PROJECT: 33667.1.1 ID: B-4330

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33667.1.1	1	11

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33667.1.1 F.A. PROJ. BRZ-1158 (3)

COUNTY YANCEY

PROJECT DESCRIPTION

BRIDGE NUMBER 289 ON SR-1158 OVER COLBERT"S CREEK

SITE DESCRIPTION

CONTENTS

CAUTION NOTICE

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INVESTIGATED BY PQ LOCLAMY

CHECKED BY WD FRYE

SUBMITTED BY WD FRYE

DATE 10-6-06

NORTH CAROLINA LICENSED SEAL 1907 GEOLOGIST Patrick Q. Lockamy

P. Q. Lockamy 10-6-06

DRAWN BY: PQ LOCKAMY

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2, A-3	A-4, A-5, A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
#40	30 MX	50 MX	51 MN											
#200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT	6 MX			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			NP	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
GRAIN SIZE IN.: 12 | 3

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL - LIQUID LIMIT		
PLASTIC RANGE (PI)	- 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
- SOUNDING ROD
- SPT CPT DPT DMT VST PMT TEST BORING
- AUGER BORING
- CORE BORING
- MW MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF SPT REFUSAL

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

ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] ________
- [ ] ________

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

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: BM-2 RR SPIKE IN POWER POLE -BL- STATION 12+05 50 RT.

ELEVATION: 2900.35 FT.

NOTES:
BORINGS WERE ORIGINALLY REFERENCED TO BL-3, BL STA. 12+05.13, ELE. 2899.47 AND LATER TIED TO BM-2

CLAY PLUGGED (ILLUVIAL): SOILS THAT HAVE PORES OR VOIDS FILLED WITH CLAY

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

October 10, 2006

STATE PROJECT: 33667.1.1 (B-4330)
F. A. PROJECT NO: BRZ-1158 (3)
COUNTY: Yancey

DESCRIPTION: Bridge No. 289 over Colbert's Creek on SR 1158 @ -L- Station 14+42.5

SUBJECT: Geotechnical Report – Foundation Investigation

Site Description

Bridge 289 is located in eastern Yancey County on SR 1158, approximately 7 miles northeast of Mount Mitchell. The existing bridge is a three-span structure 68 feet long with steel girders and timber abutments. The existing foundations are concrete encased timber sills placed on alluvial boulders. Plans call for a dual lane, single span, box beam bridge to be constructed in two stages.

The bridge site is an alluvial fan, a natural catchment along the stream where gradient lessens enough to collect material (mostly rocks at this site) that were ultimately derived from mass wasting events and reworked by the stream. The drainage area is extremely steep and crowned with cliff-like slopes at the ridge top. Relief exceeds 33 hundred feet.

The Geotechnical Engineering Unit conducted an investigation for PDEA in October of 2004. Borings from that investigation were used for this inventory. Four borings were made using a CME 550 drilling machine equipped with a NX casing with an advancer. Standard Penetration Tests (SPT's) were performed at 5-foot intervals using an automatic hammer.

The Bridge Survey and Hydraulics Design Report states that the 100 year and 500 year storms are contained in the channel therefore there is no contraction scour. A scour report was not made for this structure.

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LOCATION:
CENTURY CENTER COMPLEX
BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Soil and Rock Materials

Borings at this site encountered embankment, fill, alluvium, saprolite, weathered rock of Ashe Formation Gneiss and Spruce Pine pegmatite, and thin zones of crystalline rock of Spruce Pine pegmatite.

Embankment, fill and the underlying alluvium are all composed of mixtures of subrounded boulders, cobbles, gravel, and moist to saturated, silty fine to coarse sand (A-1-b). Many of the boulders are more than 2 feet in intermediate diameter.

An upper layer of the saprolite has been filled or plugged with clay delivered by groundwater, transforming the saprolite from a silty sand (A-2-4) to a sandy silty clay (A-6). Known as an illuvial horizon, it was encountered in borings EB1-A and EB2-A. It can be a barrier to groundwater flow.

Unplugged saprolite encountered is 24 to 34+ feet thick and consists of brown, tan, orange, or white silty fine to coarse sand. The white saprolite is described as kaolinitic meaning that it has an abundant amount of aluminum rich clay or kaolin derived from insitu weathering of microcline feldspar. Numerous quartz veins are present in the saprolite.

