STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.11.R.56	1	14

ID: 17BP11R56

PROJECT: 17BP.11.R.56

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 17BP.11.R.56 F.A. PROJ. _____

COUNTY SURRY

PROJECT DESCRIPTION _____

SITE DESCRIPTION BRIDGE NO. 156 ON SR 1815 (COOK SCHOOL RD) OVER US 52

CONTENTS

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 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.

PERSONNEL

ESP Associates, P.A.

ConeTec

INVESTIGATED BY J.E. BEVERLY

CHECKED BY C.B. LITTLE

SUBMITTED BY C.B. LITTLE

DATE APRIL 2013

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE

5-16-13

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.

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.

PROJECT REFERENCE NO.	SHEET NO.
17BP.11.R.56	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 #40 #200	50 MX 30 MX 15 MX		50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
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/FT²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	>30	>4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT (PLASTIC RANGE (PI))	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- 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 — 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

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
- [ ] CME-550
- [ ] PORTABLE HOIST
- [X] CME-55 LC
- [ ] _____

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

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

CORE SIZE:
- [ ] -B____
- [X] -N 03
- [ ] -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 (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: GPS-1

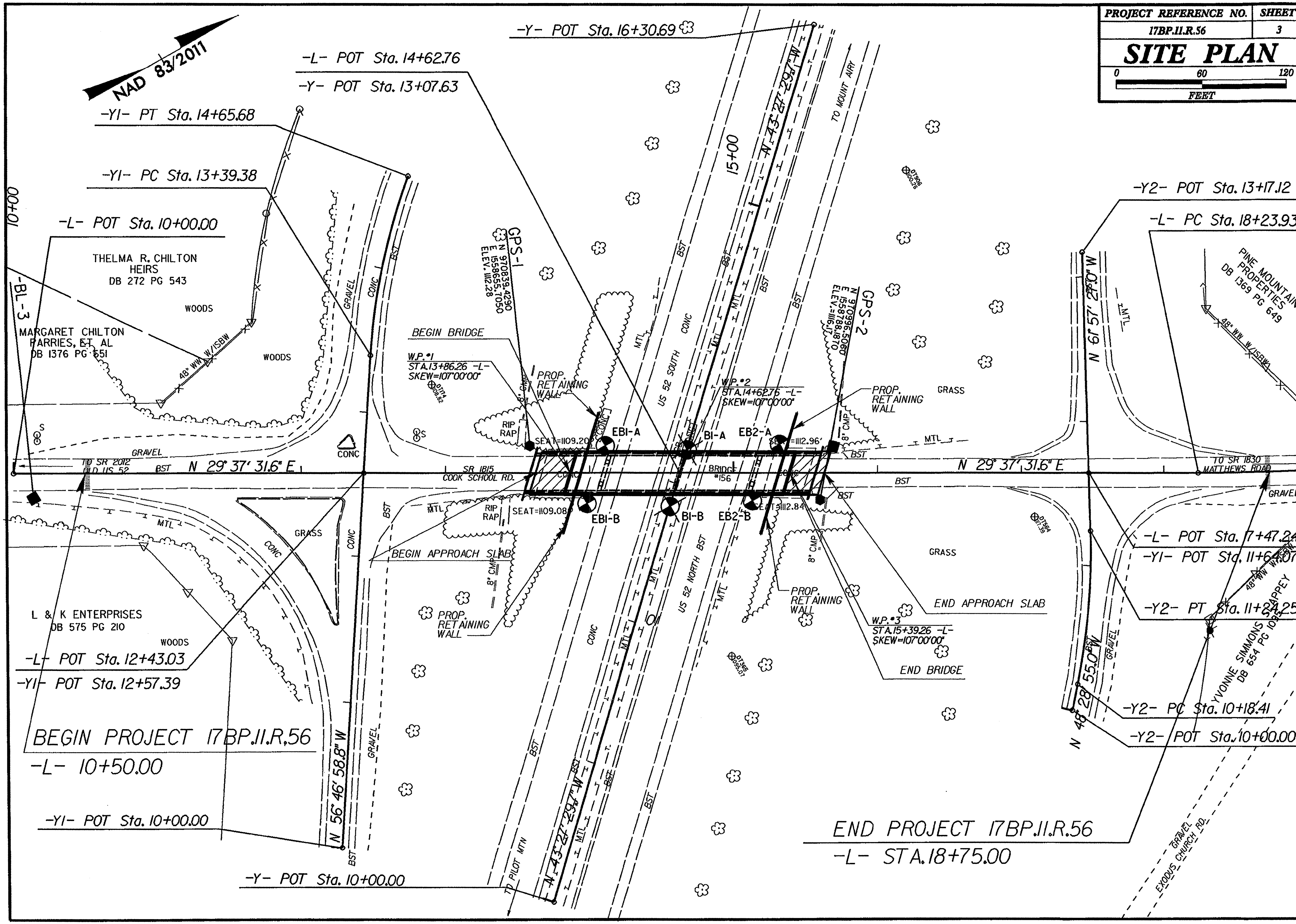
N 970839.4290 E 1558655.7050 ELEVATION: 112.28 FT.

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

REVISED 09/23/09

PROJECT REFERENCE NO.	SHEET
17BP.11.R.56	3

SITE PLAN



PROJECT REFERENCE NO.	SHEET
17BP.11.R.56	4

Profile -L-
Bridge No. 156 on SR 1815 (Cook School Rd.) over US 52

0 100 200
FEET
V.E. = 5:1

PI = 11+75.00
EL = 1109.90'
VC = 175'
K = 98
V = 50 MPH

PI = 14+75.00
EL = 1121.40'
VC = 370'
K = 84
V = 50 MPH

PI = 17+50.00
EL = 1119.85'
VC = 180'
K = 94
V = 50 MPH

-L- SR 1815 (COOK SCHOOL ROAD)

-L- POT STA. 14+62.76
-Y- POT STA. 13+07.63

BEGIN GRADE
-L- Sta. 10+75.00
EL = 1107.85'

BEGIN BRIDGE
-L- Sta. 13+86.26

END BRIDGE
-L- Sta. 15+39.26

END CONST.
-L- Sta. 18+75.00

(+)12.0500%
(+)3.8333%
(+)3.8333%
(+)0.5636%
(-)0.5636%
(+)11.3500%

EB1-A
14+11 -L-
18.0 LT.
ELEV. 1096.3

B1-A
14+68 -L-
16.0 LT.
ELEV. 1086.1

EB2-A
15+32 -L-
20.0 LT.
ELEV. 1094.1

PROPOSED
RETAINING WALL

PROPOSED
RETAINING WALL

BEGIN CONST.
-L- Sta. 10+50.00

END GRADE
-L- Sta. 18+50.00
EL = 1121.20'

RESIDUAL
BROWN, RED, TAN & WHITE V. STIFF WET CSE. TO F. SANDY SILT (A-4)
ORANGE & WHITE V. DENSE DRY F. TO CSE. SAND (A-1-B) W/ABUNDANT ROCK FRAGMENTS
BROWN, RED & WHITE MED. DENSE MOIST CSE. TO F. SAND (A-2-4)
BROWN, TAN, WHITE & ORANGE MED. STIFF TO V. STIFF WET TO MOIST F. SANDY SILT (A-4) W/LITTLE MICA @ 23.5-31.0
BROWN, ORANGE & WHITE MED. DENSE MOIST CSE. TO F. SAND (A-2-4)
BROWN, GRAY & BROWN W/WHITE V. STIFF TO HARD MOIST MICA. SILT (A-4) SAPROLITE
WEATHERED ROCK, GRAY & BROWN SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE).
CRYSTALLINE ROCK
BT DRY (4/08/13)
WEATHERED ROCK GRAY & ORANGE-BROWN SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE)

RESIDUAL
RESIDUAL
RED, ORANGE-BROWN, TAN, BROWN & GRAY STIFF TO HARD MOIST TO WET F. SANDY SILT & SILT (A-4) W/LITTLE TO SOME MICA
RED, TAN, BRN W/BLACK, ORANGE-BRN W/RED & BLACK, BRN W/GRAY, BROWN & GRAY STIFF TO HARD MOIST F. SANDY SILT & SILT (A-4) W/LITTLE TO SOME MICA. (SAPROLITE @ 43.5)
WEATHERED ROCK, GRAY W/BROWN & WHITE SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE)
CRYSTALLINE ROCK
BT DRY (4/08/13)

GRAY WITH SOME BROWN & WHITE, MED. HARD TO HARD SLI. WEATH. TO FRESH META-GRAYWACKE WITH V. CLOSE TO MOD. CLOSE FRACTURE SPACING
REC = 94%
RQD = 79%
BT

1150 1140 1130 1120 1110 1100 1090 1080 1070 1060 1050 1040 1030 1020 1010

10 11 12 13 14 15 16 17 18 19

PROJECT REFERENCE NO.	SHEET
17BP.11.R.56	5

Section Through End Bent One
Sta. 13+86.26 -L- (W.P. #1)
Skew = 107°00'00"

0 10 20
FEET

SR 1815
COOK SCHOOL RD.

