| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | BD-5109AF | 1 | 16 |

REFERENCE: BD-5109AF

PROJECT: 45355

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

# STRUCTURE SUBSURFACE INVESTIGATION

COUNTY *STOKES*

PROJECT DESCRIPTION *BRIDGE 108 ON SR 1674 (SHEPPARDS MILL RD.) OVER SNOW CREEK*

SITE DESCRIPTION

## CONTENTS


| SHEET NO. | DESCRIPTION |
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| 1 | TITLE SHEET |
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## 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.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS 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.

NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
2. 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.

PERSONNEL

*J.K. STICKNEY*

*C.L. SMITH*

INVESTIGATED BY *J.E. BEVERLY*

DRAWN BY *J.K. McCLURE*

CHECKED BY *C.B. LITTLE*

SUBMITTED BY *C.B. LITTLE*

DATE *SEPTEMBER 2014*

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE

DocuSigned by:
Clinton B. Little
930443D5AC8E452...
SIGNATURE

10/2/2014
DATE

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| BD-5109AF | 2 |

# 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,

*VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6*

## 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<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,<br>A-7-6 | | | |
| SYMBOL | | | | | | | | | | | | | | |
| % PASSING<br>#10<br>#40<br>#200 | 50 MX<br>30 MX<br>15 MX | 50 MX<br>25 MX | 51 MN<br>10 MX | 35 MX | 35 MX | 35 MX | 35 MX | 36 MN | 36 MN | 36 MN | 36 MN | GRANULAR SOILS | SILT-CLAY SOILS | MUCK, PEAT |
| MATERIAL PASSING #40<br>LL<br>PI | —<br>6 MX | | —<br>NP | 40 MX<br>10 MX | 41 MN<br>10 MX | 40 MX<br>11 MN | 41 MN<br>11 MN | 40 MX<br>10 MX | 41 MN<br>10 MX | 40 MX<br>11 MN | 41 MN<br>11 MN | SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER | | HIGHLY ORGANIC SOILS |
| 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 | UNSUITABLE |

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 RESISTENCE (N-VALUE) | RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$) |
|---|---|---|---|
| GENERALLY GRANULAR MATERIAL (NON-COHESIVE) | VERY LOOSE | < 4 | N/A |
| | LOOSE | 4 TO 10 | |
| | MEDIUM DENSE | 10 TO 30 | |
| | DENSE | 30 TO 50 | |
| | VERY DENSE | > 50 | |
| GENERALLY SILT-CLAY MATERIAL (COHESIVE) | VERY SOFT | < 2 | < 0.25 |
| | SOFT | 2 TO 4 | 0.25 TO 0.5 |
| | MEDIUM STIFF | 4 TO 8 | 0.5 TO 1.0 |
| | STIFF | 8 TO 15 | 1 TO 2 |
| | VERY STIFF | 15 TO 30 | 2 TO 4 |
| | HARD | > 30 | > 4 |

## TEXTURE OR GRAIN SIZE

| U.S. STD. SIEVE SIZE | 4 | 10 | 40 | 60 | 200 | 270 |
|---|---|---|---|---|---|---|
| OPENING (MM) | 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 |
|---|---|---|
| | - SATURATED - (SAT.) | USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE |
| LL — LIQUID LIMIT | | |
| PLASTIC RANGE (PI) | - WET - (W) | SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE |
| PL — PLASTIC LIMIT | | |
| | - MOIST - (M) | SOLID; AT OR NEAR OPTIMUM MOISTURE |
| OM — OPTIMUM MOISTURE<br>SL — SHRINKAGE LIMIT | | |
| | - 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
- PW — 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
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT / DPT / DMT / VST / PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING WITH CORE
- SPT N-VALUE

## RECOMMENDATION SYMBOLS

- UNDERCUT EXCAVATION
- 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
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
FRAGS. - FRAGMENTS
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
$\gamma$ - UNIT WEIGHT
$\gamma_d$ - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

## EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [ ] CME-55
- [X] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [X] TUNG.-CARBIDE INSERTS
- [X] CASING [X] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [X] TRICONE 2 15/16" TUNG.-CARB.
- [X] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC
- [ ] MANUAL

CORE SIZE:
- [ ] -B _____
- [ ] -H _____
- [X] -N 0/NQ

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] 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 (NCR) | FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. |
| COASTAL PLAIN SEDIMENTARY ROCK (CP) | 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 (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 KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL* |
| 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. *IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF* |
| 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. *IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF* |
| 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 GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. |
| 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 DISLODGED 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 (SREC.) - 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: NC DOT GPS STATION BD5109AF 2
(LOCALIZED PROJECT COORDINATES)
N 982044.686 E 1664431.403 ELEVATION: 731.54 FEET

NOTES:

SOIL STRATIGRAPHY IS THROUGH THE BORINGS FOR PROFILE AND CROSS-SECTIONS.