Weathered rock of Ashe Formation Gneiss and Spruce Pine pegmatite was encountered across EB1 at elevations 2863 to 2865 feet but not encountered in borings at EB2.

A small layer of crystalline rock of Spruce Pine Pegmatite was encountered at a depth of 44± feet in boring EB1-C. The crystalline rock of Spruce Pine Pegmatite is encased within a thicker mass of weathered rock of Ashe Formation Gneiss or Spruce Pine Pegmatite.

Bent Descriptions

End Bent One (EB1)

Three feet of fill to 7 feet of embankment is present across End Bent One. Approximately 5 to 9 feet of alluvium underlies the embankment and fill. Fill embankment, and alluvium consist of silty fine to coarse sand, gravel, cobbles and boulders (A-1-b). Approximately 24± feet of saprolite underlies all of the above. It is predominantly composed of loose to dense kaolinitic silty fine to coarse sand (A-2-4) with the top few feet having the voids or pores filled or plugged with clay resulting in from 1 to 3 feet of medium stiff sandy silty clay (A-6) intermittently capping the saprolite. Numerous quartz veins are present in the saprolite.

Weathered rock of Spruce Pine Pegmatite and Ashe Formation Gneiss with small zones of crystalline rock of Spruce Pine Pegmatite underlies the saprolite at depths of 36 to 39 feet across the bent.

End Bent Two (EB2)

Thirteen feet of fill to 7 feet of embankment is present across End Bent Two. Approximately 8 to 11 feet of alluvium underlies the embankment and fill. Fill embankment, and alluvium consist of silty fine to coarse sand, gravel, cobbles and boulders (A-1-b). Deep saprolite underlies all of the above. It is predominantly composed of medium dense to very dense kaolinitic silty fine to coarse sand (A-2-4) with the top few feet having the voids or pores filled or plugged with clay resulting in from 1 to 5 feet of medium stiff illuvial sandy silty clay (A-6) intermittently capping the saprolite. Numerous quartz veins are present in the saprolite.

