STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BD-5109Y	1	15

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 45355.1.25 (BD-5109Y) F.A. PROJ. _____

COUNTY FORSYTH

PROJECT DESCRIPTION BRIDGE NO. 116 ON SR 2991 (FRATERNITY CHURCH RD) OVER SALEM CREEK (MIDDLE FORK CREEK)

SITE DESCRIPTION BRIDGE NO. 116 ON SR 2991 (FRATERNITY CHURCH RD) OVER SALEM CREEK (MIDDLE FORK CREEK)

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CAUTION NOTICE

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PERSONNEL

J.K. STICKNEY

C.L. SMITH

INVESTIGATED BY J.E. BEVERLY

CHECKED BY C.B. LITTLE

SUBMITTED BY C.B. LITTLE

DATE APRIL 2014

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE

4-30-14

PROJECT: 45355.1.25

ID: BD-5109Y

DRAWN BY: J.K. McCLURE

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

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PROJECT REFERENCE NO.	SHEET NO.
45355.1.25 (BD-5109Y)	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 TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

VERY STIFF, GRAY, SILTY CLAY, 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 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING # 10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
# 40	30 MX	50 MX	51 MN											
# 200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT	6 MX		NP	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A 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 LOOSE MEDIUM DENSE DENSE VERY DENSE	<4 4 TO 10 10 TO 30 30 TO 50 >50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	<2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<0.25 0.25 TO 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >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
GRAIN SIZE 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) PL — PLASTIC LIMIT	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
OM — OPTIMUM MOISTURE SL — 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
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	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
- HW MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING W/ CORE
- SPT N-VALUE
- REF SPT REFUSAL

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
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_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:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] 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.
- [ ] CORE BIT
- [ ] _____

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

CORE SIZE:
- [ ] -B_____
- [X] -N O/NQ
- [ ] -H_____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

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 (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. *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, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *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.

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 FEET
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 THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

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, 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 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 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: BM #1: RR SPIKE IN NW ROOT OF 20" WILLOW OAK
STA. 16+50 -L- 50' RT. = 16+50 -EL- 50' RT.
N 824425 E 1605226 ELEVATION: 698.89 FT.

NOTES:
SOIL STRATIGRAPHY IS THROUGH THE BORINGS FOR X-SECTIONS.

PROJECT REFERENCE NO.	SHEET
45355.1.25 (BD-5109Y)	3

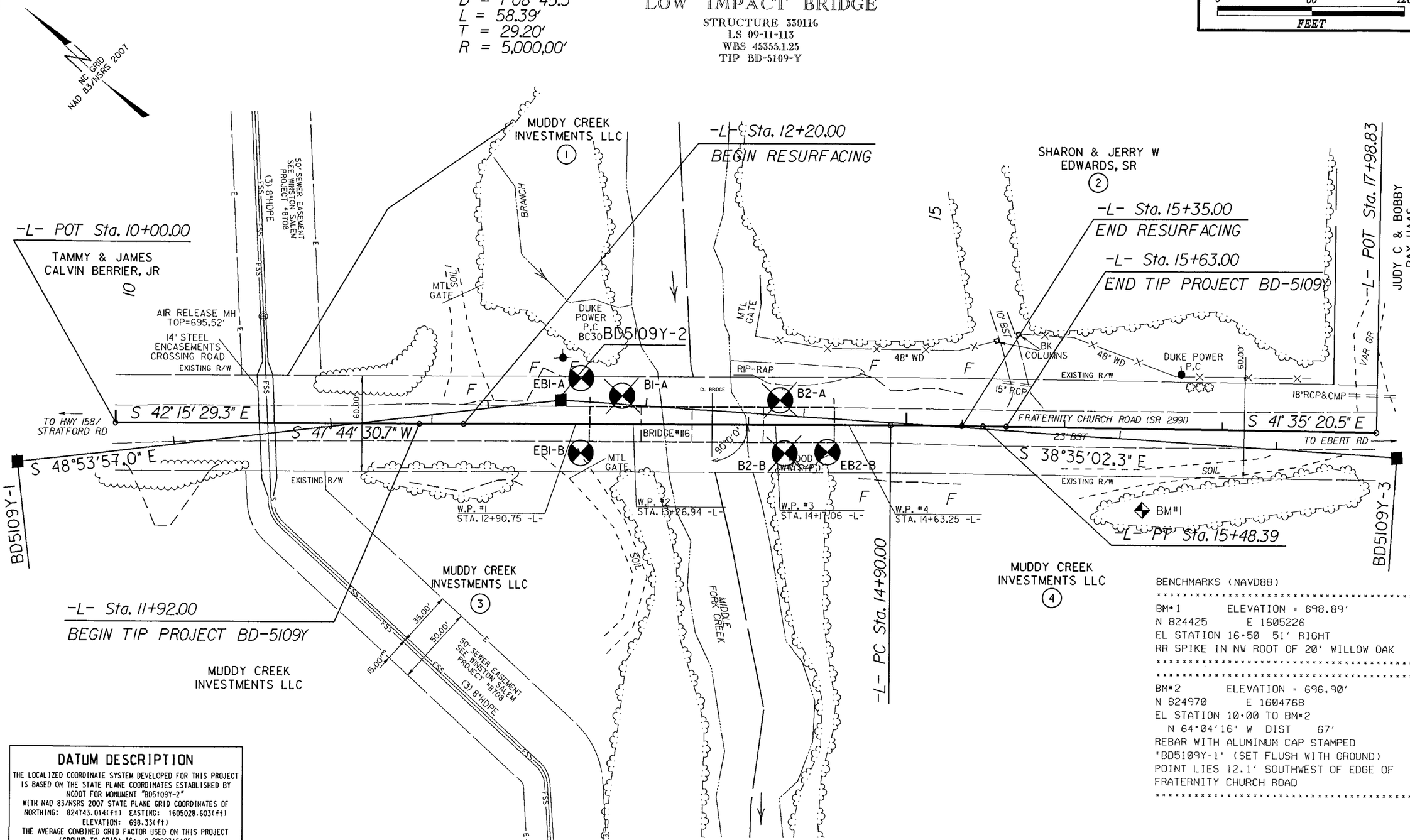
SITE PLAN

0 60 120
FEET

-L- CURVE DATA

PI Sta 15+19.19
Δ = 0° 40' 08.8" (RT)
D = 1° 08' 45.3"
L = 58.39'
T = 29.20'
R = 5,000.00'

