

REFERENCE: B-5682

PROJECT: 45637.1.1

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5682	1	8

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	BORING LOCATION PLAN
4	PROFILE
5-6	CROSS SECTIONS
7-8	BORE LOGS

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY GRANVILLE  
PROJECT DESCRIPTION BRIDGE NO. 129 ON SR 1400  
(GRASSYCREEK VIRGINIA RD.)  
OVER LITTLE JOHNSON CREEK

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT 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 THE 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.

- NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
  2. 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.

PERSONNEL

TRIGON  
GOODNIGHT, D. J.  
HILL, M. J.

INVESTIGATED BY GOODNIGHT, D. J.  
DRAWN BY HILL, M. J.  
CHECKED BY HAMM, J. R.  
SUBMITTED BY FALCON ENG.  
DATE MARCH 2017



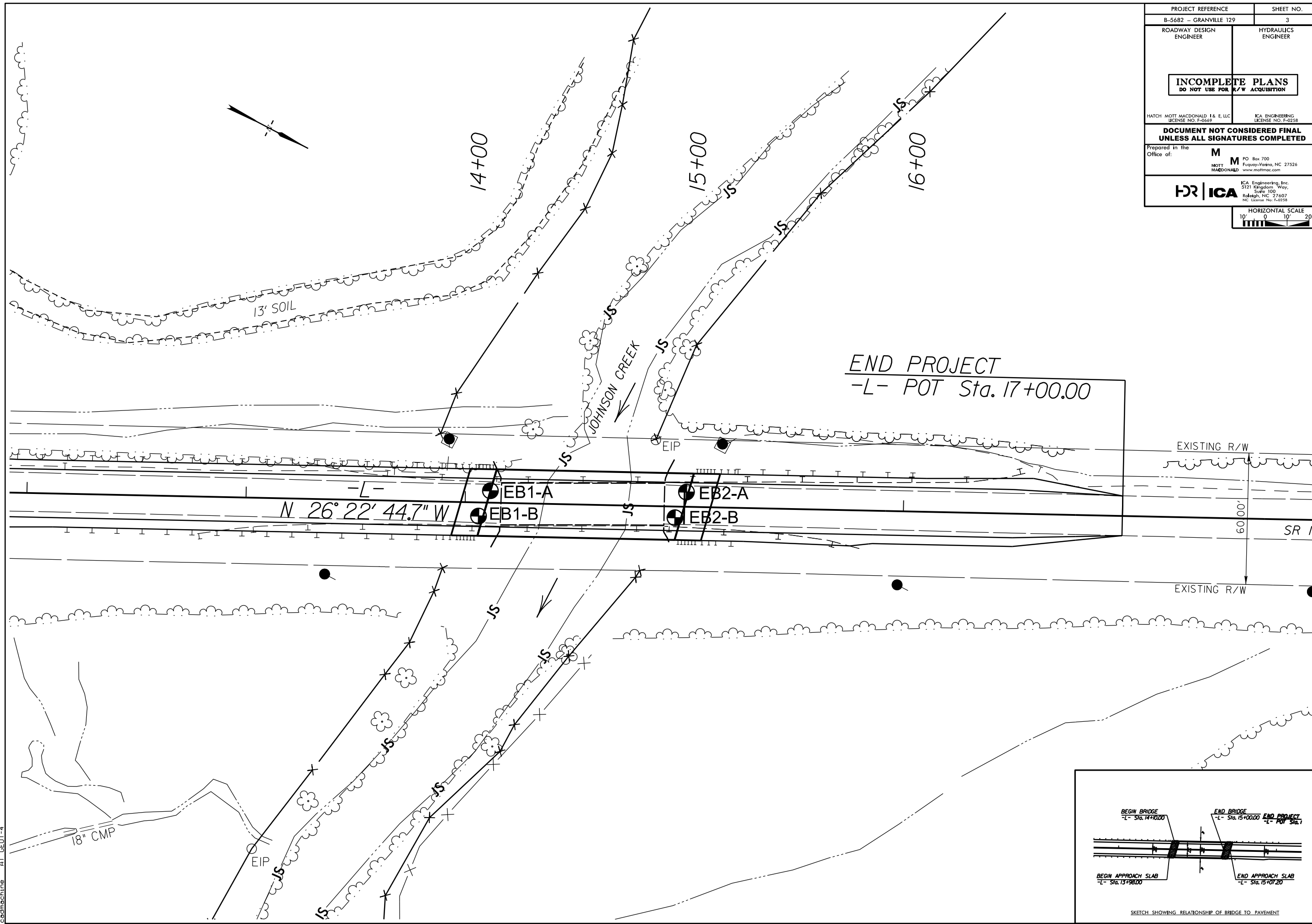
*Jeremy R. Hamm* 3/28/17

SIGNATURE DATE

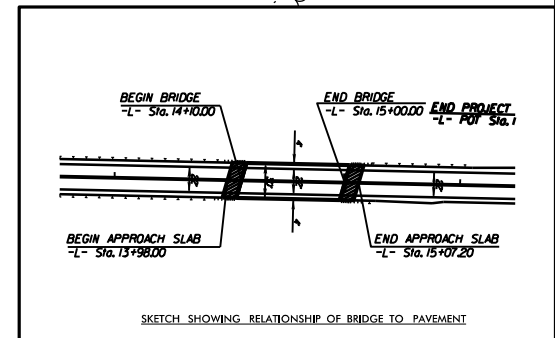
**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
**GEOTECHNICAL ENGINEERING UNIT**  
**SUBSURFACE INVESTIGATION**  
**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																																																																				
<p>SOIL IS CONSIDERED 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 THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>										<p><b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.  <b>UNIFORMLY GRADED</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.  <b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.</p>										<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, 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:</p>										<p><b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.  <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.  <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.  <b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.  <b>ARTESIAN</b> - 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.  <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.  <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.  <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.  <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.  <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.  <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.  <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.  <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.  <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOADED FROM PARENT MATERIAL.  <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.  <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.  <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.  <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.  <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.  <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.  <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.  <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.  <b>ROCK QUALITY DESIGNATION (ROD)</b> - 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.  <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.  <b>SILL</b> - 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.  <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.  <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.  <b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.  <b>STRATA ROCK QUALITY DESIGNATION (SROD)</b> - 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.  <b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																				
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<p><b>GENERAL CLASS.</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="5">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (&gt; 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th colspan="5"></th> </tr> <tr> <th>SYMBOL</th> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td colspan="5"></td> </tr> <tr> <th>% PASSING #10 #40 #200</th> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX 10 MX</td> <td>51 MN 35 MX 35 MX</td> <td>40 MX 41 MN 40 MX 41 MN</td> <td>40 MX 41 MN 40 MX 41 MN</td> <td>40 MX 41 MN 40 MX 41 MN</td> <td>40 MX 41 MN 40 MX 41 MN</td> <td>40 MX 41 MN 40 MX 41 MN</td> <td>40 MX 41 MN 40 MX 41 MN</td> <td>40 MX 41 MN 40 MX 41 MN</td> <td>40 MX 41 MN 40 MX 41 MN</td> <td>40 MX 41 MN 40 MX 41 MN</td> <td colspan="5"></td> </tr> <tr> <th>MATERIAL PASSING #40 LL PI</th> <td colspan="2">-</td> <td>NP</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td>40 MX 41 MN 10 MX 11 MN</td> <td colspan="5"></td> </tr> <tr> <th>GROUP INDEX</th> <td colspan="2">0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>NO MX</td> <td colspan="5"></td> <td colspan="5"></td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td colspan="2">STONE FRAGS. 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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.  <b>MODERATELY SEVERE (MOD. SEV.)</b> - 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. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i>  <b>SEVERE (SEV.)</b> - 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. <i>IF TESTED, WOULD YIELD SPT N VALUES &gt; 100 BPF</i>  <b>VERY SEVERE (IV SEV.)</b> - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</i>  <b>COMPLETE</b> - 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.</p>										<p><b>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</b>  <b>SOIL SYMBOL</b>  <b>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</b>  <b>INFERRED SOIL BOUNDARY</b>  <b>INFERRED ROCK LINE</b>  <b>ALLUVIAL SOIL BOUNDARY</b></p>									
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<p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>										<p><b>FRACURE SPACING</b></p>										<p><b>INDURATION</b></p>																																																																																																																																																														

