STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BD-5114AH	1	25

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 45360.1.34 F.A. PROJ. N/A

COUNTY Polk

PROJECT DESCRIPTION Bridge No. 740021 on SR 1501 (Hunting Country Rd) over North Pacolet River

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7-24	BORE LOG REPORTS, CORE REPORT, AND ROCK CORE PHOTOS

PERSONNEL

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INVESTIGATED BY F&R, Inc.

CHECKED BY P. Alton, P.E.

SUBMITTED BY F&R, Inc.

DATE January 2015

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. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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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 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 DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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.

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.

DRAWN BY: M. Brewer, P.E.

PROJECT REFERENCE NO.	SHEET NO.
BD-5114AH	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
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

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.

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 / PLASTIC INDEX	6 MX		NP	40 MX / 10 MX	41 MN / 10 MX	40 MX / 11 MN	41 MN / 11 MN	40 MX / 10 MX	41 MN / 10 MX	40 MX / 11 MN	41 MN / 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 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

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

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

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 W/ CORE
- SPT N-VALUE
- REF SPT REFUSAL

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

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
CT - CORING TERMINATED
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
EMBANK. - EMBANKMENT
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
SDY. - SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
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

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.

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [X] CME-550X
- [X] CME-75
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

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

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

CORE SIZE:
- [ ] -B_____
- [X] -N Q2
- [ ] -H_____

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

REVISED 09/23/09

PROJECT REFERENCE NO.	SHEET NO.
BD-5114AH	2A

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

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 DISCOLOREO 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 SCATTEREO 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 MIXEO 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.

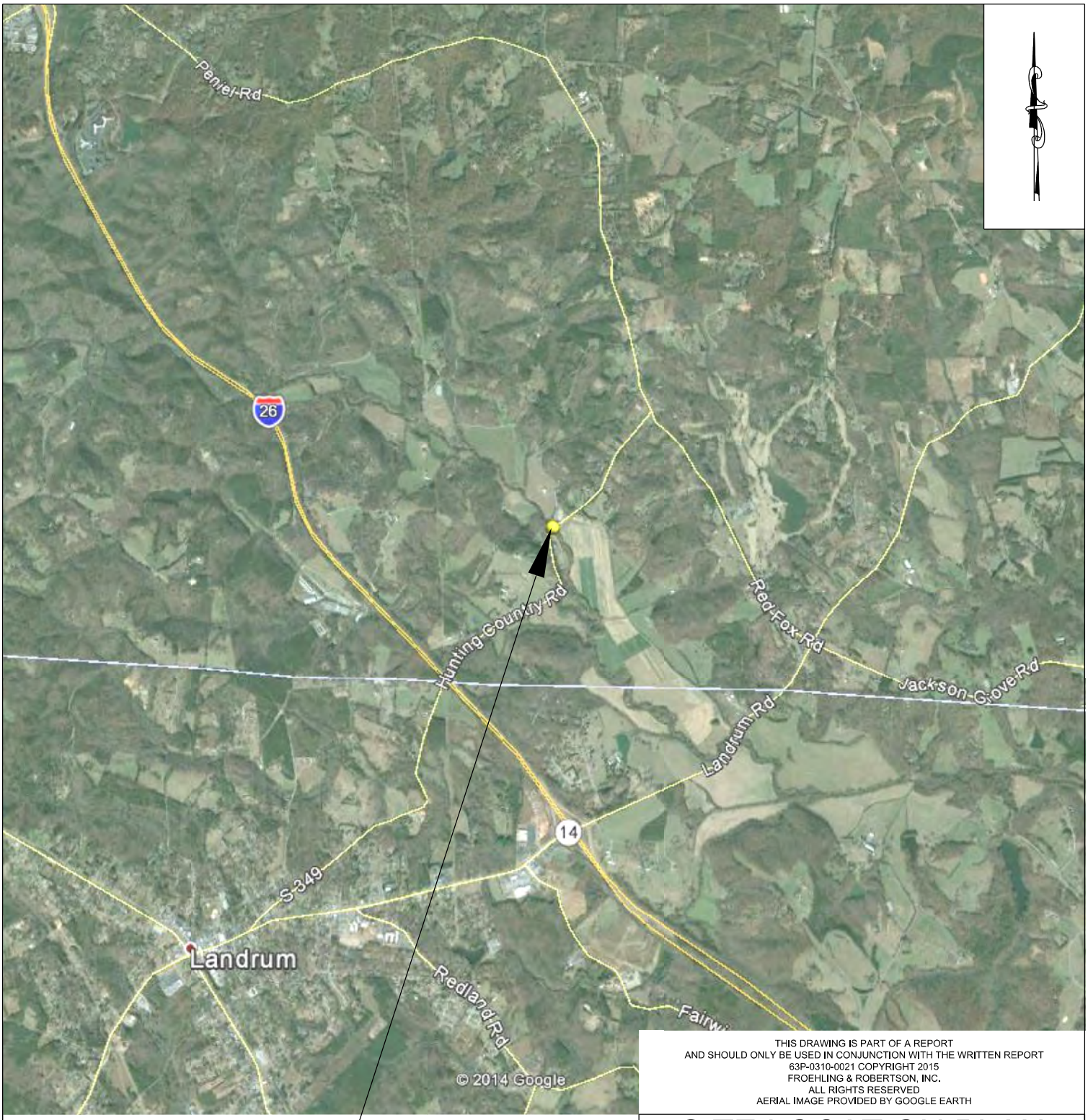
STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: Survey information provided by Vaughn & Melton, Inc.
BM #2: N - 544,540 E - 1,056,741
ELEVATION: 848.03 FT.

NOTES:

REVISED 09/23/09



SITE

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SITE LOCATION PLAN

Bridge No. 740021 on SR 1152 (Hunting Country Road) over North Pacolet River

Scale: N.T.S.	DR. DMB	CHK. MJW	REV.

Prepared For:

