

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-------|-----------------------------|-----------|--------------|
| N.C. | 45355.1.14 (BD-5109N) | 1 | 14 |

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 45355.1.14 (BD-5109N) F.A. PROJ. BRZ-1940(3)
COUNTY FORSYTH
PROJECT DESCRIPTION REPLACE BRIDGE 40 OVER RED BANK CREEK ON SR 1940

SITE DESCRIPTION _____

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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) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE 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 OPINIONS 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 THIS 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 OFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

PERSONNEL

J. K. STICKNEY

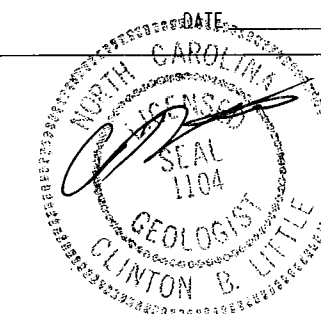
C. L. SMITH

INVESTIGATED BY J. E. BEVERLY

CHECKED BY C. B. LITTLE

SUBMITTED BY C. B. LITTLE

DATE JANUARY 2013



1-8-13

PROJECT: 45355.1.14 ID: BD-5109N

DRAWN BY: C. E. BURRIS

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

| SOIL DESCRIPTION | | GRADATION | | ROCK DESCRIPTION | | TERMS AND DEFINITIONS | | | |
|---|--|---|--|--|--|--|--|--|--|
| SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, MEDIUM PLASTIC, A-7-6</i> | | WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED. | | HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 60 BLOWS PER FOOT 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) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP) | | 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, 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 IN OR BPF OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 60 BLOWS PER FOOT. 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. | | | |
| SOIL LEGEND AND AASHTO CLASSIFICATION | | MINERALOGICAL COMPOSITION | | WEATHERING | | ROCK HARDNESS | | | |
| GENERAL CLASS. GRANULAR MATERIALS (≤ 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS | | MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE. | | FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. VERY SLIGHT 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 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 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 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, YIELDS SPT REFUSAL. SEVERE 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, YIELDS SPT N VALUES > 100 BPF. VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS 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. | | COMPRESSIONIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50 | | WEATHERING EFFECTS 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 IN OR BPF OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 60 BLOWS PER FOOT. 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. | |
| GROUP CLASS. A-1, A-2, A-3, A-4, A-5, A-6, A-7, A-7-5, A-7-6, A-8 | | 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 | | 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 PIECES 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. | | | |
| USUAL TYPES STONE FRAGS. GRAVEL AND SAND FINE SAND SILTY OR CLAYEY GRAVEL AND SAND SILTY SOILS CLAYEY SOILS GRANULAR SOILS SILT-CLAY SOILS MUCK, PEAT HIGHLY ORGANIC SOILS | | 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 | | TEST BORING W/ CORE TEST BORING W/ CORE SPT N-VALUE SPT REFUSAL AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD | | 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. | | | |
| CONSISTENCY OR DENSENESS PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²) | | ABBREVIATIONS AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HL - 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 W - MOISTURE CONTENT V - VERY VST - VANE SHEAR TEST WEA. - WEATHERED WGT - UNIT WEIGHT WGT - 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: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HDIST | | 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 FEET VERY CLOSE LESS THAN 0.16 FEET | | | |
| 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 | | EQUIPMENT USED ON SUBJECT PROJECT ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER B" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING W/ ADVANCER TRICONE STEEL TEETH TRICONE 2 15/16" TUNG-CARB. CORE BIT | | 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 | | BENCH MARK: BD5109N-2 STA. 11+47.44 -L- 15.8748 LT N 900835.9760 E 1650979.9950 ELEVATION: 710.48 FT. | | | |
| SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION | | EQUIPMENT USED ON SUBJECT PROJECT HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B N H HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST | | INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. | | NOTES: STRATIGRAPHY SHOWN THROUGH BORINGS | | | |
| PLASTICITY NONPLASTIC 0-5 LOW PLASTICITY 6-15 MED. PLASTICITY 16-25 HIGH PLASTICITY 26 OR MORE | | EQUIPMENT USED ON SUBJECT PROJECT 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. | | INDURATION | | NOTES: STRATIGRAPHY SHOWN THROUGH BORINGS | | | |

FORSYTH COUNTY
LOW IMPACT BRIDGE

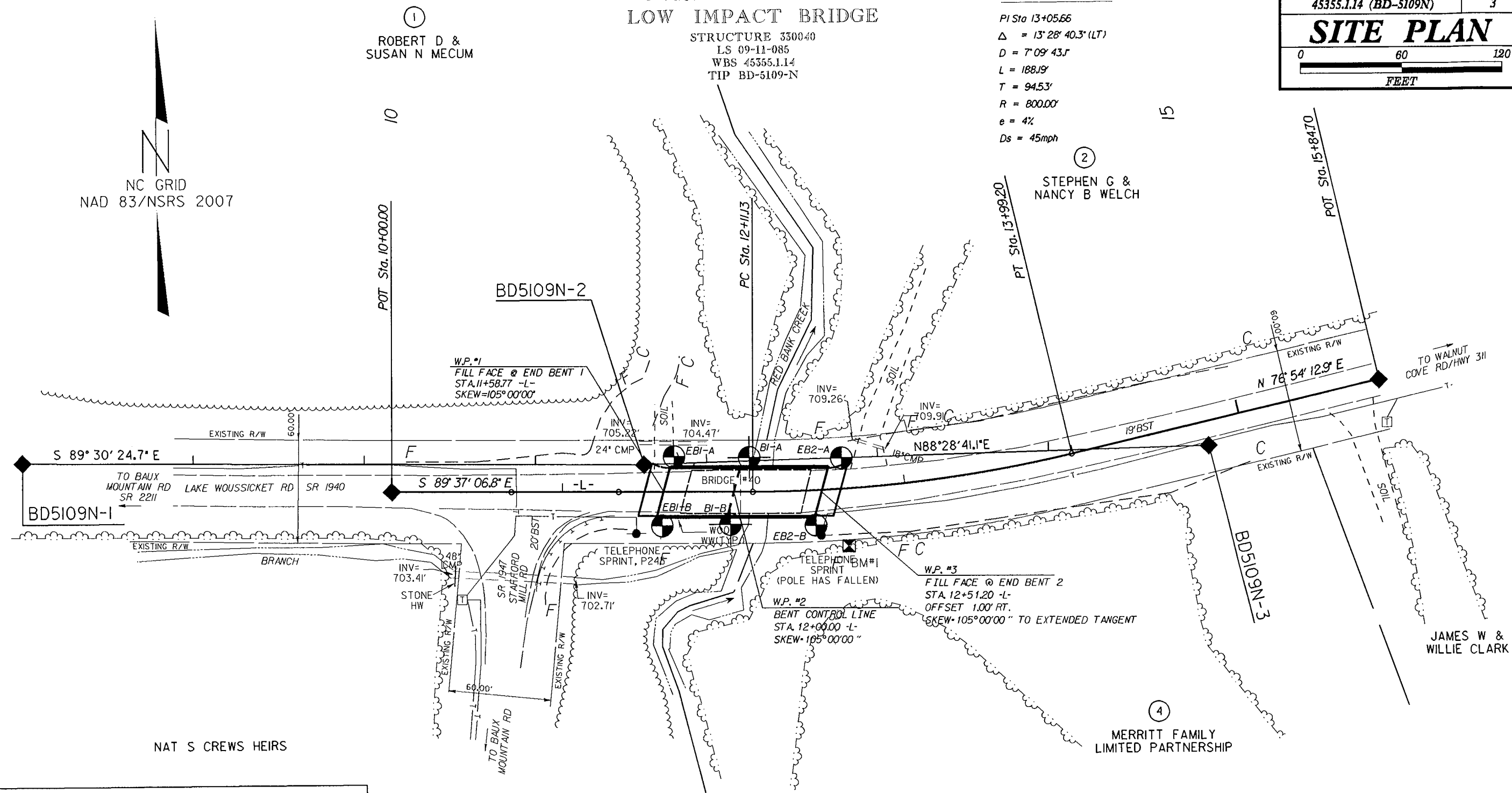
STRUCTURE 330040
LS 09-11-085
WBS 45355.1.14
TIP BD-5109-N

