

**STATE OF NORTH CAROLINA**

DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

**GEOTECHNICAL ENGINEERING UNIT**

STATE	STATE PROJECT NUMBER OR N.C.	SHEET NO.	TOTAL SHEETS
	55033.1.1 (B-5533)	1	12

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# STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 55033.1.1 (B-5533) F.A. PROJ. BRZ-1424(9)

COUNTY HALIFAX

PROJECT DESCRIPTION BRIDGE NO. 87 ON -L- (SR 1424) OVER  
DEEP CREEK AT STA. 12+64

**CAUTION NOTICE**

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSES OF ESTABLISHING AND DESIGNING ONE OR MORE CONDUITS FOR PUMPAGE OF THE VARIOUS FIELDS BEING LIFTED FROM AREAS AND SOIL TEST DATA AVAILABLE TO BE RECORDED OR INTERPRETATION MADE BY CONTRACTOR'S REPRESENTATIVE OR SUBSIDIARY OF THE CONTRACTOR'S GEOTECHNICAL ENGINEERING UNIT AT 1981-2013-2014. 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 BOUNDARY OF THE LABORATORY SAMPLE DATA AND THE IN-SITU IN-PLACE TEST DATA CAN BE FILED OR USED TO THE EXTENT OF RELIABILITY INDICATED IN THE STANDARD TEST METHODS. 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 THE ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER HYDROLOGICAL FACTORS.

THE DESIGN OR CONSTRUCTION IS ESTIMATED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR DESIGN 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 ACCURACY OR SCOPE OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR ANY PART OF THE INFORMATION AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BENCH MARK 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 THE FIRM ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED BY THE SUBSURFACE INFORMATION.

**PERSONNEL**

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O. E. OTT

H. R. CONLEY

J. R. MATULA

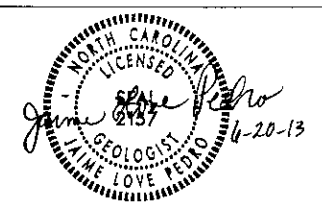
H. L. FROATS

INVESTIGATED BY J. L. PEDRO

CHECKED BY N. T. ROBERSON

SUBMITTED BY J. L. PEDRO

DATE JUNE 13



**PROJECT: 55033.1.1**  
**ID: B-5533**

DRAWN BY: J. L. PEDRO, T. T. WALKER

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT 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.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO.
55033.1(10-5533)
SHEET NO.
2