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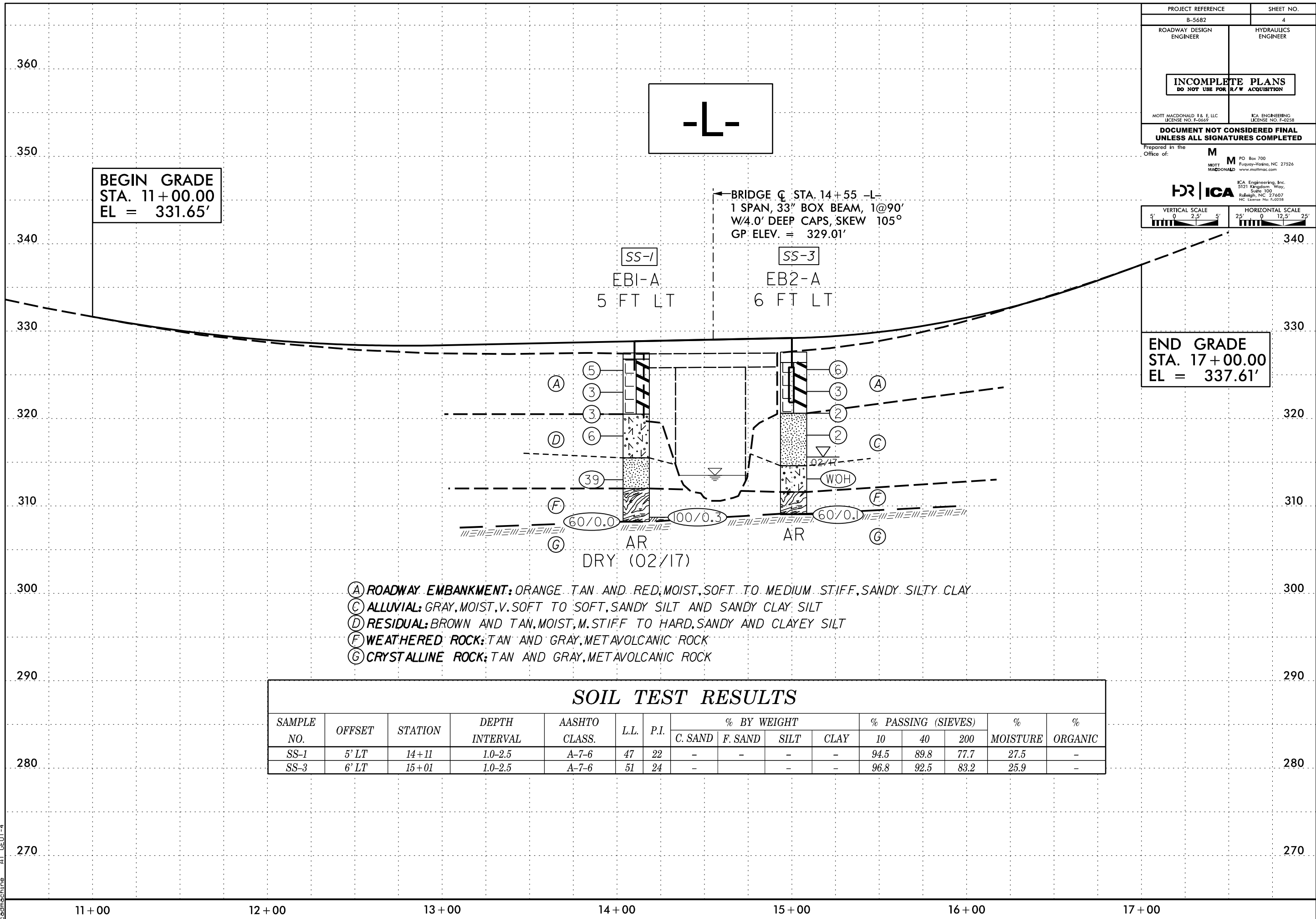
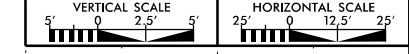
PROJECT REFERENCE B-5682 - GRANVILLE 129	SHEET NO. 3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
HATCH MOTT MACDONALD I & E, LLC LICENSE NO. F-0669	ICA ENGINEERING LICENSE NO. F-0258
<b>DOCUMENT NOT CONSIDERED FINAL</b> <b>UNLESS ALL SIGNATURES COMPLETED</b>	
Prepared in the Office of:	<b>M</b> PO Box 700 Furqay-Vasno, NC 27526 MOTT MACDONALD www.mottmac.com
<b>ICA</b> ICA Engineering, Inc. 3121 Kingdom Way, Suite 100 Raleigh, NC 27607 NC License No. F-0258	
HORIZONTAL SCALE 1" = 20'	