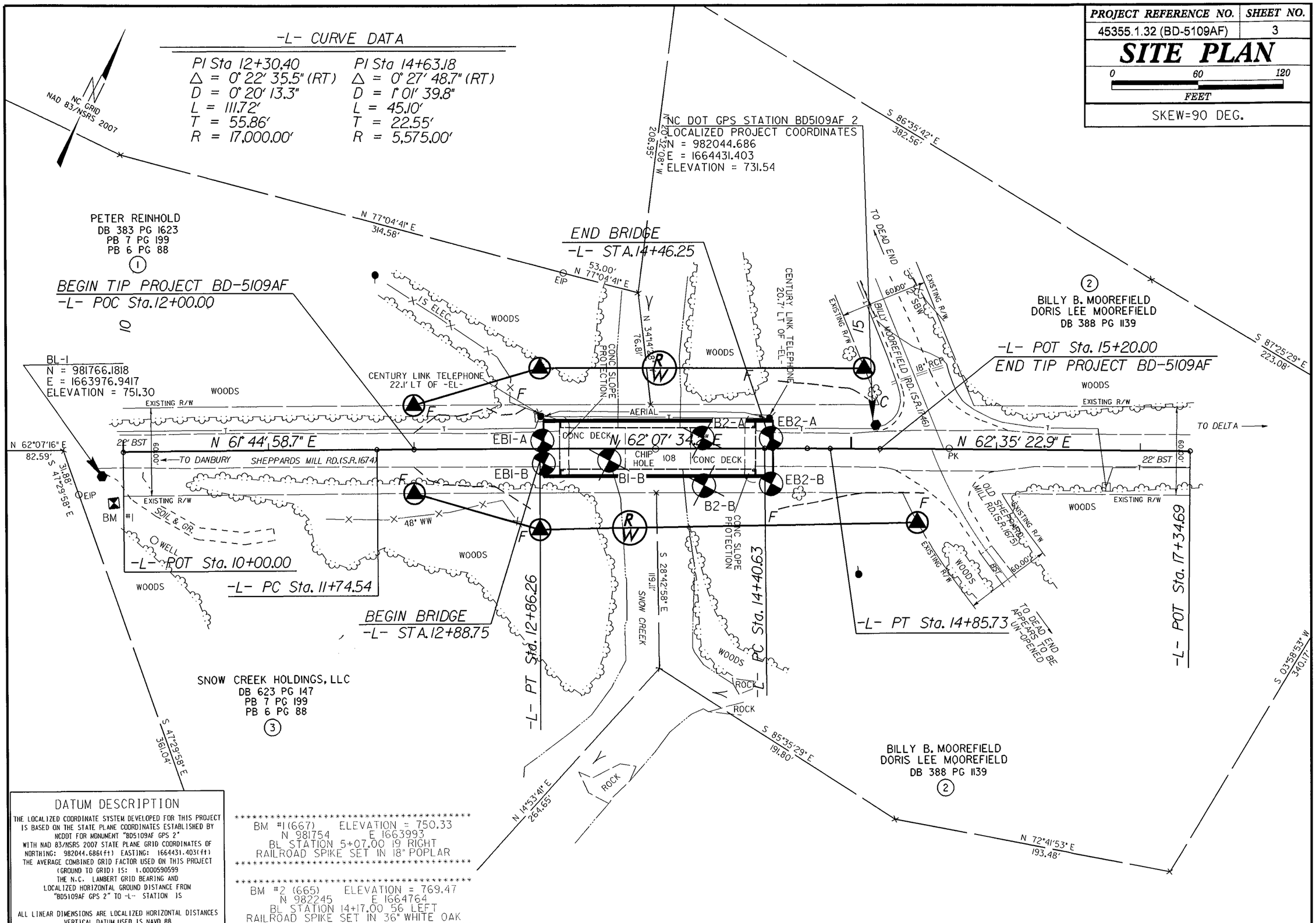
DATE: 8-15-14

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 45355.1.32 (BD-5109AF) | 3 |

# SITE PLAN

0 60 120
FEET

SKEW=90 DEG.




## DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "BD5109AF GPS 2" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 982044.686(ft) EASTING: 1664431.403(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0000590599 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BD5109AF GPS 2" TO -L- STATION IS

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

BM #1(667) ELEVATION = 750.33
N 981754 E 1663993
BL STATION 5+07.00 19 RIGHT
RAILROAD SPIKE SET IN 18" POPLAR

BM #2 (665) ELEVATION = 769.47
N 982245 E 1664764
BL STATION 14+17.00 56 LEFT
RAILROAD SPIKE SET IN 36" WHITE OAK

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| 45355.1.32 (BD-5109AF) | 4 |

Profile –L–
Bridge 108 on SR 1674 (Sheppards Mill Rd.) over Snow Creek

0 50 100
FEET
V.E. = 5:1

**BORING DESCRIPTIONS**

- Ⓐ ARTIFICIAL FILL RIP-RAP AND CONCRETE DEBRIS
- Ⓑ ALLUVIAL VERY LOOSE BROWN CLAYEY SILTY SAND, WET
- Ⓒ ALLUVIAL VERY LOOSE BROWN CLAYEY SILTY SAND, MOIST
- Ⓓ ALLUVIAL MEDIUM DENSE GRAY SILTY COARSE SAND AND GRAVEL, WET
- Ⓔ RESIDUAL DENSE TO VERY DENSE TAN-BROWN CLAYEY SILTY SAND, MOIST
- Ⓕ ALLUVIAL SOFT TO MEDIUM STIFF GRAY SANDY SILTY CLAY, WET

–L– Sta. 12+50.00
BEGIN GRADE
EL.732.48'

–L– Sta. 12+00.00
BEGIN RESURFACING

CL STA 13+67.50
CL EL.732.13
THREE SPANS
1@ 40', 21" CORED SLAB
1@ 70', 24" CORED SLAB
1@ 45', 21" CORED SLAB
90° SKEW

–L– Sta.14+70.00
END GRADE
EL.731.81'

–L– Sta.15+20.00
END RESURFACING

EB1-A
12+88 –L–
6 LT.
ELEV. 731.5

B1-B
13+34 –L–
8 RT.
ELEV. 707.5

B2-A
13+98 –L–
7 LT.
ELEV. 716.7

EB2-A
14+45 –L–
7 LT.
ELEV. 731.5

(–)0.3000%

750 740 730 720 710 700 690 680

10 11 12 13 14 15 16 17

ROADWAY EMBANKMENT (FILL)

SOFT TAN-ORANGE-BROWN SILTY SANDY CLAY, MOIST

3 3 4 2 38

08/14

100/.2

RESIDUAL
DENSE TAN-BROWN CLAYEY SILTY SAND MOIST

WEATHERED ROCK
SEV. WEATHERED CRYSTALLINE ROCK (BIOTITE GNEISS)

CRYSTALLINE ROCK

CAR

100 YR WSEL 722.35

25 YR WSEL 719.4

WSE 707.0
DATE OF SURVEY
(7/18/2012)

Ⓐ 08/14

ALLUVIAL

Ⓑ WR

RESIDUAL

100/.2

BLACK AND WHITE BANDED SLI. WEATH. TO FRESH HARD TO VERY HARD BIOTITE GNEISS WITH SMALL INTERMIXED LAYERS OF GRANITE FRACTURE SPACING RANGES FROM VERY CLOSE TO WIDE
REC = 97% RQD = 82%
R1 = 15, R2 = 17, R3 = 15, R4 = 12, R5 = 7, RMR = 66

CRYSTALLINE ROCK

BT

Ⓒ 0 Ⓓ 14 Ⓔ 100/.3

100/.2

BT
FIAD
(8/19/14)

ROADWAY EMBANKMENT (FILL)

6 6 5

MED. STIFF RED-ORANGE SANDY CLAYEY SILT, MOIST

Ⓕ RESIDUAL
ALLUVIUM
DENSE TO VERY DENSE TAN-BROWN CLAYEY SILTY SAND, MOIST

100/.4

WEATHERED ROCK
SEV. WEATHERED CRYSTALLINE ROCK (BIOTITE GNEISS)

100/.2

CRYSTALLINE ROCK

CAR
FIAD
(8/27/14)

WEATHERED ROCK
SEV. WEATHERED CRYSTALLINE ROCK (BIOTITE GNEISS)

100/.2

BLACK AND WHITE BANDED SLI. WEATH. TO FRESH HARD TO VERY HARD BIOTITE GNEISS WITH VERY CLOSE TO WIDE FRACTURE SPACING
REC = 99% RQD = 95%
R1 = 15, R2 = 20, R3 = 15, R4 = 15, R5 = 7, RMR = 72

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| 45355.1.32 (BD-5109AF) | 5 |

Section Through End Bent One
Sta. 12+88.75 -L- (W.P.#1)
Skew=90 Deg.