FORSYTH COUNTY
LOW IMPACT BRIDGE
STRUCTURE 330116
LS 09-11-113
WBS 45355.1.25
TIP BD-5109-Y



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "BD5109Y-2"
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF
NORTHING: 824743.014(ft) EASTING: 1605028.603(ft)
ELEVATION: 698.33(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999315125
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BD5109Y-2" TO -L- STATION IS

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

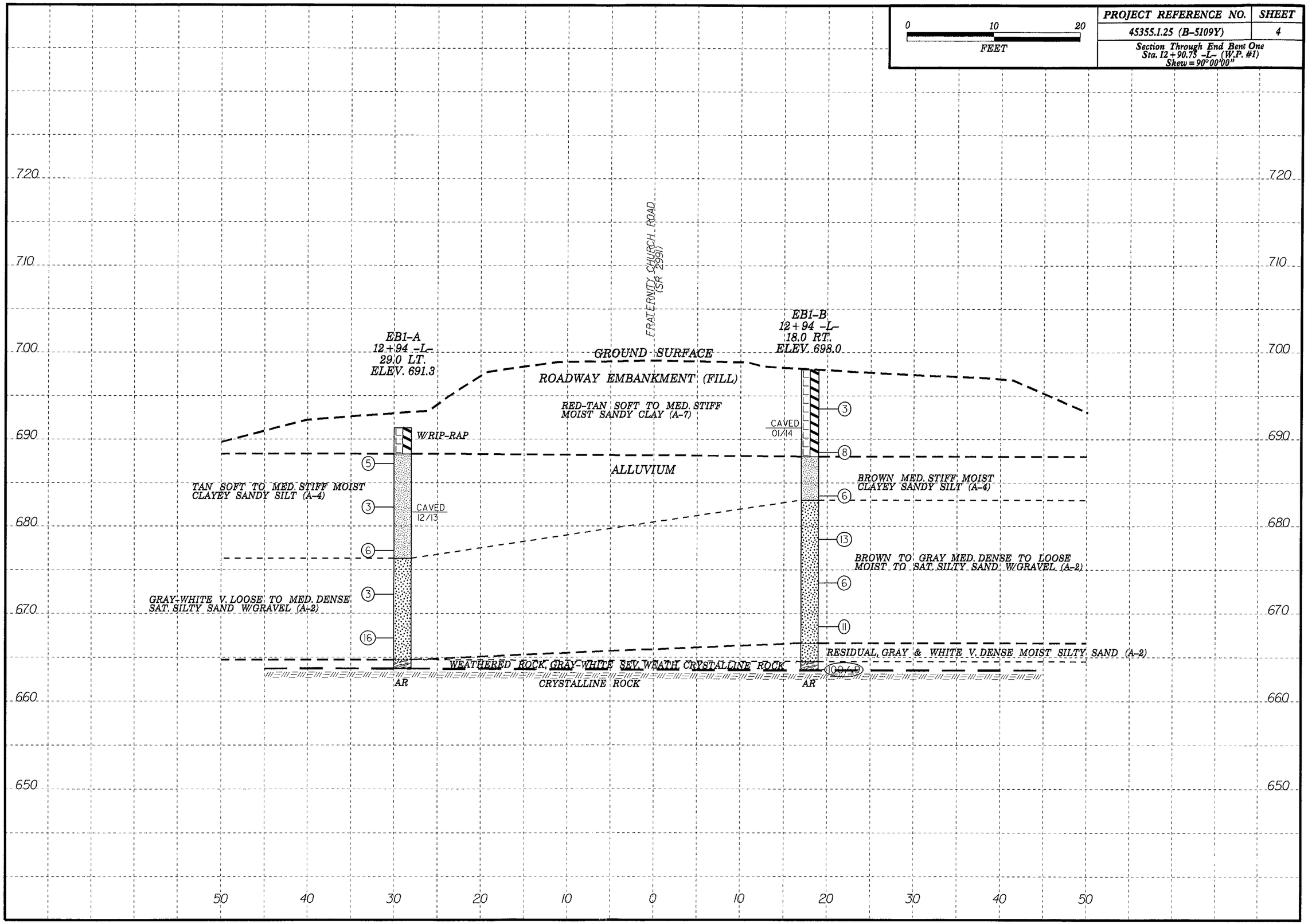
BENCHMARKS (NAVD88)
****
BM#1 ELEVATION = 698.89'
N 824425 E 1605226
EL STATION 16+50 51' RIGHT
RR SPIKE IN NW ROOT OF 20" WILLOW OAK
****
****
BM#2 ELEVATION = 696.90'
N 824970 E 1604768
EL STATION 10+00 TO BM#2
N 64°04'16" W DIST 67'
REBAR WITH ALUMINUM CAP STAMPED
"BD5109Y-1" (SET FLUSH WITH GROUND)
POINT LIES 12.1' SOUTHWEST OF EDGE OF
FRATERNITY CHURCH ROAD
****

BL

POINT	DESC.	NORTH	EAST	ELEVATION	EL STATION	OFFSET
1	BD5109Y-1	824970.3671	1604767.9909	696.90	OUTSIDE PROJECT LIMITS	
2	BD5109Y-2	824743.0140	1605028.6030	698.33	12+81.20	15.05 LT
3	BD5109Y-3	824327.2469	1605360.3150	716.04	OUTSIDE PROJECT LIMITS	

