

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	46118	1	8

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY TRANSYLVANIA
PROJECT DESCRIPTION REPLACE BRIDGE 196 OVER
CRAB CREEK ON SR 1532

SITE DESCRIPTION _____

CONTENTS

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

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.

REFERENCE: 46118

PROJECT: B-5403

PERSONNEL

DC ELLIOTT

DO CHEEK

CJ COFFEE

INVESTIGATED BY DM MULLEN

DRAWN BY DM MULLEN

CHECKED BY JC KUHNE

SUBMITTED BY DM MULLEN

DATE 12.29.2014

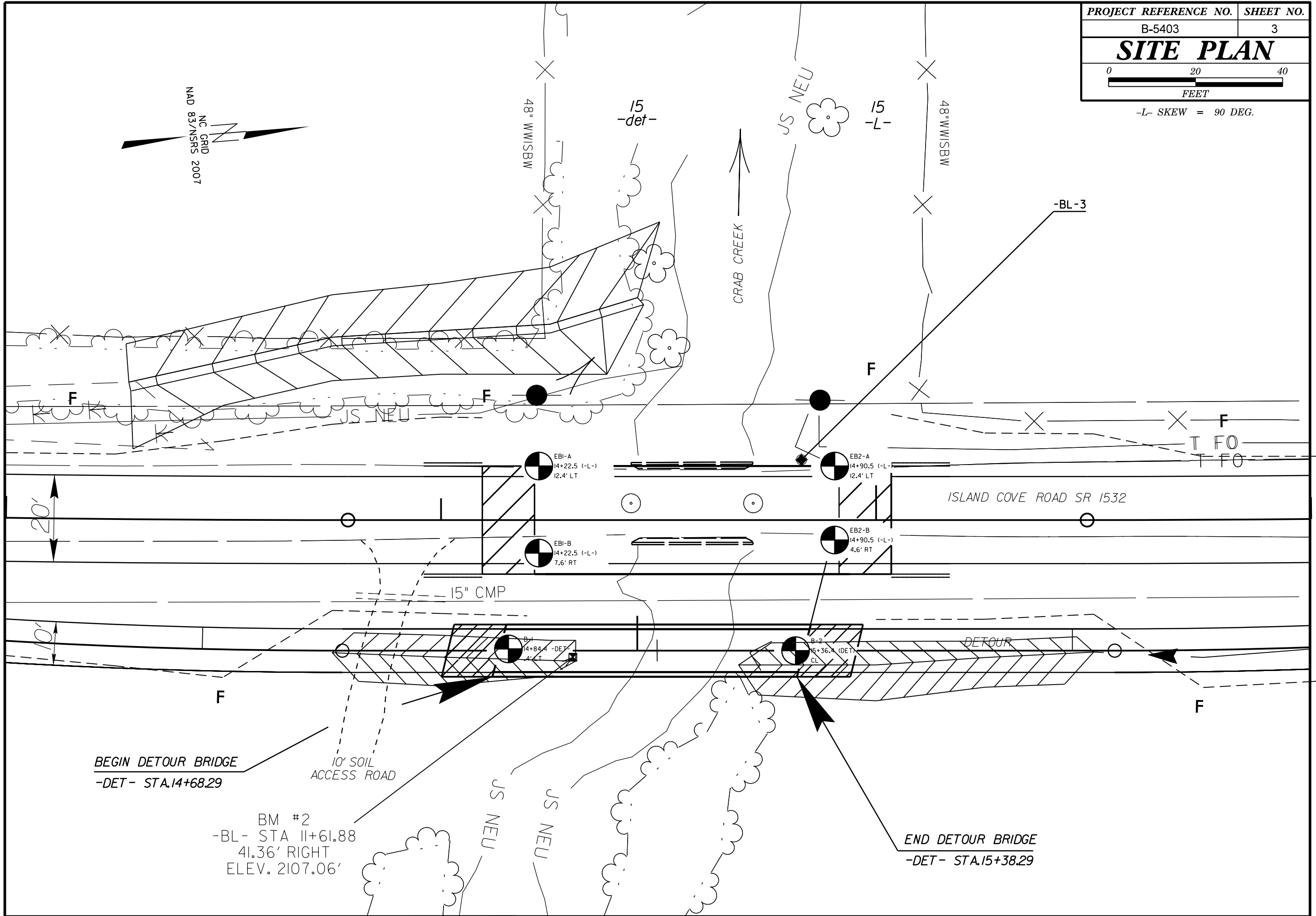
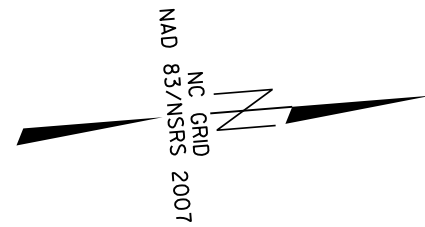