0 10 20
FEET
V.E. = 1:1

SHEPPARDS MILL RD. (S.R.1674)

EB1-A
12+88 -L-
6 LT.
ELEV. 731.5

EB1-B
12+89 -L-
10 RT.
ELEV. 731.5

GROUND SURFACE

ROADWAY EMBANKMENT (FILL)
SOFT TAN-ORANGE-BROWN SILTY SANDY CLAY, MOIST

ROADWAY EMBANKMENT (FILL)
SOFT TO MEDIUM STIFF TAN-ORANGE-BROWN SILTY SANDY CLAY, MOIST

RESIDUAL
DENSE TAN-BROWN CLAYEY SILTY SAND MOIST

RESIDUAL
DENSE TAN-BROWN CLAYEY SILTY SAND MOIST

3
3
4
2
38

2
5
4
5
40

08/14
08/14

100/2
100/4

CRYSTALLINE ROCK
CAR
CAR
CRYSTALLINE ROCK

WEATHERED ROCK
SEVERELY WEATHERED CRYSTALLINE ROCK (BIOTITE GNEISS)

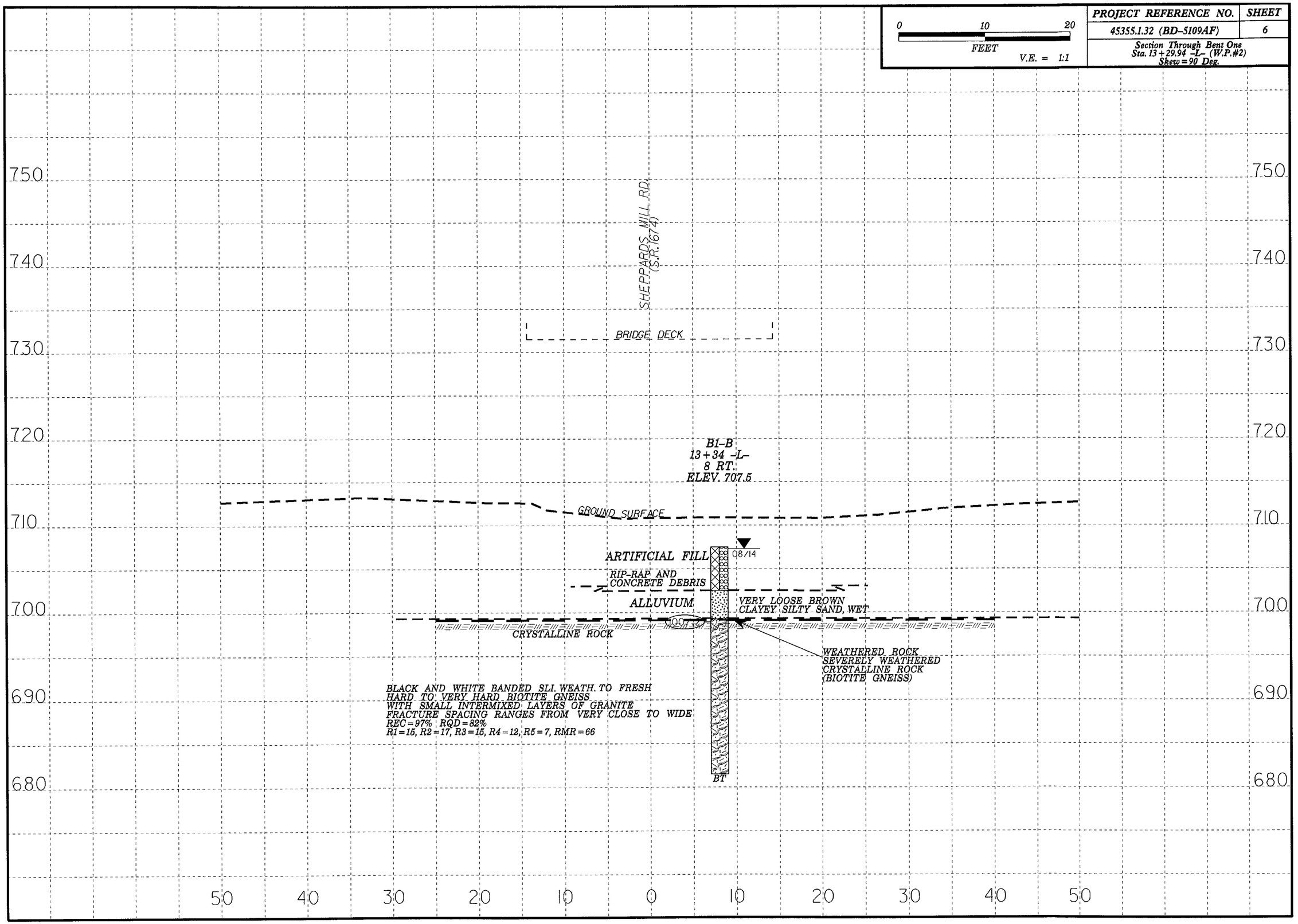
750
740
730
720
710
700
690
680

50 40 30 20 10 0 10 20 30 40 50

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| 45355.1.32 (BD-5109AF) | 6 |

0 10 20
FEET
V.E. = 1:1

Section Through Bent One
Sta. 13+29.94 -L- (W.P.#2)
Skew = 90 Deg.



| PROJECT REFERENCE NO. | SHEET |
|---|---|
| 45355.1.32 (BD-5109AF) | 7 |

Section Through Bent Two
Sta. 14+00.06 -L- (W.P.#3)
Skew=90 Deg.