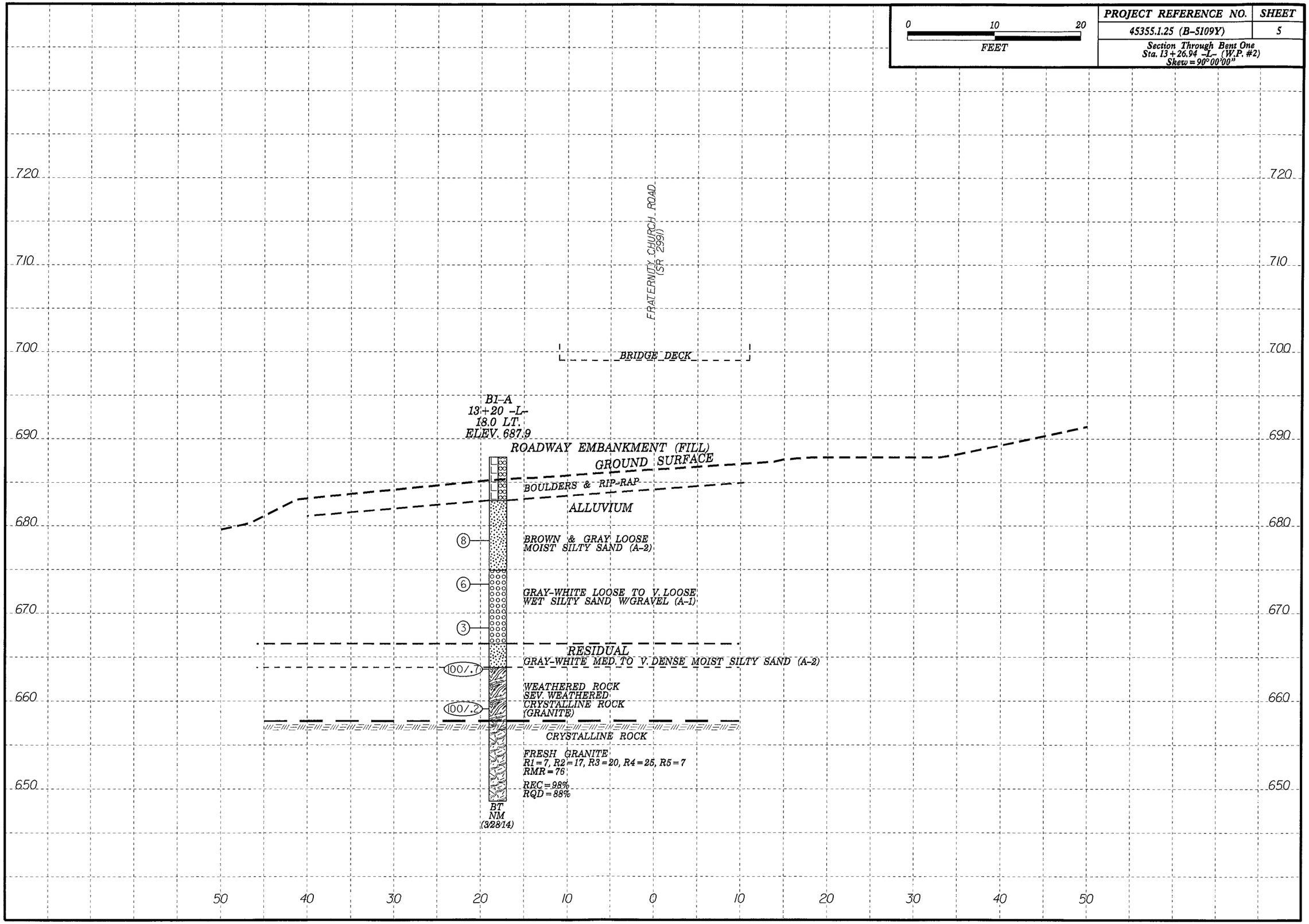
PROJECT REFERENCE NO.	SHEET
45355.1.25 (B-5109Y)	4

Section Through End Bent One
Sta. 12+90.75 -L- (W.P. #1)
Skew = 90° 00' 00"