BRIDGE DECK
(APPROX. ELEV.)

EB1-A
14+11 -L-
19.0 LT.
ELEV. 1095.3

EB1-B
13+98 -L-
21.0 RT.
ELEV. 1095.7

GROUND SURFACE

1120
1110
1100
1090
1080
1070
1060
1050
1040

RESIDUAL

BROWN, RED, TAN & WHITE V. STIFF WET CSE. TO F. SANDY SILT (A-4) (17)

ORANGE & WHITE V. DENSE DRY F. TO CSE. SAND (A-1-B) W/ABUNDANT ROCK FRAGMENTS (64)

BROWN, RED & WHITE MED. DENSE MOIST CSE. TO F. SAND (A-2-4) (16)

(8)

BROWN, TAN, WHITE & ORANGE MED. STIFF TO V. STIFF WET TO MOIST F. SANDY SILT (A-4) W/LITTLE MICA @ 23.5-31.0 (15)

(12)

BROWN, ORANGE & WHITE MED. DENSE MOIST CSE. TO F. SAND (A-2-4) (23)

04/13

(21)

BROWN, GRAY & BROWN W/WHITE V. STIFF TO HARD MOIST MICA. SILT (A-4) SAPROLITE (19)

(78)

WEATHERED ROCK, GRAY & BROWN SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE) (100/.2) (50/0.0)

BT
DRY
(4/08/13)

CRYSTALLINE ROCK (META-GRAYWACKE)

RESIDUAL

TAN, BROWN & ORANGE MED. STIFF TO STIFF MOIST F. SANDY SILT (A-4) W/LITTLE MICA. (8)

(14)

(12)

ORANGE & WHITE MED. DENSE MOIST SILTY CSE. TO F. SAND (A-2-4) (12)

(13)

04/13

WHITE, BROWN, GRAY & ORANGE W/BLACK STIFF TO HARD WET TO MOIST F. SANDY SILT (A-4) (MICA. & SAPROLITE @ 28.5-37.2) (23)

(33)

ORANGE & WHITE MED. DENSE MOIST SILTY CSE. TO F. SAND (A-2-4) (24)

WEATHERED ROCK ORANGE & WHITE SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK) (100/.8)

ORANGE & WHITE V. DENSE MOIST SILTY CSE. TO F. SAND (A-2-4) (61)

WEATHERED ROCK ORANGE & WHITE SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK) (50/0.0)

BT
DRY
(4/03/13)

50 40 30 20 10 0 10 20 30 40 50

PROJECT REFERENCE NO.	SHEET
17BP.11.R.56	6

Section Through Bent One
Sta. 14+62.76 -L- (W.P. #2)
Skew = 107°00'00"

0 10 20
FEET

INSET

SR 1815
COOK SCHOOL RD.
BRIDGE DECK
(APPROX. ELEV.)

B1-A
14+68 -L-
16.0 LT.
ELEV. 1095.1

B1-B
14+56 -L-
23.0 RT.
ELEV. 1094.6

GROUND SURFACE

RESIDUAL

RED, TAN, BRN. W/BLACK, ORANGE-BRN. W/RED & BLACK, BRN. W/GRAY, BROWN & GRAY, STIFF TO HARD MOIST F. SANDY SILT & SILT (A-4) W/LITTLE TO SOME MICA. (SAPROLITE @ 43.5)

13 19 39 20 21 24 18 40 46 100/.4 100/.8 100/.6 60/.0

04/13

04/13

WEATHERED ROCK
GRAY & ORANGE-BROWN SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE)

CRYSTALLINE ROCK

GRAY WITH SOME BROWN & WHITE MED. HARD TO HARD SLI. WEATH. TO FRESH META-GRAYWACKE WITH V. CLOSE TO MOD. CLOSE FRACTURE SPACING

REC = 94%
RQD = 79%

BT

RESIDUAL

12 9 13 8 19 22 53 11 24 16 68 60/.0

ORANGE & WHITE TO RED-BROWN W/GRAY MED. STIFF TO HARD MOIST CSE. TO F. SANDY SILT & SILT (A-4) W/TRACE TO SOME MICA

WHITE & ORANGE TO ORANGE-BROWN & BROWN MED. DENSE MOIST SILTY CSE. TO F. SAND (A-2-4) W/LITTLE MICA @ 48.5-52.6

ORANGE-BROWN, BROWN & GRAY HARD MOIST F. SANDY SILT (A-4) W/SOME MICA (SAPROLITE)

WEATHERED ROCK
SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE)

CRYSTALLINE ROCK

GRAY W/BROWN & WHITE MED. HARD TO HARD MOD. SEV. WEATH. TO FRESH META-GRAYWACKE W/V. CLOSE TO MOD. CLOSE FRACTURE SPACING.

REC = 90%
RQD = 74%

BT

1110 1100 1090 1080 1070 1060 1050 1040 1030 1020 1010

50 40 30 20 10 0 10 20 30 40 50

PROJECT REFERENCE NO.	SHEET
17BP.11.R.56	7
Section Through End Bent Two Sta. 15+39.26 -L- (W.P. #3) Skew=107°00'00"	

0 10 20
FEET

SR 1815
COOK SCHOOL RD.

BRIDGE DECK
(APPROX. ELEV.)

EB2-A
15+32 -L-
20.0 LT.
ELEV. 1094.1

EB2-B
15+13 -L-
19.0 RT.
ELEV. 1094.9

GROUND SURFACE

RESIDUAL

RESIDUAL

RED, ORANGE-BROWN, TAN, BROWN, & GRAY
STIFF TO HARD MOIST TO WET
F. SANDY SILT & SILT (A-4)
W/LITTLE TO SOME MICA

ORANGE, BROWN, TAN, & GRAY STIFF TO HARD
MOIST SILT & F. SANDY SILT (A-4)
W/LITTLE TO SOME MICA (SAPROLITE @ 38.5)

WEATHERED ROCK GRAY W/BROWN & WHITE
SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE)

WEATHERED ROCK
BROWN & GRAY, SEV. WEATH.
CRYSTALLINE ROCK (META-GRAYWACKE)

BROWN & GRAY, V. STIFF
MOIST F. SANDY SILT (A-4)
W/LITTLE MICA

BT
DRY
(4/08/13)

04/13

1120 1110 1100 1090 1080 1070 1060 1050 1040

50 40 30 20 10 0 10 20 30 40 50

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 17BP.11.R.56	**TIP** 17BP11R56	**COUNTY** SURRY	**GEOLOGIST** Weaver, P.	
SITE DESCRIPTION BRIDGE NO. 156 ON SR 1815 (COOK SCHOOL RD.) OVER US 52				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 14+11	**OFFSET** 19 ft LT	**ALIGNMENT** -L-	**0 HR.** 33.3
COLLAR ELEV. 1,095.3 ft	**TOTAL DEPTH** 50.0 ft	**NORTHING** 970,885	**EASTING** 1,558,682	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CON1145 CME-55LC 79% 04/02/2013		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER White, D.	**START DATE** 04/02/13	**COMP. DATE** 04/02/13	**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)
1100										
1095										1,095.3 GROUND SURFACE 0.0
										RESIDUAL BROWN, RED, TAN & WHITE V. STIFF WET CSE. TO F. SANDY SILT (A-4)
	1,091.8	3.5	9	9	8	17		W		
1090										1,086.3 9.0
	1,086.8	8.5	8	31	33	64		D		**RESIDUAL** ORANGE & WHITE V. DENSE DRY F. TO CSE. SAND (A-1-B) W/ ABUNDANT ROCK FRAGMENTS
1085										1,083.7 11.6
	1,081.8	13.5	10	6	10	16		M		**RESIDUAL** BROWN, RED & WHITE MED. DENSE MOIST CSE. TO F. SAND (A-2-4)
1080										1,076.6 18.7
	1,076.8	18.5	4	3	5	8		W		**RESIDUAL** BROWN, TAN, WHITE & ORANGE MED. STIFF TO V. STIFF WET TO MOIST F. SANDY SILT (A-4) W/ LITTLE MICA @ 23.5-31.0
1075										
	1,071.8	23.5	6	7	8	15		M		
1070										
	1,066.8	28.5	5	5	7	12		M		
1065										1,064.3 31.0
	1,062.8	32.5	5	6	17	23		M		**RESIDUAL** BROWN, ORANGE & WHITE MED. DENSE MOIST CSE. TO F. SAND (A-2-4)
1060										1,061.0 34.3
	1,058.8	36.5	9	9	12	21		M		**RESIDUAL** BROWN, GRAY & BROWN W/ WHITE V. STIFF TO HARD MOIST MICA. SILT (A-4) SAPROLITE
	1,057.3	38.0	7	8	11	19		M		
1055										
	1,051.8	43.5	17	33	45	78		M		
1050										1,048.2 47.1
	1,046.8	48.5	100/0.2			100/.2				**WEATHERED ROCK** GRAY & BROWN SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE)
	1,045.3	50.0	60/0.0			60/0.0				1,045.3 50.0
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,045.3 ft ON CRYSTALLINE ROCK (META-GRAYWACKE)
										NOTE: DRIVES TAKEN AT SHORTER INTERVALS AT 32.5, 36.5 & 38.0 FOR ENERGY MEASUREMENTS (AUTO HAMMER CALIBRATION)