-L- CURVE DATA

PI Sta 13+05.66
Δ = 13°28'40.3" (LT)
D = 7°09'43.1"
L = 188.19'
T = 94.53'
R = 800.00'
e = 4%
Ds = 45mph

| | |
|-----------------------|-------|
| PROJECT REFERENCE NO. | SHEET |
| 45355.1.14 (BD-5109N) | 3 |
| SITE PLAN | |
| | |

NC GRID
NAD 83/NSRS 2007



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCCS FOR MONUMENT "BD5109N-1" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 900839.104(±) EASTING: 1650616.580(±) ELEVATION: 713.08(±) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999862616 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BD5109N-1" TO -EL- STATION 10+00.00 IS S79°48'38.5"E 90.22'

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

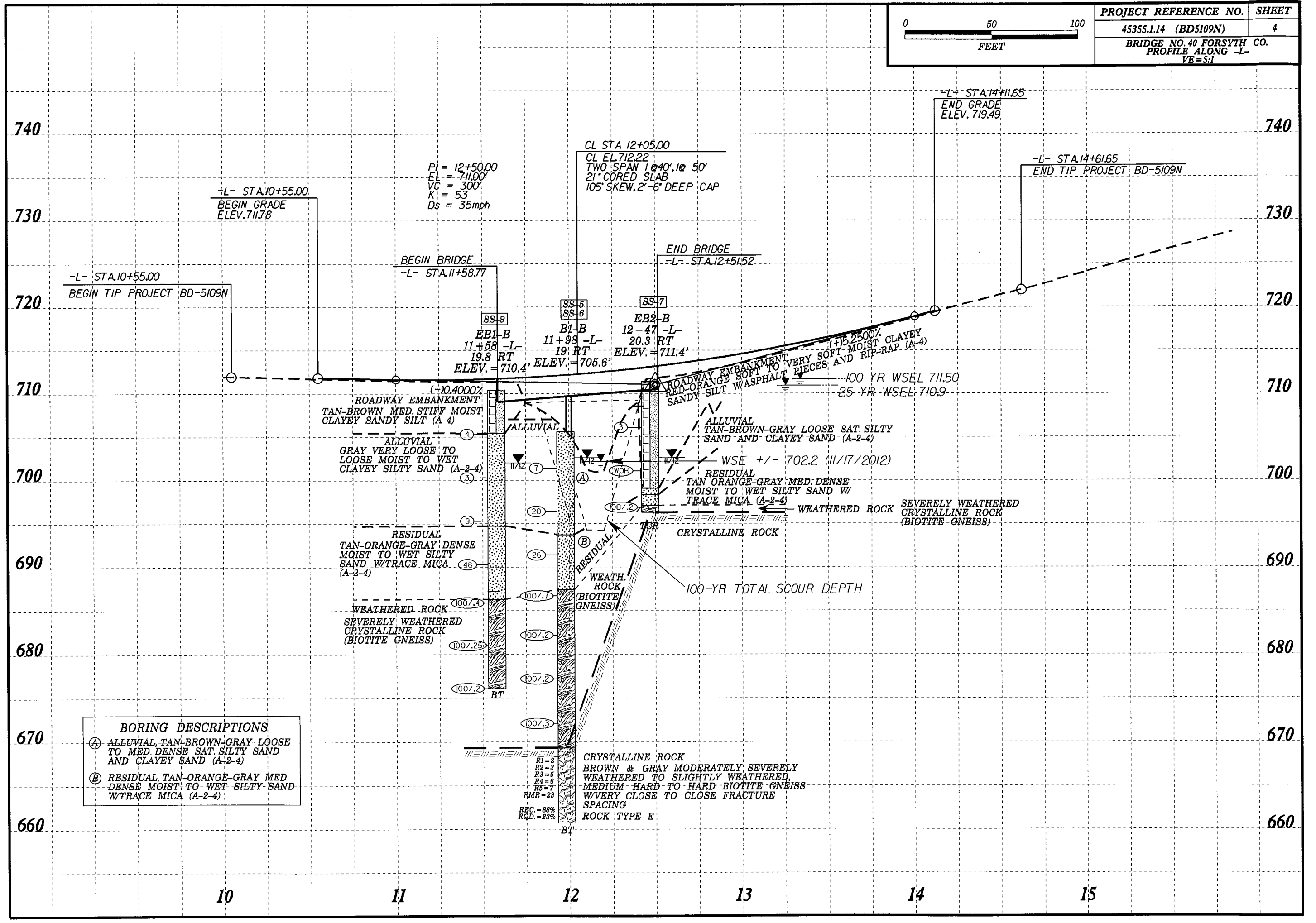
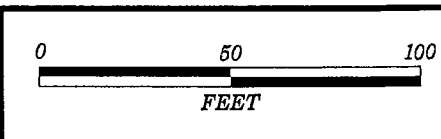
③
MERRITT FAMILY LIMITED PARTNERSHIP

| BL | POINT | DESC. | NORTH | EAST | ELEVATION | EL STATION | OFFSET |
|----|-----------|-------|-------------|--------------|-----------|------------------------|----------|
| 1 | BD5109N-1 | | 900839.1040 | 1650616.5800 | 713.08 | OUTSIDE PROJECT LIMITS | |
| 2 | BD5109N-2 | | 900835.9760 | 1650979.9950 | 710.48 | 12+74.54 | 15.87 LT |
| 3 | BD5109N-3 | | 900844.7502 | 1651310.2399 | 722.65 | 16+05.36 | 13.97 RT |