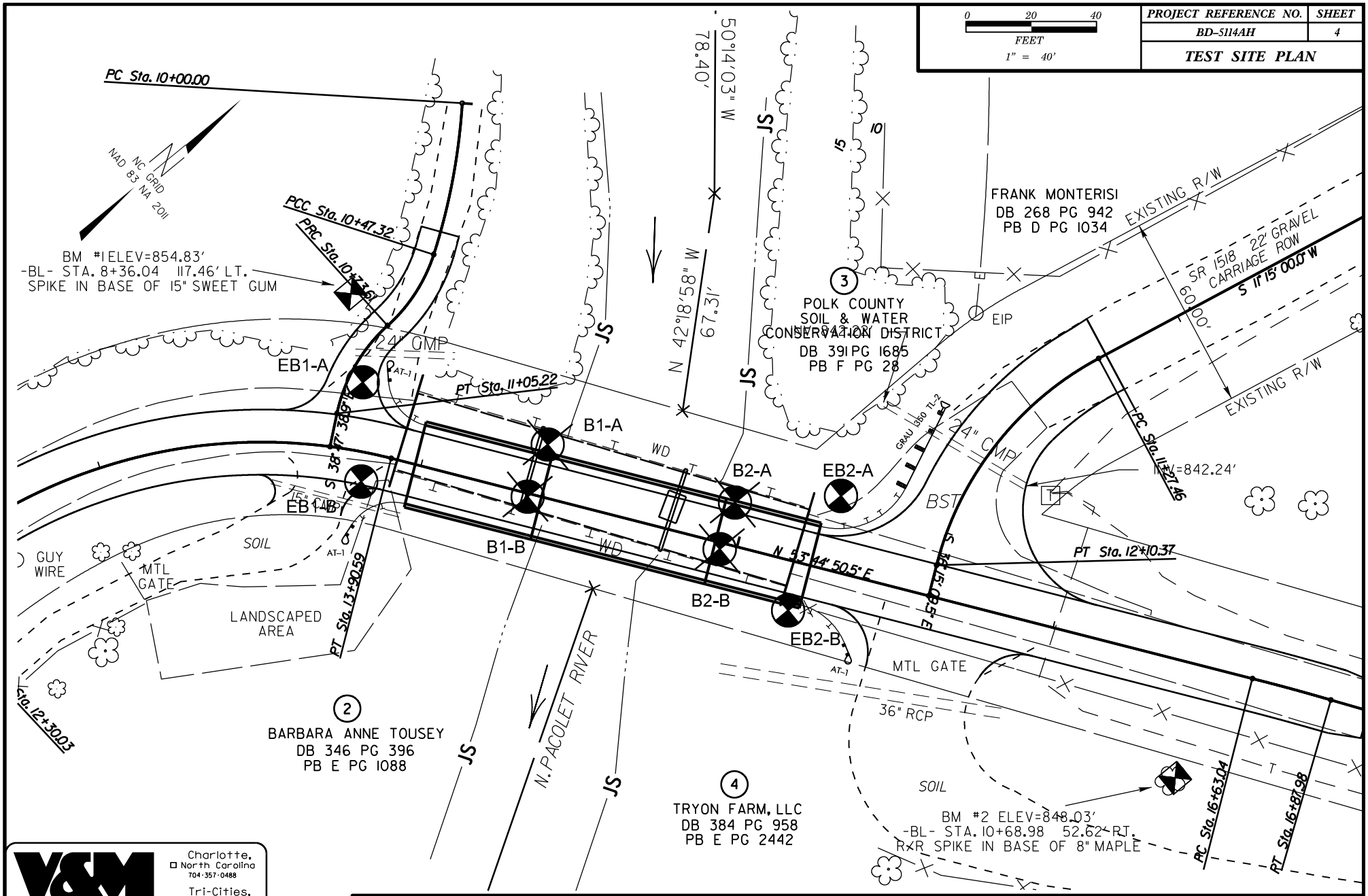
NCDOT TIP No.: BD-5114AH

Froehling & Robertson, Inc.
2505 Hutchison-McDonald Road
Charlotte, North Carolina

Proj.: 63P-0310-0021	Date: January 2015	Sheet No. 3

PROJECT REFERENCE NO.	SHEET
BD-5114AH	4
TEST SITE PLAN	

0 20 40
FEET
1" = 40'



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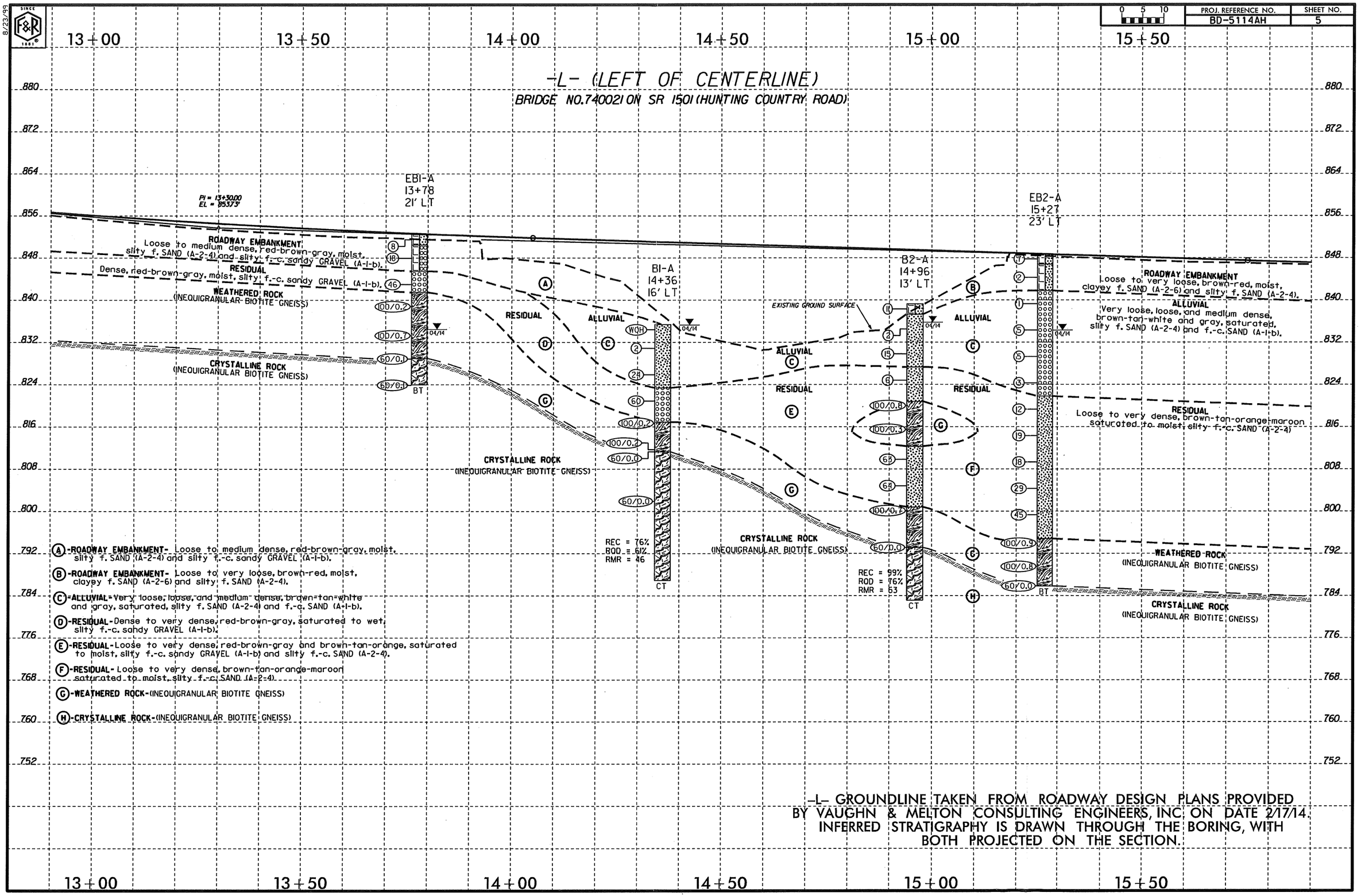
TEST SITE PLAN

PROJECT REFERENCE NO.: 45360.1.34		F&R PROJECT NO.: 63P-0310-0021
I.D. NO.: BD-5114AH	F.A. PROJECT NO.: N/A	COUNTY: POLK
PROJECT DESCRIPTION: Bridge No. 740021 on SR 1501 (Hunting Country Road) over North Pacolet River		
SITE DESCRIPTION: Bridge No. 740021 on SR 1501 (Hunting Country Road) over North Pacolet River		
DRAWN BY: M. Brewer, E.I.	CHECKED BY: M. Walko, P.E.	
DATE: January 15	SCALE: 1"= 40'	