WBS 17BP.11.R.56	**TIP** 17BP11R56	**COUNTY** SURRY	**GEOLOGIST** Weaver, P.	
SITE DESCRIPTION BRIDGE NO. 156 ON SR 1815 (COOK SCHOOL RD.) OVER US 52				**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 13+98	**OFFSET** 21 ft RT	**ALIGNMENT** -L-	**0 HR.** 28.2
COLLAR ELEV. 1,095.7 ft	**TOTAL DEPTH** 53.0 ft	**NORTHING** 970,854	**EASTING** 1,558,710	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CON1145 CME-55LC 79% 04/02/2013		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER White, D.	**START DATE** 04/02/13	**COMP. DATE** 04/02/13	**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
1100										
1095										1,095.7 GROUND SURFACE 0.0
	1,092.2	3.5	4	4	4	8		M		**RESIDUAL** TAN, BROWN & ORANGE MED. STIFF TO STIFF MOIST F. SANDY SILT (A-4) W/ LITTLE MICA.
1090										
	1,087.2	8.5	5	6	8	14		M		
1085										1,083.1 12.6
	1,082.2	13.5	4	6	6	12		M		**RESIDUAL** ORANGE & WHITE MED. DENSE MOIST SILTY CSE. TO F. SAND (A-2-4)
1080										
	1,077.2	18.5	4	5	7	12		M		
1075										1,071.9 23.8
	1,072.2	23.5	5	5	8	13		W		**RESIDUAL** WHITE, BROWN, GRAY & ORANGE W/ BLACK STIFF TO HARD WET TO MOIST F. SANDY SILT (A-4) (MICA. & SAPROLITE @ 28.5-37.2)
1070										
	1,067.2	28.5	9	12	11	23		M		
1065										
	1,062.2	33.5	26	18	15	33		M		
1060										1,058.5 37.2
	1,057.2	38.5	6	10	14	24		M		**RESIDUAL** ORANGE & WHITE MED. DENSE MOIST SILTY CSE. TO F. SAND (A-2-4)
1055										1,051.7 44.0
	1,052.2	43.5	9	19	81/0.3	100/.8				**WEATHERED ROCK** ORANGE & WHITE SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK)
1050										1,048.6 47.1
	1,047.2	48.5	16	32	29	61		M		**RESIDUAL** ORANGE & WHITE V. DENSE MOIST SILTY CSE. TO F. SAND (A-2-4)
1045										1,043.4 52.3
	1,042.7	53.0	60/0.0			60/0.0				1,042.7 53.0 **WEATHERED ROCK** ORANGE & WHITE SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK)
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,042.7 ft ON CRYSTALLINE ROCK (GRANITIC ROCK)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 17BP.11.R.56	**TIP** 17BP11R56	**COUNTY** SURRY	**GEOLOGIST** Weaver, P.	
SITE DESCRIPTION BRIDGE NO. 156 ON SR 1815 (COOK SCHOOL RD.) OVER US 52				**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 14+68	**OFFSET** 16 ft LT	**ALIGNMENT** -L-	**0 HR.** NM
COLLAR ELEV. 1,095.1 ft	**TOTAL DEPTH** 80.3 ft	**NORTHING** 970,933	**EASTING** 1,558,713	**24 HR.** 24.9
DRILL RIG/HAMMER EFF./DATE CON1145 CME-55LC 79% 04/02/2013		**DRILL METHOD** Mud Rotary / Core	**HAMMER TYPE** Automatic	
DRILLER White, D.	**START DATE** 04/09/13	**COMP. DATE** 04/09/13	**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)
1100										
1095										1,095.1 GROUND SURFACE 0.0
	1,091.6	3.5	5	6	7	13		M		**RESIDUAL** RED, TAN, BRN W/ BLACK, ORANGE-BRN W/ RED & BLACK, BRN W/ GRAY, BROWN & GRAY STIFF TO HARD MOIST F. SANDY SILT & SILT (A-4) W/ LITTLE TO SOME MICA. (SAPROLITE @ 43.5)
1090										
	1,086.6	8.5	5	9	10	19		M		
1085										
	1,081.6	13.5	16	23	16	39		M		
1080										
	1,076.6	18.5	8	8	12	20		M		
1075										
	1,071.6	23.5	7	9	12	21		M		
1070										
	1,066.6	28.5	7	12	12	24		M		
1065										
	1,061.6	33.5	5	7	11	18		M		
1060										
	1,056.6	38.5	11	17	23	40		M		
1055										
	1,051.6	43.5	15	17	29	46		M		
1050										
	1,046.6	48.5	100/0.4			100/.4				
1045										
	1,041.6	53.5	13	52	48/0.3	100/.8				
1040										
	1,036.6	58.5	57	43/0.1		100/.6				
1035	1,034.2	60.9	60/0.0			60/0.0				1,047.9 47.2 **WEATHERED ROCK** GRAY & ORANGE-BROWN SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE)
1030										1,034.2 60.9 **CRYSTALLINE ROCK** GRAY WITH SOME BROWN & WHITE, MED. HARD TO HARD SLI. WEATH. TO FRESH META-GRAYWACKE WITH V. CLOSE TO MOD. CLOSE FRACTURE SPACING
1025										
1020										
1015										1,014.8 80.3 Boring Terminated at Elevation 1,014.8 ft IN CRYSTALLINE ROCK (META-GRAYWACKE)

NOTE: B1-A BORLOG LOG SCALE=15:1

NCDOT BORE SINGLE 085&000_GEO_BH_BRDG0156_SURRY.GPJ NC_DOT.GDT 5/16/13

SHEET 9

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 17BP.11.R.56	**TIP** 17BP11R56	**COUNTY** SURRY	**GEOLOGIST** Weaver, P.	
SITE DESCRIPTION BRIDGE NO. 156 ON SR 1815 (COOK SCHOOL RD.) OVER US 52				**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 14+68	**OFFSET** 16 ft LT	**ALIGNMENT** -L-	**0 HR.** NM
COLLAR ELEV. 1,095.1 ft	**TOTAL DEPTH** 80.3 ft	**NORTHING** 970,933	**EASTING** 1,558,713	**24 HR.** 24.9
DRILL RIG/HAMMER EFF./DATE CON1145 CME-55LC 79% 04/02/2013		**DRILL METHOD** Mud Rotary / Core	**HAMMER TYPE** Automatic	
DRILLER White, D.	**START DATE** 04/09/13	**COMP. DATE** 04/09/13	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ3	**TOTAL RUN** 19.4 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)
1034.2											Begin Coring @ 60.9 ft
	1,034.2	60.9	4.4	*N=60/0.0* 2:15/1.0 6:35/1.0 5:07/1.0 3:39/1.0 2:10/0.4	(3.9) 89%	(2.1) 48%		(18.3) 94%	(15.4) 79%		1,034.2 **CRYSTALLINE ROCK** 60.9 GRAY WITH SOME BROWN & WHITE, MED. HARD TO HARD SLI. WEATH. TO FRESH META-GRAYWACKE WITH V. CLOSE TO MOD. CLOSE FRACTURE SPACING
1030	1,029.8	65.3	5.0	3:34/1.0 4:05/1.0 3:40/1.0 5:21/1.0 5:16/1.0	(4.5) 90%	(3.6) 72%					
1025	1,024.8	70.3	5.0	4:21/1.0 3:38/1.0 3:53/1.0 3:50/1.0 3:26/1.0	(5.0) 100%	(4.8) 96%					
1020	1,019.8	75.3	5.0	2:39/1.0 2:51/1.0 2:46/1.0 2:41/1.0 2:35/1.0	(4.9) 98%	(4.9) 98%					
1015	1,014.8	80.3									1,014.8 80.3 Boring Terminated at Elevation 1,014.8 ft IN CRYSTALLINE ROCK (META-GRAYWACKE)