Respectfully Submitted,

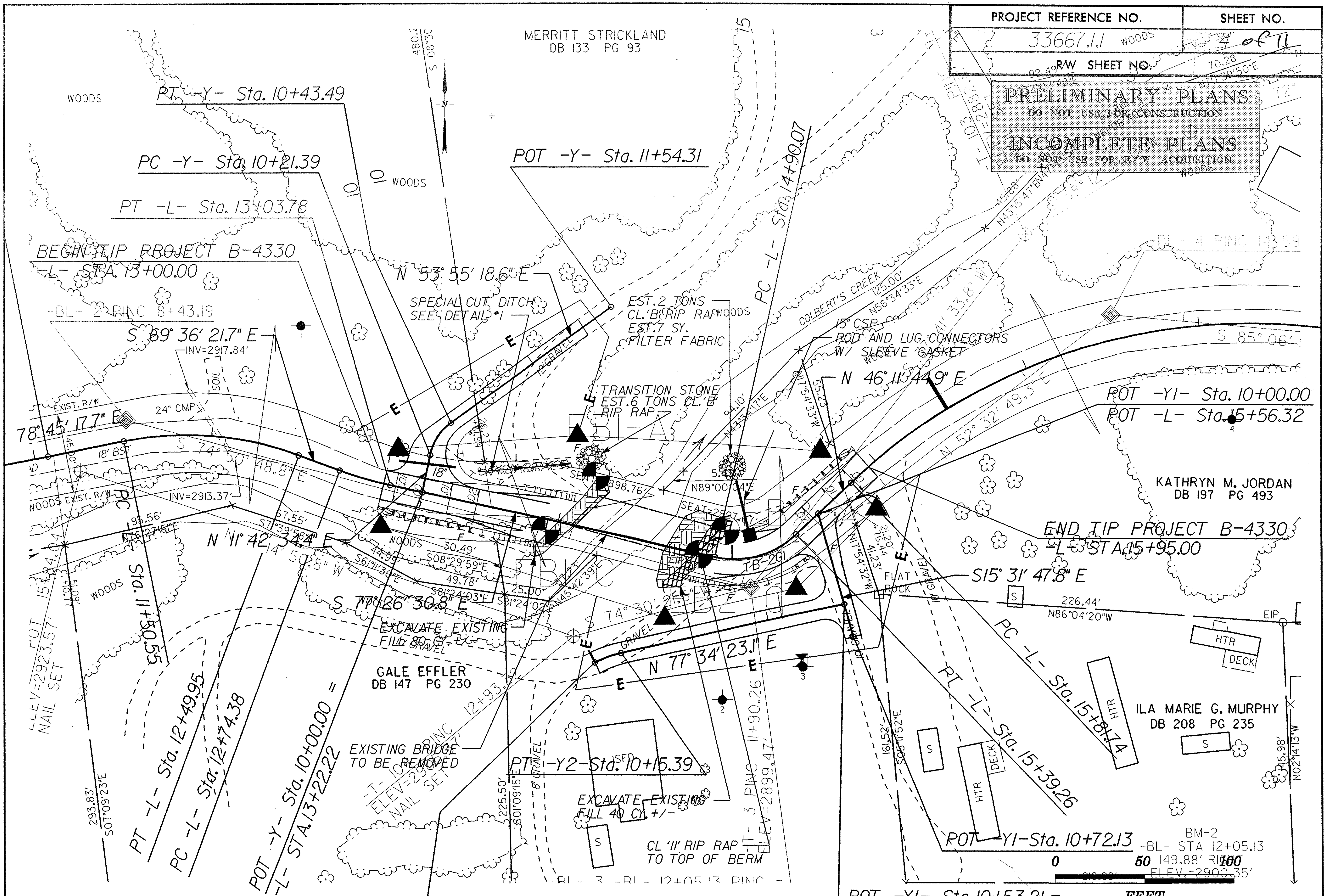
P. Q. Lockamy

PQ Lockamy, PG
Project Geologist

PROJECT REFERENCE NO.	SHEET NO.
33667.1.1	4 of 11
R/W SHEET NO.	

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



0	10	20
FEET		
VE = 1		

PROJECT REFERENCE NO.	SHEET
B-4330	5/11

PROFILE ALONG -L-

EB1-C
13+94
6 RT

EB2-C
14+81
0.5 RT

FILL: BROWN TO GREY BOULDERS, COBBLES AND SAND WITH SILTY FINE TO COARSE SAND, MOI.

WATER SURFACE

GROUND SURFACE

FILL: BROWN TO GREY BOULDERS, COBBLES AND SAND WITH SILTY FINE TO COARSE SAND, MOI. TO SAT

ALLUVIUM: BROWN, FINE TO COARSE SAND WITH BOULDERS, COBBLES AND GRAVEL, MOI. TO SAT.

SAPROLITE: BROWN TO ORANGE TO WHITE KAOLINITIC SILTY FINE TO COARSE SAND WITH QUARTZ VEINS, SAT.

WEATHERED ROCK OF (ASHE FORMATION GNEISS AND SPRUCE PINE PEGMATITE) WITH SMALL ZONES OF CRYSTALLINE ROCK OF (SPRUCE PINE PEGMATITE).

10/04

10/04

10/04

BT

BT

2900
2890
2880
2870
2860
2850

99
28
15
9
7
16
12
100/.9
60/.05
100/.55

38
33
79
33
25
44
22
23
11
34
52

14+00
14+50
15+00

PROJ. REFERENCE NO. 3.3667.11 | SHEET NO. 6/11

SECTION THRU EB1
SKEW ANGLE IS 120 DEGREES

EB1-A
14+15
30 LT.

EB1-C
13+94
6 RT

GROUND SURFACE

ALLUVIUM: BROWN FINE TO COARSE SILTY SAND WITH BOULDERS, COBBLES AND GRAVEL, MOI. TO SAT

SAPROLITE: BROWN TO ORANGE TO WHITE, KAOLINITIC, SILTY FINE TO COARSE SAND WITH QUARTZ VEINS, SAT.

WEATHERED ROCK OF (SPRUCE PINE PEGMATITE AND ASHE FORMATION GNEISS) WITH SMALL ZONES OF CRYSTALLINE ROCK OF (SPRUCE PINE PEGMATITE)

	EB1-A	EB1-C
E	24	99
	16	28 (10/.04)
S	5	15
	5	9
	13	7
	41	16
	42	12
	100/.95	100/.9
	100/.35	60/.05
	100/.4	100/.55
	BT	BT

10/.04

E — EMBANKMENT: BROWN SILTY FINE TO COARSE SAND WITH GRAVEL COBBLES AND BOULDERS, MOI

S — SAPROLITE: CLAY PLUGGED, TAN TO BLACK SANDY SILTY CLAY, WET

F — FILL: BROWN TO GREY BOULDERS, COBBLES AND GRAVEL WITH SILTY FINE TO COARSE SAND, MOI.