BENCHMARKS (NAVD88)

BM#1 ELEVATION = 711.93'
N 900788 E 1651100
EL STATION 13+92 33' RIGHT
RR SPIKE IN NE ROOT OF TWIN SWEET GUM TREE

BM#2 ELEVATION = 722.65'
N 900845 E 1651310
EL STATION 16+05 14' RIGHT
REBAR WITH ALUMINUM CAP STAMPED 'BD5109N-3' (SET FLUSH WITH GROUND). POINT LIES 4.2' SOUTH OF EDGE OF LAKE WOUSSICKET ROAD



PI = 12+50.00
 EL = 711.00
 VC = 300'
 K = 53
 Ds = 35mph

CL STA 12+05.00
 CL EL 712.22
 TWO SPAN 1 @ 40', 1 @ 50'
 21" CORED SLAB
 105' SKEW, 2'-6" DEEP CAP

-L- STA.10+55.00
 BEGIN TIP PROJECT BD-5109N

-L- STA.10+55.00
 BEGIN GRADE
 ELEV. 711.78

BEGIN BRIDGE
 -L- STA.11+58.77

END BRIDGE
 -L- STA.12+51.52

-L- STA.14+11.65
 END GRADE
 ELEV. 719.49

-L- STA.14+61.65
 END TIP PROJECT BD-5109N

(-)+0.4000%
 ROADWAY EMBANKMENT
 TAN-BROWN MED. STIFF MOIST
 CLAYEY SANDY SILT (A-4)

ALLUVIAL
 GRAY VERY LOOSE TO
 LOOSE MOIST TO WET
 CLAYEY SILTY SAND (A-2-4)

RESIDUAL
 TAN-ORANGE-GRAY DENSE
 MOIST TO WET SILTY
 SAND W/TRACE MICA
 (A-2-4)

WEATHERED ROCK
 SEVERELY WEATHERED
 CRYSTALLINE ROCK
 (BIOTITE GNEISS)

ROADWAY EMBANKMENT
 RED-ORANGE SOFT TO VERY SOFT MOIST CLAYEY
 SANDY SILT W/ASPHALT
 (+)5.2500%
 100 YR WSEL 711.50
 25 YR WSEL 710.9

ALLUVIAL
 TAN-BROWN-GRAY LOOSE SAT. SILTY
 SAND AND CLAYEY SAND (A-2-4)

WSE +/- 702.2 (11/17/2012)

RESIDUAL
 TAN-ORANGE-GRAY MED. DENSE
 MOIST TO WET SILTY SAND W/
 TRACE MICA (A-2-4)

WEATHERED ROCK
 CRYSTALLINE ROCK

SEVERELY WEATHERED
 CRYSTALLINE ROCK
 (BIOTITE GNEISS)

100-YR TOTAL SCOUR DEPTH

BORING DESCRIPTIONS
 (A) ALLUVIAL, TAN-BROWN-GRAY LOOSE TO MED. DENSE SAT. SILTY SAND AND CLAYEY SAND (A-2-4)
 (B) RESIDUAL, TAN-ORANGE-GRAY MED. DENSE MOIST TO WET SILTY SAND W/TRACE MICA (A-2-4)

CRYSTALLINE ROCK
 BROWN & GRAY MODERATELY SEVERELY WEATHERED TO SLIGHTLY WEATHERED, MEDIUM HARD TO HARD BIOTITE GNEISS W/VERY CLOSE TO CLOSE FRACTURE SPACING
 ROCK TYPE E
 R1 = 2
 R2 = 3
 R3 = 6
 R4 = 6
 R5 = 7
 RMR = 23
 REC. = 88%
 RQD. = 23%

10

11

12

13

14

15

660

670

680

690

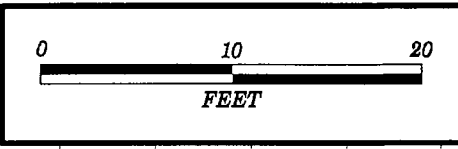
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710