Proposed by: D. Matt Mullen
197737B5B9764F6... 12/30/2014

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 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>				GRADATION WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <u>ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</u>				ROCK DESCRIPTION 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: 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 YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTARY ROCK (CPI) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.				TERMS AND DEFINITIONS <u>ALLUVIUM (ALLUV.)</u> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <u>AQUIFER</u> - A WATER BEARING FORMATION OR STRATA. <u>ARENACEOUS</u> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <u>ARGILLACEOUS</u> - 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. <u>ARTESIAN</u> - 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. <u>CALCAREOUS (CALC.)</u> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <u>COLLUVIUM</u> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <u>CORE RECOVERY (REC.)</u> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <u>DIP DIRECTION (DIP AZIMUTH)</u> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <u>FAULT</u> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <u>FISSILE</u> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <u>FLOAT</u> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOADED FROM PARENT MATERIAL. <u>FLOOD PLAIN (FP)</u> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <u>FORMATION (FM)</u> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <u>JOINT</u> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <u>LEDGE</u> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <u>LENS</u> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <u>MOTTLED (MOT.)</u> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <u>PERCHED WATER</u> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <u>RESIDUAL (RES.) SOIL</u> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <u>ROCK QUALITY DESIGNATION (ROD)</u> - 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. <u>SAPROLITE (SAP.)</u> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <u>SILL</u> - 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. <u>SLICKENSIDE</u> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <u>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</u> - 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. <u>STRATA CORE RECOVERY (SREC.)</u> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <u>STRATA ROCK QUALITY DESIGNATION (SROD)</u> - 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. <u>TOPSOIL (TS.)</u> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.			
SOIL LEGEND AND AASHTO CLASSIFICATION				MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.				WEATHERING							
GENERAL CLASS. GRANULAR MATERIALS (≤ 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS				COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50				PERCENTAGE OF MATERIAL							
GROUP CLASS.				PERCENTAGE OF MATERIAL				GROUND WATER							
SYMBOL				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
% PASSING #10 #200				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
MATERIAL PASSING #40 LL PI				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
GROUP INDEX				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
USUAL TYPES OF MAJOR MATERIALS				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
GEN. RATING AS SUBGRADE				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
CONSISTENCY OR DENSENESS				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
PRIMARY SOIL TYPE				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
GENERAL GRANULAR MATERIAL (NON-COHESSIVE)				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
GENERAL SILT-CLAY MATERIAL (COHESIVE)				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
TEXTURE OR GRAIN SIZE				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
U.S. STD. SIEVE SIZE OPENING (MM)				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CS.E. SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
GRAIN SIZE				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
SOIL MOISTURE - CORRELATION OF TERMS				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
SOIL MOISTURE SCALE (ATTERBERG LIMITS)				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
FIELD MOISTURE DESCRIPTION				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
GUIDE FOR FIELD MOISTURE DESCRIPTION				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
LIQUID LIMIT (LL) PLASTIC LIMIT (PL) OPTIMUM MOISTURE SHRINKAGE LIMIT (OM) SL				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
PLASTICITY				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
NON PLASTIC SLIGHTLY PLASTIC MODERATELY PLASTIC HIGHLY PLASTIC				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
COLOR				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							
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.				PERCENTAGE OF MATERIAL				MISCELLANEOUS SYMBOLS							