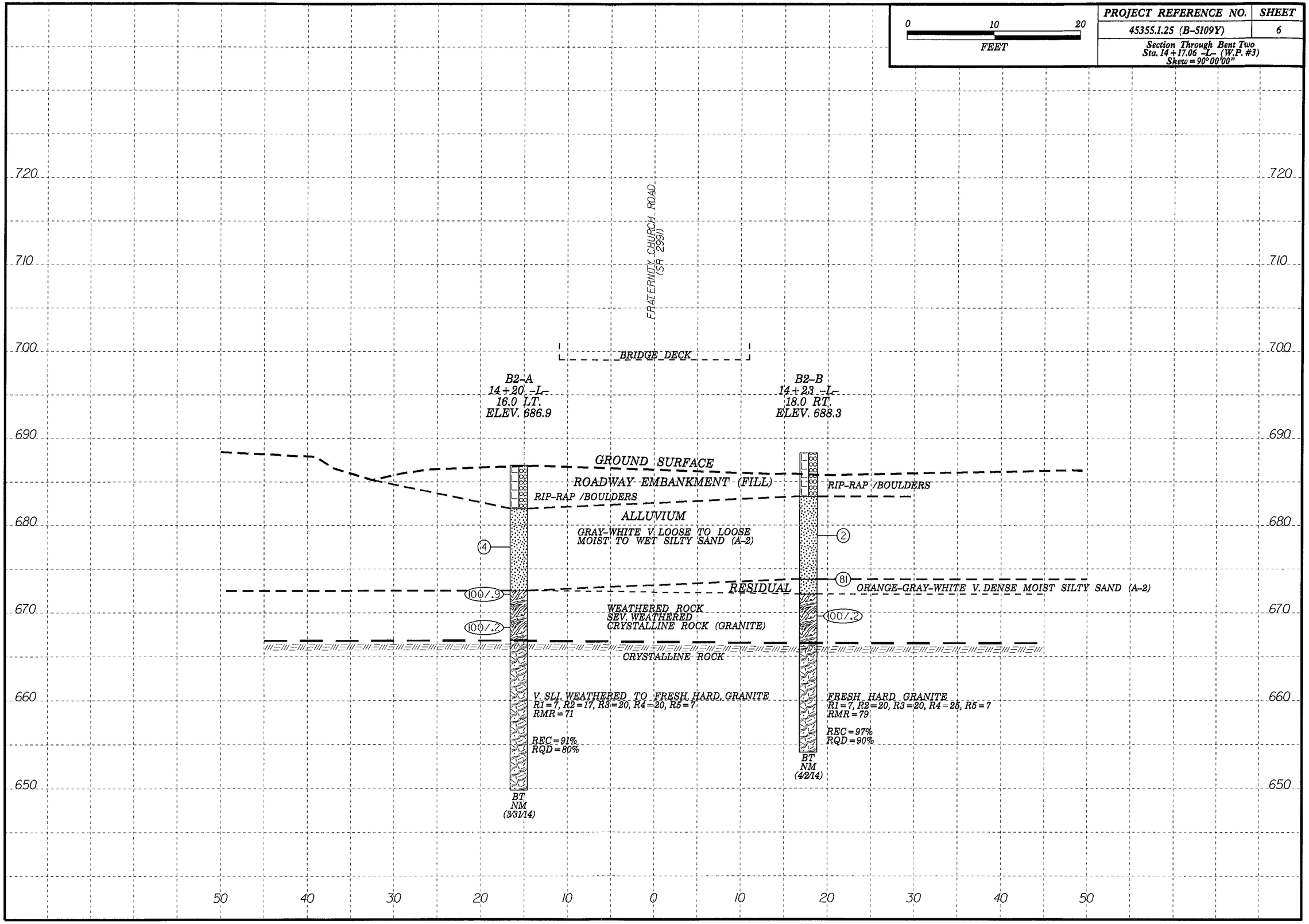
PROJECT REFERENCE NO.	SHEET
45355.1.25 (B-5109Y)	5

Section Through Bent One
Sta. 13+26.94 -L- (W.P. #2)
Skew = 90° 00' 00"



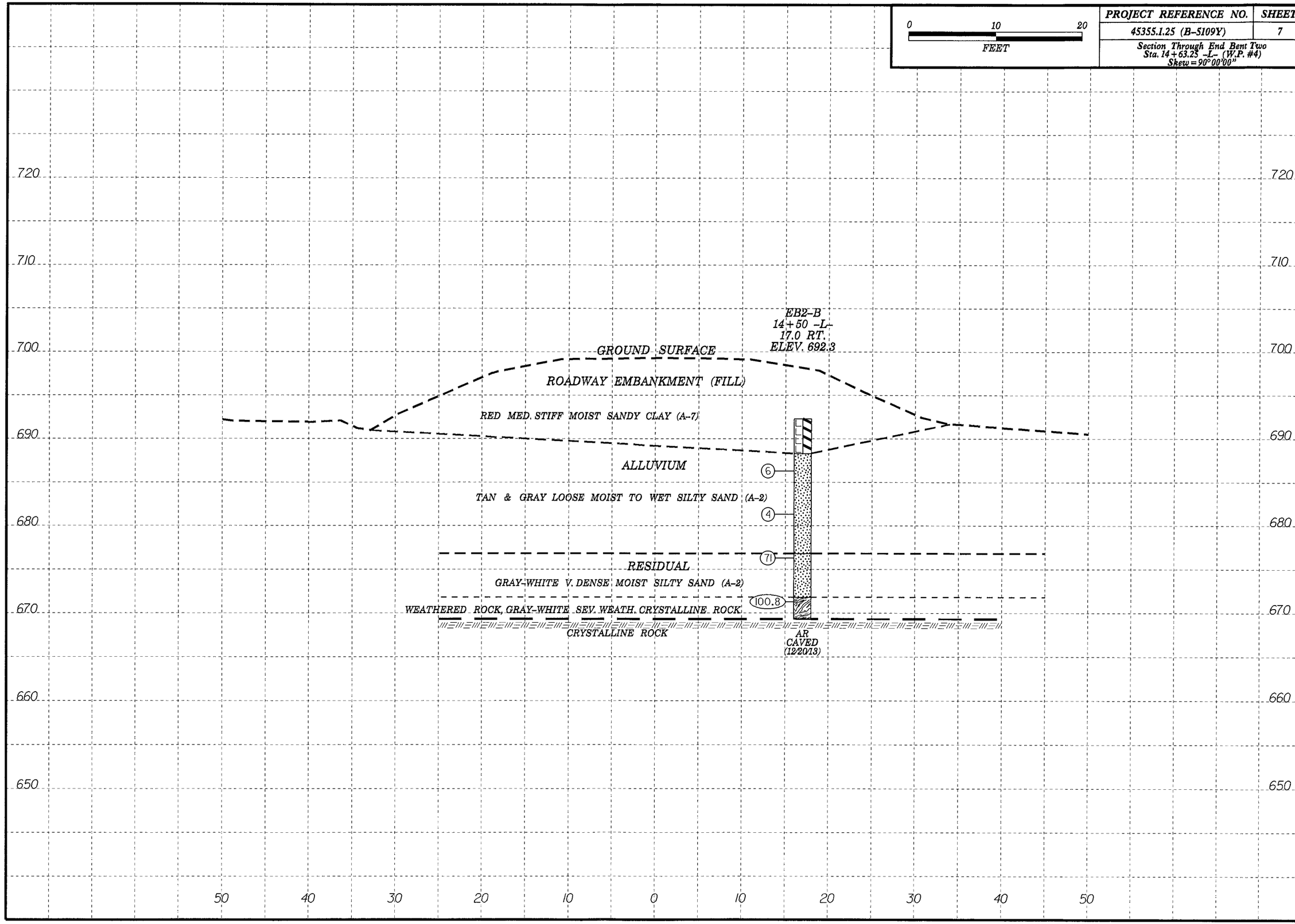
PROJECT REFERENCE NO.	SHEET
45355.1.25 (B-5109Y)	6