NCDOT CORE SINGLE 085&000_GEO_BH_BRDG0156_SURRY.GPJ NC_DOT.GDT 5/16/13

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 17BP.11.R.56	**TIP** 17BP11R56	**COUNTY** SURRY	**GEOLOGIST** Weaver, P.	
SITE DESCRIPTION BRIDGE NO. 156 ON SR 1815 (COOK SCHOOL RD.) OVER US 52				**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 14+56	**OFFSET** 23 ft RT	**ALIGNMENT** -L-	**0 HR.** 17.5
COLLAR ELEV. 1,094.6 ft	**TOTAL DEPTH** 74.8 ft	**NORTHING** 970,904	**EASTING** 1,558,741	**24 HR.** 25.7
DRILL RIG/HAMMER EFF./DATE CON1145 CME-55LC 79% 04/02/2013		**DRILL METHOD** Mud Rotary / Core	**HAMMER TYPE** Automatic	
DRILLER White, D.	**START DATE** 04/08/13	**COMP. DATE** 04/08/13	**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)
1095										1,094.6 GROUND SURFACE 0.0
										RESIDUAL ORANGE & WHITE TO RED-BROWN W/ GRAY MED. STIFF TO HARD MOIST CSE. TO F. SANDY SILT & SILT (A-4) W/ TRACE TO SOME MICA
1090	1,091.1	3.5	6	6	6	12		M		
1085	1,086.1	8.5	3	3	6	9		M		
1080	1,081.1	13.5	4	6	7	13		M		
1075	1,076.1	18.5	4	4	4	8		M		
1070	1,071.1	23.5	5	7	12	19		M		
1065	1,066.1	28.5	8	9	13	22		M		
1060	1,061.1	33.5	14	20	33	53		M		
1055	1,056.1	38.5	3	5	6	11		M		
1050	1,051.1	43.5	10	12	12	24		M		
1045	1,046.1	48.5	6	7	9	16		M		
1040	1,041.1	53.5	16	39	29	68		M		
1035	1,035.8	58.8	60/0.0			60/0.0				1,057.3 37.3
										RESIDUAL WHITE & ORANGE TO ORANGE-BROWN & BROWN MED. DENSE MOIST SILTY CSE. TO F. SAND (A-2-4) W/ LITTLE MICA @ 48.5-52.6
1030										1,042.0 52.6
										RESIDUAL ORANGE-BROWN , BROWN & GRAY HARD MOIST F. SANDY SILT (A-4) W/ SOME MICA (SAPROLITE)
1025										1,037.8 56.8
										WEATHERED ROCK SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE)
1020										1,035.8 58.8
										CRYSTALLINE ROCK GRAY W/ BROWN & WHITE MED. HARD TO HARD MOD. SEV. WEATH. TO FRESH META-GRAYWACKE W/ V. CLOSE TO MOD. CLOSE FRACTURE SPACING.
										1,019.8 74.8
										Boring Terminated at Elevation 1,019.8 ft IN CRYSTALLINE ROCK (META-GRAYWACKE)

NCDOT BORE SINGLE 055&000_GEO_BH_BRDG0156_SURRY.GPJ NC_DOT.GDT 5/16/13

SHEET 10

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 17BP.11.R.56	**TIP** 17BP11R56	**COUNTY** SURRY	**GEOLOGIST** Weaver, P.	
SITE DESCRIPTION BRIDGE NO. 156 ON SR 1815 (COOK SCHOOL RD.) OVER US 52				**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 14+56	**OFFSET** 23 ft RT	**ALIGNMENT** -L-	**0 HR.** 17.5
COLLAR ELEV. 1,094.6 ft	**TOTAL DEPTH** 74.8 ft	**NORTHING** 970,904	**EASTING** 1,558,741	**24 HR.** 25.7
DRILL RIG/HAMMER EFF./DATE CON1145 CME-55LC 79% 04/02/2013		**DRILL METHOD** Mud Rotary / Core	**HAMMER TYPE** Automatic	
DRILLER White, D.	**START DATE** 04/08/13	**COMP. DATE** 04/08/13	**SURFACE WATER DEPTH** N/A	
CORE SIZE NQ3	**TOTAL RUN** 16.0 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)
1035.8											Begin Coring @ 58.8 ft
1035	1,035.8	58.8	1.0	*N=60/0.0*	(0.9)	(0.5)		(14.4)	(11.8)		1,035.8 **CRYSTALLINE ROCK** 58.8
	1,034.8	59.8	5.0	4:00/1.0	90%	50%		90%	74%		GRAY W/ BROWN & WHITE MED. HARD TO HARD MOD. SEV. WEATH. TO FRESH META-GRAYWACKE W/ V. CLOSE TO MOD. CLOSE FRACTURE SPACING.
				2:25/1.0							
				2:38/1.0							
				2:37/1.0	(3.5)	(1.3)					
				4:05/1.0	70%	26%					
1030	1,029.8	64.8		3:05/1.0							
			5.0	3:22/1.0	(5.0)	(5.0)					
				3:38/1.0	100%	100%					
				3:13/1.0							
				2:43/1.0							
1025	1,024.8	69.8		2:18/1.0							
			5.0	3:38/1.0	(5.0)	(5.0)					
				3:20/1.0	100%	100%					
				3:07/1.0							
				3:31/1.0							
1020	1,019.8	74.8		3:23/1.0							1,019.8 74.8
											Boring Terminated at Elevation 1,019.8 ft IN CRYSTALLINE ROCK (META-GRAYWACKE)

NCDOT CORE SINGLE 055&000_GEO_BH_BRDG0156_SURRY.GPJ NC_DOT.GDT 5/16/13

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 17BP.11.R.56	**TIP** 17BP11R56	**COUNTY** SURRY	**GEOLOGIST** Weaver, P.	
SITE DESCRIPTION BRIDGE NO. 156 ON SR 1815 (COOK SCHOOL RD.) OVER US 52				**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 15+32	**OFFSET** 20 ft LT	**ALIGNMENT** -L-	**0 HR.** 45.1
COLLAR ELEV. 1,094.1 ft	**TOTAL DEPTH** 55.1 ft	**NORTHING** 970,991	**EASTING** 1,558,741	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CON1145 CME-55LC 79% 04/02/2013		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER White, D.	**START DATE** 04/03/13	**COMP. DATE** 04/03/13	**SURFACE WATER DEPTH** N/A	

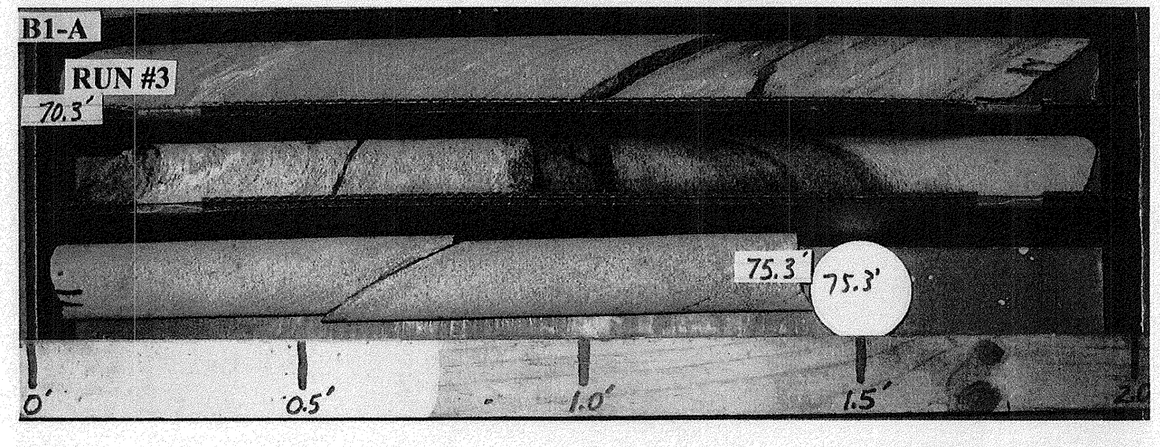
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1095										1,094.1 GROUND SURFACE 0.0
										RESIDUAL
										RED, ORANGE-BROWN, TAN, BROWN, & GRAY STIFF TO HARD MOIST TO WET F. SANDY SILT & SILT (A-4) W/ LITTLE TO SOME MICA
1090	1,090.6	3.5	7	7	7	14		M		
1085	1,085.6	8.5	6	6	8	14		M		
1080	1,080.6	13.5	7	9	9	18		M		
1075	1,075.6	18.5	6	8	8	16		M		
1070	1,070.6	23.5	4	4	6	10		W		
1065	1,065.6	28.5	8	7	9	16		M		
1060	1,060.6	33.5	8	14	16	30		M		
1055	1,055.6	38.5	7	12	17	29		M		
1050	1,050.6	43.5	10	16	23	39		M		
1045	1,045.6	48.5	22	22	23	45		M		
1040	1,040.6	53.5	13	23	77/0.2	100/.7		M		1,040.1 54.0
	1,039.0	55.1	60/0.0			60/0.0				**WEATHERED ROCK**
										GRAY W/ BROWN & WHITE SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE)
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,039.0 ft ON CRYSTALLINE ROCK (META-GRAYWACKE)