0 5	PROJ. REFERENCE NO.	SHEET NO.
	3366JJ	7/11

SECTION THRU EB2

SKEW ANGLE IS 120 DEGREES

EB2-A
14+94
16 LT

EB2-C
14+81
0.5 RT

GROUND SURFACE

EMBANKMENT: BROWN SILTY FINE TO COARSE SAND WITH GRAVEL COBBLES AND BOULDERS, MOI

FILL: BROWN TO GREY BOULDERS, COBBLES AND GRAVEL WITH SILTY FINE TO COARSE SAND, MOI. TO SAT.

ALLUVIUM: BROWN FINE TO COARSE SAND WITH BOULDERS, COBBLES AND GRAVEL, MOI. TO SAT

SAPROLITE: CLAY PLUGGED, TAN TO ORANGE SANDY SILTY CLAY, WET

SAPROLITE: BROWN TO ORANGE TO WHITE, KAOLINITIC, SILTY FINE TO COARSE SAND WITH QUARTZ VEINS, SAT.

EB2-A		EB2-C	
26		38	
10/04		10/04	
23		33	
100		79	
13		33	
24		25	
51		44	
72		22	
59		23	
52	BT	11	
		34	
		52	BT

2910 2900 2890 2880 2870 2860 2850 2840

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

8/11

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33667.1.1	**ID** B-4330	**COUNTY** YANCEY	**GEOLOGIST** MM HAGER
SITE DESCRIPTION BRIDGE 289 ON SR-1158 OVER COLBERT'S CREEK			**GND WATER**
BORING NO EB1-A	**NORTHING** 763008.00	**EASTING** 1046813.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 14+15.000	**OFFSET** 30.00ft LT	**24 HR** 11.00ft
COLLAR ELEV 2901.90ft	**TOTAL DEPTH** 49.30ft	**START DATE** 10/25/04	**COMPLETION DATE** 10/25/04
DRILL MACHINE CME-550X	**DRILL METHOD** CASING SPT		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH	**DEPTH TO ROCK** N/A		Log EB1-A, Page 1 of 2

ELEV	DEPTH	BLOW CT 6in	6in	6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
2901.90						Ground Surface				
2900.00	3.90	13	9	15	1.0	24				EMBANKMENT: BROWN SILTY FINE TO COARSE SAND WITH GRAVEL, COBBLES AND BOULDERS, MOI.
	8.90	7	8	8	1.0	16		▼		ALLUVIUM: BROWN TO TAN TO ORANGE SILTY FINE TO COARSE SAND WITH BOULDERS, COBBLES AND GRAVEL. MOI TO SAT.
2890.00	13.90	1	2	3	1.0	5				SAPROLITE: CLAY PLUGGED TAN TO ORANGE FINE SANDY SILTY CLAY, WET
	18.90	2	2	3	1.0	5				SAPROLITE: TAN TO ORANGE TO WHITE, KAOLINITIC, SILTY FINE TO COARSE SAND WITH QUARTZ VEINS, SAT.
2880.00	23.90	2	6	7	1.0	13				
	28.90	8	12	29	1.0	41				
2870.00	33.90	12	20	22	1.0	42				
	38.90	5	22	78	0.9	100				WEATHERED ROCK OF PEGMATITE
	43.90	100			0.3	100				
2852.60	48.90	100			0.4	100				

Continued on the next page

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33667.1.1	**ID** B-4330	**COUNTY** YANCEY	**GEOLOGIST** MM HAGER
SITE DESCRIPTION BRIDGE 289 ON SR-1158 OVER COLBERT'S CREEK			**GND WATER**
BORING NO EB1-A	**NORTHING** 763008.00	**EASTING** 1046813.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 14+15.000	**OFFSET** 30.00ft LT	**24 HR** 11.00ft
COLLAR ELEV 2901.90ft	**TOTAL DEPTH** 49.30ft	**START DATE** 10/25/04	**COMPLETION DATE** 10/25/04
DRILL MACHINE CME-550X	**DRILL METHOD** CASING SPT		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH	**DEPTH TO ROCK** N/A		Log EB1-A, Page 2 of 2

ELEV	DEPTH	BLOW CT 6in	6in	6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
2852.60						BT IN WEATHERED ROCK OF PEGMATITE AT A DEPTH OF 49.3 FEET.				

