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7/2/98

REFERENCE: R-5812

PROJECT: 46981

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY GREENE  
 PROJECT DESCRIPTION US 13 BYPASS FROM NC 58  
(KINGOLD BOULEVARD) TO NC 91  
 SITE DESCRIPTION RETAINING WALL ALONG -L- STA  
42+49.99 (33.48' LT) TO -L- STA 39+00.00 (35.00' LT)

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-------|-----------------------------|-----------|--------------|
| N.C.  | R-5812                      | 1         | 8            |

**CAUTION NOTICE**

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

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

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PERSONNEL

S. ABERNATHY

CATLIN INC.

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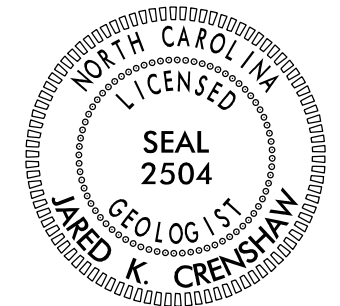
INVESTIGATED BY J. CRENSHAW

DRAWN BY J. CRENSHAW

CHECKED BY E. HOWEY

SUBMITTED BY D. WAINWRIGHT

DATE FEBRUARY, 2019



*Jared K. Crenshaw* 3/5/2019

SIGNATURE DATE

**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

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

## SUBSURFACE INVESTIGATION

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

| SOIL DESCRIPTION  |  |   |  |                         |                         |  |              |          |                   |
|---|--|---|--|-------------------------|-------------------------|--|--------------|----------|-------------------|
| SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i> |  |   |  |                         |                         |  |              |          |                   |
| SOIL LEGEND AND AASHTO CLASSIFICATION   |  |   |  |                         |                         |  |              |          |                   |
| GENERAL CLASS.  | GRANULAR MATERIALS (≤ 35% PASSING #200)                          |   |  |                         |                         | SILT-CLAY MATERIALS (> 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 | A-4, A-5          |
| SYMBOL  |  |   |  |                         |                         |  |              |          |                   |
| % PASSING #10 #40 #200  | 50 MX 30 MX 15 MX  | 50 MX 25 MX 10 MX   | 51 MN 35 MX 35 MX  | 35 MX 35 MX 35 MX       | 36 MN 36 MN 36 MN       | 36 MN 36 MN 36 MN                        |              |          |                   |
| MATERIAL PASSING #40 LL PI  | 6 MX   | NP  | 40 MX 41 MN 10 MX 11 MN  | 40 MX 41 MN 10 MX 11 MN | 40 MX 41 MN 10 MX 11 MN | 40 MX 41 MN 10 MX 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            |  |              |          |                   |
| GEN. RATING AS SUBGRADE   | EXCELLENT TO GOOD  |   |  | FAIR TO POOR            |                         |  | FAIR TO POOR | POOR     | UNSATURABLE       |
| PI OF A-7-5 SUBGROUP IS ≤ 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 0.5<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 OPENING (MM)   | 4  | 10  | 40   | 60                      | 200                     | 270                                      |              |          |                   |
|   | 4.76   | 2.00  | 0.42   | 0.25                    | 0.075                   | 0.053                                    |              |          |                   |
| BOULDER (BLDR.)   | COBBLE (COB.)  | GRAVEL (GR.)  | COARSE SAND (CSE. SD.)   | FINE SAND (F. SD.)      | SILT (SL.)              | CLAY (CL.)                               |              |          |                   |
| GRAIN SIZE  | MM 305   | 75  | 2.0  | 0.25                    | 0.05                    | 0.005                                    |              |          |                   |
|   | IN. 12   | 3   |  |                         |                         |  |              |          |                   |
| SOIL MOISTURE - CORRELATION OF TERMS  |  |   |  |                         |                         |  |              |          |                   |
| SOIL MOISTURE SCALE (ATTERBERG LIMITS)  | FIELD MOISTURE DESCRIPTION                                       | GUIDE FOR FIELD MOISTURE DESCRIPTION                                |  |                         |                         |  |              |          |                   |
| LL - LIQUID LIMIT   | - SATURATED - (SAT.)   | USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE |  |                         |                         |  |              |          |                   |
| PLASTIC RANGE (PI)  | - WET - (W)  | SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE               |  |                         |                         |  |              |          |                   |
| OM - OPTIMUM MOISTURE SHRINKAGE LIMIT   | - MOIST - (M)  | SOLID; AT OR NEAR OPTIMUM MOISTURE                                  |  |                         |                         |  |              |          |                   |
|   | - DRY - (D)  | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE                |  |                         |                         |  |              |          |                   |