**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

Prepared in the Office of: **M**  
MOTT MACDONALD  
PO Box 700  
Fayetteville, NC 27526  
www.mottmac.com

**ICA** ICA Engineering, Inc.  
3121 Kingdom Way  
Suite 100  
Raleigh, NC 27607  
NC License No. F-0258



**BEGIN GRADE**  
STA. 11+00.00  
EL = 331.65'

← BRIDGE @ STA. 14+55 -L-  
1 SPAN, 33" BOX BEAM, 1@90'  
W/4.0' DEEP CAPS, SKEW 105°  
GP. ELEV. = 329.01'

**END GRADE**  
STA. 17+00.00  
EL = 337.61'

- (A) ROADWAY EMBANKMENT: ORANGE TAN AND RED, MOIST, SOFT TO MEDIUM STIFF, SANDY SILTY CLAY
- (C) ALLUVIAL: GRAY, MOIST, V. SOFT TO SOFT, SANDY SILT AND SANDY CLAY SILT
- (D) RESIDUAL: BROWN AND TAN, MOIST, M. STIFF TO HARD, SANDY AND CLAYEY SILT
- (F) WEATHERED ROCK: TAN AND GRAY, METAVOLCANIC ROCK
- (G) CRYSTALLINE ROCK: TAN AND GRAY, METAVOLCANIC ROCK

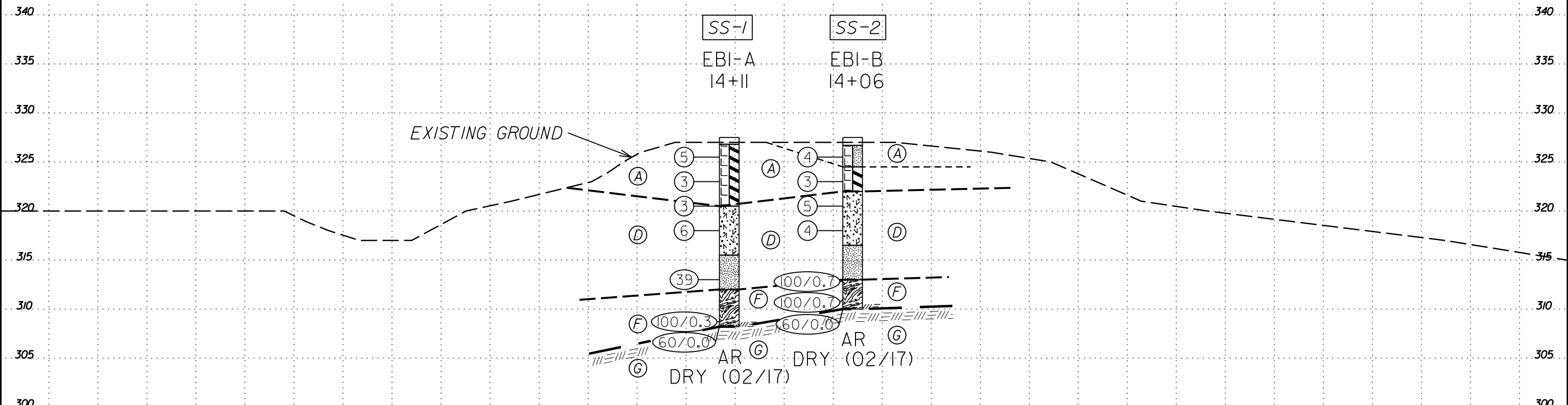
**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	5' LT	14+11	1.0-2.5	A-7-6	47	22	-	-	-	-	94.5	89.8	77.7	27.5	-
SS-3	6' LT	15+01	1.0-2.5	A-7-6	51	24	-	-	-	-	96.8	92.5	83.2	25.9	-