Section Through Bent Two
Sta. 14+17.06 -L- (W.P. #3)
Skew = 90° 00' 00"



PROJECT REFERENCE NO.	SHEET
45355.1.25 (B-5109Y)	7

Section Through End Bent Two
Sta. 14+63.25 -L- (W.P. #4)
Skew = 90° 00' 00"



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45355.1.25	**TIP** BD-5109Y	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 116 ON SR 2991 (FRATERNITY CHURCH ROAD) OVER SALEM CREEK (MIDDLE FORK CREEK)			**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 12+94	**OFFSET** 29 ft LT	**ALIGNMENT** -L-
COLLAR ELEV. 691.3 ft	**TOTAL DEPTH** 27.6 ft	**NORTHING** 824,743	**EASTING** 1,605,048
DRILL RIG/HAMMER EFF./DATE HFO0064 CME-550 84% 03/19/2014		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Smith, Chad	**START DATE** 12/18/13	**COMP. DATE** 12/18/13	**SURFACE WATER DEPTH** N/A

0 HR. N/A
24 HR Caved @ 9.7

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)
695											
										691.3 GROUND SURFACE	0.0
690										**ROADWAY EMBANKMENT** RED & TAN MED. STIFF MOIST SANDY CLAY (A-7) W/RIP-RAP	
	688.2	3.1	1	2	3	5		M		688.3	3.0
685										**ALLUVIAL** TAN SOFT TO MED. STIFF MOIST CLAYEY SANDY SILT (A-4)	
	683.2	8.1	1	1	2	3		M			
680											
	678.2	13.1	4	2	4	6		M		676.3	15.0
675										**ALLUVIAL** GRAY-WHITE V. LOOSE TO MED. DENSE SAT. SILTY SAND W/GRAVEL (A-2)	
	673.2	18.1	1	2	1	3		Sat.			
670											
	668.2	23.1	9	7	9	16		Sat.		664.7	26.6
665										663.7 **WEATHERED ROCK** SEV. WEATH. CRYSTALLINE ROCK	27.6

Boring Terminated by Auger Refusal at Elevation 663.7 ft ON CRYSTALLINE ROCK

NOTE: AASHTO CLASSIFICATIONS ON BORLOG ARE BASED ON FIELD DESCRIPTIONS.

WBS 45355.1.25	**TIP** BD-5109Y	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 116 ON SR 2991 (FRATERNITY CHURCH ROAD) OVER SALEM CREEK (MIDDLE FORK CREEK)			**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 12+94	**OFFSET** 18 ft RT	**ALIGNMENT** -L-
COLLAR ELEV. 698.0 ft	**TOTAL DEPTH** 34.5 ft	**NORTHING** 824,711	**EASTING** 1,605,013
DRILL RIG/HAMMER EFF./DATE HFO0064 CME-550 84% 03/19/2014		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Smith, Chad	**START DATE** 01/06/14	**COMP. DATE** 01/06/14	**SURFACE WATER DEPTH** N/A

0 HR. Caved
24 HR Caved @ 6.7

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)
700											
										698.0 GROUND SURFACE	0.0
695										**ROADWAY EMBANKMENT** RED-TAN SOFT TO MED. STIFF MOIST SANDY CLAY (A-7)	
	694.5	3.5	0	1	2	3		M			
690											
	689.5	8.5	4	4	4	8		M		688.0	10.0
685										**ALLUVIAL** BROWN MED. STIFF MOIST CLAYEY SANDY SILT (A-4)	
	684.5	13.5	3	3	3	6		W		683.0	15.0
680										**ALLUVIAL** BROWN TO GRAY MED. DENSE TO LOOSE MOIST TO SAT. SILTY SAND W/ GRAVEL (A-2)	
	679.5	18.5	3	6	7	13		W			
675											
	674.5	23.5	1	4	2	6		Sat.			
670											
	669.5	28.5	4	6	5	11		Sat.		666.6	31.4
665										**RESIDUAL** GRAY & WHITE V. DENSE MOIST SILTY SAND (A-2)	
	664.5	33.5	22	78/.4		100/.9				664.5	33.5
										663.5 **WEATHERED ROCK** GRAY-WHITE SEV. WEATH. CRYSTALLINE ROCK	34.5

Boring Terminated by Auger Refusal at Elevation 663.5 ft ON CRYSTALLINE ROCK

NOTE: AASHTO CLASSIFICATIONS ON BORLOG ARE BASED ON FIELD DESCRIPTIONS.