BEGIN DETOUR BRIDGE
-DET- STA.14+68.29

BM #2
-BL- STA 11+61.88
41.36' RIGHT
ELEV. 2107.06'

END DETOUR BRIDGE
-DET- STA.15+38.29



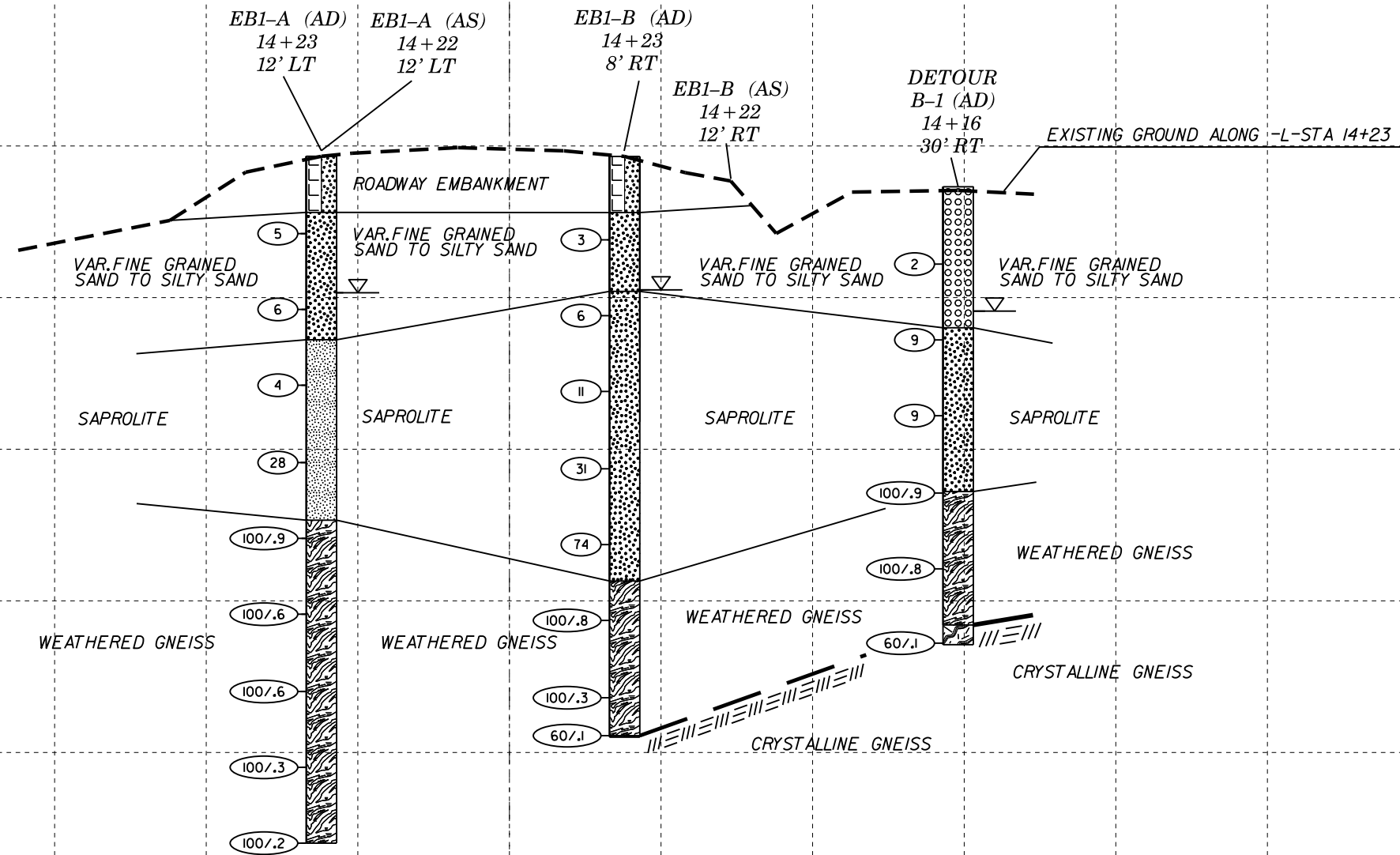
VE = 1H = 1V

-L- SKEW = 90 DEG.

