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REFERENCE: B-5405

PROJECT: 46120

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY TRANSYLVANIA
PROJECT DESCRIPTION REPLACE BRIDGE #139 ON
SR-1139 OVER EAST BRANCH TOXAWAY CREEK
SITE DESCRIPTION _____

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4-5	CROSS SECTIONS
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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	46120	1	10

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.

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- 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.
 - 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

DCE _____

DOC _____

CJC _____

INVESTIGATED BY DMM

DRAWN BY DMM ^{DS} Jk

CHECKED BY JCK

SUBMITTED BY DMM

DATE 12/22/2016



DocuSigned by:
D Matt Mullen 12/21/2016
18909B... DATE

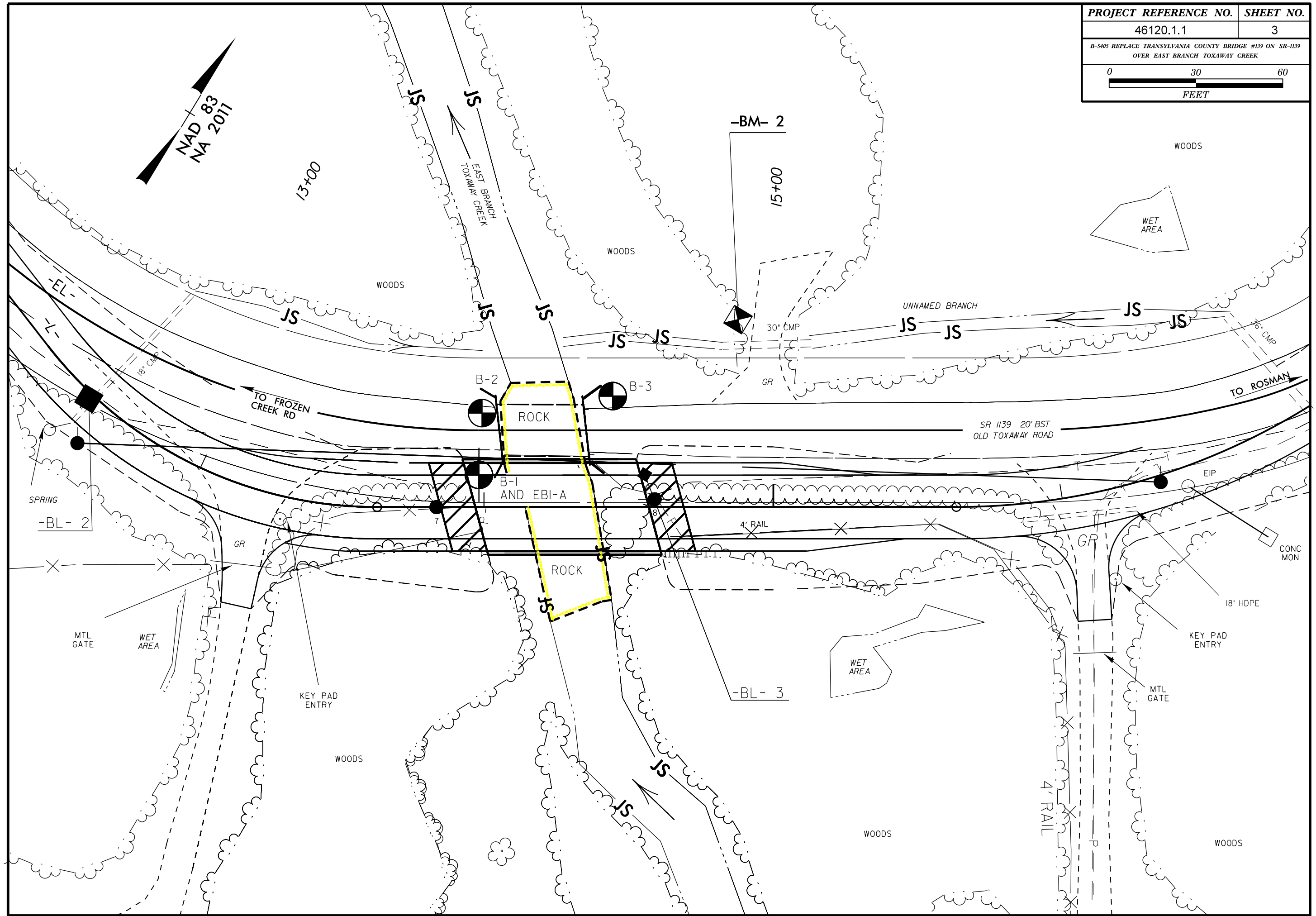
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