720

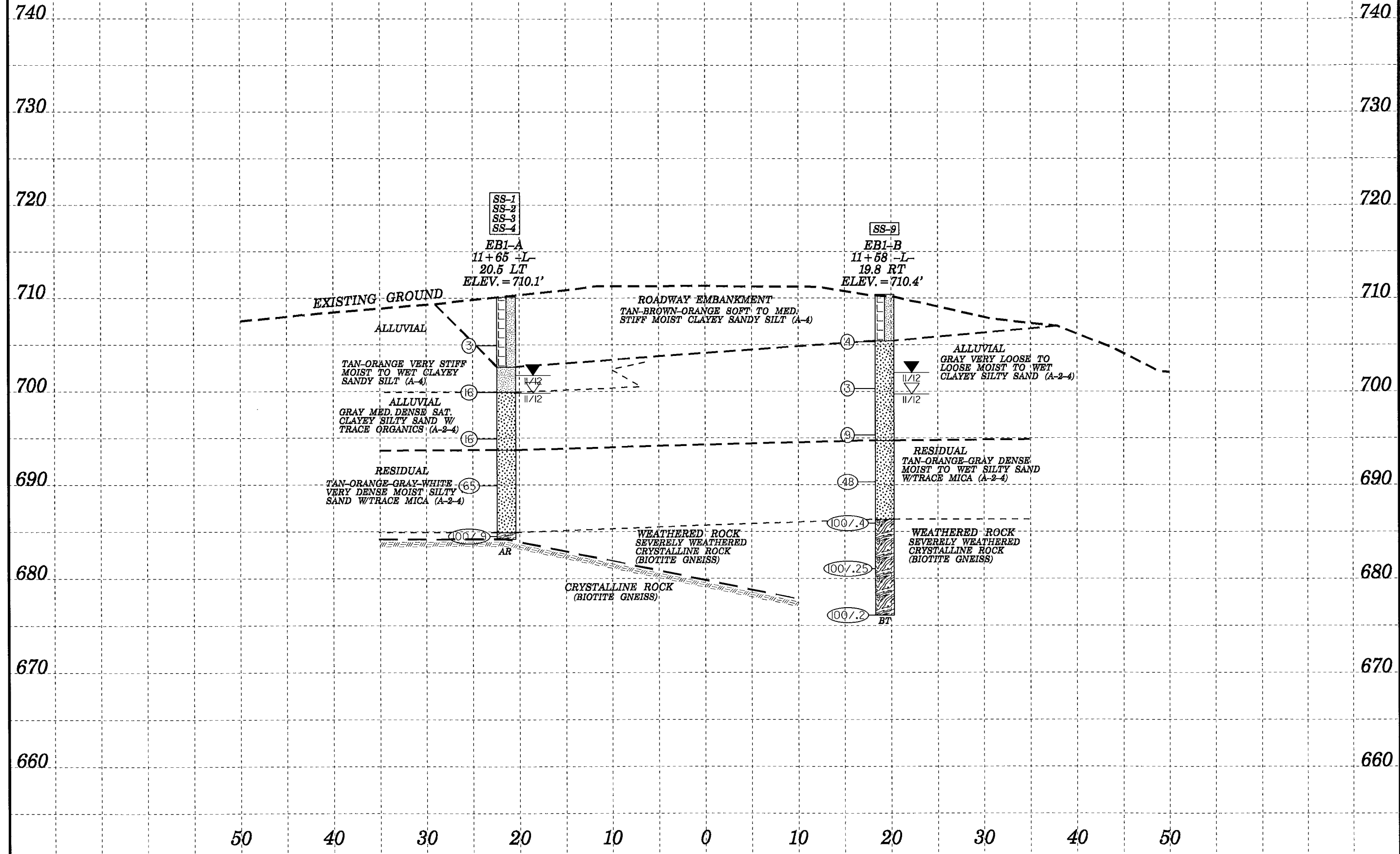
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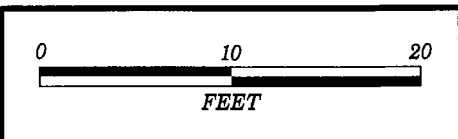
740



| | |
|-----------------------|-------|
| PROJECT REFERENCE NO. | SHEET |
| 45355.1.14 (BD-5109N) | 5 |
| SECTION THROUGH EB-1 | |
| STA. 11+58.77 -L- | |
| SKEW=105°00'00" | |

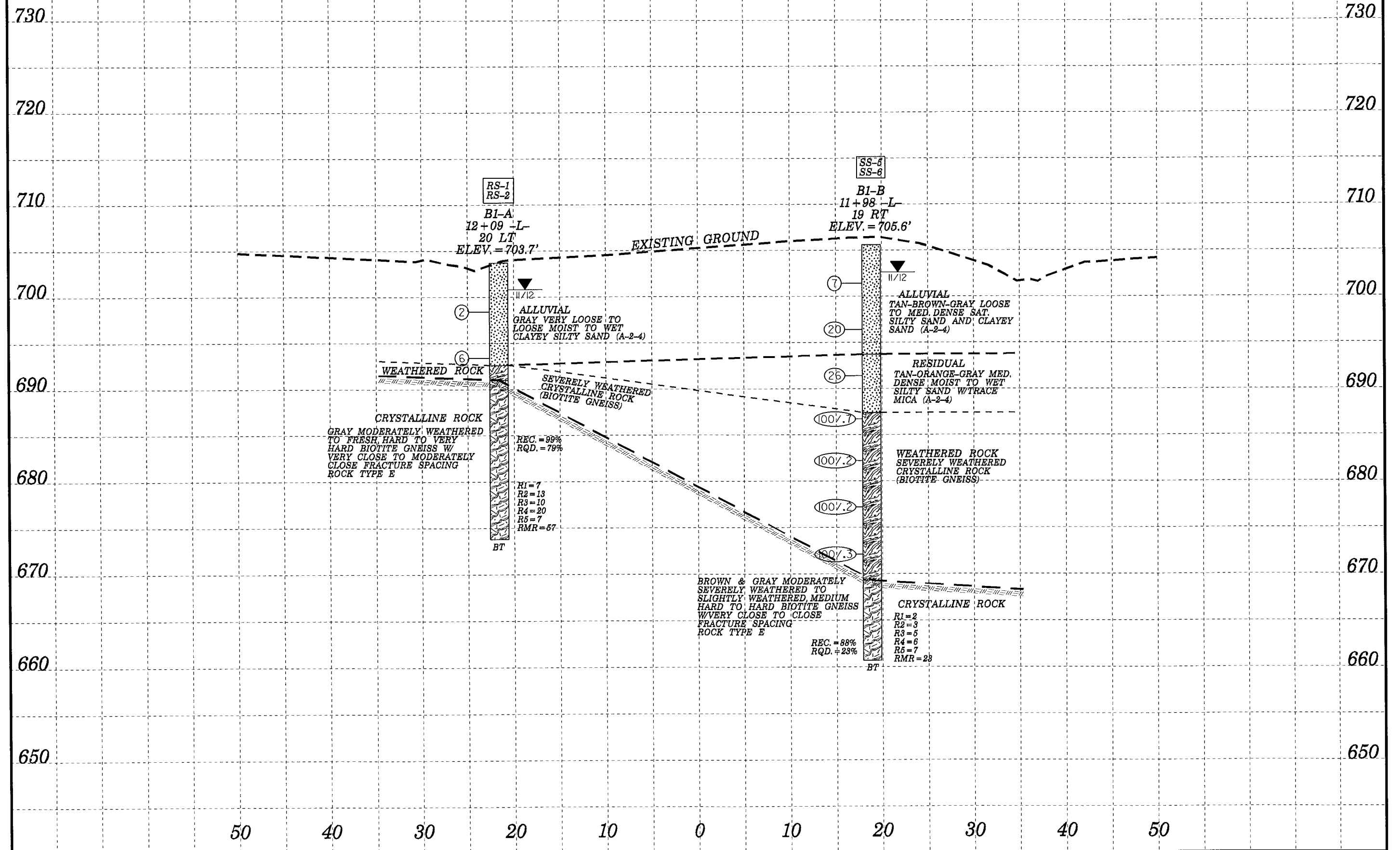
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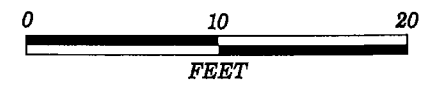