WBS 17BP.11.R.56	**TIP** 17BP11R56	**COUNTY** SURRY	**GEOLOGIST** Weaver, P.	
SITE DESCRIPTION BRIDGE NO. 156 ON SR 1815 (COOK SCHOOL RD.) OVER US 52				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 15+13	**OFFSET** 19 ft RT	**ALIGNMENT** -L-	**0 HR.** 37.5
COLLAR ELEV. 1,094.9 ft	**TOTAL DEPTH** 60.0 ft	**NORTHING** 970,955	**EASTING** 1,558,765	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE CON1145 CME-55LC 79% 04/02/2013		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER White, D.	**START DATE** 04/02/13	**COMP. DATE** 04/03/13	**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
1095										1,094.9 GROUND SURFACE 0.0
										RESIDUAL
										ORANGE, BROWN, TAN, & GRAY STIFF TO HARD MOIST SILT & F. SANDY SILT (A-4) W/ LITTLE TO SOME MICA (SAPROLITE @ 38.5)
1090	1,091.4	3.5	4	7	5	12		M		
1085	1,086.4	8.5	8	12	16	28		M		
1080	1,081.4	13.5	8	7	8	15		M		
1075	1,076.4	18.5	6	7	11	18		M		
1070	1,071.4	23.5	5	7	8	15		M		
1065	1,066.4	28.5	48	50	17	67		M		
1060	1,061.4	33.5	16	20	18	38		M		
1055	1,056.4	38.5	6	11	12	23		M		
1050	1,051.4	43.5	32	50	50/0.3	100/.8		M		1,051.7 43.2
1045	1,046.4	48.5	100/0.4			100/.4		M		**WEATHERED ROCK**
1040	1,041.4	53.5	100/0.2			100/.2		M		BROWN & GRAY SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE)
	1,038.7	56.2								**RESIDUAL**
1035	1,036.4	58.5	6	8	16	24		M		BROWN & GRAY V. STIFF MOIST F. SANDY SILT (A-4) W/ LITTLE MICA
										1,034.9 60.0
										Boring Terminated at Elevation 1,034.9 ft IN RESIDUAL V. STIFF MOIST F. SANDY SILT (A-4)

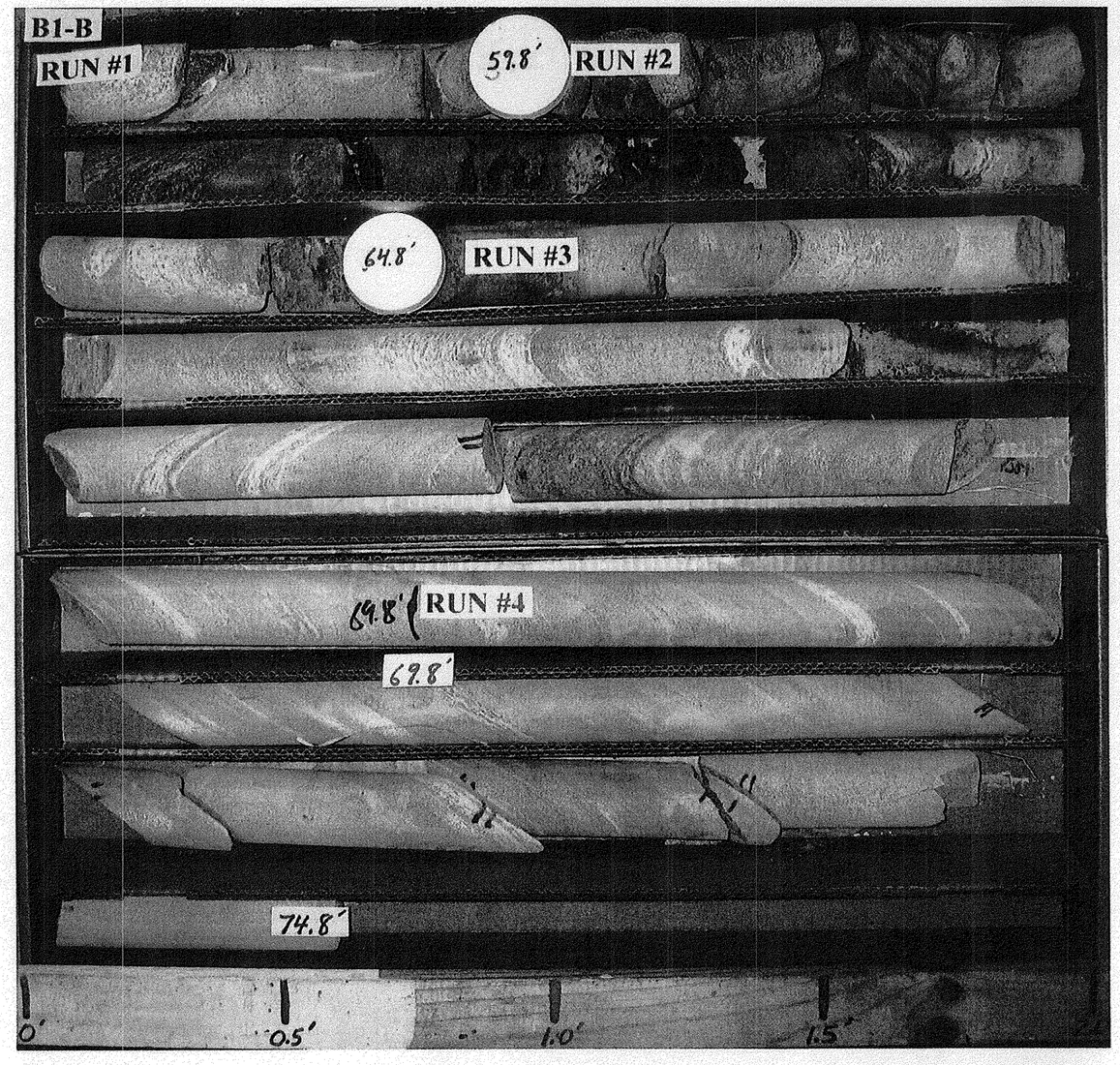
17BP.11.R.56
SURRY COUNTY
BRIDGE NO. 156 ON SR 1815 (COOK SCHOOL RD.) OVER US 52