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

SHEET

WBS 45355.1.25	**TIP** BD-5109Y	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 116 ON SR 2991 (FRATERNITY CHURCH ROAD) OVER SALEM CREEK (MIDDLE FORK CREEK)			**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 13+20	**OFFSET** 18 ft LT	**ALIGNMENT** -L-	**0 HR.** Caved
COLLAR ELEV. 687.9 ft	**TOTAL DEPTH** 39.3 ft	**NORTHING** 824,716	**EASTING** 1,605,057	**24 HR.** NM
DRILL RIG/HAMMER EFF./DATE HFO0064 CME-550 84% 03/19/2014		**DRILL METHOD** NW Casing w/ Advancer	**HAMMER TYPE** Automatic
DRILLER Smith, Chad	**START DATE** 03/27/14	**COMP. DATE** 03/27/14	**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)
690											
										687.9 GROUND SURFACE	0.0
685										**ROADWAY EMBANKMENT** BOULDERS & RIP-RAP	
										682.9	5.0
680	679.3	8.6	2	4	4	8		M		**ALLUVIAL** BROWN & GRAY LOOSE MOIST SILTY SAND (A-2)	
675	674.3	13.6	3	2	4	6		W		674.9	13.0
670	669.3	18.6	1	2	1	3		W		**ALLUVIAL** GRAY-WHITE LOOSE TO V. LOOSE WET SILTY SAND W/ GRAVEL (A-1)	
										666.5	21.4
665	664.3	23.6	6	94/.2		100/.7				**RESIDUAL** GRAY-WHITE MED. TO V. DENSE MOIST SILTY SAND (A-2)	
										663.8	24.1
660	659.3	28.6	100/0.2			100/.2				**WEATHERED ROCK** SEV. WEATH. CRYSTALLINE ROCK (GRANITE)	
										657.7	30.2
655										**CRYSTALLINE ROCK** FRESH GRANITE	
650										648.6	39.3
										Boring Terminated at Elevation 648.6 ft IN CRYSTALLINE ROCK	

NOTE: AASHTO CLASSIFICATIONS ON BORLOG ARE BASED ON FIELD DESCRIPTIONS.

NCDOT BORE SINGLE BD5109Y_GEO_BH_BRDG0116.GPJ NC_DOT.GDT 4/17/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

SHEET 9

WBS 45355.1.25	**TIP** BD-5109Y	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 116 ON SR 2991 (FRATERNITY CHURCH ROAD) OVER SALEM CREEK (MIDDLE FORK CREEK)			**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 13+20	**OFFSET** 18 ft LT	**ALIGNMENT** -L-	**0 HR.** Caved
COLLAR ELEV. 687.9 ft	**TOTAL DEPTH** 39.3 ft	**NORTHING** 824,716	**EASTING** 1,605,057	**24 HR.** NM
DRILL RIG/HAMMER EFF./DATE HFO0064 CME-550 84% 03/19/2014		**DRILL METHOD** NW Casing w/ Advancer	**HAMMER TYPE** Automatic
DRILLER Smith, Chad	**START DATE** 03/27/14	**COMP. DATE** 03/27/14	**SURFACE WATER DEPTH** N/A
CORE SIZE NXWL	**TOTAL RUN** 9.1 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)
657.66											Begin Coring @ 30.2 ft	
	657.7	30.2	4.1		(4.1) 100%	(3.4) 83%		(8.9) 98%	(8.0) 88%		657.7 **CRYSTALLINE ROCK** FRESH GRANITE R1=7 R2=17 R3=20 R4=25 R5=7 RMR=76	30.2
655	653.6	34.3	5.0		(4.8) 96%	(4.6) 92%						
650	648.6	39.3									648.6	39.3
											Boring Terminated at Elevation 648.6 ft IN CRYSTALLINE ROCK	

NOTE: AASHTO CLASSIFICATIONS ON BORLOG ARE BASED ON FIELD DESCRIPTIONS.

NCDOT CORE SINGLE BD5109Y_GEO_BH_BRDG0116.GPJ NC_DOT.GDT 4/17/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

SHEET

WBS 45355.1.25	**TIP** BD-5109Y	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 116 ON SR 2991 (FRATERNITY CHURCH ROAD) OVER SALEM CREEK (MIDDLE FORK CREEK)			**GROUND WTR (ft)**
BORING NO. B2-A	**STATION** 14+20	**OFFSET** 16 ft LT	**ALIGNMENT** -L- / **0 HR.** Caved
COLLAR ELEV. 686.9 ft	**TOTAL DEPTH** 37.1 ft	**NORTHING** 824,641	**EASTING** 1,605,122 / **24 HR.** Caved
DRILL RIG/HAMMER EFF./DATE HFO0064 CME-550 84% 03/19/2014		**DRILL METHOD** NW Casing w/ Advancer	**HAMMER TYPE** Automatic
DRILLER Smith, Chad	**START DATE** 03/31/14	**COMP. DATE** 03/31/14	**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)
690											
										686.9 GROUND SURFACE	0.0
685										**ROADWAY EMBANKMENT** RIP-RAP / BOULDERS	
										681.9	5.0
680										**ALLUVIAL** GRAY-WHITE LOOSE MOIST TO WET SILTY SAND (A-2)	
	678.5	8.4	0	1	3	4		M/W			
675											
	673.5	13.4	1	5	95/.4						
						100/.9				672.5	14.4
670										**WEATHERED ROCK** SEV. WEATH. CRYSTALLINE ROCK (GRANITE)	
	668.5	18.4	100/.2			100/.2					
										666.8	20.1
665										**CRYSTALLINE ROCK** V. SLI. WEATHERED TO FRESH, HARD, GRANITE	
660											
655											
650										649.8	37.1
										Boring Terminated at Elevation 649.8 ft IN CRYSTALLINE ROCK NOTE: AASHTO CLASSIFICATIONS ON BORLOG ARE BASED ON FIELD DESCRIPTIONS.	