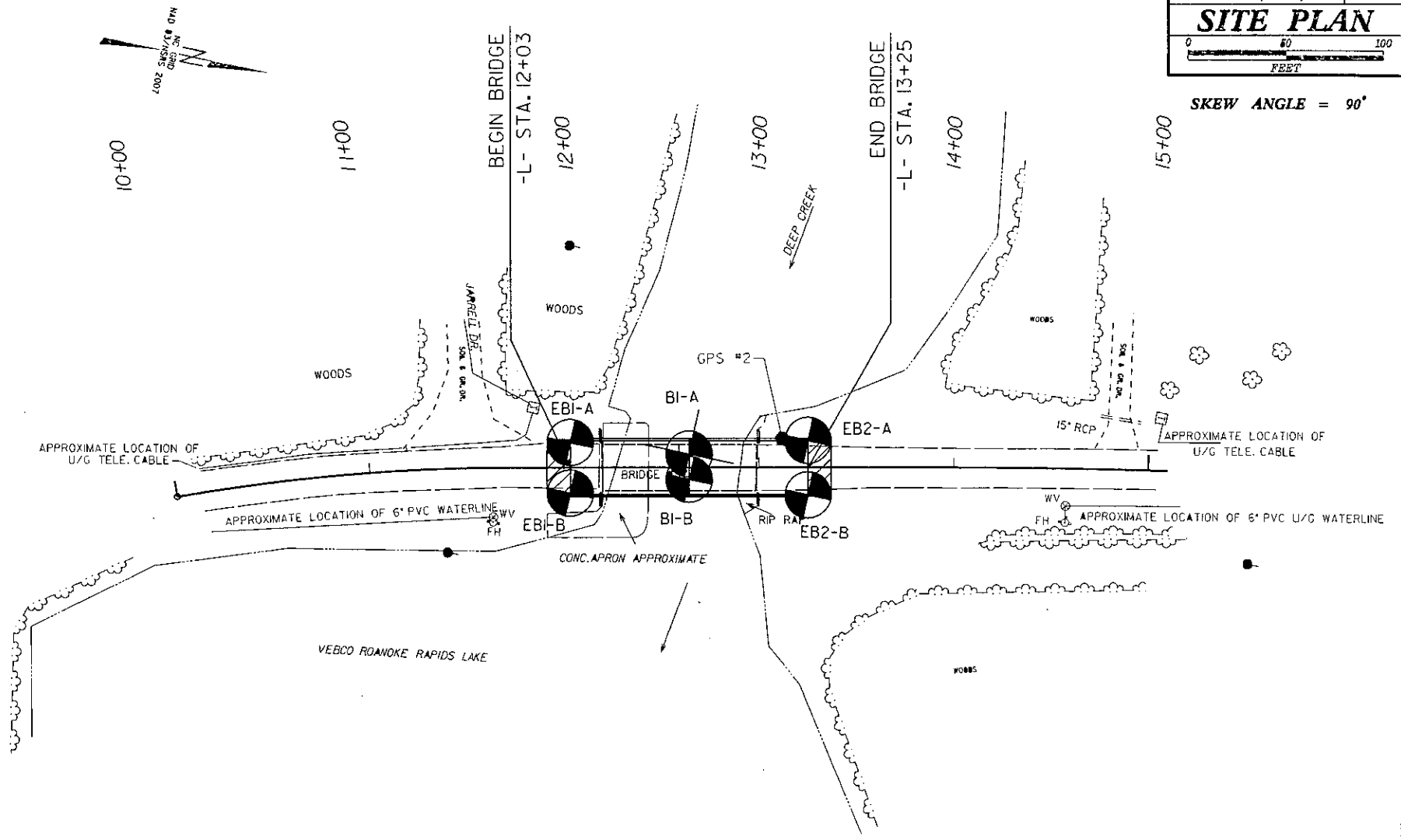
SUBSURFACE INVESTIGATION

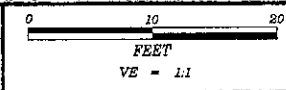
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL LEGEND AND AASHTO CLASSIFICATION table with columns for soil types (A-1 to A-7, U, O, M, S, etc.), descriptions, and consistency. Includes sections for GRADATION, MINERALOGICAL COMPOSITION, COMPRESSION, PERCENTAGE OF MATERIAL, GROUND WATER, MISCELLANEOUS SYMBOLS, ABBREVIATIONS, EQUIPMENT USED ON SUBJECT PROJECT, FRACTURE SPACING, BEDDING, and PLASTICITY.