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 cadmachine AT GEO-18

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	5' LT	14+11	1.0-2.5	A-7-6	47	22	-	-	-	-	94.5	89.8	77.7	27.5	-
SS-2	6' RT	14+06	1.0-2.5	A-4	35	10	-	-	-	-	83.8	76.1	62.7	23.7	-



- Ⓐ ROADWAY EMBANKMENT: ORANGE, GRAY AND TAN, MOIST, SOFT TO M. STIFF, SANDY SILTY CLAY AND CLAYEY SILT
- Ⓓ RESIDUAL: ORANGE TAN AND BROWN, MOIST, SOFT TO HARD, SANDY CLAYEY SILT AND SANDY SILT
- Ⓕ WEATHERED ROCK: TAN, METAVOLCANIC ROCK
- Ⓖ CRYSTALLINE ROCK: GRAY AND GRAY-GREEN, METAVOLCANIC ROCK

**NOTES:**

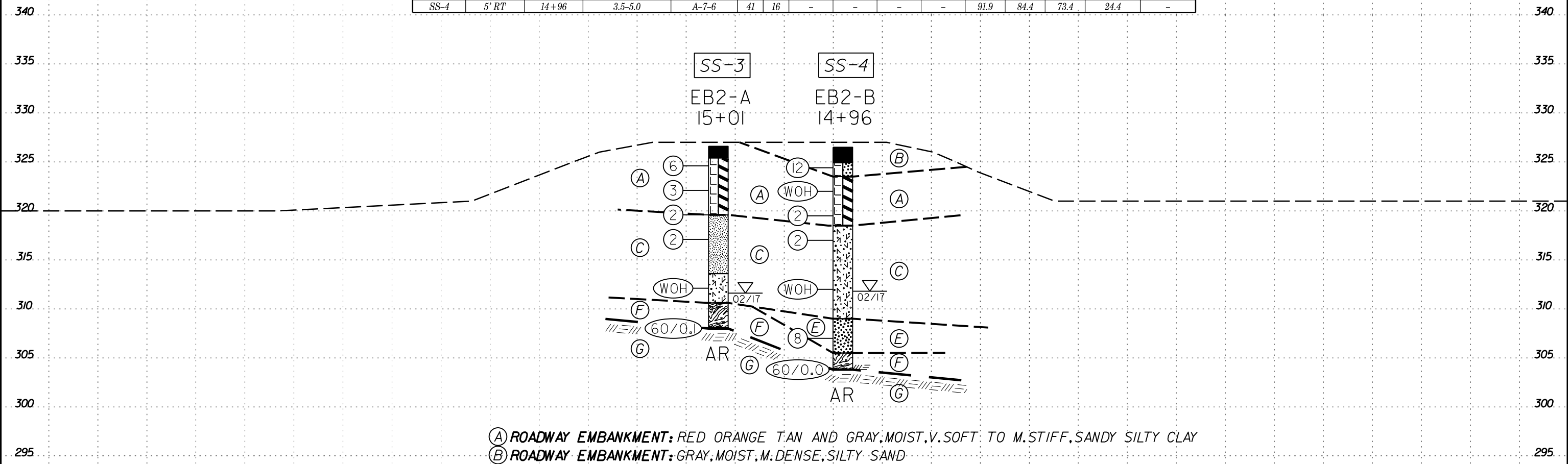
- GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM MOTT MACDONALD DATED FEBRUARY 2017.
- INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.
- BRIDGE SKEW: 105 DEGREES

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 cadmachine AT GEO

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

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SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
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SS-3	6' LT	15+01	1.0-2.5	A-7-6	51	24	-	-	-	-	96.8	92.5	83.2	25.9	-
SS-4	5' RT	14+96	3.5-5.0	A-7-6	41	16	-	-	-	-	91.9	84.4	73.4	24.4	-



- (A) ROADWAY EMBANKMENT: RED ORANGE TAN AND GRAY, MOIST, V. SOFT TO M. STIFF, SANDY SILTY CLAY
- (B) ROADWAY EMBANKMENT: GRAY, MOIST, M. DENSE, SILTY SAND
- (C) ALLUVIAL: GRAY, WET TO MOIST, V. SOFT TO SOFT, SANDY CLAYEY SILT AND SANDY SILT
- (E) RESIDUAL: GRAY AND TAN, WET, LOOSE, SILTY SAND
- (F) WEATHERED ROCK: LIGHT GRAY, METAVOLCANIC ROCK
- (G) CRYSTALLINE ROCK: LIGHT GRAY AND TAN, METAVOLCANIC ROCK