| PLASTICITY  |  |   |  |                         |                         |  |              |          |                   |
|   |  | PLASTICITY INDEX (PI)   | DRY STRENGTH   |                         |                         |  |              |          |                   |
| NON PLASTIC   |  | 0-5   | VERY LOW   |                         |                         |  |              |          |                   |
| SLIGHTLY PLASTIC  |  | 6-15  | SLIGHT   |                         |                         |  |              |          |                   |
| MODERATELY PLASTIC  |  | 16-25   | MEDIUM   |                         |                         |  |              |          |                   |
| HIGHLY PLASTIC  |  | 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. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES 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 WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.   |  |   |                      |
| COMPRESSIBILITY   |  |   |                      |
| SLIGHTLY COMPRESSIBLE   | LL < 31  |   |                      |
| MODERATELY COMPRESSIBLE   | LL = 31 - 50   |   |                      |
| HIGHLY COMPRESSIBLE   | LL > 50  |   |                      |
| PERCENTAGE OF MATERIAL  |  |   |                      |
| ORGANIC MATERIAL  | GRANULAR SOILS   | SILT - CLAY SOILS   | OTHER MATERIAL       |
| TRACE OF ORGANIC MATTER   | 2 - 3%   | 3 - 5%  | TRACE 1 - 10%        |
| LITTLE ORGANIC MATTER   | 3 - 5%   | 5 - 12%   | LITTLE 10 - 20%      |
| MODERATELY ORGANIC  | 5 - 10%  | 12 - 20%  | SOME 20 - 35%        |
| HIGHLY ORGANIC  | > 10%  | > 20%   | HIGHLY 35% AND ABOVE |
| 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  |   |                      |
|   | SOIL SYMBOL  |   |                      |
|   | ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT   |   |                      |
|   | INFERRED SOIL BOUNDARY   |   |                      |
|   | INFERRED ROCK LINE   |   |                      |
|   | ALLUVIAL SOIL BOUNDARY   |   |                      |
|   | DIP & DIP DIRECTION OF ROCK STRUCTURES   |   |                      |
|   | SPT TEST BORING  |   |                      |
|   | AUGER BORING   |   |                      |
|   | CORE BORING  |   |                      |
|   | MONITORING WELL  |   |                      |
|   | PIEZOMETER INSTALLATION  |   |                      |
|   | SLOPE INDICATOR INSTALLATION   |   |                      |
|   | CONE PENETROMETER TEST   |   |                      |
|   | SOUNDING ROD   |   |                      |
|   | TEST BORING WITH CORE  |   |                      |
|   | SPT N-VALUE  |   |                      |
| RECOMMENDATION SYMBOLS  |  |   |                      |
|   | UNDERCUT   |   |                      |
|   | SHALLOW UNDERCUT   |   |                      |
|   | UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE   |   |                      |
|   | UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK   |   |                      |
|   | UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL |   |                      |
| 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 - DRY UNIT WEIGHT   |                      |
| CSE. - COARSE   | ORG. - ORGANIC   |   |                      |
| DMT - DILATOMETER TEST  | PMT - PRESSUREMETER TEST   | SAMPLE ABBREVIATIONS  |                      |
| DPT - DYNAMIC PENETRATION TEST  | SAP. - SAPROLITIC  | S - BULK  |                      |
| e - 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   |  |   |                      |
| DRILL UNITS:  | ADVANCING TOOLS:   | HAMMER TYPE:  |                      |
| <input type="checkbox"/> CME-45C  | <input checked="" type="checkbox"/> CLAY BITS  | <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL |                      |
| <input type="checkbox"/> CME-55   | <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER  | CORE SIZE:  |                      |
| <input type="checkbox"/> CME-55B  | <input type="checkbox"/> 8" HOLLOW AUGERS  | <input type="checkbox"/> B <input type="checkbox"/> H                         |                      |
| <input type="checkbox"/> VANE SHEAR TEST  | <input type="checkbox"/> HARD FACED FINGER BITS  | <input type="checkbox"/> N  |                      |
| <input type="checkbox"/> PORTABLE HOIST   | <input type="checkbox"/> TUNG-CARBIDE INSERTS  | HAND TOOLS:   |                      |
| <input checked="" type="checkbox"/> CME-45B   | <input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER                                 | <input type="checkbox"/> POST HOLE DIGGER                                     |                      |
|   | <input type="checkbox"/> TRICONE _____" STEEL TEETH  | <input checked="" type="checkbox"/> HAND AUGER                                |                      |
|   | <input type="checkbox"/> TRICONE _____" TUNG-CARB.   | <input type="checkbox"/> SOUNDING ROD   |                      |
|   | <input type="checkbox"/> CORE BIT  | <input type="checkbox"/> VANE SHEAR TEST                                      |                      |