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33667.1.1	**ID** B-4330	**COUNTY** YANCEY	**GEOLOGIST** MM HAGER
SITE DESCRIPTION BRIDGE 289 ON SR-1158 OVER COLBERT'S CREEK			**GND WATER**
BORING NO EB1-C	**NORTHING** 762977.00	**EASTING** 1046786.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 13+94.000	**OFFSET** 6.00ft RT	**24 HR** 11.00ft
COLLAR ELEV 2901.40ft	**TOTAL DEPTH** 50.47ft	**START DATE** 10/22/04	**COMPLETION DATE** 10/22/04
DRILL MACHINE CME-550X	**DRILL METHOD** CASING SPT		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH	**DEPTH TO ROCK** N/A		**Log EB1-C, Page 1 of 2**

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
2901.40						Ground Surface				
2900.00										FILL: BROWN TO GREY BOULDERS, COBBLES AND GRAVEL WITH SILTY FINE TO COARSE SAND, MOI.
	4.40	39	60		0.6	99				
	9.40	18	19	9	1.0	28		▼		ALLUVIUM: BROWN SILTY FINE TO COARSE SAND WITH BOULDERS, COBBLES AND GRAVEL, MOI. TO SAT.
2890.00										
	14.40	6	6	9	1.0	15				SAPROLITE: BROWN TO ORANGE TO WHITE, KAOLINITIC, SILTY FINE TO COARSE SAND WITH QUARTZ VEINS, SAT.
	19.40	4	5	4	1.0	9				
2880.00										
	24.40	2	3	4	1.0	7				
	29.40	4	8	8	1.0	16				
2870.00										
	34.40	3	6	6	1.0	12				
	39.40	100			0.2	100				WEATHERED ROCK OF PEGMATITE AND ASHE FORMATION GNEISS
2856.40	44.40	60			0.1	60				CRYSTALLINE ROCK OF PEGMATITE

Continued on the next page.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33667.1.1	**ID** B-4330	**COUNTY** YANCEY	**GEOLOGIST** MM HAGER
SITE DESCRIPTION BRIDGE 289 ON SR-1158 OVER COLBERT'S CREEK			**GND WATER**
BORING NO EB1-C	**NORTHING** 762977.00	**EASTING** 1046786.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 13+94.000	**OFFSET** 6.00ft RT	**24 HR** 11.00ft
COLLAR ELEV 2901.40ft	**TOTAL DEPTH** 50.47ft	**START DATE** 10/22/04	**COMPLETION DATE** 10/22/04
DRILL MACHINE CME-550X	**DRILL METHOD** CASING SPT		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH	**DEPTH TO ROCK** N/A		**Log EB1-C, Page 2 of 2**

ELEV	DEPTH	BLOW CT 6in	BLOW CT 6in	BLOW CT 6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
2856.40										
2850.93	49.40	18	59	41	0.6	100				WEATHERED ROCK OF PEGMATITE AND ASHE FORMATION GNEISS
						BT IN WEATHERED ROCK OF ASHE FORMATION GNEISS AT A DEPTH OF 50.47 FEET.				

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33667.1.1	**ID** B-4330	**COUNTY** YANCEY	**GEOLOGIST** MM HAGER
SITE DESCRIPTION BRIDGE 289 ON SR-1158 OVER COLBERT'S CREEK			**GND WATER**
BORING NO EB2-A	**NORTHING** 762978.00	**EASTING** 1046887.00	**0 HR** N/A
ALIGNMENT L	**BORING LOCATION** 14+94.000	**OFFSET** 16.00ft LT	**24 HR** 9.00ft
COLLAR ELEV 2898.60ft	**TOTAL DEPTH** 46.60ft	**START DATE** 10/20/04	**COMPLETION DATE** 10/20/04
DRILL MACHINE CME-550X	**DRILL METHOD** CASING SPT		**HAMMER TYPE** AUTOMATIC
SURFACE WATER DEPTH	**DEPTH TO ROCK** N/A		**Log EB2-A, Page 1 of 1**