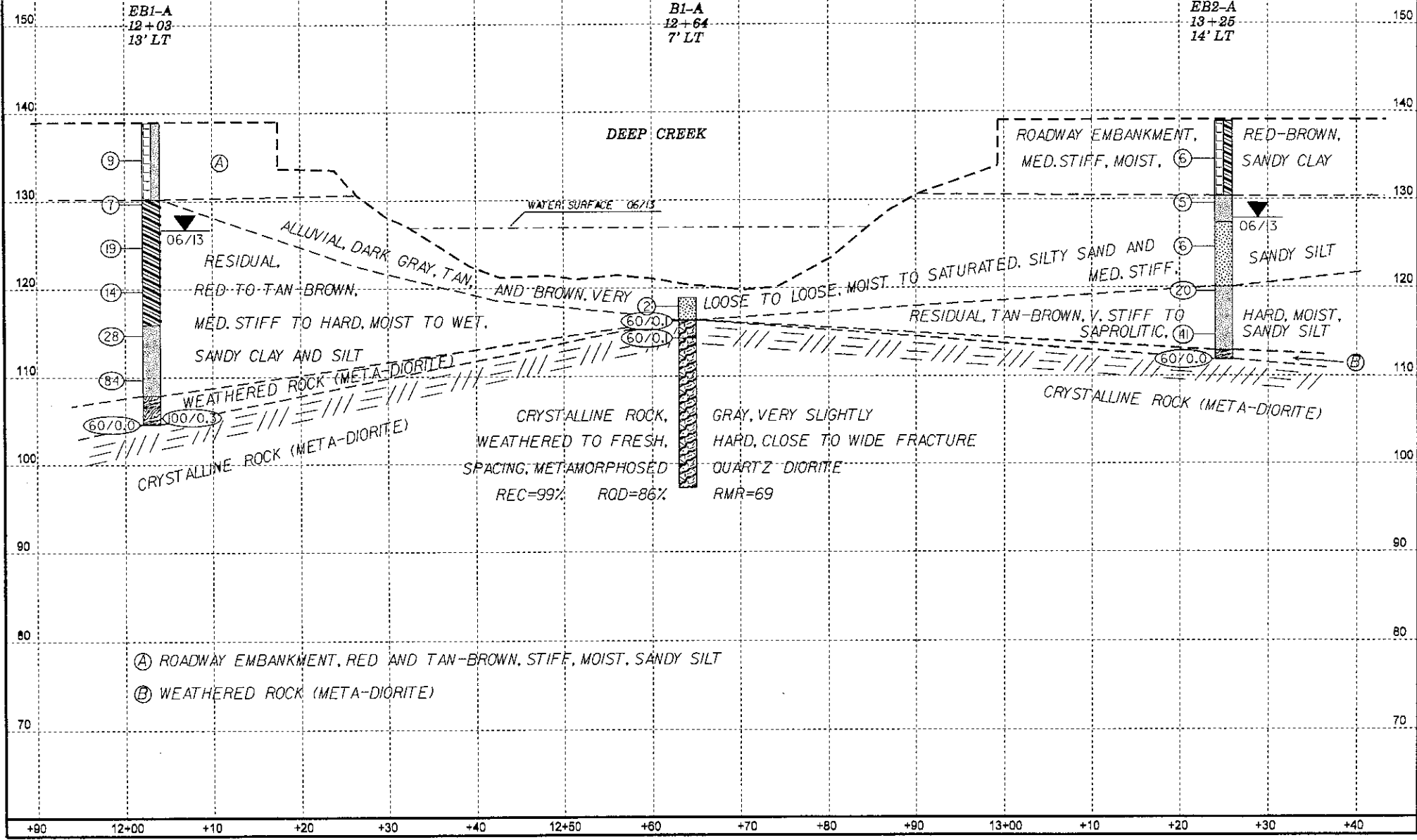
PROJECT REFERENCE NO.	SHEET
55033.1.I (B-5533)	3
<b>SITE PLAN</b>	
FEET	

SKEW ANGLE = 90°





PROJECT REFERENCE NO.	SHEET
55033.1.1 (B-5533)	4
FENCE DIAGRAMS OF BORINGS PROJECTED ALONG -L- PROFILE	



EB1-A  
12+03  
13' LT

B1-A  
12+64  
7' LT

EB2-A  
13+25  
14' LT

DEEP CREEK

ROADWAY EMBANKMENT,  
MED. STIFF, MOIST.

RED-BROWN,  
SANDY CLAY

WATER SURFACE 06/13

ALLUVIAL, DARK GRAY, TAN,  
AND BROWN, VERY  
RESIDUAL,  
RED-TO-TAN-BROWN,  
MED. STIFF TO HARD, MOIST TO WET,  
SANDY CLAY AND SILT

LOOSE TO LOOSE, MOIST TO SATURATED, SILTY SAND AND  
MED. STIFF.

SANDY SILT

RESIDUAL, TAN-BROWN, V. STIFF TO  
SAPROLITIC.