| ROCK DESCRIPTION  |   |
|---|---|
| HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: |   |
| WEATHERED ROCK (WR)   | NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.  |
| CRYSTALLINE ROCK (CR)   | FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.  |
| NON-CRYSTALLINE ROCK (INCR)   | 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.   |
| COASTAL PLAIN SEDIMENTARY ROCK (CPI)  | COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.   |
| WEATHERING  |   |
| FRESH   | ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.   |
| VERY SLIGHT (V SLI.)  | 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 (SLI.)   | ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.   |
| MODERATE (MOD.)   | SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.  |
| MODERATELY SEVERE (MOD. SEV.)   | ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i>   |
| SEVERE (SEV.)   | ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES &gt; 100 BPF</i>   |
| VERY SEVERE (V SEV.)  | ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</i> |
| 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 GROOVED 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 GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.   |
| VERY SOFT   | CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.   |
| FRACTURE SPACING  |   |
| TERM  | SPACING   |
| VERY WIDE   | MORE THAN 10 FEET   |
| WIDE  | 3 TO 10 FEET  |
| MODERATELY CLOSE  | 1 TO 3 FEET   |
| CLOSE   | 0.16 TO 1 FOOT  |
| VERY CLOSE  | LESS THAN 0.16 FEET   |
| BEDDING   |   |
| TERM  | THICKNESS   |
| VERY THICKLY BEDDED   | 4 FEET  |
| THICKLY BEDDED  | 1.5 - 4 FEET  |
| THINLY BEDDED   | 0.16 - 1.5 FEET   |
| VERY THINLY BEDDED  | 0.03 - 0.16 FEET  |
| THICKLY LAMINATED   | 0.008 - 0.03 FEET   |
| THINLY LAMINATED  | < 0.008 FEET  |
| INDURATION  |   |
| FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.   |   |
| FRIABLE   | RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.  |
| MODERATELY INDURATED  | GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.   |
| INDURATED   | GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.  |
| EXTREMELY INDURATED   | SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.   |

| TERMS AND DEFINITIONS   |  |
|---|--|
| ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.  |  |
| AQUIFER - A WATER BEARING FORMATION OR STRATA.  |  |
| ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.  |  |
| ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.  |  |
| ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.   |  |
| CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.   |  |
| COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.   |  |
| CORE RECOVERY (REC) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.  |  |
| DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.  |  |
| DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.   |  |
| DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.   |  |
| FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.  |  |
| FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.   |  |
| FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.  |  |
| FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.   |  |
| FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.   |  |
| JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.  |  |
| LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.   |  |
| LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.   |  |
| MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.  |  |
| PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.  |  |
| RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.  |  |
| ROCK QUALITY DESIGNATION (RQD) - 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.  |  |
| SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.   |  |
| SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.  |  |
| SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.   |  |
| STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. |  |
| STRATA CORE RECOVERY (SRC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.  |  |
| STRATA ROCK QUALITY DESIGNATION (SRQD) - 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.   |  |
| TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.  |  |
| BENCH MARK: SEE NOTE BELOW  |  |
| ELEVATION: _____ FEET   |  |
| NOTES:<br>BORING AND GROUND SURFACE ELEVATIONS OBTAINED FROM 'R5812.ls_tin.tin' FILE DATED 12/8/2017<br>FIAD - Filled Immediately After Drilling  |  |
|   |  |

8/17/09

|  |                       |
|--|-----------------------|
| PROJECT REFERENCE NO.<br><i>R-5812</i>                                   | SHEET NO.<br><i>3</i> |
| RW SHEET NO.   |                       |
| ROADWAY DESIGN ENGINEER  | HYDRAULICS ENGINEER   |
| <b>DOCUMENT NOT CONSIDERED FINAL<br/>UNLESS ALL SIGNATURES COMPLETED</b> |                       |

END RETAINING WALL  
 -W\_L- POT Sta. 13+50.00  
 -L- POT Sta. 39+00.00  
 OFFSET 35.00' LT

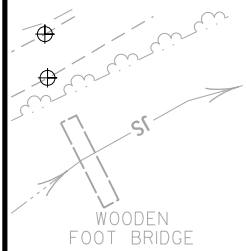
BEGIN RETAINING WALL  
 -W\_L- POT Sta. 10+00.00 =  
 -L- POT Sta. 42+49.99  
 OFFSET 33.48' LT

-W\_L- PI Sta. 10+90.00

-L- POT Sta. 39+18.07 =  
 -YISPUR- POT Sta. 10+00.00

40

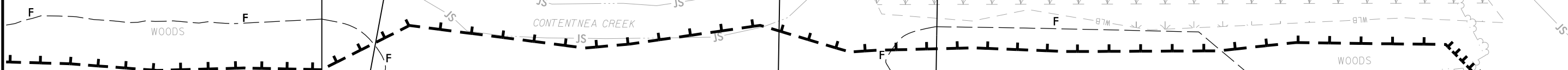
45



ALLUVIAL



ALLUVIAL



S 53° 32' 25.7" W c -W\_L-

S 54° 30' 19.1" W c

ROADWAY EMBANKMENT

TO SNOW HILL

TO GREENVILLE

WI-1

WI-2

WI-3

WI-4

WI-5

WI-6

WI-7

S 36° 27' 34.3" E

-YISPUR- PC Sta. 10+79.73

ROADWAY EMBANKMENT

ALLUVIAL

ALLUVIAL

-YI- POC Sta. 17+35.66 =

YISPUR- PT Sta. 12+20.55

ALLUVIAL

ROADWAY EMBANKMENT

15

17

REVISIONS

2/7/2009  
1:56:12 geo-wall-Plan.dgn  
5:20:55

5/14/09

|  |                       |
|--|-----------------------|
| PROJECT REFERENCE NO.<br><b>R-5812</b>                           | SHEET NO.<br><b>4</b> |
| ROADWAY DESIGN ENGINEER  | HYDRAULICS ENGINEER   |
| DOCUMENT NOT CONSIDERED FINAL<br>UNLESS ALL SIGNATURES COMPLETED |                       |