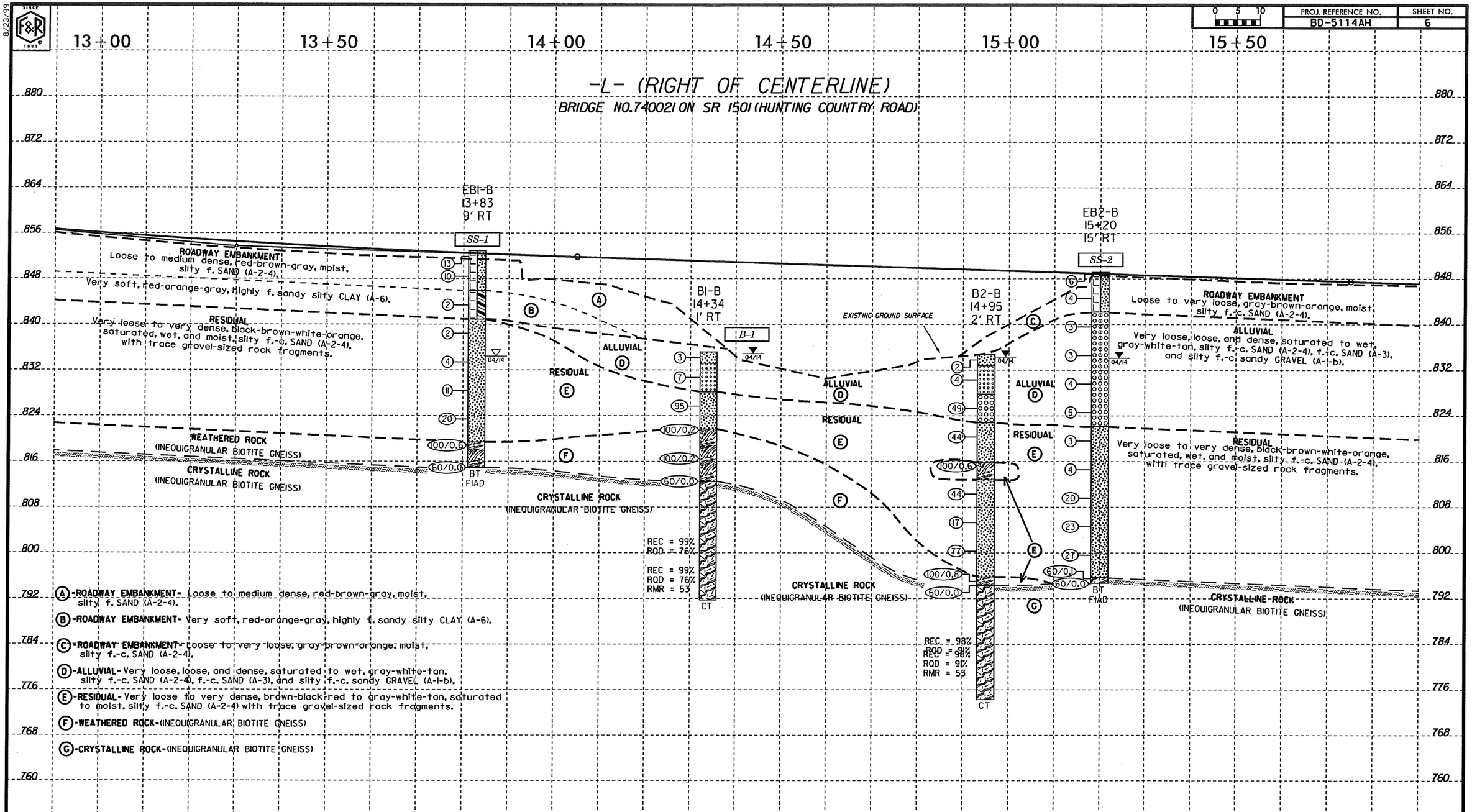
8/23/99

PROJ. REFERENCE NO.	SHEET NO.
BD-5114AH	5



8/23/99

PROJ. REFERENCE NO.	SHEET NO.
BD-5114AH	6



Ⓐ-ROADWAY EMBANKMENT- Loose to medium dense, red-brown-gray, moist, silty f. SAND (A-2-4).

Ⓑ-ROADWAY EMBANKMENT- Very soft, red-orange-gray, highly f. sandy silty CLAY (A-6).

Ⓒ-ROADWAY EMBANKMENT- Loose to very loose, gray-brown-orange, moist, silty f.-c. SAND (A-2-4).

Ⓓ-ALLUVIAL- Very loose, loose, and dense, saturated to wet, gray-white-tan, silty f.-c. SAND (A-2-4), f.-c. SAND (A-3), and silty f.-c. sandy GRAVEL (A-1-b).

Ⓔ-RESIDUAL- Very loose to very dense, brown-black-red to gray-white-tan, saturated to moist, silty f.-c. SAND (A-2-4) with trace gravel-sized rock fragments.

Ⓕ-WEATHERED ROCK-(INEQUIGRANULAR BIOTITE GNEISS)

Ⓖ-CRYSTALLINE ROCK-(INEQUIGRANULAR BIOTITE GNEISS)

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
B-1	CL	14+40	0.0'-1.0'	A-1-b(0)	14	NP	71.2	27.4	0.6	0.9	69.7	42.3	1.3	24.4	NT
SS-1	9' RT	13+89	23.5'-25.0'	A-2-4(0)	33	1	40.3	36.6	17.5	5.6	100.0	78.5	28.4	29.7	NT
SS-2	15' RT	15+20	13.5'-15.0'	A-1-b(0)	13	NP	71.2	24.8	1.6	2.4	83.5	24.0	4.3	19.7	NT