2150
2140
2130
2120
2110
2100
2090
2080
2070
2060

2140
2130
2120
2110
2100
2090
2080
2070
2060

-60 -50 -40 -30 -20 -10 C/L 10 20 30 40 50 60 70



EB1-A (AD)
14+23
12' LT

EB1-A (AS)
14+22
12' LT

EB1-B (AD)
14+23
8' RT

EB1-B (AS)
14+22
12' RT

DETOUR
B-1 (AD)
14+16
30' RT

ROADWAY EMBANKMENT

VAR. FINE GRAINED SAND TO SILTY SAND

VAR. FINE GRAINED SAND TO SILTY SAND

VAR. FINE GRAINED SAND TO SILTY SAND

VAR. FINE GRAINED SAND TO SILTY SAND

SAPROLITE

SAPROLITE

SAPROLITE

SAPROLITE

WEATHERED GNEISS

WEATHERED GNEISS

WEATHERED GNEISS

WEATHERED GNEISS

CRYSTALLINE GNEISS

CRYSTALLINE GNEISS

EXISTING GROUND ALONG -L- STA 14+23



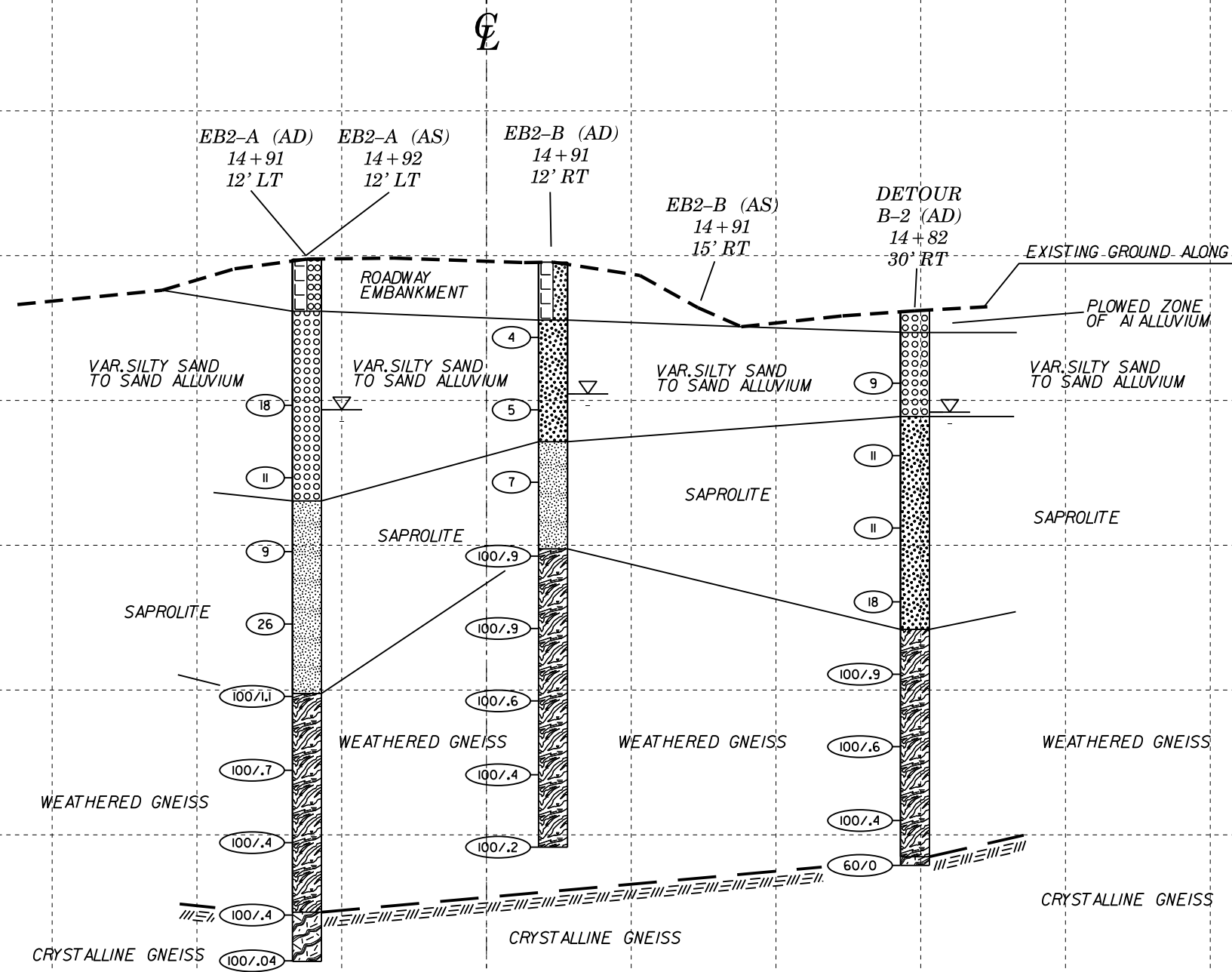
VE = 1H = 1V

-L- SKEW = 90 DEG.

2150
2140
2130
2120
2110
2100
2090
2080
2070
2060

2140
2130
2120
2110
2100
2090
2080
2070
2060

-60 -50 -40 -30 -20 -10 C/L 10 20 30 40 50 60 70





NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 46118.1.1		TIP B5403		COUNTY TRANSYLVANIA		GEOLOGIST Elliott, D. C.										
SITE DESCRIPTION N/A							GROUND WTR (ft)									
BORING NO. EB1-A		STATION 14+27		OFFSET 14 ft LT		ALIGNMENT L										