GROUNDLINE PROFILE CREATED FROM R5812\_Is\_tin.tin FILE  
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE WALL PROFILE

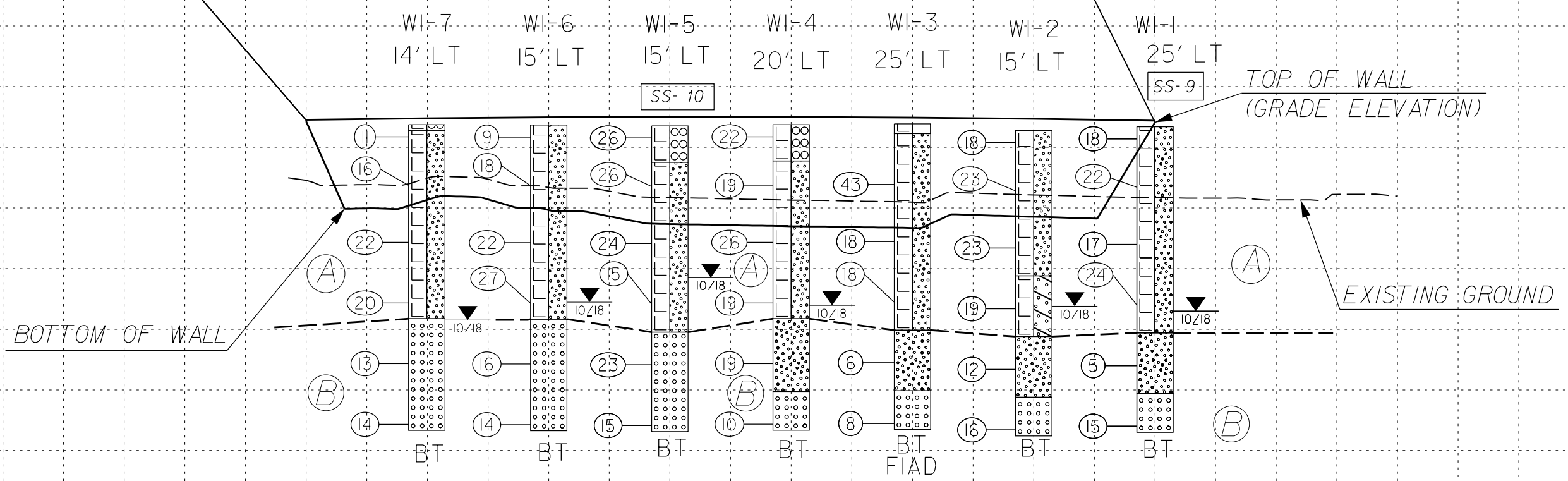
| SAMPLE NO. | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | P.I. | % BY WEIGHT |        |      |      | % PASSING (SIEVES) |    |     | % MOISTURE | % ORGANIC |
|------------|--------|---------|----------------|---------------|------|------|-------------|--------|------|------|--------------------|----|-----|------------|-----------|
|            |        |         |                |               |      |      | C.SAND      | F.SAND | SILT | CLAY | 10                 | 40 | 200 |            |           |
| SS-10      | 15' LT | 11+50   | 13.7-15.2      | A-2-4         | 25   | 6    | 13.7        | 66.0   | 3.2  | 17.1 | 100                | 97 | 23  | 25         | -         |
| SS-9       | 25' LT | 13+50   | 8.7-10.2       | A-2-4         | 21   | 4    | 44.3        | 37.2   | 5.3  | 13.1 | 100                | 78 | 21  | 17         | -         |

90  
80  
70  
60  
50  
40  
30  
20  
10  
0

BEGIN RETAINING WALL  
-W\_L- STA. 10+00.00 =  
-L- STA. 42+49.99 (33.48' LT)  
EL. = 52.14'

RETAINING WALL #1  
APPROXIMATE WALL FACE AREA = 2632 SQ.FT.  
OFFSETS ARE SHOWN AS DISTANCE FROM -W\_L-

END RETAINING WALL  
-W\_L- STA. 13+50.00 =  
-L- STA. 39+00.00 (35.00' LT)  
EL. = 52.06'