0 10 20
FEET
V.E. = 1:1

SHEPPARDS MILL RD.
(S.R.1674)

BRIDGE DECK

B2-A
13+98 -L-
7 LT.
ELEV. 716.7

B2-B
13+99 -L-
25 RT.
ELEV. 717.1

GROUND SURFACE

ALLUVIUM

VERY LOOSE BROWN
CLAYEY SILTY SAND
MOIST

MEDIUM DENSE GRAY SILTY
COARSE SAND AND GRAVEL
WET

DENSE TO VERY DENSE TAN-BROWN CLAYEY SILTY SAND, MOIST

RESIDUAL

WEATHERED ROCK
SEVERELY WEATHERED
CRYSTALLINE ROCK
(BIOTITE GNEISS)

CRYSTALLINE ROCK

BLACK AND WHITE BANDED SLI. WEATHERED TO FRESH
HARD TO VERY HARD BIOTITE GNEISS
WITH VERY CLOSE TO WIDE FRACTURE SPACING
REC=99% RQD=96%
R1=15, R2=20, R3=15, R4=15, R5=7, RMR=72

BT
FIAD
(8/19/14)

08/14

ALLUVIUM

VERY LOOSE BROWN
CLAYEY SILTY SAND
MOIST

DENSE TO VERY DENSE TAN-BROWN
CLAYEY SILTY SAND, MOIST

CRYSTALLINE ROCK

BLACK AND WHITE BANDED MOD. WEATHERED TO FRESH
HARD TO VERY HARD BIOTITE GNEISS
WITH VERY CLOSE TO CLOSE FRACTURE SPACING
REC=100% RQD=76%
R1=15, R2=17, R3=15, R4=20, R5=7, RMR=74

BT

750
740
730
720
710
700
690
680

50 40 30 20 10 0 10 20 30 40 50

| PROJECT REFERENCE NO. | SHEET |
|---|---|
| 45355.1.32 (BD-5109AF) | 8 |

Section Through End Bent Two
Sta. 14+46.25 -L- (W.P.#4)
Skew = 90 Deg.

0 10 20
FEET
V.E. = 1:1

SHEPPARDS MILL RD.
(S.R.1674)

EB2-A
14+45 -L-
7 LT.
ELEV. 731.5

EB2-B
14+45 -L-
24 RT.
ELEV. 721.3

GROUND SURFACE

ROADWAY EMBANKMENT (FILL)

⑥ MEDIUM STIFF RED-ORANGE SANDY CLAYEY SILT, MOIST

⑥

ALLUVIUM

⑤ SOFT TO MEDIUM STIFF GRAY SANDY SILTY CLAY, WET

DENSE TO VERY DENSE TAN-BROWN CLAYEY SILTY SAND MOIST

100/.4

WEATHERED ROCK
SEVERELY WEATHERED
CRYSTALLINE ROCK
(BIOTITE GNEISS)

100/.2

CRYSTALLINE ROCK

CAR
FIAD
(8/27/14)

ALLUVIUM

⑦ MEDIUM STIFF BROWN FINE SANDY SILTY CLAY MOIST

RESIDUAL

DENSE TO VERY DENSE TAN-BROWN CLAYEY SILTY SAND, MOIST

100/.8

WEATHERED ROCK
SEVERELY WEATHERED
CRYSTALLINE ROCK (BIOTITE GNEISS)

CRYSTALLINE ROCK

AR
DRY
(8/13/14)

750 740 730 720 710 700 690 680

50 40 30 20 10 0 10 20 30 40 50

# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BORELOG REPORT

| | | | | |
|---|---|---|---|---|
| **WBS** 45355.1.32 | **TIP** BD-5109AF | **COUNTY** STOKES | **GEOLOGIST** Stickney, J. K. | |
| **SITE DESCRIPTION** Bridge 108 on SR 1674 (Sheppards Mill Rd.) over Snow Creek Between SR 1697 and SR 1647 | | | | **GROUND WTR (ft)** |
| **BORING NO.** EB1-A | **STATION** 12+88 | **OFFSET** 6 ft LT | **ALIGNMENT** -L- | **0 HR.** 10.0 |
| **COLLAR ELEV.** 731.5 ft | **TOTAL DEPTH** 29.9 ft | **NORTHING** 981,928 | **EASTING** 1,664,234 | **24 HR.** 19.0 |
| **DRILL RIG/HAMMER EFF./DATE** HFO0072 CME-550 88% 03/19/2014 | | **DRILL METHOD** NW Casing w/ Advancer | **HAMMER TYPE** Automatic | |
| **DRILLER** Smith, C.L. | **START DATE** 08/26/14 | **COMP. DATE** 08/26/14 | **SURFACE WATER DEPTH** N/A | |

| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT 0.5ft | 0.5ft | 0.5ft | BLOWS PER FOOT 0 25 50 75 100 | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION ELEV. (ft) | DEPTH (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 735 | | | | | | | | | | 731.5 GROUND SURFACE | 0.0 |
| 730 | 727.1 | 4.4 | 1 | 1 | 2 | 3 | | M | | **ROADWAY EMBANKMENT** SOFT TAN-ORANGE-BROWN SILTY SANDY CLAY, MOIST | |
| 725 | 722.1 | 9.4 | 1 | 1 | 2 | 3 | | M | | | |
| 720 | 717.1 | 14.4 | 1 | 2 | 2 | 4 | | M | | | |
| 715 | 712.1 | 19.4 | 0 | 0 | 2 | 2 | | M | | 707.8 | 23.7 |
| 710 | 707.1 | 24.4 | 7 | 17 | 21 | 38 | | M | | **RESIDUAL** DENSE TAN-BROWN CLAYEY SILTY SAND (MOIST) | |
| 705 | 702.1 | 29.4 | 100/.2 | | | 100/.2 | | | | 702.1 / 701.6 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK (BIOTITE GNEISS) | 29.4 / 29.9 |

Boring Terminated with Casing Advancer Refusal at Elevation 701.6 ft On Crystalline Rock (Biotite Gneiss)

| | | | | |
|---|---|---|---|---|
| **WBS** 45355.1.32 | **TIP** BD-5109AF | **COUNTY** STOKES | **GEOLOGIST** Stickney, J. K. | |
| **SITE DESCRIPTION** Bridge 108 on SR 1674 (Sheppards Mill Rd.) over Snow Creek Between SR 1697 and SR 1647 | | | | **GROUND WTR (ft)** |
| **BORING NO.** EB1-B | **STATION** 12+89 | **OFFSET** 10 ft RT | **ALIGNMENT** -L- | **0 HR.** 8.8 |
| **COLLAR ELEV.** 731.5 ft | **TOTAL DEPTH** 29.8 ft | **NORTHING** 981,915 | **EASTING** 1,664,242 | **24 HR.** 18.4 |
| **DRILL RIG/HAMMER EFF./DATE** HFO0072 CME-550 88% 03/19/2014 | | **DRILL METHOD** NW Casing w/ Advancer | **HAMMER TYPE** Automatic | |
| **DRILLER** Smith, C.L. | **START DATE** 08/26/14 | **COMP. DATE** 08/26/14 | **SURFACE WATER DEPTH** N/A | |

| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT 0.5ft | 0.5ft | 0.5ft | BLOWS PER FOOT 0 25 50 75 100 | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION ELEV. (ft) | DEPTH (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 735 | | | | | | | | | | 731.5 GROUND SURFACE | 0.0 |
| 730 | 727.3 | 4.2 | 1 | 1 | 1 | 2 | | M | | **ROADWAY EMBANKMENT** SOFT TO MEDIUM STIFF TAN-ORANGE-BROWN SILTY SANDY CLAY, MOIST | |
| 725 | 722.3 | 9.2 | 2 | 2 | 3 | 5 | | M | | | |
| 720 | 717.3 | 14.2 | 2 | 2 | 2 | 4 | | M | | | |
| 715 | 712.3 | 19.2 | 1 | 2 | 3 | 5 | | M | | 707.7 | 23.8 |
| 710 | 707.3 | 24.2 | 8 | 19 | 21 | 40 | | M | | **RESIDUAL** DENSE TAN-BROWN CLAYEY SILTY SAND, MOIST | |
| 705 | 702.3 | 29.2 | 100/.4 | | | 100/.4 | | | | 702.3 / 701.7 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK (BIOTITE GNEISS) | 29.2 / 29.8 |