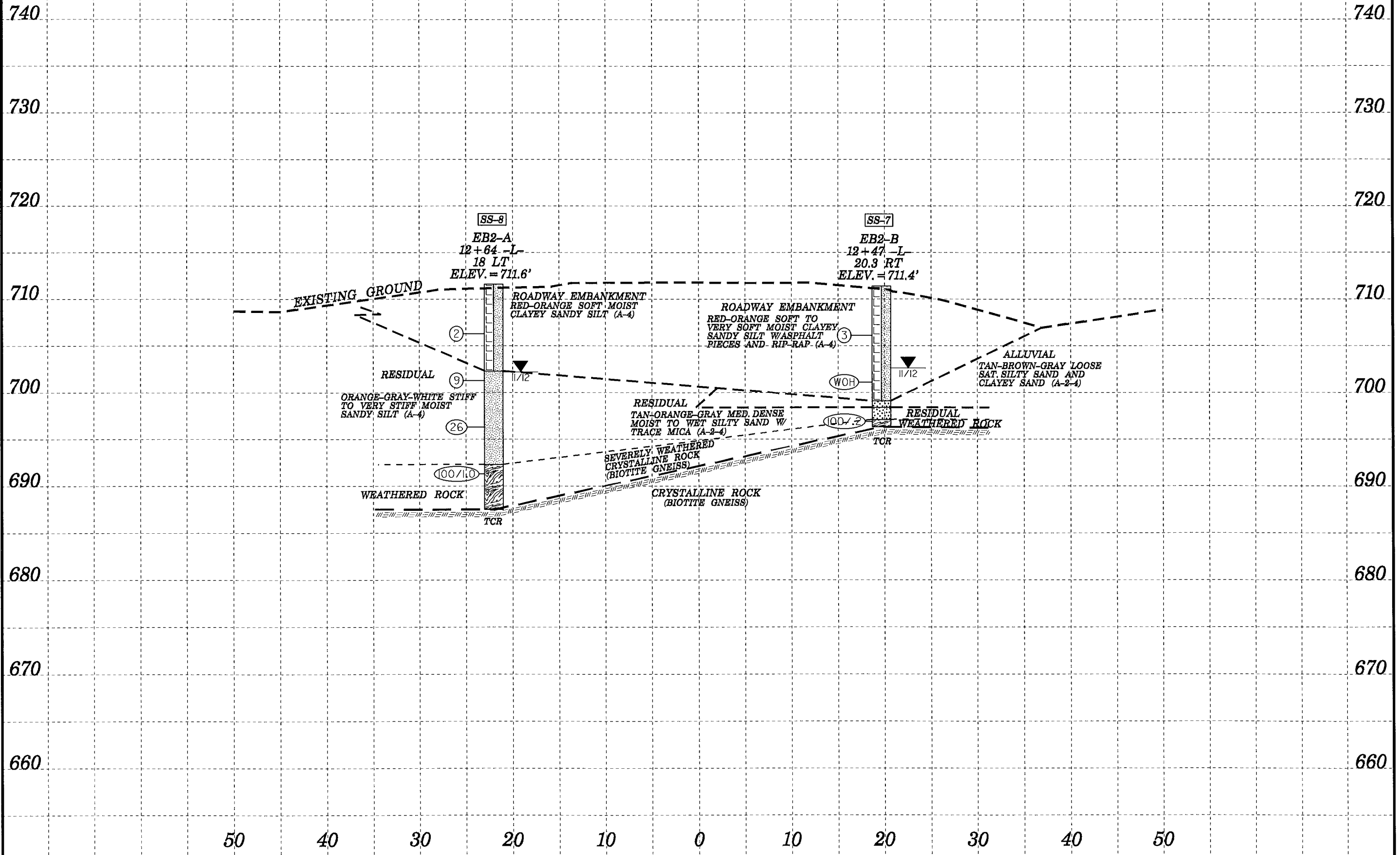
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|-----------------------|-------|
| PROJECT REFERENCE NO. | SHEET |
| 45355.1.14 (BD-5109N) | 6 |
| SECTION THROUGH B-1 | |
| STA. 12+00.00 -L- | |
| SKEW = 105° 00' 00" | |

-L-





-L-



| WBS 45355.1.14 | | TIP BD5109N | | COUNTY FORSYTH | | GEOLOGIST Stickney, J. K. | | | | | | | | | | | |
|--|-----------------|-------------------------------------|------------|-----------------------|-------|---------------------------|-----------------|----|----|-----|-----------|-----|-----|---------------------------|------------|--|------|
| SITE DESCRIPTION Replace Bridge 40 over Red Bank Creek on SR 1940 | | | | | | | GROUND WTR (ft) | | | | | | | | | | |
| BORING NO. B1-A | | STATION 12+09 | | OFFSET 20 ft LT | | ALIGNMENT -L- | | | | | | | | | | | |
| COLLAR ELEV. 703.7 ft | | TOTAL DEPTH 29.9 ft | | NORTHING 900,840 | | EASTING 1,651,042 | | | | | | | | | | | |
| DRILL RIG/HAMMER EFF./DATE HFO0064 CME-550 88% 09/02/2009 | | DRILL METHOD NW Casing W/SPT & Core | | HAMMER TYPE Automatic | | | | | | | | | | | | | |
| DRILLER Smith, C. L. | | START DATE 11/16/12 | | COMP. DATE 11/16/12 | | 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 | DEPTH (ft) | | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | | | | | |
| 705 | | | | | | | | | | | | | | | 703.7 | GROUND SURFACE | 0.0 |
| 700 | 699.4 | 4.3 | 1 | 1 | 1 | | | | | | | | | | | ALLUVIAL GRAY VERY LOOSE TO LOOSE MOIST TO WET CLAYEY SILTY SAND (A-2-4) | |
| 695 | 694.4 | 9.3 | 17 | 3 | 3 | | | | | | | | | | | | |
| 690 | | | | | | | | | | | | | | | 692.6 | WEATHERED ROCK SEVERELY WEATHERED CRYSTALLINE ROCK (BIOTITE GNEISS) | 11.1 |
| 685 | | | | | | | | | | | | | | | 691.0 | CRYSTALLINE ROCK BIOTITE GNEISS | 12.7 |
| 680 | | | | | | | | | | | | | | | | | |
| 675 | | | | | | | | | | | | | | | 673.8 | | 29.9 |
| Boring Terminated at Elevation 673.8 ft in crystalline rock (biotite gneiss) | | | | | | | | | | | | | | | | | |