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 2/17/14. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45360.1.34	**TIP** BD-5114AH	**COUNTY** Polk	**GEOLOGIST** R. Kral
SITE DESCRIPTION Bridge No. 740021 on SR 1501 (Hunting Country Road) over N. Pacolet River			**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 13+78	**OFFSET** 21 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 852.5 ft	**TOTAL DEPTH** 28.6 ft	**NORTHING** 544,424	**EASTING** 1,056,489	**24 HR.** 18.0
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 75% 02/22/14		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 04/16/14	**COMP. DATE** 04/16/14	**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)
855											
	852.5	0.0								852.5 GROUND SURFACE	0.0
850			5	4	4	8		M		**ROADWAY EMBANKMENT** Red-brown, silty fine SAND (A-2-4), with trace clay and gravel.	2.0
	849.0	3.5	5	6	12	18		M		Gray-brown-red, silty fine to coarse sandy GRAVEL (A-1-b).	
845										845.5	7.0
	844.0	8.5	6	23	23	46		M		**RESIDUAL** Gray-brown-red, silty fine to coarse sandy GRAVEL (A-1-b).	
840										841.5	11.0
	839.0	13.5	100/0.2			100/0.2				**WEATHERED ROCK** Gray-orange-tan, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ).	
835											
	834.0	18.5	42	58/0.2		100/0.7					
830											
	829.0	23.5	60/0.1			60/0.1				829.0	23.5
										CRYSTALLINE ROCK (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ)	
825											
	824.0	28.5	60/0.1			60/0.1				824.0	28.5
										Boring Terminated with Standard Penetration Test Refusal at Elevation 823.9 ft IN CRYSTALLINE ROCK (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ)	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45360.1.34	**TIP** BD-5114AH	**COUNTY** Polk	**GEOLOGIST** M. Brewer
SITE DESCRIPTION Bridge No. 740021 on SR 1501 (Hunting Country Road) over N. Pacolet River			**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 13+83	**OFFSET** 9 ft RT	**ALIGNMENT** -L-	**0 HR.** 18.5
COLLAR ELEV. 852.9 ft	**TOTAL DEPTH** 38.0 ft	**NORTHING** 544,404	**EASTING** 1,056,512	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 73% 02/22/14		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Fowler	**START DATE** 04/18/14	**COMP. DATE** 04/18/14	**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))
855										
	852.9	0.0								852.9 GROUND SURFACE 0.0
			5	6	7	13		M		**ROADWAY EMBANKMENT** Brown-red-orange, silty fine to coarse SAND (A-2-4), with trace clay from 0.0-1.5'.
850	849.4	3.5	8	6	4	10		M		
845	844.4	8.5	WOH	1	1	2		M		845.9 7.0 Red-orange-gray, highly fine sandy, silty CLAY (A-6), with trace mica.
840	839.4	13.5	2	1	1	2		W		840.9 12.0 **RESIDUAL** Gray-brown to orange-tan-red, silty fine to coarse SAND (A-2-4(0)), with trace mica and trace gravel sized rock fragments from 28.5'-33.5'.
835	834.4	18.5	3	2	2	4		W		
830	829.4	23.5	3	4	7	11	SS-1	30%		
825	824.4	28.5	8	10	10	20		M		
820	819.4	33.5	25	75/0.1		100/0.6				819.4 33.5 **WEATHERED ROCK** Orange-tan-red, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ).
815	814.9	38.0	60/0.0			60/0.0				814.9 38.0 Boring Terminated with Standard Penetration Test Refusal at Elevation 814.9 ft ON CRYSTALLINE ROCK (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45360.1.34	**TIP** BD-5114AH	**COUNTY** Polk	**GEOLOGIST** R. Kral
SITE DESCRIPTION Bridge No. 740021 on SR 1501 (Hunting Country Road) over N. Pacolet River			**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 14+36	**OFFSET** 16 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 835.4 ft	**TOTAL DEPTH** 48.5 ft	**NORTHING** 544,455	**EASTING** 1,056,540	**24 HR.** 0.1
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 75% 02/22/14		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 04/16/14	**COMP. DATE** 04/17/14	**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))
840										
835	835.4	0.0	WOH	WOH	WOH	0		Sat.		835.4 GROUND SURFACE 0.0
	831.9	3.5	2	1	1	2		Sat.		**ALLUVIAL** Brown, silty fine to coarse SAND (A-2-4), with trace mica and little gravel from 8.5-10.0'.
830										
	826.9	8.5	28	15	9	24		Sat.		
825										823.4 12.0
	821.9	13.5	5	7	53	60		Sat.		**RESIDUAL** Brown-tan-orange, silty fine to coarse sandy GRAVEL (A-1-b), with trace clay.
820										
	816.9	18.5	100/0.2			100/0.2				816.9 18.5 **WEATHERED ROCK** Brown-gray-black, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ).
815										
	811.9	23.5								
	811.3	24.1	100/0.2			100/0.2				811.3 24.1 **CRYSTALLINE ROCK** Gray-white-black, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ).
810			60/0.0			60/0.0				
805										
	801.9	33.5	60/0.0			60/0.0				
800							RS-1			
795										
790										786.9 48.5
										Boring Terminated at Elevation 786.9 ft IN CRYSTALLINE ROCK (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ)

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 45360.1.34	**TIP** BD-5114AH	**COUNTY** Polk	**GEOLOGIST** R. Kral
SITE DESCRIPTION Bridge No. 740021 on SR 1501 (Hunting Country Road) over N. Pacolet River			**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 14+36	**OFFSET** 16 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 835.4 ft	**TOTAL DEPTH** 48.5 ft	**NORTHING** 544,455	**EASTING** 1,056,540	**24 HR.** 0.1
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 75% 02/22/14		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 04/16/14	**COMP. DATE** 04/17/14	**SURFACE WATER DEPTH** N/A
CORE SIZE NQ2	**TOTAL RUN** 24.4 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))
811.3											Begin Coring @ 24.1 ft
810	811.3	24.1	5.0	N=60/0.0 1:46/1.0 2:02/1.0 2:46/1.0 4:48/1.0 2:46/1.0	(4.8) 96%	(3.0) 60%		(18.5) 76%	(15.0) 61%		811.3 **CRYSTALLINE ROCK** 24.1 Slightly weathered to fresh, hard to very hard, gray-white-black, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ), with very close, close, and moderately close fracture spacing. Core Barrel refusal encountered at 29.1', tricone utilized to advance from 29.1' to 33.5' through fresh, very hard, white, (QUARTZ), with very close fracture spacing. RS-1: 35.6' - 36.0' q_u = 7,120 psi RMR_1 = 4 + 13 + 10 + 12 + 7 = 46
	806.3	29.1									
805			4.4		(0.0) 0%	(0.0) 0%					
	801.9	33.5									
800			5.0	N=60/0.0 1:53/1.0 0:45/1.0 2:04/1.0 3:22/1.0 1:38/1.0	(4.4) 88%	(3.8) 76%	RS-1				
	796.9	38.5									
795			5.0	1:35/1.0 2:45/1.0 2:04/1.0 1:46/1.0 2:47/1.0	(5.0) 100%	(4.9) 98%					
	791.9	43.5									
790			5.0	2:22/1.0 1:52/1.0 2:00/1.0 2:17/1.0 2:15/1.0	(4.3) 86%	(3.3) 66%					
	786.9	48.5									786.9 48.5 Boring Terminated at Elevation 786.9 ft IN CRYSTALLINE ROCK (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ)

NCDOT CORE SINGLE 63P-0310-0021-DIVISION 14 BRIDGE 021.GPJ NC_DOT.GDT 9/3/14

Bridge No. 740021 on SR 1501 over N. Pacolet River

CORE PHOTOGRAPHS: B1-A: Station 14+36, 16' LT

Begin Run 1
24.1 feet

Begin Run 3
33.5 feet

End Run 3
38.5 feet

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE IN FEET

Begin Run 4
38.5 feet

Begin Run 5
43.5 feet

End Run 5
48.5 feet

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE IN FEET

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45360.1.34	**TIP** BD-5114AH	**COUNTY** Polk	**GEOLOGIST** M. Brewer
SITE DESCRIPTION Bridge No. 740021 on SR 1501 (Hunting Country Road) over N. Pacolet River			**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 14+34	**OFFSET** 1 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 835.2 ft	**TOTAL DEPTH** 43.5 ft	**NORTHING** 544,442	**EASTING** 1,056,548	**24 HR.** 0.3
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 75% 02/22/14		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 04/17/14	**COMP. DATE** 04/17/14	**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)
840											
835	835.2	0.0								835.2 GROUND SURFACE	0.0
			2	1	2	3		Sat.		**ALLUVIAL** 833.2 Gray-red-brown, silty fine to coarse SAND (A-2-4), with trace gravel.	2.0
	831.7	3.5	3	2	5	7		Sat.		Tan-gray, fine to coarse SAND (A-3). 828.2	7.0
830											
	826.7	8.5	34	43	52	95		Sat.		**RESIDUAL** Brown-tan, silty fine to coarse SAND (A-2-4), with trace gravel-sized rock fragments.	
825											
	821.7	13.5	100/0.2			100/0.2				821.7	13.5
820										**WEATHERED ROCK** Brown-tan-white, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ).	
	816.7	18.5	100/0.2			100/0.2					
815											
	812.5	22.7	60/0.0			60/0.0				812.5	22.7
810										**CRYSTALLINE ROCK** Gray-white-black, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ).	
805											
800											
795							RS-2			791.7	43.5
										Boring Terminated at Elevation 791.7 ft IN CRYSTALLINE ROCK (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ)	