**NOTES:**

- GROUNDLINE CROSS SECTION ALONG BENT LINE DRAWN FROM TOPOGRAPHIC DATA FROM ELECTRONIC FILES RECEIVED FROM MOTT MACDONALD DATED FEBRUARY 2017.
- INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE CROSS SECTION.
- BRIDGE SKEW: 105 DEGREES

15 + 00.00  
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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

# GEOTECHNICAL BORING REPORT BORE LOG

<b>WBS</b> 45637.1.1	<b>TIP</b> B-5682	<b>COUNTY</b> GRANVILLE	<b>GEOLOGIST</b> HILL, M.J.
<b>SITE DESCRIPTION</b> BRIDGE NO. 129 ON SR 1400 (GRASSY CREEK VIRGILINA ROAD) OVER LITTLE JOHNSON CREEK			<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> EB1-A	<b>STATION</b> 14+11	<b>OFFSET</b> 5 ft LT	<b>ALIGNMENT</b> -L-
<b>COLLAR ELEV.</b> 327.5 ft	<b>TOTAL DEPTH</b> 19.3 ft	<b>NORTHING</b> 1,008,519	<b>EASTING</b> 2,101,870
<b>DRILL RIG/HAMMER EFF./DATE</b> TRI8016 MOBILE B-57 90% 02/22/2016		<b>DRILL METHOD</b> H.S. Augers	<b>HAMMER TYPE</b> Automatic
<b>DRILLER</b> Estep, J. E.	<b>START DATE</b> 02/07/17	<b>COMP. DATE</b> 02/07/17	<b>SURFACE WATER DEPTH</b> N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
330															
325	326.5	1.0	6	3	2							SS-1	28%	0.7' BITUMINOUS CONCRETE	0.7
	324.0	3.5	1	1	2									ROADWAY EMBANKMENT ORANGE-TAN, SILTY CLAY (A-7-6) WITH TRACE GRAVEL	
320	321.5	6.0	3	1	2									RESIDUAL BROWN-TAN, F. SANDY CLAYEY SILT (A-5)	7.0
	319.0	8.5	2	2	4									TAN, F. SANDY SILT (A-4) WITH QUARTZ FRAGMENTS	12.0
315	314.0	13.5	5	15	24									WEATHERED ROCK TAN, METAVOLCANIC ROCK	15.5
310	309.0	18.5												Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 308.2 ft ON CR: METAVOLCANIC ROCK	19.3
	308.2	19.3	100/0.3												
			60/0.0												

<b>WBS</b> 45637.1.1	<b>TIP</b> B-5682	<b>COUNTY</b> GRANVILLE	<b>GEOLOGIST</b> HILL, M.J.
<b>SITE DESCRIPTION</b> BRIDGE NO. 129 ON SR 1400 (GRASSY CREEK VIRGILINA ROAD) OVER LITTLE JOHNSON CREEK			<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> EB1-B	<b>STATION</b> 14+06	<b>OFFSET</b> 6 ft RT	<b>ALIGNMENT</b> -L-
<b>COLLAR ELEV.</b> 327.5 ft	<b>TOTAL DEPTH</b> 17.5 ft	<b>NORTHING</b> 1,008,520	<b>EASTING</b> 2,101,882
<b>DRILL RIG/HAMMER EFF./DATE</b> TRI8016 MOBILE B-57 90% 02/22/2016		<b>DRILL METHOD</b> H.S. Augers	<b>HAMMER TYPE</b> Automatic
<b>DRILLER</b> Estep, J. E.	<b>START DATE</b> 02/07/17	<b>COMP. DATE</b> 02/07/17	<b>SURFACE WATER DEPTH</b> N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
330															
325	326.5	1.0	4	2	2							SS-2	24%	0.6' BITUMINOUS CONCRETE 0.2' AGGREGATE BASE COURSE	0.8
	324.0	3.5	2	1	2									ROADWAY EMBANKMENT ORANGE AND GRAY, SANDY SILT (A-4) WITH SOME GRAVEL	3.0
320	321.5	6.0	2	3	2									RESIDUAL ORANGE, SILTY CLAY (A-7-6)	5.5
	319.0	8.5	2	2	2									RESIDUAL ORANGE AND TAN-BROWN, F. SANDY CLAYEY SILT (A-5)	11.0
315	314.0	13.5	9	12	87/0.2									TAN, SANDY SILT (A-4) WITH SOME ROCK FRAGMENTS	14.5
	311.7	15.8	55	45/0.2										WEATHERED ROCK TAN, METAVOLCANIC ROCK	17.5
310	310.0	17.5	60/0.0											Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 310.0 ft ON CR: METAVOLCANIC ROCK	