NCDOT BORE SINGLE BD5109N_GEO_BH_BRDG0040_FORSYTH.GPJ NC_DOT.GDT 1/8/13

| WBS 45355.1.14 | | TIP BD5109N | | COUNTY FORSYTH | | GEOLOGIST Stickney, J. K. | | | | | | |
|--|---------------|-------------------------------------|----------|-----------------------|----------|---------------------------|-----------------|----------|---------|-----|--|------------|
| SITE DESCRIPTION Replace Bridge 40 over Red Bank Creek on SR 1940 | | | | | | | GROUND WTR (ft) | | | | | |
| BORING NO. B1-A | | STATION 12+09 | | OFFSET 20 ft LT | | ALIGNMENT -L- | | | | | | |
| COLLAR ELEV. 703.7 ft | | TOTAL DEPTH 29.9 ft | | NORTHING 900,840 | | EASTING 1,651,042 | | | | | | |
| DRILL RIG/HAMMER EFF./DATE HFO0064 CME-550 88% 09/02/2009 | | DRILL METHOD NW Casing W/SPT & Core | | HAMMER TYPE Automatic | | | | | | | | |
| DRILLER Smith, C. L. | | START DATE 11/16/12 | | COMP. DATE 11/16/12 | | SURFACE WATER DEPTH N/A | | | | | | |
| ELEV (ft) | RUN ELEV (ft) | DEPTH (ft) | RUN (ft) | DRILL RATE (Min/ft) | RUN | | SAMP. NO. | STRATA | | LOG | DESCRIPTION AND REMARKS | DEPTH (ft) |
| | | | | | REC. (%) | RQD (%) | | REC. (%) | RQD (%) | | | |
| 691 | | | | | | | | | | | | |
| 690 | 691.0 | 12.7 | 2.2 | 1.5/1.0 | (2.2) | (1.4) | | (17.1) | (13.6) | | Begin Coring @ 12.7 ft | 12.7 |
| | 688.8 | 14.9 | 5.0 | 1.5/1.0 | 100% | 64% | RS-1 | 99% | 79% | | CRYSTALLINE ROCK GRAY MODERATELY WEATHERED TO FRESH, HARD TO VERY HARD BIOTITE GNEISS W/ VERY CLOSE TO MODERATELY CLOSE FRACTURE SPACING | |
| 685 | | | | | | | | | | | ROCK TYPE E | |
| | 683.8 | 19.9 | 5.0 | 1.4/1.0 | 100% | 60% | RS-2 | | | | R1=7 | |
| | | | | | | | | | | | R2=13 | |
| 680 | | | | | | | | | | | R3=10 | |
| | 678.8 | 24.9 | 5.0 | 1.5/1.0 | (5.0) | (4.4) | | | | | R4=20 | |
| | | | | | | | | | | | R5=7 | |
| | | | | | | | | | | | RMR=57 | |
| 675 | | | | | | | | | | | | |
| | 673.8 | 29.9 | 5.0 | 1.2/1.0 | (4.9) | (4.8) | | | | | | |
| | | | | | | | | | | | | |
| Boring Terminated at Elevation 673.8 ft in crystalline rock (biotite gneiss) | | | | | | | | | | | | |

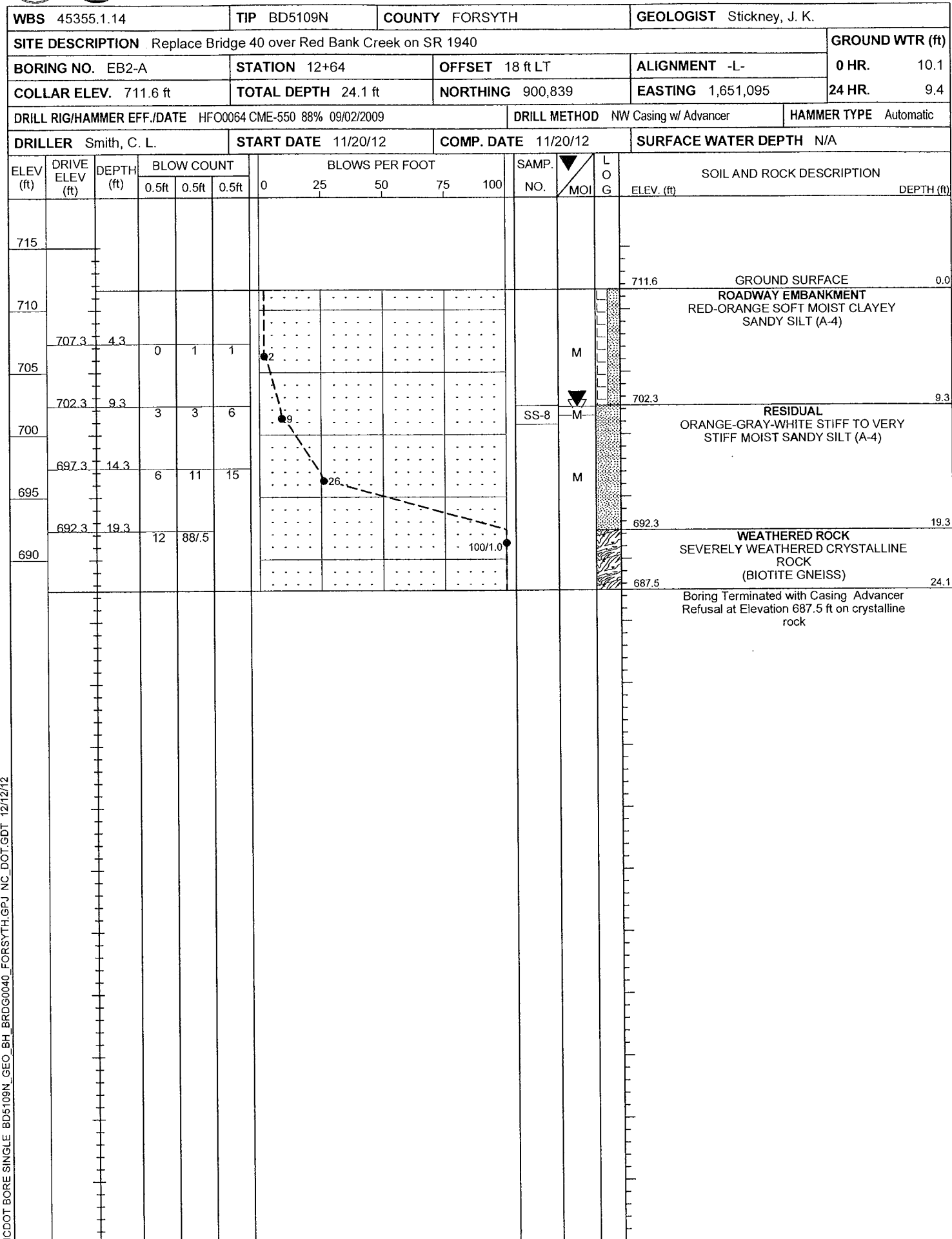
NCDOT CORE SINGLE BD5109N_GEO_BH_BRDG0040_FORSYTH.GPJ NC_DOT.GDT 1/8/13