- (A) Loose to dense, gray, red, orange, and brown, SAND with gravel and silty, clayey SAND (A-1-b, A-2-4, A-2-6), moist to saturated (ROADWAY EMBANKMENT)
- (B) Loose to medium dense, orange, brown, tan, and gray, SAND (A-3, A-2-4), with trace gravel, saturated (ALLUVIAL)

**- WALL 1 -**

10+00      11+00      12+00      13+00      14+00

VE = 5

2/22/2019 10:35:40 AM GEO\_WALL\_PFL3.dgn

# GEOTECHNICAL BORING REPORT

## BORE LOG

| WBS 46981.1.1   |                 | TIP R-5812          |            | COUNTY GREENE           |       | GEOLOGIST S. Abernathy  |                 |    |    |     |           |         |                           |  |                |
|---|-----------------|---------------------|------------|-------------------------|-------|-------------------------|-----------------|----|----|-----|-----------|---------|---------------------------|--|----------------|
| SITE DESCRIPTION Retaining Wall Along -L- STA 42+49.99 (33.48' LT) to -L- STA 39+00 (35.00' LT) |                 |                     |            |                         |       |                         | GROUND WTR (ft) |    |    |     |           |         |                           |  |                |
| BORING NO. W1-1   |                 | STATION 13+50       |            | OFFSET 25 ft LT         |       | ALIGNMENT -W_L-         |                 |    |    |     |           |         |                           |  |                |
| COLLAR ELEV. 51.7 ft  |                 | TOTAL DEPTH 25.2 ft |            | NORTHING 624,148        |       | EASTING 2,393,837       |                 |    |    |     |           |         |                           |  |                |
| DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 76% 07/10/2017                                       |                 |                     |            | DRILL METHOD Mud Rotary |       | HAMMER TYPE Automatic   |                 |    |    |     |           |         |                           |  |                |
| DRILLER T. Chalmers   |                 | START DATE 10/02/18 |            | COMP. DATE 10/02/18     |       | SURFACE WATER DEPTH N/A |                 |    |    |     |           |         |                           |  |                |
| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT |                         |       | BLOWS PER FOOT          |                 |    |    |     | SAMP. NO. | LOG MOI | SOIL AND ROCK DESCRIPTION | DEPTH (ft)   |                |
|   |                 |                     | 0.5ft      | 0.5ft                   | 0.5ft | 0                       | 25              | 50 | 75 | 100 |           |         |                           |  |                |
| 55  |                 |                     |            |                         |       |                         |                 |    |    |     |           |         |                           |  |                |
|   | 51.7            | 0.0                 |            |                         |       |                         |                 |    |    |     |           |         |                           | 51.7   | GROUND SURFACE |
| 50  | 47.7            | 4.0                 | 4          | 11                      | 7     |                         |                 |    |    |     |           |         | D                         | ROADWAY EMBANKMENT<br>Medium dense, orange, brown, and tan, fine SAND (A-2-4), with trace gravel |                |
| 45  |                 |                     | 5          | 10                      | 12    |                         |                 |    |    |     |           |         | M                         |  |                |
| 40  | 43.0            | 8.7                 | 8          | 8                       | 9     |                         |                 |    |    |     |           |         | M                         |  |                |
| 35  | 38.0            | 13.7                | 9          | 9                       | 15    |                         |                 |    |    |     |           |         | M                         |  |                |
| 30  | 33.0            | 18.7                | 3          | 2                       | 3     |                         |                 |    |    |     |           |         | Sat.                      | ALLUVIAL<br>Loose to medium dense, orange, tan, and brown, fine to coarse SAND (A-2-4, A-3)      | 17.0           |
|   | 28.0            | 23.7                | 6          | 7                       | 8     |                         |                 |    |    |     |           |         | Sat.                      |  | 22.0           |
|   |                 |                     |            |                         |       |                         |                 |    |    |     |           |         | Sat.                      |  | 25.2           |
| Boring Terminated at Elevation 26.5 ft Boring terminated in SAND (A-3)                          |                 |                     |            |                         |       |                         |                 |    |    |     |           |         |                           |  |                |