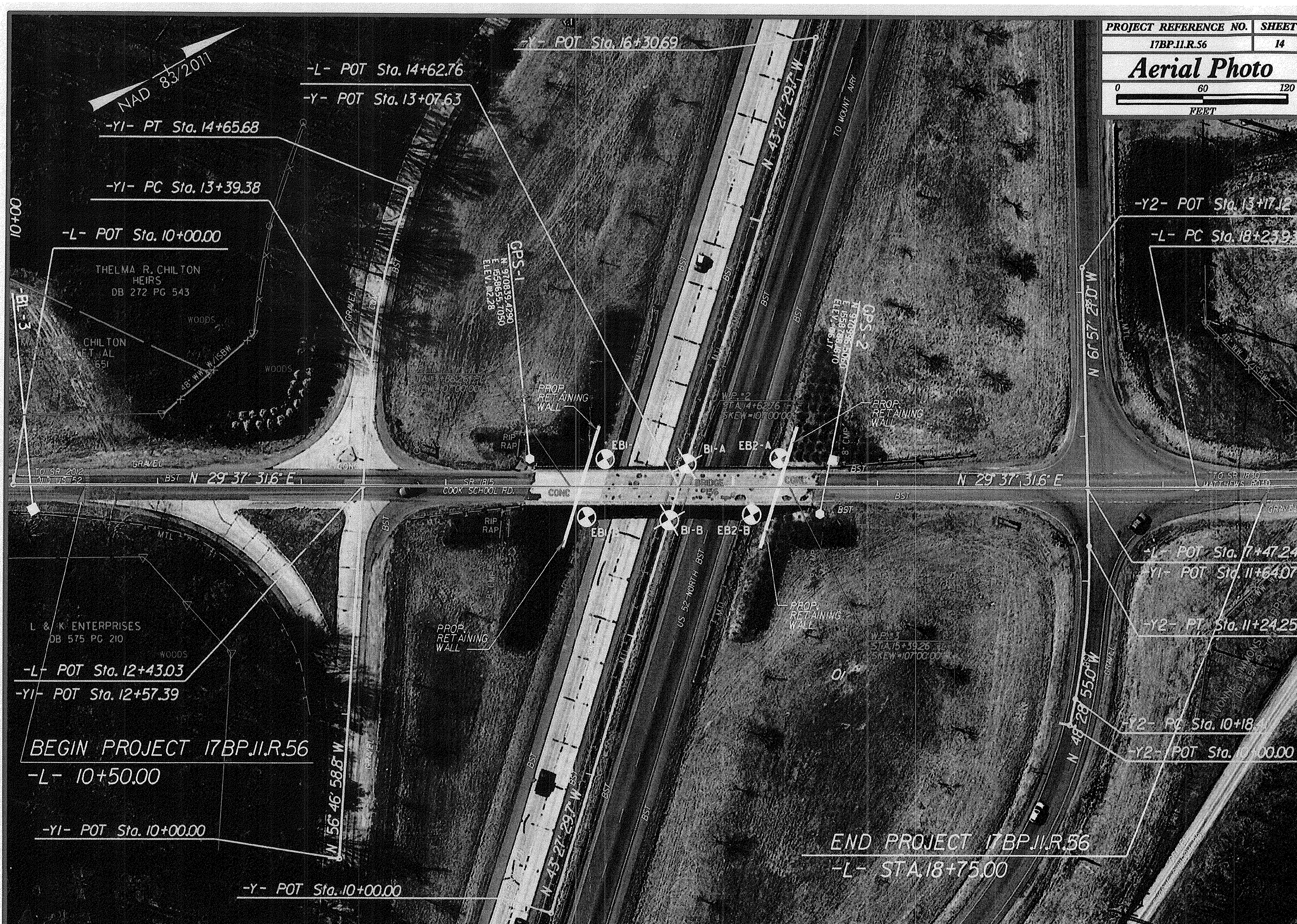
CORE PHOTOS



17BP.11.R.56
SURRY COUNTY
BRIDGE NO. 156 ON SR 1815 (COOK SCHOOL RD.) OVER US 52

CORE PHOTOS




PROJECT REFERENCE NO. 17BP.11.R.56
SHEET 14
Aerial Photo
0 60 120
FEET
NAD 83/2011
-Y- POT Sta. 16+30.69
-L- POT Sta. 14+62.76
-Y- POT Sta. 13+07.63
-Y1- PT Sta. 14+65.68
-Y1- PC Sta. 13+39.38
-L- POT Sta. 10+00.00
10+00
-BL-3
THELMA R. CHILTON HEIRS DB 272 PG 543
WOODS
GPS-1
GPS-2
PROP. RETAINING WALL
RIP RAP
EB1-
B1-A
EB2-A
B1-B
EB2-B
N 29° 37' 31.6" E
TO SR 2012 OLD US 52
SR 1815 COOK SCHOOL RD.
CONC
BST
GRAVEL
TO SR 1830 MATTHEWS ROAD
N 43° 27' 29.7" W
TO MOUNT AIRY
US 52-NORTH BST
-Y2- POT Sta. 13+17.12
-L- PC Sta. 18+23.93
N 61° 57' 21.0" W
-L- POT Sta. 17+47.24
-Y1- POT Sta. 11+64.07
-Y2- PT Sta. 11+24.25
-Y2- POT Sta. 10+00.00
N 48° 28' 55.0" W
L & K ENTERPRISES DB 575 PG 210
-L- POT Sta. 12+43.03
-Y1- POT Sta. 12+57.39
BEGIN PROJECT 17BP.11.R.56
-L- 10+50.00
N 56° 46' 58.8" W
-Y1- POT Sta. 10+00.00
-Y- POT Sta. 10+00.00
END PROJECT 17BP.11.R.56
-L- STA. 18+75.00

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.11.R.56	1	11

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *17BP.11.R.56* F.A. PROJ. _____

COUNTY *SURRY*

PROJECT DESCRIPTION _____

SITE DESCRIPTION *BRIDGE NO. 155 ON NC 268 OVER US 52*

ID: 17BP11R56

PROJECT: 17BP.11.R.56

CONTENTS

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 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.

PERSONNEL

ESP Associates, P.A.

ConeTec

INVESTIGATED BY *J.E. BEVERLY*

CHECKED BY *C.B. LITTLE*

SUBMITTED BY *C.B. LITTLE*

DATE *MAY 2013*

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE 5-15-13

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.

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.

PROJECT REFERENCE NO.	SHEET NO.
17BP.11.R.56	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 # 40 # 200	50 MX 30 MX 15 MX	25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
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 MX	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/FT²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	>30	>4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- 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 / CPT / 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

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
- [ ] CME-550
- [ ] PORTABLE HOIST
- [X] CME-55 LC
- [ ] _____

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

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

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -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 (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: GPS-1
STA. 9+65.51-BL-
N 959047.3601 E 1562185.8770 ELEVATION: 1090.20 FT.

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

REVISED 09/23/09

PROJECT REFERENCE NO.	SHEET
17BP.11.R.56	3

SITE PLAN

0 50 100
FEET

BRIDGE NO. 155 ON NC 268
OVER US 52

NAD 83/2011

TOWN OF PILOT MTN
DB 0397 PG 1488

48" WW W/ISBW

GRASS

BST

15+00

-L- POT Sta. 15+67.28
-Y- POT Sta. 13+57.01

00+51

GPS-1 STA. 9+65.51-BL-
N 959047.3601
E 1562185.8770
ELEV. 1090.20

PROP. RETAINING WALL

CONC

US.52 SBL

US.52 NBL

-Y- N 20° 03' 21.4" W

MTL

TO MT. AIRY

WOODS

GPS-2

END APPROACH SLAB

BEGIN BRIDGE

BEGIN APPROACH SLAB

48" C&G

10" CURB

RK WALL

-L-

N 64° 33' 26.0" E

BRIDGE NO. 155

NC 268

EB1-A

B1-A

EB2-A

18" CMP

W.P. #1
STA. 14+90.28 -L-
SKEW=95° 26'00"

W.P. #2
STA. 15+67.28 -L-
SKEW=95° 26'00"

W.P. #3
STA. 16+44.28 -L-
SKEW=95° 26'00"

EB1-B

B1-B

EB2-B

END BRIDGE

END PROJECT 17BP.11.R.56
-L- STA. 18+06.70

BEGIN PROJECT 17BP.11.R.56
-L- STA. 13+40.50

PROP. RETAINING WALL

PLANTER BOX

24" C&G

48" WW W/ISBW

GRAVEL

TO WINSTON SALEM

RBC CENTURA BANK
DB 1228 PG 0151

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

PROJECT REFERENCE NO.	SHEET
17BP.11.R.56	4
Profile -L- Bridge No. 155 on NC 268 over US 52	

-L- NC 268 (SOUTH KEY STREET)

-Y- STA. 13+57.01

BEGIN GRADE
-L- Sta. 13+40.50
EL = 1,088.67'

BEGIN BRIDGE
-L- Sta. 14+91.27

PI = 15+33.00
EL = 1,098.63'
VC = 310'
K = 45
V = 40 MPH

END BRIDGE
-L- Sta. 16+43.28

END GRADE
-L- Sta. 18+06.70
EL = 1,095.40'

(+)2.9841%

(+)5.4100%

(-)1.5000%

(+)0.3747%

ROADWAY EMBANKMENT (FILL)

PROPOSED
RETAINING WALL

PROPOSED
RETAINING WALL

ROADWAY EMBANKMENT (FILL)

ROADWAY EMBANKMENT (FILL)

U.S. 52 SBL

U.S. 52 NBL

EB1-A
15+04 -L-
26.0 LT.
ELEV. 1071.2

B1-A
15+70 -L-
24.0 LT.
ELEV. 1071.6

EB2-A
16+32 -L-
23.0 LT.
ELEV. 1070.5

PI = 13+59.25
EL = 1,089.23'
VC = 37.5'
K = 16
V = 15 MPH

PI = 17+60.00
EL = 1,095.22'
VC = 80'
K = 43
V = 30 MPH

RESIDUAL

RESIDUAL

RESIDUAL

04/13

04/13

BROWN, TAN & BROWN W/BLACK
MED. STIFF TO HARD MOIST TO DRY
NON-MICA. TO MICA. SILT (A-4)
W/GRAVEL @ 3.5 & LITTLE F. SAND
@ 18.5-46.7

ORANGE-BROWN, DARK BROWN,
BROWN, WHITE & BROWN W/BLACK
MED. STIFF TO HARD MOIST MICA. SILT (A-4)
W/TRACE F. SAND @ 18.5

WEATHERED ROCK
WHITE & BROWN SEV. WEATH.
CRYSTALLINE ROCK (GRANITIC ROCK)

WEATHERED ROCK
BROWN W/BLACK & DARK GREEN-BLACK
SEV. WEATH. CRYSTALLINE ROCK (MICA-SCHIST)

CRYSTALLINE ROCK
(MICA-SCHIST)

BT

BT
CRYSTALLINE
ROCK

BT
FIAD
(4/15/13)

BORING DESCRIPTIONS	
(A)	BROWN W/BLACK, WHITE, BROWN & GRAY STIFF TO HARD MOIST MICA. SILT (A-4) W/TRACE F. & CSE. SAND 18.5-35.2 (RESIDUAL)
(B)	WEATHERED ROCK WHITE & GRAY SEV. WEATHERED CRYSTALLINE ROCK (META-GRAYWACKE)

1,100
1,090
1,080
1,070
1,060
1,050
1,040
1,030
1,020

12 13 14 15 16 17 18 19

0	10	20
FEET		

PROJECT REFERENCE NO.	SHEET
17BP.11.R.56	5

Section Through End Bent One
Sta. 14+90.28 -L- (W.P. #1)
Skew = 95°26'00"