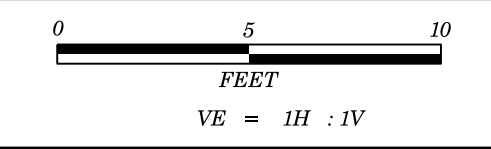
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

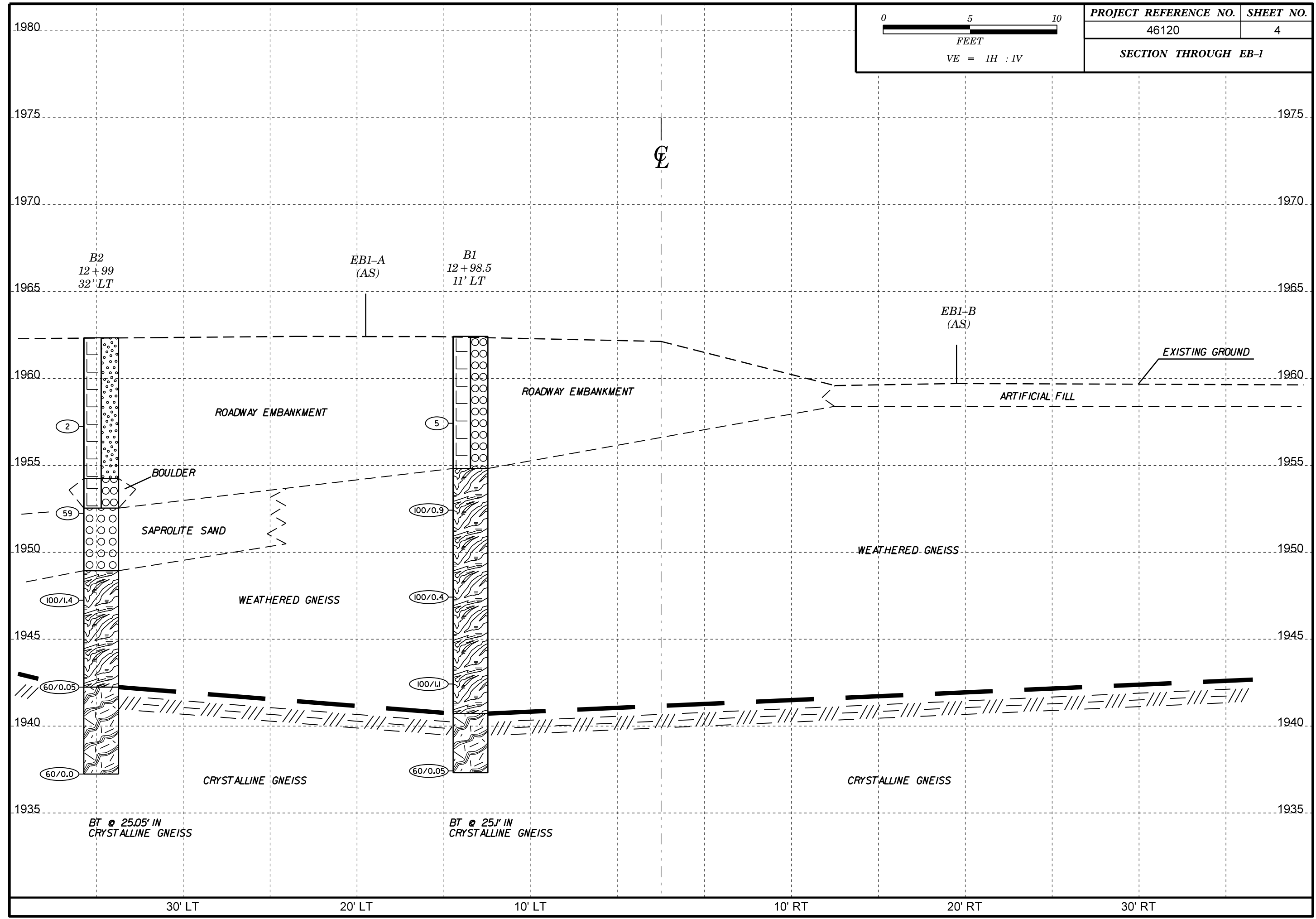
Table with multiple columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, SOIL LEGEND AND AASHTO CLASSIFICATION, MINERALOGICAL COMPOSITION, COMPRESSIBILITY, PERCENTAGE OF MATERIAL, GROUND WATER, MISCELLANEOUS SYMBOLS, RECOMMENDATION SYMBOLS, ABBREVIATIONS, EQUIPMENT USED ON SUBJECT PROJECT, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, COLOR, FRACTURE SPACING, BEDDING, INDURATION, and NOTES.