NCDOT BORE SINGLE 63P-0310-0021-DIVISION 14 BRIDGE 021.GPJ NC_DOT.GDT 9/3/14

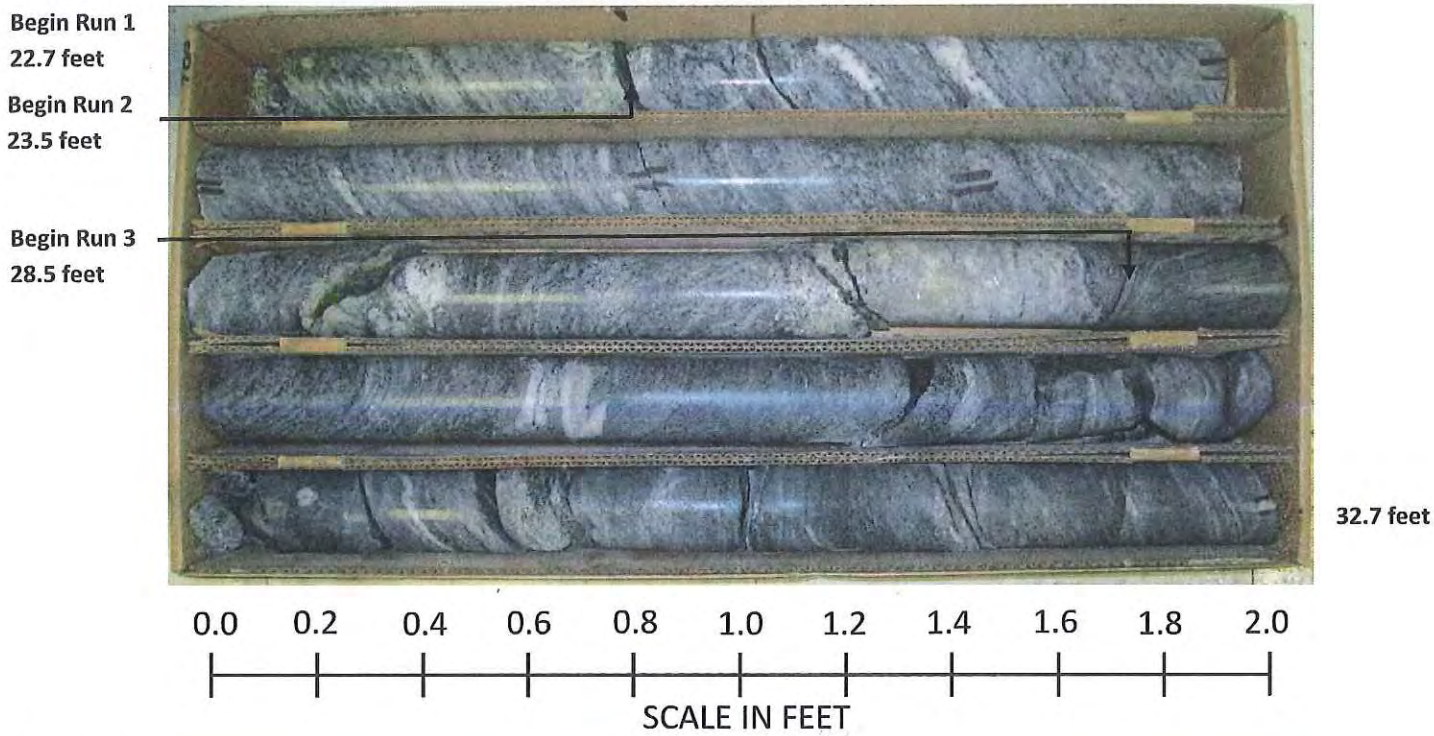
NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

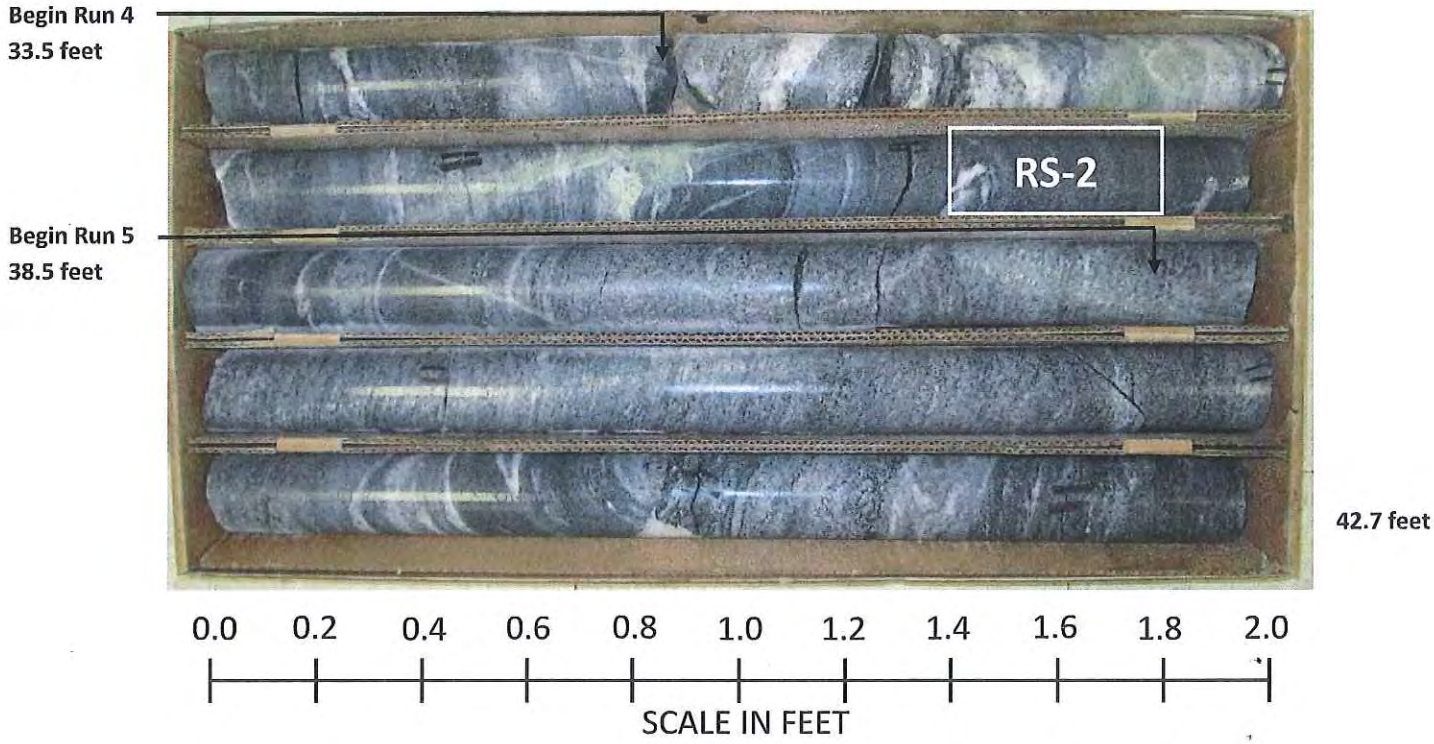
WBS 45360.1.34	**TIP** BD-5114AH	**COUNTY** Polk	**GEOLOGIST** M. Brewer
SITE DESCRIPTION Bridge No. 740021 on SR 1501 (Hunting Country Road) over N. Pacolet River			**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 14+34	**OFFSET** 1 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 835.2 ft	**TOTAL DEPTH** 43.5 ft	**NORTHING** 544,442	**EASTING** 1,056,548	**24 HR.** 0.3
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 75% 02/22/14		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 04/17/14	**COMP. DATE** 04/17/14	**SURFACE WATER DEPTH** N/A
CORE SIZE NQ2	**TOTAL RUN** 20.8 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))
812.5											Begin Coring @ 22.7 ft
	812.5 / 811.7	22.7 / 23.5	0.8	N=60/0.0	(0.8)	(0.7)		(20.5)	(15.8)		812.5 — **CRYSTALLINE ROCK** — 22.7
810			5.0	1:56/0.8	100%	88%		99%	76%		Slightly weathered to fresh, hard to very hard, gray-white-black, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ), with very close, close and moderately close fracture spacing.
				2:14/1.0							
				1:41/1.0	(5.0)	(4.0)					
				1:50/1.0	100%	80%					
				1:50/1.0							
	806.7	28.5		1:52/1.0							
805			5.0	1:55/1.0	(5.0)	(2.6)					RS-2: 36.9' - 37.3' q_u = 7,520 psi RMR_2 = 7 + 17 + 10 + 12 + 7 = 53
				1:24/1.0	100%	52%					
				2:22/1.0							
				2:10/1.0							
	801.7	33.5		2:16/1.0							
800			5.0	1:57/1.0	(5.0)	(4.3)					
				2:11/1.0	100%	86%					
				2:16/1.0							
				2:36/1.0			RS-2				
	796.7	38.5		2:21/1.0							
795			5.0	2:17/1.0	(4.7)	(4.2)					
				1:45/1.0	94%	84%					
				1:31/1.0							
				1:35/1.0							
	791.7	43.5		1:34/1.0							791.7 — 43.5
											Boring Terminated at Elevation 791.7 ft IN CRYSTALLINE ROCK (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ)