| WBS 46981.1.1   |                 | TIP R-5812          |            | COUNTY GREENE           |       | GEOLOGIST S. Abernathy  |                 |    |    |     |           |         |                           |   |                |
|---|-----------------|---------------------|------------|-------------------------|-------|-------------------------|-----------------|----|----|-----|-----------|---------|---------------------------|---|----------------|
| SITE DESCRIPTION Retaining Wall Along -L- STA 42+49.99 (33.48' LT) to -L- STA 39+00 (35.00' LT) |                 |                     |            |                         |       |                         | GROUND WTR (ft) |    |    |     |           |         |                           |   |                |
| BORING NO. W1-2   |                 | STATION 13+00       |            | OFFSET 15 ft LT         |       | ALIGNMENT -W_L-         |                 |    |    |     |           |         |                           |   |                |
| COLLAR ELEV. 51.5 ft  |                 | TOTAL DEPTH 25.2 ft |            | NORTHING 624,159        |       | EASTING 2,393,887       |                 |    |    |     |           |         |                           |   |                |
| DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 76% 07/10/2017                                       |                 |                     |            | DRILL METHOD Mud Rotary |       | HAMMER TYPE Automatic   |                 |    |    |     |           |         |                           |   |                |
| DRILLER T. Chalmers   |                 | START DATE 10/02/18 |            | COMP. DATE 10/02/18     |       | SURFACE WATER DEPTH N/A |                 |    |    |     |           |         |                           |   |                |
| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT |                         |       | BLOWS PER FOOT          |                 |    |    |     | SAMP. NO. | LOG MOI | SOIL AND ROCK DESCRIPTION | DEPTH (ft)  |                |
|   |                 |                     | 0.5ft      | 0.5ft                   | 0.5ft | 0                       | 25              | 50 | 75 | 100 |           |         |                           |   |                |
| 55  |                 |                     |            |                         |       |                         |                 |    |    |     |           |         |                           |   |                |
|   | 51.5            | 0.0                 |            |                         |       |                         |                 |    |    |     |           |         |                           | 51.5  | GROUND SURFACE |
| 50  | 47.5            | 4.0                 | 6          | 12                      | 6     |                         |                 |    |    |     |           |         | D                         | ROADWAY EMBANKMENT<br>Medium dense, brown, tan, and gray, fine SAND and clayey SAND (A-2-4, A-2-6)    |                |
| 45  |                 |                     | 8          | 10                      | 13    |                         |                 |    |    |     |           |         | M                         |   |                |
| 40  | 42.8            | 8.7                 | 8          | 11                      | 12    |                         |                 |    |    |     |           |         | M                         |   |                |
| 35  | 37.8            | 13.7                | 9          | 8                       | 11    |                         |                 |    |    |     |           |         | M                         |   |                |
| 30  | 32.8            | 18.7                | 4          | 5                       | 7     |                         |                 |    |    |     |           |         | Sat.                      | ALLUVIAL<br>Medium dense, orange, brown, and tan, fine to coarse SAND (A-2-4, A-3), with trace gravel | 12.0           |
|   | 27.8            | 23.7                | 7          | 9                       | 7     |                         |                 |    |    |     |           |         | Sat.                      |   | 17.0           |
|   |                 |                     |            |                         |       |                         |                 |    |    |     |           |         | Sat.                      |   | 22.0           |
|   |                 |                     |            |                         |       |                         |                 |    |    |     |           |         | Sat.                      |   | 25.2           |
| Boring Terminated at Elevation 26.3 ft Boring terminated in SAND (A-3)                          |                 |                     |            |                         |       |                         |                 |    |    |     |           |         |                           |   |                |

NCDOT BORE DOUBLE R-5812\_SNOWHILL\_GINT.GPJ\_NC\_DOT.GDT 11/29/18

# GEOTECHNICAL BORING REPORT

## BORE LOG

| WBS 46981.1.1   |                 | TIP R-5812          |            | COUNTY GREENE           |       | GEOLOGIST S. Abernathy  |                 |    |    |     |           |     |                           |            |  |
|---|-----------------|---------------------|------------|-------------------------|-------|-------------------------|-----------------|----|----|-----|-----------|-----|---------------------------|------------|--|
| SITE DESCRIPTION Retaining Wall Along -L- STA 42+49.99 (33.48' LT) to -L- STA 39+00 (35.00' LT) |                 |                     |            |                         |       |                         | GROUND WTR (ft) |    |    |     |           |     |                           |            |  |
| BORING NO. W1-3   |                 | STATION 12+50       |            | OFFSET 25 ft LT         |       | ALIGNMENT -W_L-         |                 |    |    |     |           |     |                           |            |  |
| COLLAR ELEV. 51.9 ft  |                 | TOTAL DEPTH 25.2 ft |            | NORTHING 624,149        |       | EASTING 2,393,937       |                 |    |    |     |           |     |                           |            |  |
| DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 76% 07/10/2017                                       |                 |                     |            | DRILL METHOD Mud Rotary |       | HAMMER TYPE Automatic   |                 |    |    |     |           |     |                           |            |  |
| DRILLER T. Chalmers   |                 | START DATE 10/01/18 |            | COMP. DATE 10/01/18     |       | 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 |           |     |                           |            |  |
| 55  |                 |                     |            |                         |       |                         |                 |    |    |     |           |     |                           |            |  |
|   |                 |                     |            |                         |       |                         |                 |    |    |     |           |     |                           |            |  |
| 50  | 47.9            | 4.0                 | 17         | 20                      | 23    |                         |                 |    |    |     |           |     |                           |            |  |
| 45  | 43.2            | 8.7                 | 10         | 7                       | 11    |                         |                 |    |    |     |           |     |                           |            |  |
| 40  | 38.2            | 13.7                | 12         | 10                      | 8     |                         |                 |    |    |     |           |     |                           |            |  |
| 35  | 33.2            | 18.7                | 2          | 3                       | 3     |                         |                 |    |    |     |           |     |                           |            |  |
| 30  | 28.2            | 23.7                | 4          | 3                       | 5     |                         |                 |    |    |     |           |     |                           |            |  |
|   |                 |                     |            |                         |       |                         |                 |    |    |     |           |     |                           |            |  |