HARD, MOIST,  
SANDY SILT

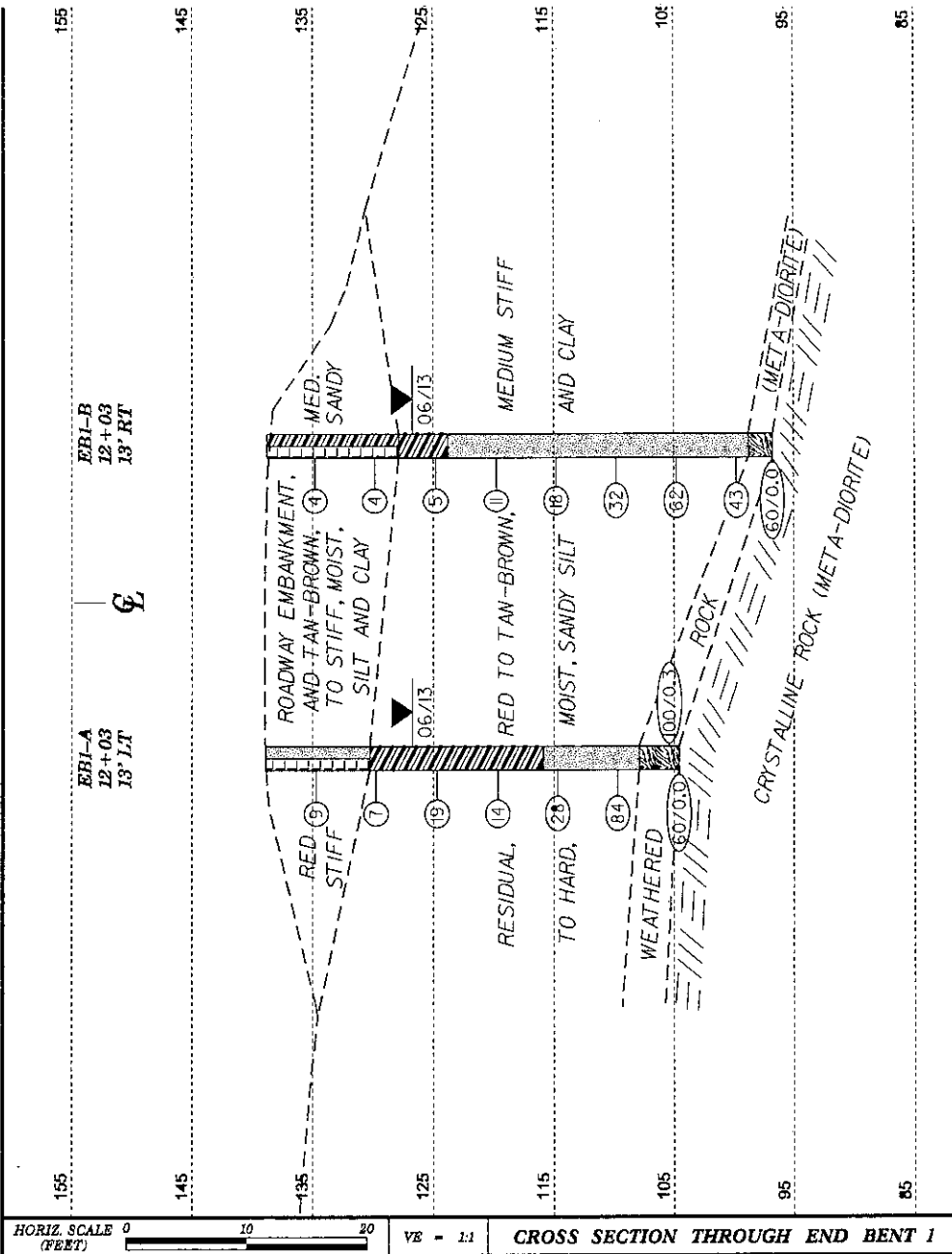
WEATHERED ROCK (META-DIORITE)