Bridge No. 740021 on SR 1151 over N. Pacolet River

CORE PHOTOGRAPHS: B1-B: Station 14+34, 1' RT

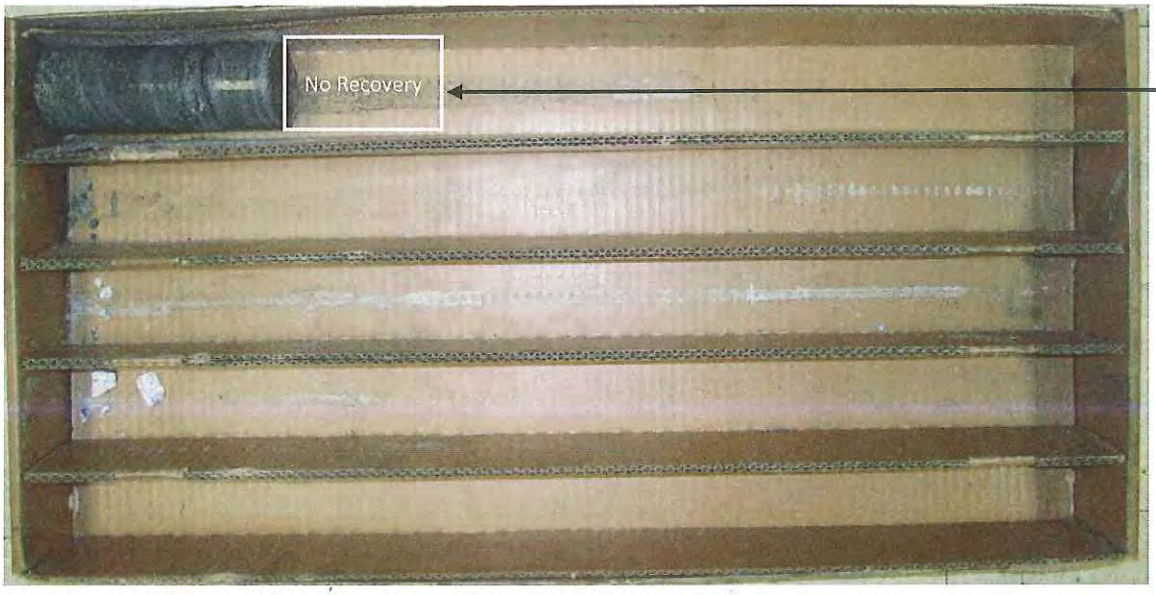




Bridge No. 740021 on SR 1151 over N. Pacolet River

CORE PHOTOGRAPHS: B1-B: Station 14+34, 1' RT

42.7 feet



End Run 5
43.5 feet

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE IN FEET

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45360.1.34	**TIP** BD-5114AH	**COUNTY** Polk	**GEOLOGIST** M. Brewer
SITE DESCRIPTION Bridge No. 740021 on SR 1501 (Hunting Country Road) over N. Pacolet River			**GROUND WTR (ft)**
BORING NO. B2-A	**STATION** 14+96	**OFFSET** 13 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 839.3 ft	**TOTAL DEPTH** 56.2 ft	**NORTHING** 544,489	**EASTING** 1,056,590	**24 HR.** 3.5
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 73% 02/22/14		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic
DRILLER J. Fowler	**START DATE** 04/16/14	**COMP. DATE** 04/17/14	**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))
840	839.3	0.0								839.3 / 0.0 GROUND SURFACE
			4	5	6	11		W		**ROADWAY EMBANKMENT** Brown-gray-orange, silty fine to coarse SAND (A-2-4), with little gravel. 837.3 / 2.0
835	835.8	3.5	3	1	1	2		Sat.		**ALLUVIAL** Gray, silty fine to coarse SAND (A-2-4), with trace gravel.
830	830.8	8.5	8	10	5	15		Sat.		
825	825.8	13.5	1	2	4	6		W		827.3 / 12.0 **RESIDUAL** Orange-brown, silty fine to coarse SAND (A-2-4), with trace mica.
820	820.8	18.5	30	70/0.3		100/0.8				820.8 / 18.5 **WEATHERED ROCK** Tan-white, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ).
815	815.8	23.5	100/0.3			100/0.3				
810	810.8	28.5	19	30	33	63		W		812.3 / 27.0 **RESIDUAL** Gray-black-tan-maroon, silty fine to coarse SAND (A-2-4), with trace gravel-sized rock fragments.
805	805.8	33.5	10	13	51	64		W		
800	800.8	38.5	75	25/0.2		100/0.7				800.8 / 38.5 **WEATHERED ROCK** Gray-black-tan, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ).
795	793.1	46.2	60/0.0			60/0.0				793.1 / 46.2 **CRYSTALLINE ROCK** Gray-white-black, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ).
790							RS-3			
785										783.1 / 56.2 Boring Terminated at Elevation 783.1 ft IN CRYSTALLINE ROCK (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ)

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 45360.1.34	**TIP** BD-5114AH	**COUNTY** Polk	**GEOLOGIST** M. Brewer
SITE DESCRIPTION Bridge No. 740021 on SR 1501 (Hunting Country Road) over N. Pacolet River			**GROUND WTR (ft)**
BORING NO. B2-A	**STATION** 14+96	**OFFSET** 13 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 839.3 ft	**TOTAL DEPTH** 56.2 ft	**NORTHING** 544,489	**EASTING** 1,056,590	**24 HR.** 3.5
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 73% 02/22/14		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic
DRILLER J. Fowler	**START DATE** 04/16/14	**COMP. DATE** 04/17/14	**SURFACE WATER DEPTH** N/A
CORE SIZE NQ2	**TOTAL RUN** 10.0 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))
793.1											Begin Coring @ 46.2 ft
	793.1	46.2	5.0	*N=60/0.0* 2:26/1.0 2:33/1.0 2:34/1.0 3:25/1.0 3:28/1.0	(5.0) 100%	(4.8) 96%		(9.9) 99%	(8.7) 87%		793.1 / 46.2 **CRYSTALLINE ROCK** Slightly weathered to fresh, hard to very hard, gray-white-black, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ), with very close, close and moderately close fracture spacing.
790											
	788.1	51.2									
			5.0	3;24/1.0 2:52/1.0 2:32/1.0 5:19/1.0 5:00/1.0	(4.9) 98%	(3.9) 78%	RS-3				RS-3: 51.3' - 51.7' q_u = 6,880 psi RMR_3 = 4 + 17 + 10 + 12 + 7 = 50
785											
	783.1	56.2									783.1 / 56.2 Boring Terminated at Elevation 783.1 ft IN CRYSTALLINE ROCK (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ)