BRIDGE DECK (+/-)

EB1-A
15+04 -L-
26.0 LT.
ELEV. 1071.2

EB1-B
15+09 -L-
25.0 RT.
ELEV. 1072.9

GROUND SURFACE

ROADWAY EMBANKMENT (FILL)

RESIDUAL

BROWN, TAN & BROWN W/BLACK MED. STIFF TO HARD MOIST TO DRY NON-MICA TO MICA SILT (A-4) W/GRAVEL @ 3.5 & LITTLE F. SAND @ 18.5-46.7

8
5
04/13
4
5
5
7
16
27
55
100/.4
100/.4
50/.0
BT

WEATHERED ROCK
BROWN W/BLACK & DARK GREEN-BLACK
SEV. WEATH. CRYSTALLINE ROCK (MICA-SCHIST)

CRYSTALLINE ROCK
(MICA-SCHIST)

RESIDUAL

WHITE, TAN, BROWN, ORANGE & BROWN W/BLACK STIFF TO V. STIFF MOIST MICA. SILT (A-4) W/F. TO CSE. SAND & GRAVEL (GRAVEL @ 8.5-29.0)

11
13
04/13
12
22
20
100/.3
100/.4
100/.2
100/.2
BT

WEATHERED ROCK
ORNAGE & BLACK W/WHITE
SEV. WEATH. CRYSTALLINE ROCK
(META-GRAYWACKE)

1090 1080 1070 1060 1050 1040 1030 1020 1010

50 40 30 20 10 0 10 20 30 40 50

0	10	20
FEET		

PROJECT REFERENCE NO.	SHEET
17BP.11.R.56	6

Section Through Bent One
Sta. 15+67.28 -L- (W.P. #2)
Skew = 95°26'00"

BRIDGE DECK (+/-)

GROUND SURFACE

B1-A
15+70 -L-
24.0 LT.
ELEV. 1071.6

B1-B
15+65 -L-
28.0 RT.
ELEV. 1070.4

RESIDUAL

BROWN W/BLACK, WHITE, BROWN & GRAY STIFF TO HARD MOIST MICA. SILT (A-4) W/TRACE F. & CSE. SAND 18.5-35.2

12
15
12
24
50
58
90
100/.4
100/.5
100/.6
50/.9

04/13

WEATHERED ROCK
WHITE & GRAY SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE)

CRYSTALLINE ROCK (META-GRAYWACKE)

BT

RESIDUAL

ORANGE-BROWN, BROWN W/WHITE, BLACK & TAN MED. STIFF TO HARD MOIST MICA. SILT (A-4) W/TRACE F. SAND @ 13.5

04/13

10
8
10
13
17
37
100/.7
100/.8
100/.9
100/.2
100/.3

WEATHERED ROCK
BROWN & WHITE SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK)

BT

1090
1080
1070
1060
1050
1040
1030
1020
1010

50 40 30 20 10 0 10 20 30 40 50

PROJECT REFERENCE NO.	SHEET
17BP.11.R.56	7

Section Through End Bent Two
Sta. 16+44.28 -L- (W.P. #3)
Skew = 95°26'00"

0 10 20
FEET

1090 BRIDGE DECK (+/-)

EB2-A
16+32 -L-
23.0 LT.
ELEV. 1070.5

EB2-B
16+28 -L-
27.0 RT.
ELEV. 1070.3

GROUND SURFACE
ROADWAY EMBANKMENT (FILL)

RESIDUAL

ORANGE-BROWN, DARK BROWN, BROWN, WHITE & BROWN W/BLACK MED. STIFF TO HARD MOIST MICA. SILT (A-4) W/TRACE F. SAND @ 18.5

7
5
9
11
21
28
36
100/.4
100/.6
100/.2
100/.2

WEATHERED ROCK
WHITE & BROWN SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK)

BT
FIAD
(4/15/13)

8
8
7
13
76
34
52
100/.5
100/.9
100/.4

RESIDUAL

TAN, BROWN, WHITE & BROWN W/BLACK MED. STIFF TO HARD MOIST MICA. SILT (A-4) W/TRACE F. SAND @ 8.5-18.5 & LITTLE F. SAND @ 23.5 & 33.5

WEATHERED ROCK
BROWN & WHITE SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK)

BT
FIAD
(4/15/13)

1090 1080 1070 1060 1050 1040 1030 1020 1010

50 40 30 20 10 0 10 20 30 40 50

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 17BP.11.R.56	**TIP** 17BP11R56	**COUNTY** SURRY	**GEOLOGIST** Billington, N.	
SITE DESCRIPTION BRIDGE NO. 155 ON NC 268 OVER US 52				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 15+04	**OFFSET** 26 ft LT	**ALIGNMENT** -L-	**0 HR.** NM
COLLAR ELEV. 1,071.2 ft	**TOTAL DEPTH** 58.6 ft	**NORTHING** 959,068	**EASTING** 1,562,228	**24 HR.** 12.4
DRILL RIG/HAMMER EFF./DATE CON1145 CME-55LC 79% 04/02/2013		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER White, D.	**START DATE** 04/11/13	**COMP. DATE** 04/11/13	**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)
1075										
1070										1,071.2 GROUND SURFACE 0.0
	1,067.7	3.5	2	4	4	8		M		**RESIDUAL** BROWN, TAN & BROWN W/ BLACK MED. STIFF TO HARD MOIST TO DRY NON-MICA. TO MICA. SILT (A-4) W/ GRAVEL @ 3.5 & LITTLE F. SAND @ 18.5-46.7
1065	1,062.7	8.5	2	3	2	5		M		
1060	1,057.7	13.5	1	2	2	4		M		
1055	1,052.7	18.5	2	2	3	5		M		
1050	1,047.7	23.5	2	2	3	5		M		
1045	1,042.7	28.5	2	3	4	7		M		
1040	1,037.7	33.5	5	6	10	16		M		
1035	1,032.7	38.5	7	12	15	27		M		
1030	1,027.7	43.5	11	24	31	55		D		
1025	1,022.7	48.5	100/0.4			100/.4				1,024.5 46.7 **WEATHERED ROCK** BROWN W/ BLACK & DARK GREEN-BLACK SEV. WEATH. CRYSTALLINE ROCK (MICA-SCHIST)
1020	1,017.7	53.5	100/0.4			100/.4				
1015	1,012.7	58.5	60/0.1			60/0.1				1,012.7 58.5 1,012.6 58.6 **CRYSTALLINE ROCK** MICA-SCHIST Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,012.6 ft IN CRYSTALLINE ROCK (MICA-SCHIST)

WBS 17BP.11.R.56	**TIP** 17BP11R56	**COUNTY** SURRY	**GEOLOGIST** Billington, N.	
SITE DESCRIPTION BRIDGE NO. 155 ON NC 268 OVER US 52				**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 15+09	**OFFSET** 25 ft RT	**ALIGNMENT** -L-	**0 HR.** NM
COLLAR ELEV. 1,072.9 ft	**TOTAL DEPTH** 43.7 ft	**NORTHING** 959,024	**EASTING** 1,562,255	**24 HR.** 16.0
DRILL RIG/HAMMER EFF./DATE CON1145 CME-55LC 79% 04/02/2013		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER White, D.	**START DATE** 04/11/13	**COMP. DATE** 04/11/13	**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
1075										
1070	1,069.4	3.5	3	5	6	11		M		1,072.9 GROUND SURFACE 0.0 **RESIDUAL** WHITE, TAN, BROWN, ORANGE & BROWN W/ BLACK STIFF TO V. STIFF MOIST MICA. SILT (A-4) W/ F. TO CSE. SAND & GRAVEL (GRAVEL @ 8.5-29.0)
1065	1,064.4	8.5	5	5	8	13		M		
1060	1,059.4	13.5	6	5	7	12		M		
1055	1,054.4	18.5	7	10	12	22		M		
1050	1,049.4	23.5	8	8	12	20		M		
1045	1,044.4	28.5	15	100/0.3		100/.3				
1040	1,039.4	33.5	100/0.4			100/.4				
1035	1,034.4	38.5	100/0.2			100/.2				
1030	1,029.4	43.5	100/0.2			100/.2				1,043.9 29.0 **WEATHERED ROCK** ORNAGE & BLACK W/ WHITE SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE) 1,029.2 43.7 Boring Terminated at Elevation 1,029.2 ft IN SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 17BP.11.R.56	**TIP** 17BP11R56	**COUNTY** SURRY	**GEOLOGIST** Weaver, P.	
SITE DESCRIPTION BRIDGE NO. 155 ON NC 268 OVER US 52				**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 15+70	**OFFSET** 24 ft LT	**ALIGNMENT** -L-	**0 HR.** NM
COLLAR ELEV. 1,071.6 ft	**TOTAL DEPTH** 53.5 ft	**NORTHING** 959,095	**EASTING** 1,562,289	**24 HR.** 14.4
DRILL RIG/HAMMER EFF./DATE CON1145 CME-55LC 79% 04/02/2013		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER White, D.	**START DATE** 04/10/13	**COMP. DATE** 04/10/13	**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)
1075										1,071.6 GROUND SURFACE 0.0
										RESIDUAL
1070										BROWN W/ BLACK, WHITE, BROWN & GRAY STIFF TO HARD MOIST MICA. SILT (A-4) W/ TRACE F. & CSE. SAND 18.5-35.2
	1,068.1	3.5	5	5	7	12		M		
1065										
	1,063.1	8.5	4	5	10	15		M		
1060										
	1,058.1	13.5	5	5	7	12				
1055										
	1,053.1	18.5	8	11	13	24		M		
1050										
	1,048.1	23.5	10	22	28	50		M		
1045										
	1,043.1	28.5	16	27	31	58		M		
1040										
	1,038.1	33.5	34	48	42	90		M		
1035										
	1,033.1	38.5	100/0.4			100/.4				
1030										
	1,028.1	43.5	100/0.5			100/.5				
1025										
	1,023.1	48.5	70	30/0.1		100/.6				
1020										
	1,018.1	53.5	60/0.0			60/0.0				1,018.1 53.5
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,018.1 ft ON CRYSTALLINE ROCK (META-GRAYWACKE)