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 45637.1.1		TIP B-5682		COUNTY GRANVILLE		GEOLOGIST HILL, M.J.										
SITE DESCRIPTION BRIDGE NO. 129 ON SR 1400 (GRASSY CREEK VIRGILINA ROAD) OVER LITTLE JOHNSON CREEK							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 15+01		OFFSET 6 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 327.6 ft		TOTAL DEPTH 18.6 ft		NORTHING 1,008,599		EASTING 2,101,829										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 90% 02/22/2016			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Estep, J. E.		START DATE 02/07/17		COMP. DATE 02/07/17		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
330																
325	326.6	1.0	8	3	3							SS-3	26%	1.0' BITUMINOUS CONCRETE 0.2' AGGREGATE BASE COURSE	1.2	
	324.1	3.5	1	1	2								M	ROADWAY EMBANKMENT RED-ORANGE, SILTY CLAY (A-7-6) WITH TRACE GRAVEL		
	321.6	6.0	1	1	1								M			
320	319.1	8.5	2	1	1								M	ALLUVIAL GRAY, SANDY SILT (A-4) WITH TRACE ORGANICS	7.0	
	314.1	13.5	WOH	WOH	WOH								M	GRAY, F. SANDY CLAYEY SILT (A-5) WITH SOME ORGANICS	13.0	
315																
310	309.1	18.5	60/0.1											WEATHERED ROCK TAN, METAVOLCANIC ROCK	18.5	
														CRYSTALLINE ROCK TAN, METAVOLCANIC ROCK	18.6	
														Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 309.0 ft ON CR: METAVOLCANIC ROCK		

WBS 45637.1.1		TIP B-5682		COUNTY GRANVILLE		GEOLOGIST HILL, M.J.										
SITE DESCRIPTION BRIDGE NO. 129 ON SR 1400 (GRASSY CREEK VIRGILINA ROAD) OVER LITTLE JOHNSON CREEK							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 14+96		OFFSET 5 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 327.5 ft		TOTAL DEPTH 22.7 ft		NORTHING 1,008,599		EASTING 2,101,841										
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 90% 02/22/2016			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Estep, J. E.		START DATE 02/07/17		COMP. DATE 02/07/17		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
330																
325	326.4	1.1	14	8	4								M	1.3' BITUMINOUS CONCRETE 0.3 AGGREGATE BASE COURSE	1.6	
	324.0	3.5	WOH	WOH	WOH								SS-4	ROADWAY EMBANKMENT GRAY, SILTY SAND (A-2-4) WITH TRACE GRAVEL	3.0	
	321.5	6.0	WOH	1	1								M	GRAY-TAN, SILTY CLAY (A-7-6) WITH TRACE GRAVEL		
320	319.0	8.5	WOH	1	1								M	ALLUVIAL GRAY, F. SANDY CLAYEY SILT (A-5) WITH SOME ORGANICS (WOOD)	8.0	
	314.0	13.5	WOH	WOH	WOH								W			
315																
310	309.0	18.5	3	5	3								W	RESIDUAL GRAY-TAN, SILTY SAND (A-2-4) WITH SOME ROCK FRAGMENTS	17.5	
	304.8	22.7	60/0.0											WEATHERED ROCK LT. GRAY, METAVOLCANIC ROCK	21.0	
305														Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 304.8 ft ON CR: METAVOLCANIC ROCK		

NCDOT BORE DOUBLE G16006.02 B-5682 BRIDGE #129 LOGS.GPJ NC\_DOT.GDT 3/28/17