| WBS 45355.1.14 | | TIP BD5109N | | COUNTY FORSYTH | | GEOLOGIST Stickney, J. K. | | | | | | | | | | | |
|---|-----------------|-------------------------------------|------------|-----------------------|-------|---------------------------|-----------------|----|----|-----|-----------|-----|------|---------------------------|------------|------------|---|
| SITE DESCRIPTION Replace Bridge 40 over Red Bank Creek on SR 1940 | | | | | | | GROUND WTR (ft) | | | | | | | | | | |
| BORING NO. B1-B | | STATION 11+98 | | OFFSET 19 ft RT | | ALIGNMENT -L- | | | | | | | | | | | |
| COLLAR ELEV. 705.6 ft | | TOTAL DEPTH 44.9 ft | | NORTHING 900,801 | | EASTING 1,651,030 | | | | | | | | | | | |
| DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009 | | DRILL METHOD NW Casing W/SPT & Core | | HAMMER TYPE Automatic | | | | | | | | | | | | | |
| DRILLER Smith, C. L. | | START DATE 11/08/12 | | COMP. DATE 11/08/12 | | 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 | ELEV. (ft) | DEPTH (ft) | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | | | | | |
| 710 | | | | | | | | | | | | | | | | | |
| 705 | | | | | | | | | | | | | | | 705.6 | 0.0 | GROUND SURFACE |
| | 702.4 | 3.2 | 2 | 3 | 4 | | | | | | | | SS-5 | Sat. | | | ALLUVIAL TAN-BROWN-GRAY LOOSE TO MED. DENSE SAT. SILTY SAND AND CLAYEY SAND (A-2-4) |
| | 697.4 | 8.2 | 6 | 8 | 12 | | | | | | | | SS-6 | Sat. | | | |
| | 692.4 | 13.2 | 9 | 11 | 15 | | | | | | | | | | 693.7 | 11.9 | RESIDUAL TAN-ORANGE-GRAY MED. DENSE MOIST TO WET SILTY SAND W/ TRACE MICA (A-2-4) |
| | 687.4 | 18.2 | 50 | 50 | 2 | | | | | | | | | | 687.4 | 18.2 | WEATHERED ROCK SEVERELY WEATHERED CRYSTALLINE ROCK (BIOTITE GNEISS) |
| | 682.4 | 23.2 | 100 | 2 | | | | | | | | | | | | | |
| | 677.4 | 28.2 | 100 | 2 | | | | | | | | | | | | | |
| | 672.4 | 33.2 | 100 | 3 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | 669.3 | 36.3 | CRYSTALLINE ROCK BIOTITE GNEISS |
| | | | | | | | | | | | | | | | 660.7 | 44.9 | Boring Terminated at Elevation 660.7 ft in crystalline rock (biotite gneiss) |

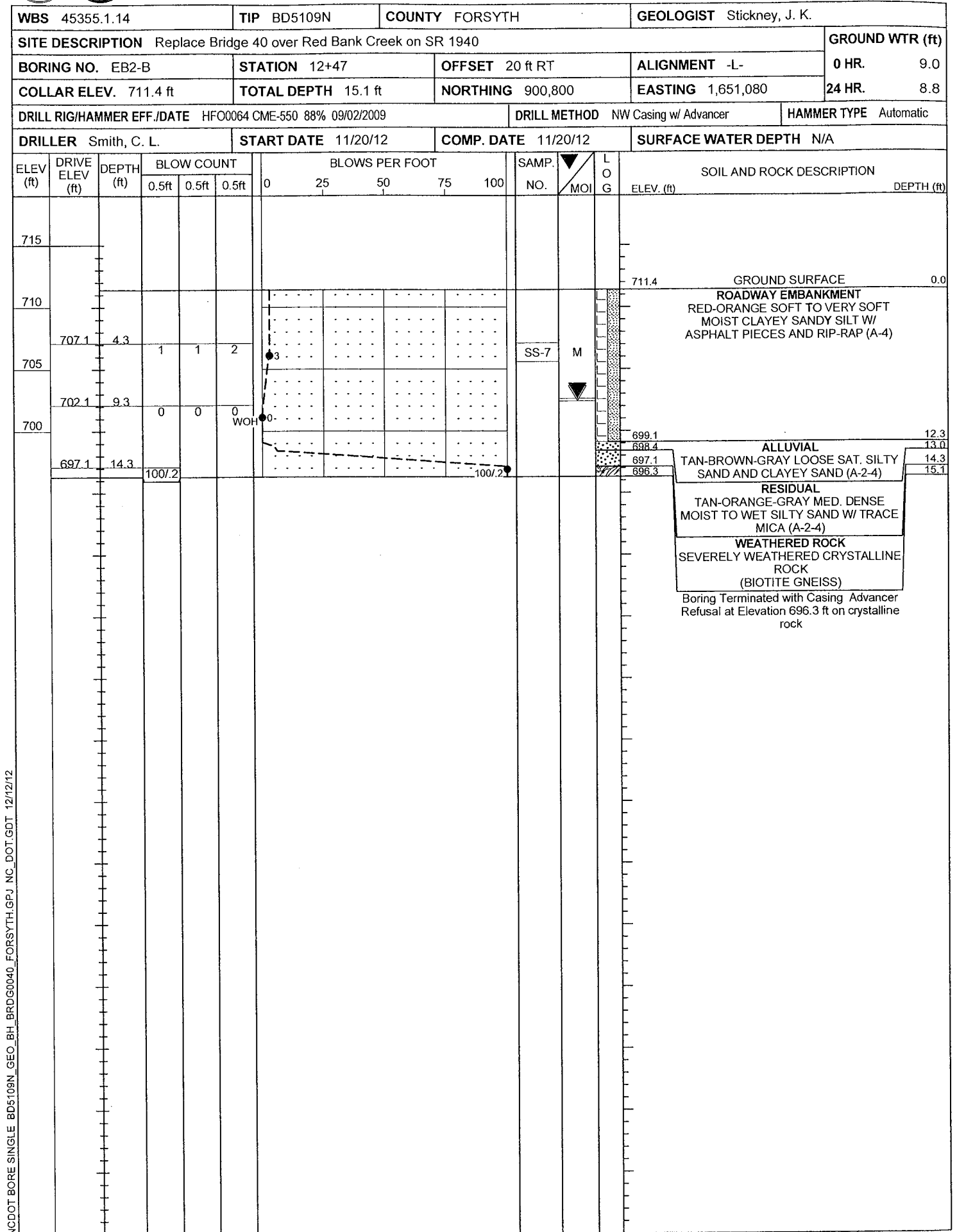
NCDOT BORE SINGLE BD5109N_GEO_BH_BRD0040_FORSYTH.GPJ NC_DOT.GDT 12/12/12