CRYSTALLINE ROCK,  
WEATHERED TO FRESH,  
SPACING, METAMORPHOSED  
REC=99% RQD=86%

GRAY, VERY SLIGHTLY  
HARD, CLOSE TO WIDE FRACTURE  
QUARTZ DIORITE  
RMR=69

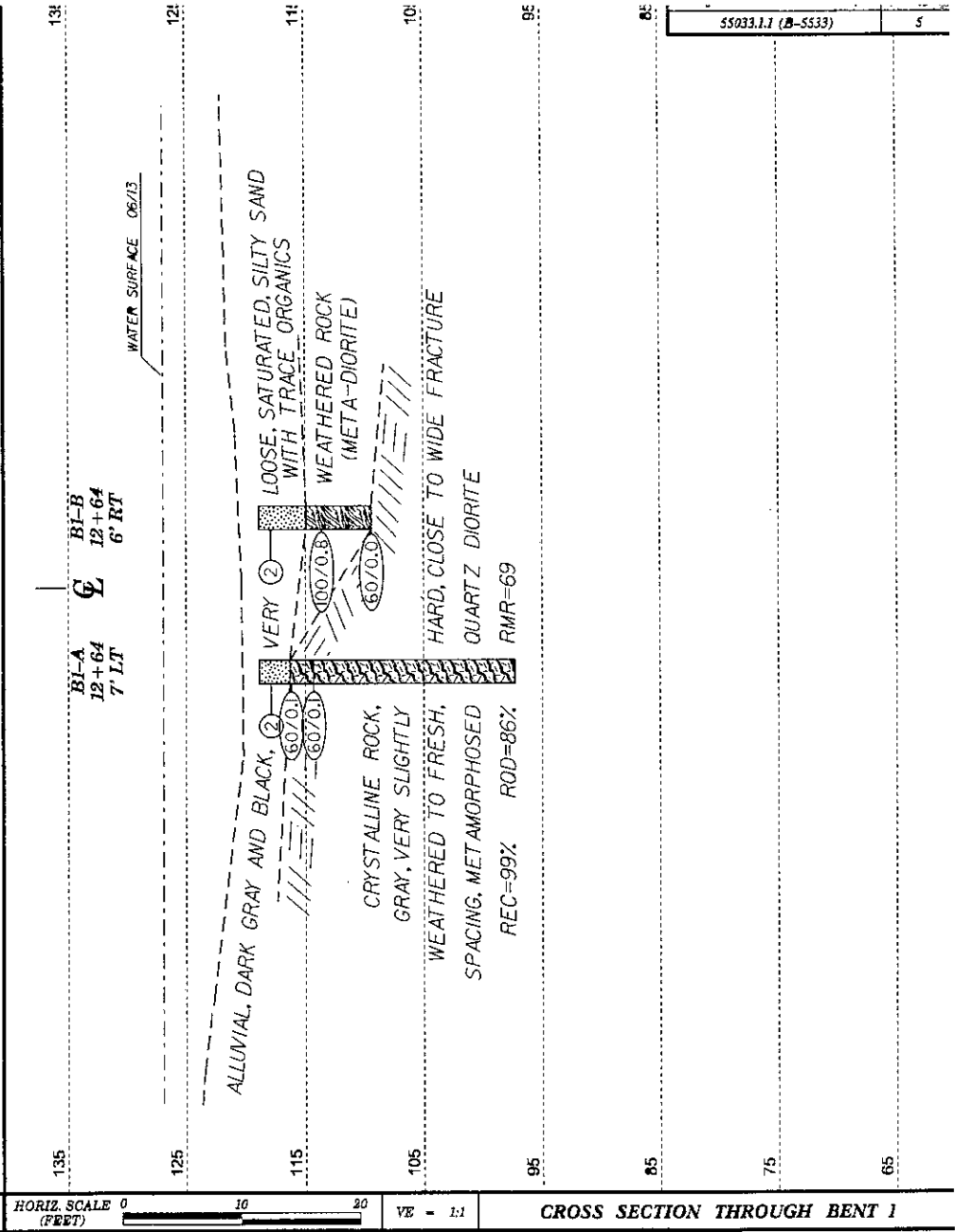
CRYSTALLINE ROCK (META-DIORITE)

- (A) ROADWAY EMBANKMENT, RED AND TAN-BROWN, STIFF, MOIST, SANDY SILT
- (B) WEATHERED ROCK (META-DIORITE)



HORIZ. SCALE 0 10 20 (FEET)

VE - 1:1 CROSS SECTION THROUGH END BENT 1



HORIZ. SCALE 0 10 20 (FEET)

VE - 1:1 CROSS SECTION THROUGH BENT 1

REC=99% RQD=86%  
RMR=69

HORIZ. SCALE 0 10 20  
(FEET)