WEATHERED ROCK
WHITE & GRAY SEV. WEATH. CRYSTALLINE ROCK (META-GRAYWACKE)

WBS 17BP.11.R.56	**TIP** 17BP11R56	**COUNTY** SURRY	**GEOLOGIST** Weaver, P.	
SITE DESCRIPTION BRIDGE NO. 155 ON NC 268 OVER US 52				**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 15+65	**OFFSET** 28 ft RT	**ALIGNMENT** -L-	**0 HR.** NM
COLLAR ELEV. 1,070.4 ft	**TOTAL DEPTH** 53.8 ft	**NORTHING** 959,045	**EASTING** 1,562,306	**24 HR.** 13.2
DRILL RIG/HAMMER EFF./DATE CON1145 CME-55LC 79% 04/02/2013		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER White, D.	**START DATE** 04/10/13	**COMP. DATE** 04/10/13	**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
										1,070.4 GROUND SURFACE 0.0
1075										**RESIDUAL**
1070										ORANGE-BROWN, BROWN W/ WHITE, BLACK & TAN MED. STIFF TO HARD MOIST MICA. SILT (A-4) W/ TRACE F. SAND @ 13.5
	1,066.9	3.5	4	4	6	10		M		
1065										
	1,061.9	8.5	3	3	5	8		M		
1060										
	1,056.9	13.5	3	4	6	10				
1055										
	1,051.9	18.5	4	5	8	13		M		
1050										
	1,046.9	23.5	5	8	9	17		M		
1045										
	1,041.9	28.5	11	15	22	37		M		
1040										1,040.0 30.4
	1,036.9	33.5	55	45/0.2		100/.7				**WEATHERED ROCK**
1035										BROWN & WHITE SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK)
	1,031.9	38.5	47	53/0.3		100/.8				
1030										
	1,026.9	43.5	41	59/0.4		100/.9				
1025										
	1,021.9	48.5	100/0.2			100/.2				
1020										
	1,016.9	53.5	100/0.3			100/.3				1,016.6 53.8
										Boring Terminated at Elevation 1,016.6 ft IN SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 17BP.11.R.56	**TIP** 17BP11R56	**COUNTY** SURRY		**GEOLOGIST** Weaver, P.
SITE DESCRIPTION BRIDGE NO. 155 ON NC 268 OVER US 52				**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 16+32	**OFFSET** 23 ft LT	**ALIGNMENT** -L-	**0 HR.** NM
COLLAR ELEV. 1,070.5 ft	**TOTAL DEPTH** 53.7 ft	**NORTHING** 959,120	**EASTING** 1,562,345	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CON1145 CME-55LC 79% 04/02/2013		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER White, D.	**START DATE** 04/15/13	**COMP. DATE** 04/15/13		**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)
1075												
1070										GROUND SURFACE	1,070.5	0.0
										RESIDUAL ORANGE-BROWN, DARK BROWN, BROWN, WHITE & BROWN W/ BLACK MED. STIFF TO HARD MOIST MICA. SILT (A-4) W/ TRACE F. SAND @ 18.5		
1065	1,067.0	3.5	4	3	4	7		M				
1060	1,062.0	8.5	3	3	2	5		M				
1055	1,057.0	13.5	3	4	5	9		M				
1050	1,052.0	18.5	4	4	7	11		M				
1045	1,047.0	23.5	5	8	13	21		M				
1040	1,042.0	28.5	8	12	16	28		M				
1035	1,037.0	33.5	12	17	19	36		M				
1030	1,032.0	38.5	100/0.4			100/.4						
1025	1,027.0	43.5	73	27/0.1		100/.6						
1020	1,022.0	48.5	100/0.2			100/.2						
	1,017.0	53.5	100/0.2			100/.2					1,034.9	35.6
										WEATHERED ROCK WHITE & BROWN SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK)		
											1,016.8	53.7
										Boring Terminated at Elevation 1,016.8 ft IN SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK)		

WBS 17BP.11.R.56	**TIP** 17BP11R56	**COUNTY** SURRY		**GEOLOGIST** Weaver, P.
SITE DESCRIPTION BRIDGE NO. 155 ON NC 268 OVER US 52				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 16+28	**OFFSET** 27 ft RT	**ALIGNMENT** -L-	**0 HR.** NM
COLLAR ELEV. 1,070.3 ft	**TOTAL DEPTH** 48.9 ft	**NORTHING** 959,073	**EASTING** 1,562,363	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE CON1145 CME-55LC 79% 04/02/2013		**DRILL METHOD** Mud Rotary		**HAMMER TYPE** Automatic
DRILLER White, D.	**START DATE** 04/15/13	**COMP. DATE** 04/15/13		**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)
1075												
1070										GROUND SURFACE	1,070.3	0.0
										RESIDUAL TAN, BROWN, WHITE & BROWN W/ BLACK MED. STIFF TO HARD MOIST MICA. SILT (A-4) W/ TRACE F. SAND @ 8.5-18.5 & LITTLE F. SAND @ 23.5 & 33.5		
1065	1,066.8	3.5	4	3	5	8		M				
1060	1,061.8	8.5	2	3	5	8		M				
1055	1,056.8	13.5	3	4	3	7		M				
1050	1,051.8	18.5	5	5	8	13		M				
1045	1,046.8	23.5	15	28	48	76		M				
1040	1,041.8	28.5	11	15	19	34		M				
1035	1,036.8	33.5	17	28	24	52		M				
1030	1,031.8	38.5	100/0.5			100/.5						
1025	1,026.8	43.5	20	35	65/0.4	100/.9						
	1,021.8	48.5	100/0.4			100/.4					1,032.7	37.6
										WEATHERED ROCK BROWN & WHITE SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK)		
											1,021.4	48.9
										Boring Terminated at Elevation 1,021.4 ft IN SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK)		

PROJECT REFERENCE NO.	SHEET
17BP.11.R.56	11

Aerial Photo

0 50 100
FEET

BRIDGE NO. 155 ON NC 268
OVER US 52

-L- POT Sta. 15+67.28
-Y- POT Sta. 13+57.01
15+00
00+51
GPS-1 STA. 9+65.51-BL-
N 955047.3601
E 1562185.8770
ELEV. 1090.20
PROP. RETAINING WALL
BEGIN BRIDGE
BEGIN APPROACH SLAB
EB1-A
B1-A
EB2-A
18" CMP
-L-
N 64° 33' 26.0" E
BRIDGE NO. 155
NC 268
W.P. #1
STA. 14+90.28 -L-
SKEW=95° 26' 00"
RB1-B
B1-B
EB2-B
W.P. #2
STA. 15+67.28 -L-
SKEW=95° 26' 00"
W.P. #3
STA. 16+44.28 -L-
SKEW=95° 26' 00"
N 20° 03' 21.4" W
-Y-
US.52 SBL
US.52 NBL
TO MT. AIRY
TO WINSTON-SALEM
NAD 83/2011
PROP. RETAINING WALL
GPS-2
END APPROACH SLAB
END BRIDGE
END PROJECT 17BPJI.R.56
-L- STA. 18+06.70
BEGIN PROJECT 17BPJI.R.56
-L- STA. 13+40.50
PROP. RETAINING WALL
PROP. RETAINING WALL
TOWN OF PILOT MTN
DB 0597 PG 1486
48" WW W/SBW
RK WALL
CONC
BST
GRASS
WOODS
GRAVEL
PLANTER BOX
RBC CENTURA BANK
DB 1228 PG 0151