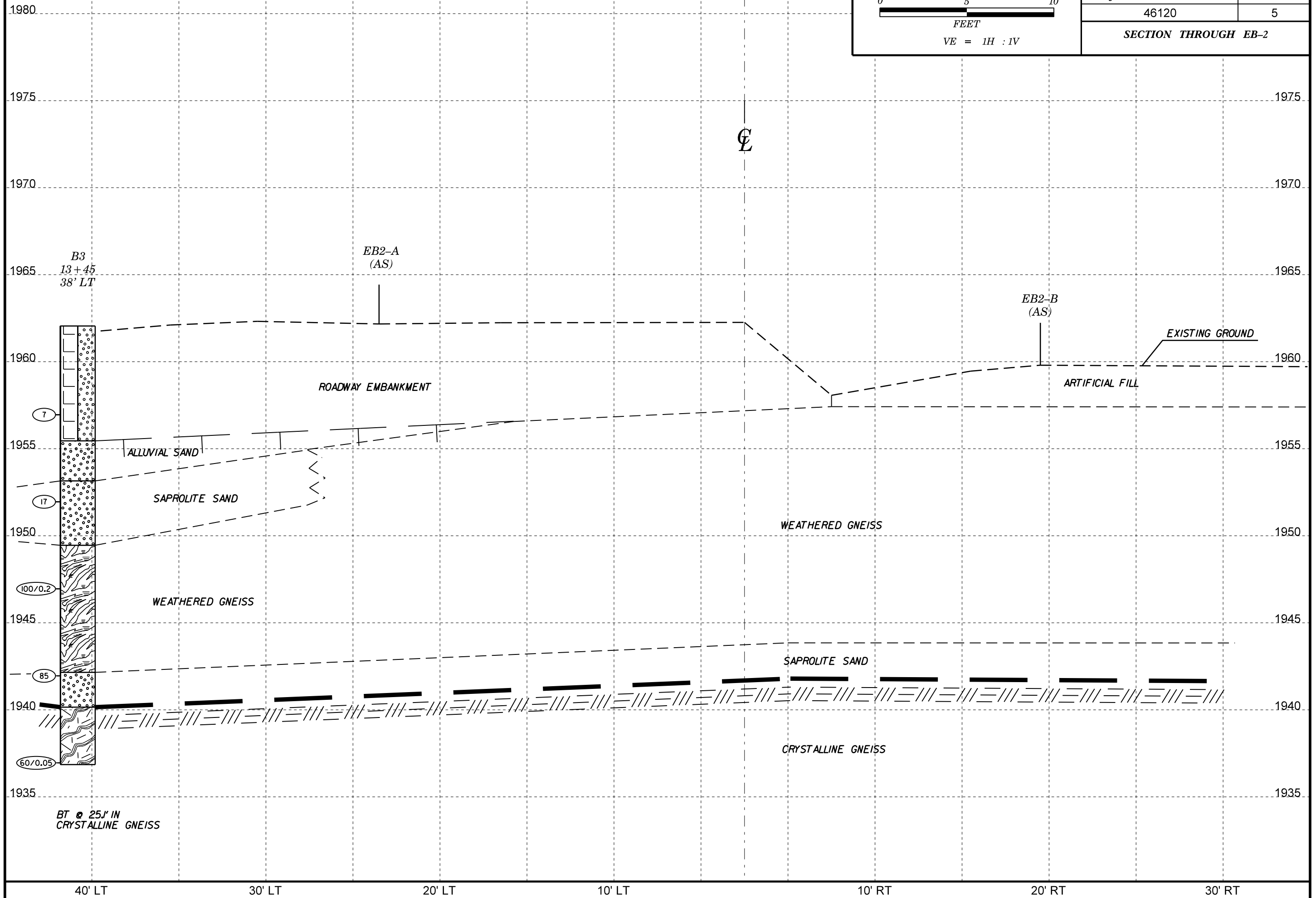
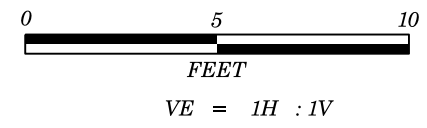
PROJECT REFERENCE NO.	SHEET NO.
46120.1.1	3
B-5405 REPLACE TRANSYLVANIA COUNTY BRIDGE #139 ON SR-1139 OVER EAST BRANCH TOXAWAY CREEK	
FEET	