Boring Terminated with Casing Advancer Refusal at Elevation 701.7 ft On Crystalline Rock (Biotite Gneiss)

NCDOT BORE DOUBLE BD5109AF_GEO_BH_BRDG0108.GPJ NC_DOT.GDT 9/29/14

# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BORELOG REPORT

| | | | | |
|---|---|---|---|---|
| **WBS** 45355.1.32 | **TIP** BD-5109AF | **COUNTY** STOKES | **GEOLOGIST** Stickney, J. K. | |
| **SITE DESCRIPTION** Bridge 108 on SR 1674 (Sheppards Mill Rd.) over Snow Creek Between SR 1697 and SR 1647 | | | | **GROUND WTR (ft)** |
| **BORING NO.** B1-B | **STATION** 13+34 | **OFFSET** 8 ft RT | **ALIGNMENT** -L- | **0 HR.** 0.0 |
| **COLLAR ELEV.** 707.5 ft | **TOTAL DEPTH** 26.0 ft | **NORTHING** 981,938 | **EASTING** 1,664,281 | **24 HR.** 0.2 |
| **DRILL RIG/HAMMER EFF./DATE** HFO0072 CME-550 88% 03/19/2014 | | **DRILL METHOD** NW Casing W/SPT & Core | **HAMMER TYPE** Automatic | |
| **DRILLER** Smith, C.L. | **START DATE** 08/20/14 | **COMP. DATE** 08/20/14 | **SURFACE WATER DEPTH** N/A | |

| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT 0.5ft | 0.5ft | 0.5ft | BLOWS PER FOOT 0 25 50 75 100 | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION ELEV. (ft) | DEPTH (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 710 | | | | | | | | | | 707.5 GROUND SURFACE | 0.0 |
| 705 | | | | | | | | | | **ARTIFICIAL FILL** RIP-RAP AND CONCRETE DEBRIS | |
| | | | | | | | | | | 702.5 | 5.0 |
| 700 | 699.1 | 8.4 | 100/.2 | | | 100/.2 | | | | **ALLUVIAL** VERY LOOSE BROWN CLAYEY SILTY SAND, WET | |
| | | | | | | | | | | 699.3 | 8.2 |
| 695 | | | | | | | | | | 699.1 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK (BIOTITE GNEISS) | 8.4 |
| | | | | | | | | | | **CRYSTALLINE ROCK** BLACK AND WHITE BANDED BIOTITE GNEISS WITH SMALL INTERMIXED LAYERS OF GRANITE | |
| 690 | | | | | | | | | | | |
| 685 | | | | | | | | | | 681.5 | 26.0 |
| | | | | | | | | | | Boring Terminated at Elevation 681.5 ft In Crystalline Rock (Biotite Gneiss) | |

NCDOT BORE SINGLE BD5109AF_GEO_BH_BRDG0108.GPJ NC_DOT.GDT 9/24/14



# NCDOT GEOTECHNICAL ENGINEERING UNIT
# CORE BORING REPORT

| | | | | |
|---|---|---|---|---|
| **WBS** 45355.1.32 | **TIP** BD-5109AF | **COUNTY** STOKES | **GEOLOGIST** Stickney, J. K. | |
| **SITE DESCRIPTION** Bridge 108 on SR 1674 (Sheppards Mill Rd.) over Snow Creek Between SR 1697 and SR 1647 | | | | **GROUND WTR (ft)** |
| **BORING NO.** B1-B | **STATION** 13+34 | **OFFSET** 8 ft RT | **ALIGNMENT** -L- | **0 HR.** 0.0 |
| **COLLAR ELEV.** 707.5 ft | **TOTAL DEPTH** 26.0 ft | **NORTHING** 981,938 | **EASTING** 1,664,281 | **24 HR.** 0.2 |
| **DRILL RIG/HAMMER EFF./DATE** HFO0072 CME-550 88% 03/19/2014 | | **DRILL METHOD** NW Casing W/SPT & Core | **HAMMER TYPE** Automatic | |
| **DRILLER** Smith, C.L. | **START DATE** 08/20/14 | **COMP. DATE** 08/20/14 | **SURFACE WATER DEPTH** N/A | |
| **CORE SIZE** N0/NQ | **TOTAL RUN** 17.6 ft | | | |

| ELEV (ft) | RUN ELEV (ft) | DEPTH (ft) | RUN (ft) | DRILL RATE (Min/ft) | RUN REC. (ft) % | RUN RQD (ft) % | SAMP. NO. | STRATA REC. (ft) % | STRATA RQD (ft) % | LOG | DESCRIPTION AND REMARKS ELEV. (ft) | DEPTH (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 699.1 | | | | | | | | | | | Begin Coring @ 8.4 ft | |
| | 699.1 | 8.4 | 2.6 | 1:05/1.0 *N=100/.2* 1:05/1.0 | (2.6) 100% | (1.4) 54% | | (17.1) 97% | (14.5) 82% | | 699.1 **CRYSTALLINE ROCK** BLACK AND WHITE BANDED SLIGHTLY WEATHERED TO FRESH, HARD TO VERY HARD BIOTITE GNEISS WITH SMALL INTERMIXED LAYERS OF GRANITE. FRACTURE SPACING RANGES FROM VERY CLOSE TO WIDE REC=97% RQD=82% R1=15, R2=17, R3=15, R4=12, R5=7, RMR=66 | 8.4 |
| 695 | 696.5 | 11.0 | 5.0 | 1:10/1.0 | (4.7) 94% | (4.4) 88% | | | | | | |
| | 691.5 | 16.0 | | | | | | | | | | |
| 690 | | | 5.0 | 1:07/1.0 | (4.8) 96% | (3.7) 74% | | | | | | |
| | 686.5 | 21.0 | | | | | | | | | | |
| 685 | | | 5.0 | 1:00/1.0 | (5.0) 100% | (5.0) 100% | | | | | | |
| | 681.5 | 26.0 | | | | | | | | | 681.5 | 26.0 |
| | | | | | | | | | | | Boring Terminated at Elevation 681.5 ft In Crystalline Rock (Biotite Gneiss) | |