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

SHEET 10

WBS 45355.1.25	**TIP** BD-5109Y	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 116 ON SR 2991 (FRATERNITY CHURCH ROAD) OVER SALEM CREEK (MIDDLE FORK CREEK)			**GROUND WTR (ft)**
BORING NO. B2-A	**STATION** 14+20	**OFFSET** 16 ft LT	**ALIGNMENT** -L- / **0 HR.** Caved
COLLAR ELEV. 686.9 ft	**TOTAL DEPTH** 37.1 ft	**NORTHING** 824,641	**EASTING** 1,605,122 / **24 HR.** Caved
DRILL RIG/HAMMER EFF./DATE HFO0064 CME-550 84% 03/19/2014		**DRILL METHOD** NW Casing w/ Advancer	**HAMMER TYPE** Automatic
DRILLER Smith, Chad	**START DATE** 03/31/14	**COMP. DATE** 03/31/14	**SURFACE WATER DEPTH** N/A
CORE SIZE NXWL	**TOTAL RUN** 17.0 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)
666.84											Begin Coring @ 20.1 ft	
665	666.8	20.1	5.0		(4.5) 90%	(3.9) 78%		(15.4) 91%	(13.6) 80%		666.8 **CRYSTALLINE ROCK** V. SLI. WEATHERED TO FRESH, HARD, GRANITE WEAKER ZONE 26.5-28.0' R1=7 R2=17 R3=20 R4=20 R5=7 RMR=71	20.1
	661.8	25.1										
660			5.0		(4.5) 90%	(3.8) 76%						
	656.8	30.1										
655			5.0		(4.4) 88%	(4.3) 86%						
	651.8	35.1										
650	649.8	37.1	2.0		(2.0) 100%	(1.6) 80%					649.8	37.1
											Boring Terminated at Elevation 649.8 ft IN CRYSTALLINE ROCK NOTE: AASHTO CLASSIFICATIONS ON BORLOG ARE BASED ON FIELD DESCRIPTIONS.	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

SHEET

WBS 45355.1.25	**TIP** BD-5109Y	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 116 ON SR 2991 (FRATERNITY CHURCH ROAD) OVER SALEM CREEK (MIDDLE FORK CREEK)			**GROUND WTR (ft)**
BORING NO. B2-B	**STATION** 14+23	**OFFSET** 18 ft RT	**ALIGNMENT** -L-	**0 HR.** Caved
COLLAR ELEV. 688.3 ft	**TOTAL DEPTH** 34.2 ft	**NORTHING** 824,616	**EASTING** 1,605,100	**24 HR.** Caved
DRILL RIG/HAMMER EFF./DATE HFO0064 CME-550 84% 03/19/2014		**DRILL METHOD** NW Casing w/ Advancer	**HAMMER TYPE** Automatic
DRILLER Smith, Chad	**START DATE** 04/01/14	**COMP. DATE** 04/01/14	**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)
690											
										688.3 GROUND SURFACE	0.0
										ROADWAY EMBANKMENT RIP-RAP / BOULDERS	
685										683.3	5.0
										ALLUVIAL GRAY-WHITE V. LOOSE TO LOOSE MOIST TO WET SILTY SAND (A-2)	
680	679.8	8.5	0	1	1	2		W			
675	674.8	13.5	2	6	75	81		W		673.8	14.5
										672.1 ORANGE-GRAY-WHITE V. DENSE MOIST SILTY SAND (A-2)	16.2
670	669.8	18.5	100/.2			100/.2				**WEATHERED ROCK** SEV. WEATH. CRYSTALLINE ROCK (GRANITE)	
										666.5	21.8
665										**CRYSTALLINE ROCK** FRESH HARD GRANITE	
660											
655										654.1	34.2
										Boring Terminated at Elevation 654.1 ft IN CRYSTALLINE ROCK	

NOTE: AASHTO CLASSIFICATIONS ON BORLOG ARE BASED ON FIELD DESCRIPTIONS.

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

SHEET 11

WBS 45355.1.25	**TIP** BD-5109Y	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 116 ON SR 2991 (FRATERNITY CHURCH ROAD) OVER SALEM CREEK (MIDDLE FORK CREEK)			**GROUND WTR (ft)**
BORING NO. B2-B	**STATION** 14+23	**OFFSET** 18 ft RT	**ALIGNMENT** -L-	**0 HR.** Caved
COLLAR ELEV. 688.3 ft	**TOTAL DEPTH** 34.2 ft	**NORTHING** 824,616	**EASTING** 1,605,100	**24 HR.** Caved
DRILL RIG/HAMMER EFF./DATE HFO0064 CME-550 84% 03/19/2014		**DRILL METHOD** NW Casing w/ Advancer	**HAMMER TYPE** Automatic
DRILLER Smith, Chad	**START DATE** 04/01/14	**COMP. DATE** 04/01/14	**SURFACE WATER DEPTH** N/A
CORE SIZE NXWL	**TOTAL RUN** 12.4 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)
666.47											Begin Coring @ 21.8 ft	
665	666.5	21.8	2.4		(2.4) 100%	(1.9) 79%		(12.0) 97%	(11.2) 90%		666.5 **CRYSTALLINE ROCK** FRESH HARD GRANITE R1=7 R2=20 R3=20 R4=25 R5=7 RMR = 79	21.8
	664.1	24.2	5.0		(4.9) 98%	(4.8) 96%						
660	659.1	29.2	5.0		(4.7) 94%	(4.5) 90%						
655	654.1	34.2									654.1	34.2
											Boring Terminated at Elevation 654.1 ft IN CRYSTALLINE ROCK	

NOTE: AASHTO CLASSIFICATIONS ON BORLOG ARE BASED ON FIELD DESCRIPTIONS.

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45355.1.25	**TIP** BD-5109Y	**COUNTY** FORSYTH	**GEOLOGIST** Stickney, J. K.
SITE DESCRIPTION BRIDGE 116 ON SR 2991 (FRATERNITY CHURCH ROAD) OVER SALEM CREEK (MIDDLE FORK CREEK)			**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 14+50	**OFFSET** 17 ft RT	**ALIGNMENT** -L- / **0 HR.** N/A
COLLAR ELEV. 692.3 ft	**TOTAL DEPTH** 23.0 ft	**NORTHING** 824,597	**EASTING** 1,605,118 / **24 HR.** Caved
DRILL RIG/HAMMER EFF./DATE HFO0064 CME-550 84% 03/19/2014		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Smith, Chad	**START DATE** 12/19/13	**COMP. DATE** 12/19/13	**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)
695											
										692.3 GROUND SURFACE	0.0
690										**ROADWAY EMBANKMENT** RED MED. STIFF MOIST SANDY CLAY (A-7)	
										688.3	4.0
	687.3	5.0	3	3	3	6		M		**ALLUVIAL** TAN & GRAY LOOSE MOIST TO WET SILTY SAND (A-2)	
685											
	682.3	10.0	1	2	2	4		W			
680											
	677.3	15.0	6	20	51	71		M		676.8	15.5
675										**RESIDUAL** GRAY-WHITE V. DENSE MOIST SILTY SAND (A-2)	
	672.3	20.0	30	70/.3		100..8				671.8	20.5
670										**WEATHERED ROCK** GRAY-WHITE SEV. WEATH. CRYSTALLINE ROCK	
										669.3	23.0

Boring Terminated by Auger Refusal at Elevation 669.3 ft ON CRYSTALLINE ROCK

NOTE: AASHTO CLASSIFICATIONS ON BORLOG ARE BASED ON FIELD DESCRIPTIONS.