PROJECT REFERENCE NO.	SHEET NO.
46120	4
SECTION THROUGH EB-1	





GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46120.1.1		TIP B-5405		COUNTY TRANSYLVANIA		GEOLOGIST Elliott, D. C.										
SITE DESCRIPTION N/A							GROUND WTR (ft)									
BORING NO. EB-1A SPT		STATION 12+99		OFFSET 32 ft LT		ALIGNMENT L										
COLLAR ELEV. 1,962.5 ft		TOTAL DEPTH 25.1 ft		NORTHING 512,205		EASTING 846,594										
DRILL RIG/HAMMER EFF./DATE AFO3163 CME-550X 85% 05/14/2014		DRILL METHOD NW Casing w/ Core		HAMMER TYPE Automatic												
DRILLER Cheek, D. O.		START DATE 03/07/13		COMP. DATE 03/07/13		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						
1965														1,962.5	GROUND SURFACE	0.0
1960															ROADWAY EMBANKMENT Brown-red silty SAND with gravel	
1955	1,957.5	5.0	3	2	3									1,954.9	WEATHERED ROCK (orange-gray-brown gneiss)	7.6
1950	1,952.5	10.0	15	29	71/0.4									100/0.9		
1945	1,947.5	15.0	100/0.4											100/0.4		
1940	1,942.5	20.0	41	48	11/0.1									100/1.1		
	1,937.5	25.0	60/0.05											60/0.05		
															CRYSTALLINE ROCK GNEISS	21.7
														1,940.8		21.7
														1,937.4		25.1
															Boring Terminated with Standard Penetration Test Refusal at Elevation 1,937.4 ft In Crystalline Rock: GNEISS	

WBS 46120.1.1		TIP B-5405		COUNTY TRANSYLVANIA		GEOLOGIST Elliott, D. C.										
SITE DESCRIPTION N/A							GROUND WTR (ft)									
BORING NO. B-2		STATION 12+99		OFFSET 11 ft LT		ALIGNMENT L										
COLLAR ELEV. 1,962.4 ft		TOTAL DEPTH 25.1 ft		NORTHING 512,186		EASTING 846,604										
DRILL RIG/HAMMER EFF./DATE AFO3163 CME-550X 85% 05/14/2014		DRILL METHOD NW Casing w/ Core		HAMMER TYPE Automatic												
DRILLER Cheek, D. O.		START DATE 03/07/13		COMP. DATE 03/07/13		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						
1965														1,962.4	GROUND SURFACE	0.0
1960															ROADWAY EMBANKMENT Brown-red silty SAND with gravel	
1955	1,957.3	5.1	1	1	1									1,954.3	ROADWAY EMBANKMENT BOULDER	8.1
1950	1,952.3	10.1	6	19	40									1,952.6	SAPROLITE	9.8
1945	1,947.3	15.1	18	37	55/0.4									1,949.0	Tan-gray silty SAND	13.4
1940	1,942.3	20.1	60/0.05											1,942.3	WEATHERED ROCK (gneiss)	20.1
	1,937.3	25.1	60/0.0											1,937.3	CRYSTALLINE ROCK GNEISS	25.1
															Boring Terminated at Elevation 1,937.3 ft In Crystalline Rock: GNEISS	

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 46120.1.1		TIP B-5405		COUNTY TRANSYLVANIA		GEOLOGIST Elliott, D. C.											
SITE DESCRIPTION N/A							GROUND WTR (ft)										
BORING NO. B-3		STATION 13+45		OFFSET 38 ft LT		ALIGNMENT L											
COLLAR ELEV. 1,962.1 ft		TOTAL DEPTH 25.2 ft		NORTHING 512,233		EASTING 846,629											
DRILL RIG/HAMMER EFF./DATE AFO3163 CME-550X 85% 05/14/2014			DRILL METHOD NW Casing w/ Core			HAMMER TYPE Automatic											
DRILLER Cheek, D. O.		START DATE 03/07/13		COMP. DATE 03/07/13		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							
1965															1,962.1	GROUND SURFACE	0.0
1960																ROADWAY EMBANKMENT Brown-red silty SAND with gravel	
1955	1,957.0	5.1	3	4	3												
1950	1,952.0	10.1	3	10	7											ROADWAY EMBANKMENT BOULDER SAPROLITE Tan-gray silty SAND	13.4
1945	1,947.0	15.1	100/0.2													WEATHERED ROCK (gneiss)	
1940	1,942.0	20.1	6	17	68											CRYSTALLINE ROCK GNEISS	20.1
	1,937.0	25.1	60/0.05													Boring Terminated with Standard Penetration Test Refusal at Elevation 1,937.0 ft In Crystalline Rock: GNEISS	25.1