VE = 1:1

CROSS SECTION THROUGH BENT 2

155

EB2-A  
13+25  
14' LT

EB2-B  
13+25  
14' RT

Σ

145

134

135

132

125

122

115

111

105

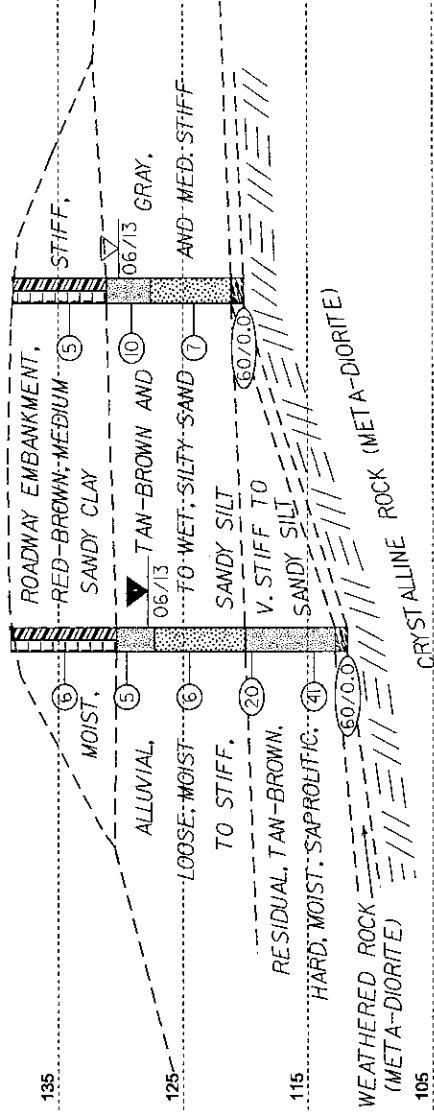
101

95

91

85

81



**NC DOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

WBS 55033.1.1		TIP B-5533		COUNTY HALIFAX		GEOLOGIST Orl, O. B.							
SITE DESCRIPTION BRIDGE NO. 87 ON L- (SR 1424) OVER DEEP CREEK													
BORING NO. EB1-A		STATION 12+03		OFFSET 13 R.LT		ALIGNMENT -L-							
COLLAR ELEV. 138.9 ft		TOTAL DEPTH 34.3 ft		NORTHING 989,984		EASTING 2,362,860							
DRILL RIGHAMMER EFF./DATE RFO0074 CME-55 81% 12/18/2012		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Conley, H. R.		START DATE 06/04/13		COMP. DATE 06/04/13		SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0-5ft	5-10ft	10-15ft	0	25	50	75				
148												GROUND SURFACE	0.0
135	135.7	3.2	3	5	4						M	ROADWAY EMBANKMENT TAN AND RED-BROWN, SANDY SILT	
130	130.7	8.2	4	3	4						M	RESIDUAL RED TO TAN-BROWN, SAPROLITIC, SANDY CLAY	8.7
125	125.7	13.2	18	12	7						M		
120	120.7	18.2	2	5	8						M		
115	115.7	23.2	10	12	16						M	TAN-BROWN, SAPROLITIC, SANDY SILT	23.8
110	110.7	28.2	31	34	50						M		
105	105.7	33.2	180/9.3								M	WEATHERED ROCK (META-DIORITE)	31.8
	104.5	34.3	60/9.8								M	Being Terminated with Standard Penetration Test Refusal at Elevation 104.6 ft ON CRYSTALLINE ROCK (META-DIORITE)	34.3

WBS 55033.1.1		TIP B-5533		COUNTY HALIFAX		GEOLOGIST Orl, O. B.							
SITE DESCRIPTION BRIDGE NO. 87 ON L- (SR 1424) OVER DEEP CREEK													
BORING NO. EB1-B		STATION 12+03		OFFSET 13 R.RT		ALIGNMENT -L-							
COLLAR ELEV. 136.8 ft		TOTAL DEPTH 42.0 ft		NORTHING 989,970		EASTING 2,362,886							
DRILL RIGHAMMER EFF./DATE RFO0074 CME-55 81% 12/18/2012		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Conley, H. R.		START DATE 06/03/13		COMP. DATE 06/03/13		SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0-5ft	5-10ft	10-15ft	0	25	50	75				
148												GROUND SURFACE	0.0
135	135.8	3.8	2	2	2						M	ROADWAY EMBANKMENT TAN-BROWN, SANDY CLAY	
130	130.8	8.0	1	2	2						M		
125	125.8	13.0	1	2	3						M	RESIDUAL TAN-BROWN, SANDY CLAY	11.8
120	120.8	18.0	3	4	7						M	TAN-BROWN, SAPROLITIC, SANDY SILT	15.0
115	115.8	23.0	4	6	12						M		
110	110.8	28.0	10	14	18						M		
105	105.8	33.0	18	38	52						M		
100	100.8	38.0	5	11	32						M		
	98.8	42.0	60/9.8								M	WEATHERED ROCK (META-DIORITE)	40.8
	96.5										M	Being Terminated with Standard Penetration Test Refusal at Elevation 96.5 ft ON CRYSTALLINE ROCK (META-DIORITE)	42.8