NCDOT BORE SINGLE BD5109Y_GEO_BH_BRDG0116.GPJ NC_DOT.GDT 4/17/14

45355.1.25 BD-5109Y
FORSYTH COUNTY
BRIDGE NO. 116 ON SR 2991 (FRATERNITY CHURCH RD.) OVER SALEM CREEK (MIDDLE FORK CREEK)

CORE PHOTOS

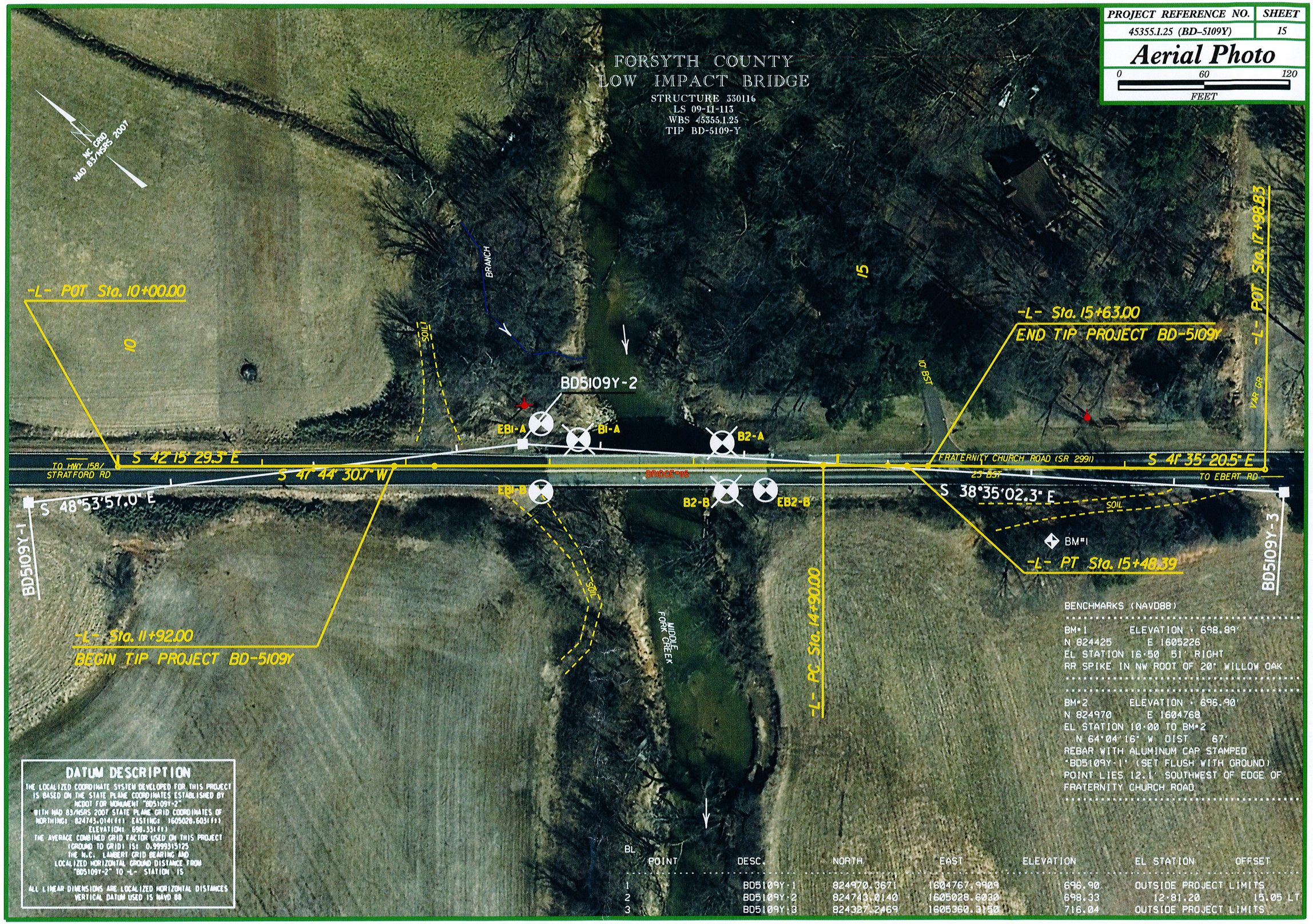
45355.1.25 BD-5109Y
FORSYTH COUNTY
BRIDGE NO. 116 ON SR 2991 (FRATERNITY CHURCH RD.) OVER SALEM CREEK (MIDDLE FORK CREEK)

CORE PHOTOS

PROJECT REFERENCE NO.	SHEET
45355.1.25 (BD-5109Y)	15

Aerial Photo

0 60 120
FEET



BL

POINT	DESC.	NORTH	EAST	ELEVATION	EL STATION	OFFSET
1	BD5109Y-1	824970.3671	1604767.9909	696.90	OUTSIDE PROJECT LIMITS	
2	BD5109Y-2	824743.0140	1605028.6030	698.33	12+81.20	15.05 LT
3	BD5109Y-3	824327.2469	1605360.3150	716.04	OUTSIDE PROJECT LIMITS	