Bridge No. 740021 on SR 1151 over N. Pacolet River

CORE PHOTOGRAPHS: B2-A: Station 14+96, 13' LT

Begin Run 1
46.2 feet

Begin Run 2
51.2 feet

End Run 2
56.2 feet

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE IN FEET

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45360.1.34	**TIP** BD-5114AH	**COUNTY** Polk	**GEOLOGIST** M. Brewer
SITE DESCRIPTION Bridge No. 740021 on SR 1501 (Hunting Country Road) over N. Pacolet River			**GROUND WTR (ft)**
BORING NO. B2-B	**STATION** 14+95	**OFFSET** 2 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 834.8 ft	**TOTAL DEPTH** 60.5 ft	**NORTHING** 544,476	**EASTING** 1,056,598	**24 HR.** 0.5
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 73% 02/22/14		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic
DRILLER J. Fowler	**START DATE** 04/17/14	**COMP. DATE** 04/18/14	**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))
835										
	834.8	0.0	1	1	1	2		W		834.8 GROUND SURFACE 0.0
										ALLUVIAL
	831.3	3.5	2	2	2	4		Sat.		832.8 Gray, clayey fine to coarse SAND (A-2-6), with trace mica. 2.0
830										Gray, fine to coarse SAND (A-3), with trace gravel.
	826.3	8.5	39	36	13	49		Sat.		827.8 7.0
825										Gray-white-tan, silty fine to coarse sandy GRAVEL (A-1-b).
	821.3	13.5	7	11	33	44		W		822.8 12.0
820										**RESIDUAL** Tan-white-orange, silty fine SAND (A-2-4), with trace gravel sized rock fragments.
	816.3	18.5	40	35	65/0.1	100/0.6				815.8 19.0
815										**WEATHERED ROCK** Brown-orange, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ).
	811.3	23.5	22	26	18	44		W		812.8 22.0
810										**RESIDUAL** Brown-tan-orange, silty fine to coarse SAND (A-2-4), with trace to little gravel-sized rock fragments.
	806.3	28.5	7	7	10	17		W		
805										
	801.3	33.5	25	52	25	77		W		
800										
	796.3	38.5	44	33	67/0.3					795.8 39.0
795	794.3	40.5	60/0.0			100/0.8 60/0.0				794.3 40.5
										WEATHERED ROCK Gray-black-tan, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ).
790										**CRYSTALLINE ROCK** Gray-white-black, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ).
785							RS-4			
780										
775										774.3 60.5
										Boring Terminated at Elevation 774.3 ft IN CRYSTALLINE ROCK (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ)

NCDOT BORE SINGLE 63P-0310-0021-DIVISION 14 BRIDGE 021.GPJ NC_DOT.GDT 9/3/14

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 45360.1.34	**TIP** BD-5114AH	**COUNTY** Polk	**GEOLOGIST** M. Brewer
SITE DESCRIPTION Bridge No. 740021 on SR 1501 (Hunting Country Road) over N. Pacolet River			**GROUND WTR (ft)**
BORING NO. B2-B	**STATION** 14+95	**OFFSET** 2 ft RT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 834.8 ft	**TOTAL DEPTH** 60.5 ft	**NORTHING** 544,476	**EASTING** 1,056,598	**24 HR.** 0.5
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 73% 02/22/14		**DRILL METHOD** SPT Core Boring	**HAMMER TYPE** Automatic
DRILLER J. Fowler	**START DATE** 04/17/14	**COMP. DATE** 04/18/14	**SURFACE WATER DEPTH** N/A
CORE SIZE NQ2	**TOTAL RUN** 20.0 ft		

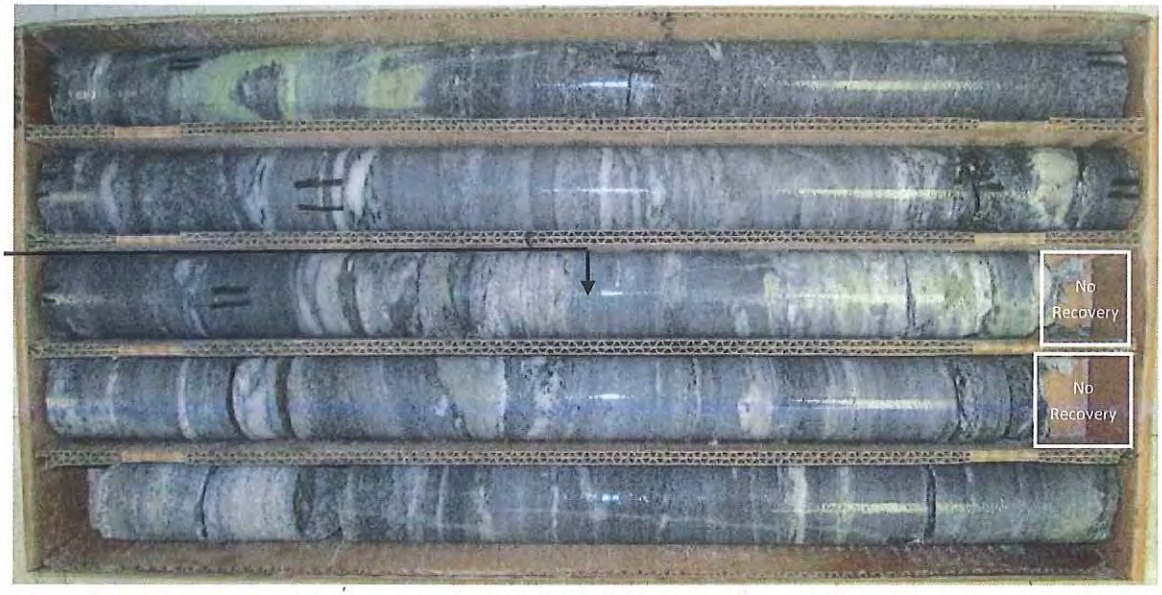
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS (ELEV. (ft) / DEPTH (ft))
794.3											Begin Coring @ 40.5 ft
	794.3	40.5	5.0	*N=60/0.0* 3:08/1.0 2:19/1.0 2:08/1.0 3:36/1.0 4:07/1.0	(5.0) 100%	(4.9) 98%		(19.5) 98%	(18.1) 91%		794.3 **CRYSTALLINE ROCK** 40.5 Slightly weathered to fresh, hard to very hard, gray-white-black, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ), with very close, close and moderately close fracture spacing. RS-4: 50.6' - 51.0' q_u = 4,670 psi RMR_4 = 4 + 20 + 10 + 12 + 7 = 53
790	789.3	45.5	5.0	3:49/1.0 6:28/1.0 4:31/1.0 6:51/1.0 7:33/1.0	(4.6) 92%	(3.9) 78%					
785	784.3	50.5	5.0	5:28/1.0 6:15/1.0 7:33/1.0 9:45/1.0 12:58/1.0	(5.0) 100%	(4.4) 88%	RS-4				
780	779.3	55.5	5.0	2:47/1.0 2:46/1.0 5:45/1.0 7:30/1.0 12:31/1.0	(4.9) 98%	(4.9) 98%					
775	774.3	60.5									774.3 60.5 Boring Terminated at Elevation 774.3 ft IN CRYSTALLINE ROCK (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ)