NC DOT BORELOG FILE #5533\_GEO\_BH-GPJ NC DOT.GDT 6/2013

WBS 55033.1.1	TIP B-5533	COUNTY HALIFAX	GEOLOGIST Orl, O. B.	
SITE DESCRIPTION BRIDGE NO. 87 ON -L- (SR 1424) OVER DEEP CREEK		GROUND WTR (ft)		
BORING NO. B1-A	STATION 12+64	OFFSET 7 ft LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 118.9 ft	TOTAL DEPTH 21.6 ft	NORTHING 990,025	EASTING 2,362,853	24 HR. N/A
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 91% 12/18/2012		DRILL METHOD NW Casing WSPT & Core	HAMMER TYPE Automatic	
DRILLER Conley, H. R.	START DATE 06/05/13	COMP. DATE 06/05/13	SURFACE WATER DEPTH 8.0 ft	

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					
138															
126													WATER SURFACE (06/05/13)		
120	118.9	8.8	1	1	1								GROUND SURFACE	0.0	
115	116.3	7.5	66/0.1										ALLUVIAL DARK GRAY, SILTY SAND WITH TRACE ORGANICS	2.6	
114	114.4	4.5	66/0.1										CRYSTALLINE ROCK (META-DIORITE)	4.6	
110													GRAY, VERY SLIGHTLY WEATHERED TO FRESH, HARD, CLOSE TO WIDE FRACTURE SPACING, METAMORPHOSED QUARTZ DIORITE		
105													REC=88% RQD=86%		
100													RMR=89		
													97.3	21.6	Boring Terminated at Elevation 97.3 ft IN CRYSTALLINE ROCK (META-DIORITE)

WBS 55033.1.1	TIP B-5533	COUNTY HALIFAX	GEOLOGIST Orl, O. B.	
SITE DESCRIPTION BRIDGE NO. 87 ON -L- (SR 1424) OVER DEEP CREEK		GROUND WTR (ft)		
BORING NO. B1-A	STATION 12+64	OFFSET 7 ft LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 118.9 ft	TOTAL DEPTH 21.6 ft	NORTHING 990,025	EASTING 2,362,853	24 HR. N/A
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 91% 12/18/2012		DRILL METHOD NW Casing WSPT & Core	HAMMER TYPE Automatic	
DRILLER Conley, H. R.	START DATE 06/05/13	COMP. DATE 06/05/13	SURFACE WATER DEPTH 8.0 ft	

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC (%)	RQD (%)		REC (%)	RQD (%)			
114.3											Begin Coring @ 4.6 ft	
114.3	114.3	4.6	2.0	1:58/1.0	(2.0)	(2.0)		116.0	114.6		114.3	4.6
112.3		6.6		1:41/1.0	100%	100%		99%	86%			
110			5.0	1:28/1.0	(6.0)	(4.5)					SCATTERED JOINTS RANGE FROM 45 TO 70 DEGREES	
				1:19/1.0	100%	80%						
			107.3	1:00/1.0								
105			5.0	1:24/1.0	(6.0)	(9.9)						
				1:18/1.0	100%	78%						
			102.3	1:04/1.0								
				1:01/1.0								
100			5.0	1:02/1.0	(4.8)	(4.2)						
				1:12/1.0	58%	84%						
				1:00/1.0								
				1:51/1.0								
			87.3	2:01/1.0							97.3	21.6
											Boring Terminated at Elevation 97.3 ft IN CRYSTALLINE ROCK (META-DIORITE)	