NCDOT CORE SINGLE BD5109AF_GEO_BH_BRDG0108.GPJ NC_DOT.GDT 9/29/14

# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BORELOG REPORT

| | | | | |
|---|---|---|---|---|
| **WBS** 45355.1.32 | **TIP** BD-5109AF | **COUNTY** STOKES | **GEOLOGIST** Stickney, J. K. | |
| **SITE DESCRIPTION** Bridge 108 on SR 1674 (Sheppards Mill Rd.) over Snow Creek Between SR 1697 and SR 1647 | | | | **GROUND WTR (ft)** |
| **BORING NO.** B2-A | **STATION** 13+98 | **OFFSET** 7 ft LT | **ALIGNMENT** -L- | **0 HR.** FIAD |
| **COLLAR ELEV.** 716.7 ft | **TOTAL DEPTH** 32.3 ft | **NORTHING** 981,981 | **EASTING** 1,664,330 | **24 HR.** N/A |
| **DRILL RIG/HAMMER EFF./DATE** HFO0072 CME-550 88% 03/19/2014 | | **DRILL METHOD** NW Casing W/SPT & Core | **HAMMER TYPE** Automatic | |
| **DRILLER** Smith, C.L. | **START DATE** 08/19/14 | **COMP. DATE** 08/19/14 | **SURFACE WATER DEPTH** N/A | |

| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT 0.5ft | 0.5ft | 0.5ft | BLOWS PER FOOT 0 25 50 75 100 | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION ELEV. (ft) | DEPTH (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 720 | | | | | | | | | | 716.7 GROUND SURFACE | 0.0 |
| 715 | 712.0 | 4.7 | 0 | 0 | 0 | 0 | | M | | **ALLUVIAL** VERY LOOSE BROWN CLAYEY SILTY SAND, MOIST | |
| 710 | 707.0 | 9.7 | 3 | 5 | 9 | 14 | | W | | 710.4 **ALLUVIAL** MEDIUM DENSE GRAY SILTY COARSE SAND AND GRAVEL, WET | 6.3 |
| 705 | 702.0 | 14.7 | 100/.3 | | | 100/.3 | | | | 704.1 **RESIDUAL** 702.0 DENSE TO VERY DENSE TAN-BROWN CLAYEY SILTY SAND, MOIST | 12.6 14.7 |
| 700 | 697.0 | 19.7 | 100/.2 | | | 100/.2 | | | | **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK (BIOTITE GNEISS) | |
| 695 | | | | | | | | | | 695.5 **CRYSTALLINE ROCK** BLACK AND WHITE BANDED BIOTITE GNEISS | 21.2 |
| 690 | | | | | | | | | | | |
| 685 | | | | | | | | | | 684.4 Boring Terminated at Elevation 684.4 ft In Crystalline Rock (Biotite Gneiss) | 32.3 |

NCDOT BORE SINGLE BD5109AF_GEO_BH_BRDG0108.GPJ NC_DOT.GDT 9/24/14



# NCDOT GEOTECHNICAL ENGINEERING UNIT
# CORE BORING REPORT

| | | | | |
|---|---|---|---|---|
| **WBS** 45355.1.32 | **TIP** BD-5109AF | **COUNTY** STOKES | **GEOLOGIST** Stickney, J. K. | |
| **SITE DESCRIPTION** Bridge 108 on SR 1674 (Sheppards Mill Rd.) over Snow Creek Between SR 1697 and SR 1647 | | | | **GROUND WTR (ft)** |
| **BORING NO.** B2-A | **STATION** 13+98 | **OFFSET** 7 ft LT | **ALIGNMENT** -L- | **0 HR.** FIAD |
| **COLLAR ELEV.** 716.7 ft | **TOTAL DEPTH** 32.3 ft | **NORTHING** 981,981 | **EASTING** 1,664,330 | **24 HR.** N/A |
| **DRILL RIG/HAMMER EFF./DATE** HFO0072 CME-550 88% 03/19/2014 | | **DRILL METHOD** NW Casing W/SPT & Core | **HAMMER TYPE** Automatic | |
| **DRILLER** Smith, C.L. | **START DATE** 08/19/14 | **COMP. DATE** 08/19/14 | **SURFACE WATER DEPTH** N/A | |
| **CORE SIZE** N0/NQ | **TOTAL RUN** 11.1 ft | | | |

| ELEV (ft) | RUN ELEV (ft) | DEPTH (ft) | RUN (ft) | DRILL RATE (Min/ft) | RUN REC. (ft) % | RUN RQD (ft) % | SAMP. NO. | STRATA REC. (ft) % | STRATA RQD (ft) % | LOG | DESCRIPTION AND REMARKS ELEV. (ft) | DEPTH (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 695.5 | | | | | | | | | | | Begin Coring @ 21.2 ft | |
| 695 | 695.5 | 21.2 | 4.1 | 1:00/1.0 | (4.1) 100% | (3.6) 88% | | (11.0) 99% | (10.5) 95% | | 695.5 **CRYSTALLINE ROCK** BLACK AND WHITE BANDED SLIGHTLY WEATHERED TO FRESH, HARD TO VERY HARD BIOTITE GNEISS WITH VERY CLOSE TO WIDE FRACTURE SPACING REC=99% RQD=95% R1=15, R2=20, R3=15, R4=15, R5=7, RMR=72 | 21.2 |
| | 691.4 | 25.3 | | | | | | | | | | |
| 690 | | | 5.0 | 1:10/1.0 | (4.9) 98% | (4.9) 98% | | | | | | |
| | 686.4 | 30.3 | | | | | | | | | | |
| 685 | 684.4 | 32.3 | 2.0 | 1:10/1.0 | (2.0) 100% | (2.0) 100% | | | | | 684.4 Boring Terminated at Elevation 684.4 ft In Crystalline Rock (Biotite Gneiss) | 32.3 |