COLLAR ELEV. 2,109.3 ft		TOTAL DEPTH 46.3 ft		NORTHING 919,987		EASTING 559,970										
DRILL RIG/HAMMER EFF./DATE AFO0134 CME-45C 88% 05/14/2014				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic										
DRILLER N/A		START DATE 10/06/14		COMP. DATE 10/06/14		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						
2110														2,109.3	0.0	GROUND SURFACE
																ROADWAY EMBANKMENT Roadway embankment
2105	2,104.2	5.1	1	3	2									2,105.6	3.7	ALLUVIAL Light Gray / Brown slightly micaceous silty sand alluvium
2100	2,099.2	10.1	2	2	4									2,097.2	12.1	SAPROLITE Off white / lt. gray / tan slightly micaceous fine sandy silt
2095	2,094.2	15.1	2	2	2									2,085.3	24.0	WEATHERED ROCK Off white / lt. gray / lt orange slightly micaceous weathered rock
2090	2,089.2	20.1	9	12	16											
2085	2,084.2	25.1	100/9													
2080	2,079.2	30.1	100/6													
2075	2,074.2	35.1	100/6													
2070	2,069.2	40.1	100/3													
2065	2,064.2	45.1	100/2													
Boring Terminated at Elevation 2,063.0 ft IN WR																