WBS 46120.1.1		TIP B-5405		COUNTY TRANSYLVANIA		GEOLOGIST Elliott, D. C.											
SITE DESCRIPTION N/A							GROUND WTR (ft)										
BORING NO. EB1-A CORE		STATION 12+99		OFFSET 11 ft LT		ALIGNMENT L											
COLLAR ELEV. 1,962.4 ft		TOTAL DEPTH 36.0 ft		NORTHING 512,186		EASTING 846,604											
DRILL RIG/HAMMER EFF./DATE AFO6744 CME - 45C 81% 01/29/2016			DRILL METHOD NW Casing w/ Core			HAMMER TYPE Automatic											
DRILLER Cheek, D. O.		START DATE 09/20/16		COMP. DATE 09/20/16		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							
1965															1,962.4	GROUND SURFACE	0.0
1960																ROADWAY EMBANKMENT Brown/red silty sand with some angular gravels	
1955	1,957.5	4.9														ALLUVIAL Beige, tan, light gray silty sand with boulders and cobbles	8.1
1950	1,954.3	8.1														SAPROLITE Beige, tan light gray silty sand	
1945	1,948.6	13.8															
1940																	
1935																	
1930																	
																	Boring Terminated with Casing Advancer Refusal at Elevation 1,926.4 ft In Crystalline Rock: GNEISS

NCDOT BORE DOUBLE B-5405 BORELOGS.GPJ NC_DOT.GDT 12/9/16

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 46120.1.1		TIP B-5405		COUNTY TRANSYLVANIA		GEOLOGIST Elliott, D. C.					
SITE DESCRIPTION N/A							GROUND WTR (ft)				
BORING NO. EB1-A CORE		STATION 12+99		OFFSET 11 ft LT		ALIGNMENT L	0 HR. 7.3				
COLLAR ELEV. 1,962.4 ft		TOTAL DEPTH 36.0 ft		NORTHING 512,186		EASTING 846,604	24 HR. N/A				
DRILL RIG/HAMMER EFF./DATE AFO6744 CME - 45C 81% 01/29/2016				DRILL METHOD NW Casing w/ Core		HAMMER TYPE Automatic					
DRILLER Cheek, D. O.		START DATE 09/20/16		COMP. DATE 09/20/16		SURFACE WATER DEPTH N/A					
CORE SIZE nxwl		TOTAL RUN 22.2 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
1948.6	1,948.6	13.8	2.2		(1.8) 82%	(0.9) 41%				Begin Coring @ 13.8 ft	13.8
	1,946.4	16.0									
1945			5.0		(3.0) 60%	(1.1) 22%					
	1,941.4	21.0									
1940			5.0		(5.0) 100%	(2.6) 52%					
	1,936.4	26.0									
1935			5.0		(5.0) 100%	(3.0) 60%					
	1,931.4	31.0									
1930			5.0		(5.1) 102%	(3.9) 78%					
	1,926.4	36.0									

NCDOT CORE DOUBLE B-5405 BORELOGS.GPJ NC_DOT.GDT 12/9/16



46120 (B-5405)
 Transylvania County
 Bridge No. 139 on SR-1139
 Over East Branch Toxaway Creek
 Boring EB-1B
 Box 1 of 3
 Depth: 13.8' – 25.0'



46120 (B-5405)
 Transylvania County
 Bridge No. 139 on SR-1139
 Over East Branch Toxaway Creek
 Boring EB-1B
 Box 2 of 3
 Depth: 25.0' – 34.8'



46120 (B-5405)
Transylvania County
Bridge No. 139 on SR-1139
Over East Branch Toxaway Creek
Boring EB-1B
Box 3 of 3
Depth: 34.8' – 36.0'