| WBS 45355.1.14 | | TIP BD5109N | | COUNTY FORSYTH | | GEOLOGIST Stickney, J. K. | | | | | | | | |
|---|---------------|-------------------------------------|----------|-----------------------|-----------|---------------------------|-----------------|-----------|-----------|-----|-------------------------|------------|------------|---|
| SITE DESCRIPTION Replace Bridge 40 over Red Bank Creek on SR 1940 | | | | | | | GROUND WTR (ft) | | | | | | | |
| BORING NO. B1-B | | STATION 11+98 | | OFFSET 19 ft RT | | ALIGNMENT -L- | | | | | | | | |
| COLLAR ELEV. 705.6 ft | | TOTAL DEPTH 44.9 ft | | NORTHING 900,801 | | EASTING 1,651,030 | | | | | | | | |
| DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009 | | DRILL METHOD NW Casing W/SPT & Core | | HAMMER TYPE Automatic | | | | | | | | | | |
| DRILLER Smith, C. L. | | START DATE 11/08/12 | | COMP. DATE 11/08/12 | | SURFACE WATER DEPTH N/A | | | | | | | | |
| ELEV (ft) | RUN ELEV (ft) | DEPTH (ft) | RUN (ft) | DRILL RATE (Min/ft) | RUN | | SAMP. NO. | STRATA | | LOG | DESCRIPTION AND REMARKS | ELEV. (ft) | DEPTH (ft) | |
| | | | | | REC. (%) | RQD (%) | | REC. (%) | RQD (%) | | | | | |
| | | | | | | | | | | | | | | |
| | 669.3 | 36.3 | 3.6 | NM/0.0 | (3.0) 83% | (0.0) 0% | | (7.6) 88% | (2.0) 23% | | | 669.3 | 36.3 | Begin Coring @ 36.3 ft |
| | 665.7 | 39.9 | 5.0 | NM/0.0 | (4.6) 92% | (2.0) 40% | | | | | | | | CRYSTALLINE ROCK BROWN & GRAY MODERATELY SEVERELY WEATHERED TO SLIGHTLY WEATHERED, MEDIUM HARD TO HARD BIOTITE GNEISS W/ VERY CLOSE TO CLOSE FRACTURE SPACING ROCK TYPE E R1=2 R2=3 R3=5 R4=6 R5=7 RMR=23 |
| | 660.7 | 44.9 | | | | | | | | | | 660.7 | 44.9 | Boring Terminated at Elevation 660.7 ft in crystalline rock (biotite gneiss) |

NCDOT CORE SINGLE BD5109N_GEO_BH_BRD0040_FORSYTH.GPJ NC_DOT.GDT 12/12/12



NCDOT BORE SINGLE BD5109N_GEO_BH_BRD0040_FORSYTH.GPJ_NC_DOT.GDT 12/12/12



NCDOT BORE SINGLE BD5109N_GEO_BH_BRD0040_FORSYTH.GPJ_NC_DOT.GDT 12/12/12

45355.1.14 (BD5109N)
FORSYTH COUNTY
BRIDGE 40 OVER RED BANK CREEK ON SR 1940

PHOTOS



FORSYTH COUNTY LOW IMPACT BRIDGE

STRUCTURE 330040
LS 09-11-085
WBS 45355.114
TIP BD-5109-N

-L- CURVE DATA
 PI Sta 13+05.66
 Δ = 15°28'40.5"(LT)
 D = 709.43f
 L = 180.19
 T = 94.55
 R = 800.00
 e = 4%
 Ds = 45mph

| | |
|-----------------------|-------|
| PROJECT REFERENCE NO. | SHEET |
| 45355.114 (BD-5109N) | 14 |
| Aerial Photo | |
| | |



DATUM DESCRIPTION
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCCS FOR MONUMENT "BD5109N-1" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 900839.104(ft) EASTING: 1650616.580(ft) ELEVATION: 713.08(ft)
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999862616
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BD5109N-1" TO -EL- STATION 10+00.00 IS S79°48'38.5"E 90.22'
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

| BL POINT | DESC. | NORTH | EAST | ELEVATION | EL STATION | OFFSET |
|----------|-----------|-------------|--------------|-----------|------------------------|----------|
| 1 | BD5109N-1 | 900839.1040 | 1650616.5800 | 713.08 | OUTSIDE PROJECT LIMITS | |
| 2 | BD5109N-2 | 900835.9760 | 1650979.9950 | 710.48 | 12+74.54 | 15.87 LT |
| 3 | BD5109N-3 | 900844.7502 | 1651310.2399 | 722.65 | 16+05.36 | 13.97 RT |

BENCHMARKS (NAVD88)
 BM#1 ELEVATION: 711.99
 N 900788 E 1651100
 EL STATION 13.92 33' RIGHT
 BR SPIKE IN NE ROOT OF TWIN SWEET GUM TREE
 BM#2 ELEVATION: 722.65
 N 900845 E 1651310
 EL STATION 16.05 14' RIGHT
 REBAR WITH ALUMINUM CAP STAMPED
 "BD5109N-3" (SET FLUSH WITH GROUND).
 POINT LIES 4.2' SOUTH OF EDGE OF LAKE WOUSSICKET ROAD