NCDOT BORE LOG FILE B5533\_GEO\_BH.GPJ, NC\_DOT.GDT 8/2013



WBS 55033.1.1		TIP B-5533		COUNTY HALIFAX		GEOLOGIST OIL, O. B.							
SITE DESCRIPTION BRIDGE NO. 87 ON -L- (SR 1424) OVER DEEP CREEK							GROUND WTR (ft)						
BORING NO. B1-B		STATION 12+64		OFFSET 6 R FT		ALIGNMENT -L-							
COLLAR ELEV. 118.9 ft		TOTAL DEPTH 9.5 ft		NORTHING 950,028		EASTING 2,362,865							
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 51% 12/14/2012		START DATE 06/05/13		COMP. DATE 06/05/13		SURFACE WATER DEPTH 8.0ft							
DRILLER Conley, H. R.						HAMMER TYPE Automatic							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75				100
138													
125													
120													
118.9	118.9	0.0											WATER SURFACE (06/05/13)
115	114.4	4.5	52	48	3								GROUND SURFACE 118.9
													ALLUVIAL GRAY-BLACK SILTY SAND WITH TRACE ORGANICS
													WEATHERED ROCK (META-DIORITE)
118	108.4	9.5	60	0	8								Boring Terminated at Elevation 108.4 ft ON CRYSTALLINE ROCK (META-DIORITE)

**NC DOT GEOTECHNICAL ENGINEERING UNIT**  
**BORELOG REPORT**

WBS 55033.1.1		TIP B-5533		COUNTY HALIFAX		GEOLOGIST Oti, O. B.									
SITE DESCRIPTION BRIDGE NO. 87 ON -L- (SR 1424) OVER DEEP CREEK						GROUND WTR (ft)									
BORING NO. EB2-A		STATION 13+25		OFFSET 14 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 138.8 ft		TOTAL DEPTH 27.0 ft		NORTHING 990,083		EASTING 2,362,833									
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 91% 12/18/2012		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Conley, H. R.		START DATE 06/04/13		COMP. DATE 06/04/13		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	MOI	O	G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75						
148														138.8	8.0
														ROADWAY EMBANKMENT RED-BROWN, SANDY CLAY	
135	135.5	3.3	3	3	3								M		
136	138.4	8.3	1	2	3								M		
														ALLUVIAL TAN-BROWN, SANDY SILT	11.5
125	125.5	13.3	1	1	5								W		
														TAN-GRAY, SILTY SAND	
120	120.5	18.3	4	5	15								M		
														RESIDUAL TAN-BROWN, SAPROLITIC, SANDY SILT	18.8
115	115.5	23.3	6	7	34								M		
														WEATHERED ROCK (META-DIORITE)	26.0
	111.8	27.0												Being Terminated at Elevation 111.8 ft ON CRYSTALLINE ROCK (META-DIORITE)	27.0

WBS 55033.1.1		TIP B-5533		COUNTY HALIFAX		GEOLOGIST Oti, O. B.									
SITE DESCRIPTION BRIDGE NO. 87 ON -L- (SR 1424) OVER DEEP CREEK						GROUND WTR (ft)									
BORING NO. EB2-B		STATION 13+25		OFFSET 14 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 138.6 ft		TOTAL DEPTH 18.5 ft		NORTHING 990,089		EASTING 2,362,861									
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 91% 12/18/2012		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Conley, H. R.		START DATE 06/04/13		COMP. DATE 06/04/13		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	MOI	O	G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75						
148														138.6	8.0
														ROADWAY EMBANKMENT RED-BROWN, SANDY CLAY	
135	135.1	3.5	2	2	3								M		
136	138.1	8.5	3	3	7								M		
														ALLUVIAL TAN-BROWN, SANDY SILT	7.5
125	125.1	13.5	1	2	5								M		
														TAN-GRAY, SILTY SAND	11.0
	120.1	18.5												WEATHERED ROCK (META-DIORITE)	17.5
														Being Terminated at Elevation 120.1 ft ON CRYSTALLINE ROCK (META-DIORITE)	18.5

NC DOT BORE LOG DOUBLE #5533\_GEO\_BH CP# 1 NC DOT\_GDT #02/13