| WBS 46981.1.1   |                 | TIP R-5812          |            | COUNTY GREENE           |       | GEOLOGIST S. Abernathy  |                 |    |    |     |           |     |                           |            |  |
|---|-----------------|---------------------|------------|-------------------------|-------|-------------------------|-----------------|----|----|-----|-----------|-----|---------------------------|------------|--|
| SITE DESCRIPTION Retaining Wall Along -L- STA 42+49.99 (33.48' LT) to -L- STA 39+00 (35.00' LT) |                 |                     |            |                         |       |                         | GROUND WTR (ft) |    |    |     |           |     |                           |            |  |
| BORING NO. W1-4   |                 | STATION 12+00       |            | OFFSET 20 ft LT         |       | ALIGNMENT -W_L-         |                 |    |    |     |           |     |                           |            |  |
| COLLAR ELEV. 51.9 ft  |                 | TOTAL DEPTH 25.2 ft |            | NORTHING 624,154        |       | EASTING 2,393,987       |                 |    |    |     |           |     |                           |            |  |
| DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 76% 07/10/2017                                       |                 |                     |            | DRILL METHOD Mud Rotary |       | HAMMER TYPE Automatic   |                 |    |    |     |           |     |                           |            |  |
| DRILLER T. Chalmers   |                 | START DATE 10/01/18 |            | COMP. DATE 10/01/18     |       | 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 |           |     |                           |            |  |
| 55  |                 |                     |            |                         |       |                         |                 |    |    |     |           |     |                           |            |  |
|   |                 |                     |            |                         |       |                         |                 |    |    |     |           |     |                           |            |  |
| 50  | 51.9            | 0.0                 | 4          | 14                      | 8     |                         |                 |    |    |     |           |     |                           |            |  |
| 45  | 47.9            | 4.0                 | 3          | 10                      | 9     |                         |                 |    |    |     |           |     |                           |            |  |
| 40  | 43.2            | 8.7                 | 7          | 12                      | 14    |                         |                 |    |    |     |           |     |                           |            |  |
| 35  | 38.2            | 13.7                | 11         | 10                      | 9     |                         |                 |    |    |     |           |     |                           |            |  |
| 30  | 33.2            | 18.7                | 7          | 8                       | 11    |                         |                 |    |    |     |           |     |                           |            |  |
|   | 28.2            | 23.7                | 3          | 4                       | 6     |                         |                 |    |    |     |           |     |                           |            |  |
|   |                 |                     |            |                         |       |                         |                 |    |    |     |           |     |                           |            |  |

NCDOT BORE DOUBLE R-5812\_SNOWHILL\_GINT.GPJ NC\_DOT.GDT 11/29/18



# GEOTECHNICAL BORING REPORT

## BORE LOG

| WBS 46981.1.1   |                 | TIP R-5812          |                         | COUNTY GREENE       |       | GEOLOGIST S. Abernathy  |                 |    |    |     |           |     |     |                           |  |  |
|---|-----------------|---------------------|-------------------------|---------------------|-------|-------------------------|-----------------|----|----|-----|-----------|-----|-----|---------------------------|--|--|
| SITE DESCRIPTION Retaining Wall Along -L- STA 42+49.99 (33.48' LT) to -L- STA 39+00 (35.00' LT) |                 |                     |                         |                     |       |                         | GROUND WTR (ft) |    |    |     |           |     |     |                           |  |  |
| BORING NO. W1-5   |                 | STATION 11+50       |                         | OFFSET 15 ft LT     |       | ALIGNMENT -W_L-         |                 |    |    |     |           |     |     |                           |  |  |
| COLLAR ELEV. 51.8 ft  |                 | TOTAL DEPTH 25.2 ft |                         | NORTHING 624,159    |       | EASTING 2,394,037       |                 |    |    |     |           |     |     |                           |  |  |
| DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 76% 07/10/2017                                       |                 |                     | DRILL METHOD Mud Rotary |                     |       | HAMMER TYPE Automatic   |                 |    |    |     |           |     |     |                           |  |  |
| DRILLER T. Chalmers   |                 | START DATE 10/01/18 |                         | COMP. DATE 10/01/18 |       | SURFACE WATER DEPTH N/A |                 |    |    |     |           |     |     |                           |  |  |
| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT              |                     |       | BLOWS PER FOOT          |                 |    |    |     | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION |  |  |
|   |                 |                     | 0.5ft                   | 0.5ft               | 0.5ft | 0                       | 25              | 50 | 75 | 100 |           |     |     | ELEV. (ft)                | DEPTH (ft)   |  |
| 55  |                 |                     |                         |                     |       |                         |                 |    |    |     |           |     |     |                           |  |  |
|   | 51.8            | 0.0                 | 4                       | 15                  | 11    |                         |                 |    |    |     |           |     |     |                           | 51.8   | GROUND SURFACE   |
| 50  | 47.8            | 4.0                 | 8                       | 12                  | 14    |                         |                 |    |    |     |           |     |     | 48.8                      | ROADWAY EMBANKMENT<br>Medium dense, brown, clayey SAND and SAND with gravel (A-2-4, A-1-b) |  |
| 45  | 43.1            | 8.7                 | 8                       | 10                  | 14    |                         |                 |    |    |     |           |     |     |                           |  |  |
| 40  | 38.1            | 13.7                | 9                       | 6                   | 9     |                         |                 |    |    |     |           |     |     |                           |  |  |
| 35  | 33.1            | 18.7                | 9                       | 11                  | 12    |                         |                 |    |    |     |           |     |     |                           |  |  |
| 30  | 28.1            | 23.7                | 5                       | 7                   | 8     |                         |                 |    |    |     |           |     |     |                           |  |  |
|   |                 |                     |                         |                     |       |                         |                 |    |    |     |           |     |     |                           | 26.6   | Boring Terminated at Elevation 26.6 ft Boring terminated in SAND (A-3) |