ELEV	DEPTH	BLOW CT 6in	6in	6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
2898.60						Ground Surface				
	5.10	7	10	16	1.0	26				EMBANKMENT: ABC GRAVEL AND FINE TO COARSE SAND, MOI.
2890.00								▼		EMBANKMENT: BROWN TO GREY SILTY FINE TO COARSE SAND WITH COBBLES AND GRAVEL, MOI. TO SAT.
	10.10	9	12	11	1.0	23				
	15.10	16	26	74	1.0	100				ALLUVIUM: BOULDERS, COBBLES AND GRAVEL WITH SILTY FINE TO COARSE SAND, SAT.
2880.00										
	20.10	4	6	7	1.0	13				SAPROLITE: CLAY PLUGGED BLACK TO ORANGE SANDY SILTY CLAY WITH MICA, WET
	25.10	4	7	17	1.0	24				SAPROLITE: BROWN TO WHITE, KAOLINITIC, SILTY FINE TO COARSE SAND, SAT
2870.00										
	30.10	19	21	30	1.0	51				
	35.10	24	24	48	1.0	72				
	40.10	19	28	31	1.0	59				
	45.10	12	31	21	1.0	52				
2852.00						BT IN VERY DENSE SAPROLITIC KAOLINITIC BROWN TO WHITE SILTY FINE TO COARSE SAND AT A DEPTH OF 46.6 FEET.				

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33667.1.1	ID B-4330	COUNTY YANCEY	GEOLOGIST MM HAGER
SITE DESCRIPTION BRIDGE 289 ON SR-1158 OVER COLBERT'S CREEK			GND WATER
BORING NO EB2-C	NORTHING 762964.00	EASTING 1046871.00	0 HR N/A
ALIGNMENT -L-	BORING LOCATION 14+81.000	OFFSET 0.50ft RT	24 HR 9.00ft
COLLAR ELEV 2899.40ft	TOTAL DEPTH 55.90ft	START DATE 10/21/04	COMPLETION DATE 10/21/04
DRILL MACHINE CME-550X	DRILL METHOD CASING SPT		HAMMER TYPE AUTOMATIC
SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A		Log EB2-C, Page 1 of 2

ELEV	DEPTH	BLOW CT 6in	6in	6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
2899.40						Ground Surface				
	4.40	19	19	19	1.0	38				FILL: BROWN TO RED BOULDERS, COBBLES AND GRAVEL WITH SILTY FINE TO COARSE SAND, MOI. TO SAT.
2890.00	9.40	24	15	18	1.0	33		▼		
	14.40	19	60		0.6	79				ALLUVIUM: BROWN SILTY FINE TO COARSE SAND WITH GRAVEL AND BOULDERS, SAT.
2880.00	19.40	14	16	17	1.0	33				
	24.40	7	11	14	1.0	25				SAPROLITE: BROWN TO ORANGE TO WHITE KAOLINITIC SILTY FINE TO COARSE SAND WITH SILTY ZONES AND QUATTZ VEINS, SAT.
2870.00	29.40	23	20	24	1.0	44				
	34.40	3	8	14	1.0	22				
2860.00	39.40	3	10	13	1.0	23				
	44.40	3	5	6	1.0	11				
	49.40	8	13	21	1.0	34				
	54.40	14	23	29	1.0	52				
2843.50										

Continued on the next page.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL UNIT BORING LOG

PROJECT NO 33667.1.1	ID B-4330	COUNTY YANCEY	GEOLOGIST MM HAGER
SITE DESCRIPTION BRIDGE 289 ON SR-1158 OVER COLBERT'S CREEK			GND WATER
BORING NO EB2-C	NORTHING 762964.00	EASTING 1046871.00	0 HR N/A
ALIGNMENT -L-	BORING LOCATION 14+81.000	OFFSET 0.50ft RT	24 HR 9.00ft
COLLAR ELEV 2899.40ft	TOTAL DEPTH 55.90ft	START DATE 10/21/04	COMPLETION DATE 10/21/04
DRILL MACHINE CME-550X	DRILL METHOD CASING SPT		HAMMER TYPE AUTOMATIC
SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A		Log EB2-C, Page 2 of 2

ELEV	DEPTH	BLOW CT 6in	6in	6in	PEN (ft)	BLOWS PER FOOT 0 25 50 75 100	SAMPLE NO	MOI	LOG	SOIL AND ROCK DESCRIPTION
2843.50						BT IN VERY DENSE SAPROLITIC SILTY FINE TO COARSE SAND WITH GRAVEL, SAT.				