NCDOT CORE SINGLE BD5109AF_GEO_BH_BRDG0108.GPJ NC_DOT.GDT 9/29/14

# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BORELOG REPORT

| | | | | |
|---|---|---|---|---|
| **WBS** 45355.1.32 | **TIP** BD-5109AF | **COUNTY** STOKES | **GEOLOGIST** Stickney, J. K. | |
| **SITE DESCRIPTION** Bridge 108 on SR 1674 (Sheppards Mill Rd.) over Snow Creek Between SR 1697 and SR 1647 | | | | **GROUND WTR (ft)** |
| **BORING NO.** B2-B | **STATION** 13+99 | **OFFSET** 25 ft RT | **ALIGNMENT** -L- | **0 HR.** 3.0 |
| **COLLAR ELEV.** 717.1 ft | **TOTAL DEPTH** 34.8 ft | **NORTHING** 981,953 | **EASTING** 1,664,346 | **24 HR.** 8.0 |
| **DRILL RIG/HAMMER EFF./DATE** HFO0072 CME-550 88% 03/19/2014 | | **DRILL METHOD** NW Casing W/SPT & Core | **HAMMER TYPE** Automatic | |
| **DRILLER** Smith, C.L. | **START DATE** 08/13/14 | **COMP. DATE** 08/13/14 | **SURFACE WATER DEPTH** N/A | |

| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT 0.5ft | 0.5ft | 0.5ft | BLOWS PER FOOT 0 25 50 75 100 | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION ELEV. (ft) | DEPTH (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 720 | | | | | | | | | | 717.1 GROUND SURFACE | 0.0 |
| 715 | 712.9 | 4.2 | 0 | 1 | 1 | 2 | | M | | **ALLUVIAL** VERY LOOSE BROWN CLAYEY SILTY SAND, MOIST | |
| 710 | 707.9 | 9.2 | 0 | 0 | 0 | 0 | | W | | 705.7 | 11.4 |
| 705 | 702.9 | 14.2 | 100/.2 | | | 100/.2 | | | | **RESIDUAL** DENSE TO VERY DENSE TAN-BROWN CLAYEY SILTY SAND, MOIST | |
| 700 | 697.9 | 19.2 | 100/.2 | | | 100/.2 | | | | 702.9 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK (BIOTITE GNEISS) | 14.2 |
| 695 | | | | | | | | | | 696.6 **CRYSTALLINE ROCK** BLACK AND WHITE BANDED BIOTITE GNEISS | 20.5 |
| 690 | | | | | | | | | | | |
| 685 | | | | | | | | | | 682.3 Boring Terminated at Elevation 682.3 ft In Crystalline Rock (Biotite Gneiss) | 34.8 |

NCDOT BORE SINGLE BD5109AF_GEO_BH_BRDG0108.GPJ NC_DOT.GDT 9/24/14



# NCDOT GEOTECHNICAL ENGINEERING UNIT
# CORE BORING REPORT

| | | | | |
|---|---|---|---|---|
| **WBS** 45355.1.32 | **TIP** BD-5109AF | **COUNTY** STOKES | **GEOLOGIST** Stickney, J. K. | |
| **SITE DESCRIPTION** Bridge 108 on SR 1674 (Sheppards Mill Rd.) over Snow Creek Between SR 1697 and SR 1647 | | | | **GROUND WTR (ft)** |
| **BORING NO.** B2-B | **STATION** 13+99 | **OFFSET** 25 ft RT | **ALIGNMENT** -L- | **0 HR.** 3.0 |
| **COLLAR ELEV.** 717.1 ft | **TOTAL DEPTH** 34.8 ft | **NORTHING** 981,953 | **EASTING** 1,664,346 | **24 HR.** 8.0 |
| **DRILL RIG/HAMMER EFF./DATE** HFO0072 CME-550 88% 03/19/2014 | | **DRILL METHOD** NW Casing W/SPT & Core | **HAMMER TYPE** Automatic | |
| **DRILLER** Smith, C.L. | **START DATE** 08/13/14 | **COMP. DATE** 08/13/14 | **SURFACE WATER DEPTH** N/A | |
| **CORE SIZE** N0/NQ | **TOTAL RUN** 14.3 ft | | | |

| ELEV (ft) | RUN ELEV (ft) | DEPTH (ft) | RUN (ft) | DRILL RATE (Min/ft) | RUN REC. (ft) % | RUN RQD (ft) % | SAMP. NO. | STRATA REC. (ft) % | STRATA RQD (ft) % | LOG | DESCRIPTION AND REMARKS ELEV. (ft) | DEPTH (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 696.6 | | | | | | | | | | | Begin Coring @ 20.5 ft | |
| 695 | 696.6 | 20.5 | 4.3 | 1:22/1.0 | (4.3) 100% | (1.5) 35% | | (14.3) 100% | (10.9) 76% | | 696.6 **CRYSTALLINE ROCK** BLACK AND WHITE BANDED MODERATELY WEATHERED TO FRESH, HARD TO VERY HARD BIOTITE GNEISS WITH VERY CLOSE TO CLOSE FRACTURE SPACING REC=100% RQD=76% R1=15, R2=17, R3=15, R4=20, R5=7, RMR=74 | 20.5 |
| | 692.3 | 24.8 | | | | | | | | | | |
| 690 | | | 5.0 | 1:45/1.0 | (5.0) 100% | (4.6) 92% | | | | | | |
| | 687.3 | 29.8 | | | | | | | | | | |
| 685 | | | 5.0 | 1:30/1.0 | (5.0) 100% | (4.8) 96% | | | | | | |
| | 682.3 | 34.8 | | | | | | | | | 682.3 Boring Terminated at Elevation 682.3 ft In Crystalline Rock (Biotite Gneiss) | 34.8 |

NCDOT CORE SINGLE BD5109AF_GEO_BH_BRDG0108.GPJ NC_DOT.GDT 9/29/14

# NCDOT GEOTECHNICAL ENGINEERING UNIT
# BORELOG REPORT

| | | | |
|---|---|---|---|
| **WBS** 45355.1.32 | **TIP** BD-5109AF | **COUNTY** STOKES | **GEOLOGIST** Stickney, J. K. |
| **SITE DESCRIPTION** Bridge 108 on SR 1674 (Sheppards Mill Rd.) over Snow Creek Between SR 1697 and SR 1647 | | | **GROUND WTR (ft)** |
| **BORING NO.** EB2-A | **STATION** 14+45 | **OFFSET** 7 ft LT | **ALIGNMENT** -L- — **0 HR.** 10.0 |
| **COLLAR ELEV.** 731.5 ft | **TOTAL DEPTH** 26.5 ft | **NORTHING** 982,003 | **EASTING** 1,664,372 — **24 HR.** FIAD |
| **DRILL RIG/HAMMER EFF./DATE** HFO0072 CME-550 88% 03/19/2014 | | **DRILL METHOD** NW Casing w/ Advancer | **HAMMER TYPE** Automatic |
| **DRILLER** Smith, C.L. | **START DATE** 08/27/14 | **COMP. DATE** 08/27/14 | **SURFACE WATER DEPTH** N/A |

| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT 0.5ft | 0.5ft | 0.5ft | BLOWS PER FOOT 0 25 50 75 100 | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION — ELEV. (ft) | DEPTH (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 735 | | | | | | | | | | 731.5 GROUND SURFACE | 0.0 |
| 730 | | | | | | | | | | **ROADWAY EMBANKMENT** MEDIUM STIFF RED-ORANGE SANDY CLAYEY SILT, MOIST | |
| | 727.0 | 4.5 | 1 | 3 | 3 | 6 | | M | | | |
| 725 | | | | | | | | | | | |
| | 722.0 | 9.5 | 2 | 3 | 3 | 6 | | M | | | |
| 720 | | | | | | | | | | | |
| | 717.0 | 14.5 | 0 | 1 | 4 | 5 | | W | | 717.0 **ALLUVIAL** SOFT TO MEDIUM STIFF GRAY SANDY SILTY CLAY, WET | 14.5 |
| 715 | | | | | | | | | | 712.3 | 19.2 |
| | 712.0 | 19.5 | 8 | 100/.4 | | 100/.4 | | | | 711.5 **RESIDUAL** DENSE TO VERY DENSE TAN-BROWN CLAYEY SILTY SAND, MOIST | 20.0 |
| 710 | | | | | | | | | | **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK (BIOTITE GNEISS) | |
| | 707.0 | 24.5 | 100/.2 | | | 100/.2 | | | | 705.0 | 26.5 |
| 705 | | | | | | | | | | Boring Terminated with Casing Advancer Refusal at Elevation 705.0 ft On Crystalline Rock (Biotite Gneiss) | |

| | | | |
|---|---|---|---|
| **WBS** 45355.1.32 | **TIP** BD-5109AF | **COUNTY** STOKES | **GEOLOGIST** Stickney, J. K. |
| **SITE DESCRIPTION** Bridge 108 on SR 1674 (Sheppards Mill Rd.) over Snow Creek Between SR 1697 and SR 1647 | | | **GROUND WTR (ft)** |
| **BORING NO.** EB2-B | **STATION** 14+45 | **OFFSET** 24 ft RT | **ALIGNMENT** -L- — **0 HR.** Dry |
| **COLLAR ELEV.** 721.3 ft | **TOTAL DEPTH** 12.5 ft | **NORTHING** 981,976 | **EASTING** 1,664,386 — **24 HR.** Dry |
| **DRILL RIG/HAMMER EFF./DATE** HFO0072 CME-550 88% 03/19/2014 | | **DRILL METHOD** H.S. Augers | **HAMMER TYPE** Automatic |
| **DRILLER** Smith, C.L. | **START DATE** 08/12/14 | **COMP. DATE** 08/12/14 | **SURFACE WATER DEPTH** N/A |

| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT 0.5ft | 0.5ft | 0.5ft | BLOWS PER FOOT 0 25 50 75 100 | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 725 | | | | | | | | | | 721.3 GROUND SURFACE | 0.0 |
| 720 | | | | | | | | | | **ALLUVIAL** MEDIUM STIFF BROWN FINE SANDY SILTY CLAY, MOIST | |
| | 717.6 | 3.7 | 2 | 3 | 4 | 7 | | M | | | |
| 715 | | | | | | | | | | 713.6 | 7.7 |
| | 712.6 | 8.7 | 8 | 32 | 68/.3 | 100/.8 | | | | 712.1 **RESIDUAL** DENSE TO VERY DENSE TAN-BROWN CLAYEY SILTY SAND, MOIST | 9.2 |
| 710 | | | | | | | | | | 708.8 **WEATHERED ROCK** SEVERELY WEATHERED CRYSTALLINE ROCK (BIOTITE GNEISS) | 12.5 |
| | | | | | | | | | | Boring Terminated by Auger Refusal at Elevation 708.8 ft On Crystalline Rock (Biotite Gneiss) | |

NCDOT BORE DOUBLE BD5109AF_GEO_BH_BRDG0108.GPJ NC_DOT.GDT 9/29/14

45355.1.32 (BD-5109AF
STOKES COUNTY
BRIDGE 108 ON SR 1674 (SHEPPARDS MILL RD.) OVER SNOW CREEK

CORE PHOTOS

45355.1.32 (BD-5109AF
STOKES COUNTY
BRIDGE 108 ON SR 1674 (SHEPPARDS MILL RD.) OVER SNOW CREEK

CORE PHOTOS

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| 45355.1.32 (BD-5109AF) | 16 |

# Aerial Photo

0 60 120
FEET

SKEW=90 DEG.

## -L- CURVE DATA

PI Sta 12+30.40
Δ = 0° 22' 35.5" (RT)
D = 0° 20' 13.3"
L = 111.72'
T = 55.86'
R = 17,000.00'

PI Sta 14+63.18
Δ = 0° 27' 48.7" (RT)
D = 1° 01' 39.8"
L = 45.10'
T = 22.55'
R = 5,575.00'

NC GRID
NAD 83/NSRS 2007

NC DOT "GPS STATION BD5109AF 2"
LOCALIZED PROJECT COORDINATES
N = 982044.686
E = 1664431.403
ELEVATION = 731.54

BEGIN TIP PROJECT BD-5109AF
-L- POC Sta.12+00.00

BL-1
N = 981766.1818
E = 1663976.9417
ELEVATION = 751.30

-L- POT Sta. 15+20.00
END TIP PROJECT BD-5109AF

TO DEAD END
BILLY MOORE FIELD RD (SR 1746)

WOODS

N 61° 44' 58.7" E
N 62° 07' 34.2" E
N 62° 35' 22.9" E

EB1-A
EB1-B
B1-B
B2-A
EB2-A
B2-B
EB2-B
CONC DECK
JOB CONC DECK

20' BST
22' BST

TO DANBURY SHEPPARDS MILL RD.(S.R.1674)
TO DELTA

BM #1

SOIL & GR

-L- POT Sta. 10+00.00
-L- PC Sta. 11+74.54
-L- PT Sta.12+86.26
-L- PC Sta. 14+40.63
-L- PT Sta. 14+85.73
-L- POT Sta. 17+34.69

SNOW CREEK

ROCK
ROCK
ROCK

OLD SHEPPARD MILL RD.(S.R.1675)
BST
TO DEAD END
PAVEMENT APPEARS TO BE UNOPENED

BM #1 (667) ELEVATION = 750.33
N 981754 E 1663993
BL STATION 5+07.00 19 RIGHT
RAILROAD SPIKE SET IN 18" POPLAR

BM #2 (665) ELEVATION = 769.47
N 982245 E 1664764
BL STATION 14+17.00 56 LEFT
RAILROAD SPIKE SET IN 36" WHITE OAK

### DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "BD5109AF GPS 2" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 982044.686(ftf) EASTING: 1664431.403(ftf) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.0000590599 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BD5109AF GPS 2" TO -L- STATION IS

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88