WBS 46118.1.1		TIP B5403		COUNTY TRANSYLVANIA		GEOLOGIST Elliott, D. C.										
SITE DESCRIPTION N/A							GROUND WTR (ft)									
BORING NO. EB1-B		STATION 14+27		OFFSET 7 ft RT		ALIGNMENT L										
COLLAR ELEV. 2,109.3 ft		TOTAL DEPTH 38.3 ft		NORTHING 920,007		EASTING 559,968										
DRILL RIG/HAMMER EFF./DATE AFO0134 CME-45C 88% 05/14/2014				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic										
DRILLER N/A		START DATE 10/07/14		COMP. DATE 10/07/14		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						
2110														2,109.3	0.0	GROUND SURFACE
																ROADWAY EMBANKMENT Roadway embankment
2105	2,103.8	5.5	1	2	1									2,105.6	3.7	ALLUVIAL Lt brown / lt gray slightly micaceous silty, fine to coarse sand with wood debris and a few round pebbles and cobbles
2100	2,098.8	10.5	2	3	3									2,100.4	8.9	SAPROLITE Off white / light gray / orange slightly micaceous silty sand
2095	2,093.8	15.5	3	7	4											
2090	2,088.8	20.5	11	13	18											
2085	2,083.8	25.5	28	31	43											
2080	2,078.8	30.5	100/8													
2075	2,073.8	35.5	100/3													
	2,071.1	38.2	60/1													
Boring Terminated at Elevation 2,071.0 ft IN CR																

NCDOT BORE DOUBLE B5403_GEO_BRDG.GPJ NC_DOT.GDT 12/29/14



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 46118.1.1	TIP B5403	COUNTY TRANSYLVANIA	GEOLOGIST Elliott, D. C.
SITE DESCRIPTION N/A			GROUND WTR (ft)
BORING NO. B1-D	STATION 14+64	OFFSET CL	ALIGNMENT L DET
COLLAR ELEV. 2,107.3 ft	TOTAL DEPTH 30.2 ft	NORTHING 920,028	EASTING 559,960
DRILL RIG/HAMMER EFF./DATE AFO0134 CME-45C 88% 05/14/2014		DRILL METHOD N/A	HAMMER TYPE Automatic
DRILLER N/A	START DATE 10/02/14	COMP. DATE 10/02/14	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				
2110													GROUND SURFACE	0.0
2105													ALLUVIAL Brown / lt brown slightly micaceous silty fine to coarse sand with some wood debris	
2100	2,102.2	5.1	1	1	1									
2095	2,097.2	10.1	2	4	5								SAPROLITE Off white / lt tan / trace of orange slightly micaceous silty, fine sand	9.3
2090	2,092.2	15.1	3	4	5									
2085	2,087.2	20.1	100/9										WEATHERED ROCK Off white / lt tan / trace of orange slightly micaceous weathered rock	20.1
2080	2,082.2	25.1	100/8											
	2,077.2	30.1	60/1										CRYSTALLINE ROCK Crystalline rock Boring Terminated at Elevation 2,077.1 ft IN CR	30.2

WBS 46118.1.1	TIP B5403	COUNTY TRANSYLVANIA	GEOLOGIST Elliott, D. C.
SITE DESCRIPTION N/A			GROUND WTR (ft)
BORING NO. B2-D	STATION 15+38	OFFSET CL	ALIGNMENT L DET
COLLAR ELEV. 2,106.0 ft	TOTAL DEPTH 38.3 ft	NORTHING 920,034	EASTING 560,025
DRILL RIG/HAMMER EFF./DATE AFO0134 CME-45C 88% 05/14/2014		DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic
DRILLER N/A	START DATE 10/03/14	COMP. DATE 10/03/14	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				
2110													GROUND SURFACE	0.0
2105													ALLUVIAL Plowed zone of A1 alluvium	1.5
2100	2,101.0	5.0	3	7	2								ALLUVIAL Brown to lt brown / tan slightly micaceous silty fine to coarse sand with some sub-rounded gravels and a few cobble frags	7.3
2095	2,096.0	10.0	3	5	6								SAPROLITE Off white / lt tan / trace orange slightly micaceous silty fine sand	
2090	2,091.0	15.0	5	4	7									
2085	2,086.0	20.0	8	9	9								WEATHERED ROCK Off white / tan / trace orange slightly micaceous weathered rock	22.0
2080	2,081.0	25.0	100/9											
2075	2,076.0	30.0	100/6											
2070	2,071.0	35.0	100/4											
	2,067.7	38.3	60/0										CRYSTALLINE ROCK Crystalline rock Boring Terminated at Elevation 2,067.7 ft IN CR	38.3