Bridge No. 740021 on SR 1151 over N. Pacolet River

CORE PHOTOGRAPHS: B2-B: Station 14+95, 2' RT

Begin Run 1
40.5 feet

Begin Run 2
45.5 feet



End Run 2
50.5 feet

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE IN FEET

Begin Run 3
50.5 feet

Begin Run 4
55.5 feet

59.7 feet

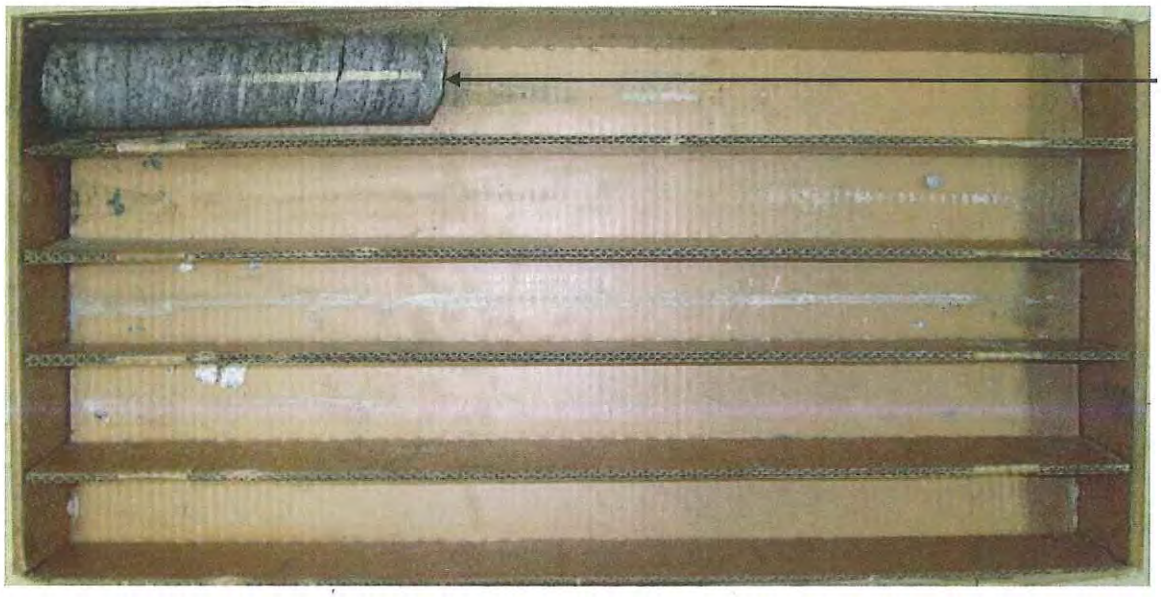
0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE IN FEET

Bridge No. 740021 on SR 1151 over N. Pacolet River

CORE PHOTOGRAPHS: B2-B: Station 14+95, 2' RT

59.7 feet



End Run 4
60.5 feet

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE IN FEET

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45360.1.34	**TIP** BD-5114AH	**COUNTY** Polk	**GEOLOGIST** R. Kral
SITE DESCRIPTION Bridge No. 740021 on SR 1501 (Hunting Country Road) over N. Pacolet River			**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 15+27	**OFFSET** 23 ft LT	**ALIGNMENT** -L-	**0 HR.** 14.0
COLLAR ELEV. 848.8 ft	**TOTAL DEPTH** 63.0 ft	**NORTHING** 544,515	**EASTING** 1,056,609	**24 HR.** 14.5
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 73% 02/22/14		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Fowler	**START DATE** 04/16/14	**COMP. DATE** 04/16/14	**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))
850										
	848.8	0.0								848.8 — GROUND SURFACE — 0.0
			2	4	3	7		M		**ROADWAY EMBANKMENT**
845	845.3	3.5								846.8 — Brown-red, silty clayey fine SAND (A-2-6), with trace gravel and mica. — 2.0
			1	1	1	2		M		Brown, silty fine SAND (A-2-4), with trace mica.
										841.8 — 7.0
840	840.3	8.5								**ALLUVIAL**
			WOH	WOH	1	1		Sat.		Brown-tan-white, fine to coarse SAND (A-1-b).
835	835.3	13.5						Sat.		
			1	2	3	5				
830	830.3	18.5								
			1	2	3	5		Sat.		
825	825.3	23.5								
			1	1	2	3		Sat.		
										821.8 — 27.0
820	820.3	28.5								**RESIDUAL**
			2	5	7	12		W		Orange-brown to brown-orange-gray-white, silty fine to coarse SAND (A-2-4), with trace gravel-sized rock fragments.
815	815.3	33.5								
			4	9	10	19		W		
810	810.3	38.5								
			7	9	9	18		W		
805	805.3	43.5								
			10	13	16	29		W		
800	800.3	48.5								
			8	19	26	45		M		
795	795.3	53.5								794.8 — 54.0
			18	51	49/0.4	100/0.9				**WEATHERED ROCK** Gray-black-white, (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ).
790	790.3	58.5								
			39	61/0.3		100/0.8				
	785.8	63.0	60/0.0			60/0.0				785.8 — 63.0
										Boring Terminated with Standard Penetration Test Refusal at Elevation 785.8 ft ON CRYSTALLINE ROCK (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45360.1.34	**TIP** BD-5114AH	**COUNTY** Polk	**GEOLOGIST** M. Brewer
SITE DESCRIPTION Bridge No. 740021 on SR 1501 (Hunting Country Road) over N. Pacolet River			**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 15+20	**OFFSET** 15 ft RT	**ALIGNMENT** -L-	**0 HR.** 15.0
COLLAR ELEV. 849.1 ft	**TOTAL DEPTH** 54.5 ft	**NORTHING** 544,480	**EASTING** 1,056,626	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE F&R4637 CME-75 73% 02/22/14		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER J. Fowler	**START DATE** 04/18/14	**COMP. DATE** 04/18/14	**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))
850										
	849.1	0.0								849.1 GROUND SURFACE 0.0
			2	3	3	6		M		**ROADWAY EMBANKMENT** Gray-brown-orange, silty fine to coarse SAND (A-2-4), with trace gravel.
845	845.6	3.5	1	2	2	4		M		
										842.1 7.0
840	840.6	8.5	1	2	1	3		W		**ALLUVIAL** Gray-white, fine to coarse SAND (A-1-b(0)), with trace gravel.
835	835.6	13.5	2	1	2	3	SS-2	20%		
830	830.6	18.5	2	2	2	4		Sat.		
825	825.6	23.5	5	2	3	5		Sat.		
										822.1 27.0
820	820.6	28.5	3	1	2	3		W		**RESIDUAL** Brown-black-orange to brown-white-gray, silty fine to coarse SAND (A-2-4), with trace mica.
815	815.6	33.5	3	2	2	4		W		
810	810.6	38.5	6	6	14	20		M		
805	805.6	43.5	3	8	15	23		M		
800	800.6	48.5	11	13	14	27		M		
795	795.6	53.5								795.6 53.5
	794.6	54.5	60/0.1			60/0.1				794.6 54.5 **CRYSTALLINE ROCK** (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ).
			60/0.0			60/0.0				Boring Terminated with Standard Penetration Test Refusal at Elevation 794.6 ft IN CRYSTALLINE ROCK (INEQUIGRANULAR BIOTITE GNEISS WITH INTERLAYERED QUARTZ)