| WBS 46981.1.1   |                 | TIP R-5812          |                         | COUNTY GREENE       |       | GEOLOGIST S. Abernathy  |                 |    |    |     |           |     |     |                           |            |  |
|---|-----------------|---------------------|-------------------------|---------------------|-------|-------------------------|-----------------|----|----|-----|-----------|-----|-----|---------------------------|------------|--|
| SITE DESCRIPTION Retaining Wall Along -L- STA 42+49.99 (33.48' LT) to -L- STA 39+00 (35.00' LT) |                 |                     |                         |                     |       |                         | GROUND WTR (ft) |    |    |     |           |     |     |                           |            |  |
| BORING NO. W1-6   |                 | STATION 11+00       |                         | OFFSET 15 ft LT     |       | ALIGNMENT -W_L-         |                 |    |    |     |           |     |     |                           |            |  |
| COLLAR ELEV. 51.9 ft  |                 | TOTAL DEPTH 25.2 ft |                         | NORTHING 624,159    |       | EASTING 2,394,086       |                 |    |    |     |           |     |     |                           |            |  |
| DRILL RIG/HAMMER EFF./DATE CAT1314 CME-45B 76% 07/10/2017                                       |                 |                     | DRILL METHOD Mud Rotary |                     |       | HAMMER TYPE Automatic   |                 |    |    |     |           |     |     |                           |            |  |
| DRILLER T. Chalmers   |                 | START DATE 10/01/18 |                         | COMP. DATE 10/01/18 |       | SURFACE WATER DEPTH N/A |                 |    |    |     |           |     |     |                           |            |  |
| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT              |                     |       | BLOWS PER FOOT          |                 |    |    |     | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION |            |  |
|   |                 |                     | 0.5ft                   | 0.5ft               | 0.5ft | 0                       | 25              | 50 | 75 | 100 |           |     |     | ELEV. (ft)                | DEPTH (ft) |  |
| 55  |                 |                     |                         |                     |       |                         |                 |    |    |     |           |     |     |                           |            |  |
|   | 51.9            | 0.0                 | 4                       | 5                   | 4     |                         |                 |    |    |     |           |     |     |                           | 51.9       | GROUND SURFACE   |
| 50  | 47.9            | 4.0                 | 3                       | 8                   | 10    |                         |                 |    |    |     |           |     |     |                           |            | ROADWAY EMBANKMENT<br>Loose to medium dense, orange, brown, and white, fine SAND (A-2-4) |
| 45  | 43.2            | 8.7                 | 9                       | 10                  | 12    |                         |                 |    |    |     |           |     |     |                           |            |  |
| 40  | 38.2            | 13.7                | 8                       | 14                  | 13    |                         |                 |    |    |     |           |     |     |                           |            |  |
| 35  | 33.2            | 18.7                | 7                       | 8                   | 8     |                         |                 |    |    |     |           |     |     |                           |            |  |
| 30  | 28.2            | 23.7                | 5                       | 7                   | 7     |                         |                 |    |    |     |           |     |     |                           |            |  |
|   |                 |                     |                         |                     |       |                         |                 |    |    |     |           |     |     |                           | 35.9       | ALLUVIAL<br>Medium dense, orange and brown, fine to coarse SAND (A-3)                    |
|   |                 |                     |                         |                     |       |                         |                 |    |    |     |           |     |     |                           | 26.7       | Boring Terminated at Elevation 26.7 ft Boring terminated in SAND (A-3)                   |

NCDOT BORE DOUBLE R-5812\_SNOWHILL\_GINT.GPJ NC\_DOT.GDT 11/29/18