NCDOT BORE DOUBLE B5403_GEO_BRDG.GPJ NC_DOT.GDT 12/29/14



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 46118.1.1	TIP B5403	COUNTY TRANSYLVANIA	GEOLOGIST Elliott, D. C.
SITE DESCRIPTION N/A			GROUND WTR (ft)
BORING NO. EB2-A	STATION 14+92	OFFSET 14 ft LT	ALIGNMENT L
COLLAR ELEV. 2,109.8 ft	TOTAL DEPTH 48.5 ft	NORTHING 919,992	EASTING 560,038
DRILL RIG/HAMMER EFF./DATE AFO0134 CME-45C 88% 05/14/2014			DRILL METHOD NW Casing w/ Advancer
DRILLER N/A			HAMMER TYPE Automatic
START DATE 10/08/14	COMP. DATE 10/08/14	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				
2110													2,109.8 GROUND SURFACE	0.0
													ROADWAY EMBANKMENT Soft, silty sand embankment	
2105													2,106.2 ALLUVIAL Gray / black silty sand with gravels	3.6
2100	2,099.7	10.1	4	12	6									
2095	2,094.7	15.1	16	8	3									
2090	2,089.7	20.1	0	4	5								2,093.1 SAPROLITE Very soft tan and white slightly micaceous fine sandy silt	16.7
2085	2,084.7	25.1	12	12	14									
2080	2,079.7	30.1	30	48	227.1								2,079.8 WEATHERED ROCK Lt. gray / tan / slightly micaceous silty sand with small rock frags	30.0
2075	2,074.7	35.1	60	40/2										
2070	2,069.7	40.1	100/4											
2065	2,064.7	45.1	100/4										2,064.7 CRYSTALLINE ROCK	45.1
	2,061.3	48.5	100/04										2,061.3 Boring Terminated at Elevation 2,061.2 ft IN CR	48.5

WBS 46118.1.1	TIP B5403	COUNTY TRANSYLVANIA	GEOLOGIST Elliott, D. C.
SITE DESCRIPTION N/A			GROUND WTR (ft)
BORING NO. EB2-B	STATION 14+92	OFFSET 4 ft RT	ALIGNMENT L
COLLAR ELEV. 2,109.6 ft	TOTAL DEPTH 40.4 ft	NORTHING 920,009	EASTING 560,036
DRILL RIG/HAMMER EFF./DATE AFO0134 CME-45C 88% 05/14/2014			DRILL METHOD NW Casing w/ Advancer
DRILLER N/A			HAMMER TYPE Automatic
START DATE 10/06/14	COMP. DATE 10/06/14	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				
2110													2,109.6 GROUND SURFACE	0.0
													ROADWAY EMBANKMENT	
2105	2,104.4	5.2	1	2	2								2,105.6 ALLUVIAL Lt gray / brown slightly micaceous silty sand with gravels at 7.9	4.0
2100	2,099.4	10.2	1	3	2									
2095	2,094.4	15.2	2	4	3								2,097.2 SAPROLITE Gray / lt gray / white slightly micaceous fine sandy silt	12.4
2090	2,089.4	20.2	100/9											
2085	2,084.4	25.2	100/9										2,089.8 WEATHERED ROCK Lt gray / off white / orange slightly micaceous seamy weathered rock	19.8
2080	2,079.4	30.2	100/6											
2075	2,074.4	35.2	100/4											
2070	2,069.4	40.2	100/2											
													Boring Terminated at Elevation 2,069.2 ft IN WR	40.4

NCDOT BORE DOUBLE B5403_GEO_BRDG.GPJ NC_DOT.GDT 12/29/14