL AND ROCK DESCRIPTION | DEPTH (ft) |  |
|-----------|-----------------|------------|------------|-------|-------|----------------|----|----|----|-----|-----------|-----|---------------------------|------------|--|
|           |                 |            | 0.5ft      | 0.5ft | 0.5ft | 0              | 25 | 50 | 75 | 100 |           |     |                           |            |  |
| 20        | 18.9            | 77.7       | 4          | 6     | 5     |                |    |    |    |     |           |     |                           |            | 20 Match Line  |
| 15        | 13.9            | 82.7       | 4          | 3     | 3     |                |    |    |    |     |           |     |                           |            | GRAY AND GREEN SILTY SAND, SATURATED (continued)                       |
| 10        | 8.9             | 87.7       | 5          | 7     | 9     |                |    |    |    |     |           |     |                           |            | 10.6 GRAY AND RED SILTY CLAY, WET 86.0                                 |
| 5         | 3.9             | 92.7       | 6          | 7     | 9     |                |    |    |    |     |           |     |                           |            |  |
| 0         | -1.1            | 97.7       | 6          | 7     | 10    |                |    |    |    |     |           |     |                           |            |  |
| -5        | -6.1            | 102.7      | 7          | 12    | 14    |                |    |    |    |     |           |     |                           |            |  |
| -10       | -11.1           | 107.7      | 7          | 11    | 14    |                |    |    |    |     |           |     |                           |            |  |
| -15       | -16.1           | 112.7      | 10         | 14    | 18    |                |    |    |    |     |           |     |                           |            |  |
|           |                 |            |            |       |       |                |    |    |    |     |           |     |                           |            | -17.6 Boring Terminated at Elevation -17.6 ft in Hard Silty Clay 114.2 |

NCDOT BORE DOUBLE SF650015 GEO\_BRDG\_0015.GPJ NC\_DOT.GDT 1/14/20