

REFERENCE: B-5869

PROJECT: 48063

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY BURKE  
PROJECT DESCRIPTION REPLACE BRDG #0099 ON  
US-64/70 (W FLEMING DR) OVER SOUTHERN R.R.

CONTENTS

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2	LEGEND (SOIL)
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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5869	I	II

CAUTION NOTICE

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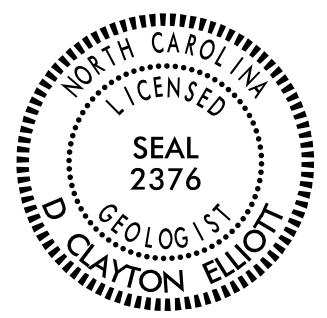
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  - BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

-NCDOT-  
DC CHEEK  
CJ COFFEY  
CD JOHNSON

INVESTIGATED BY NCDOT GEU /DCE  
DRAWN BY DC ELLIOTT  
CHECKED BY JC KUHNE  
SUBMITTED BY JC KUHNE  
DATE \_\_\_\_\_



DocuSigned by:  
D. Clayton Elliott 9/27/2019

FD421F60C80E40E SIGNATURE DATE

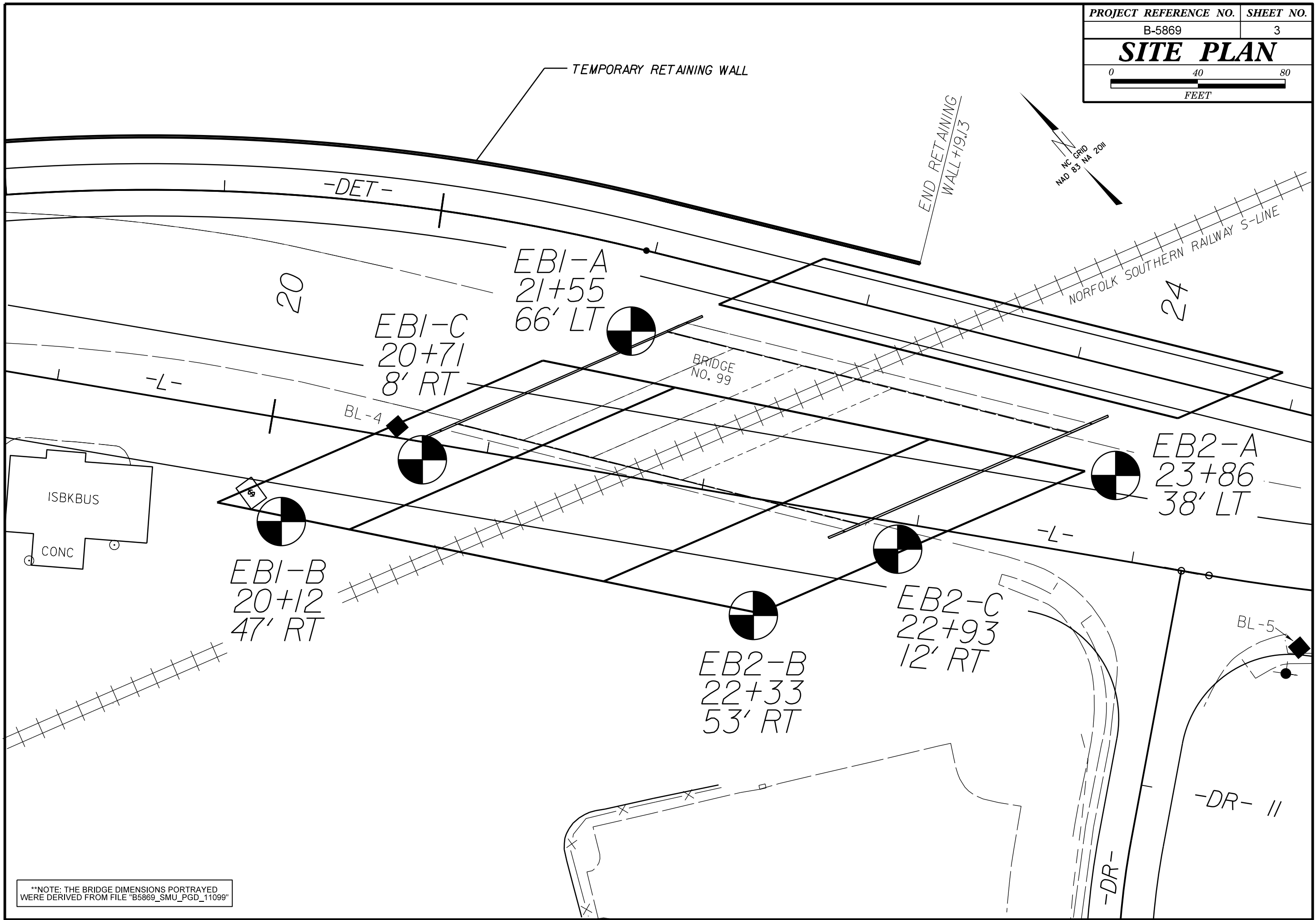
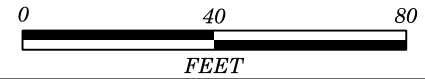
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

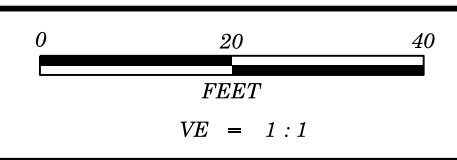
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with 4 main columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, and TERMS AND DEFINITIONS. It contains detailed technical specifications, classification tables, and symbols for geotechnical engineering.

# SITE PLAN



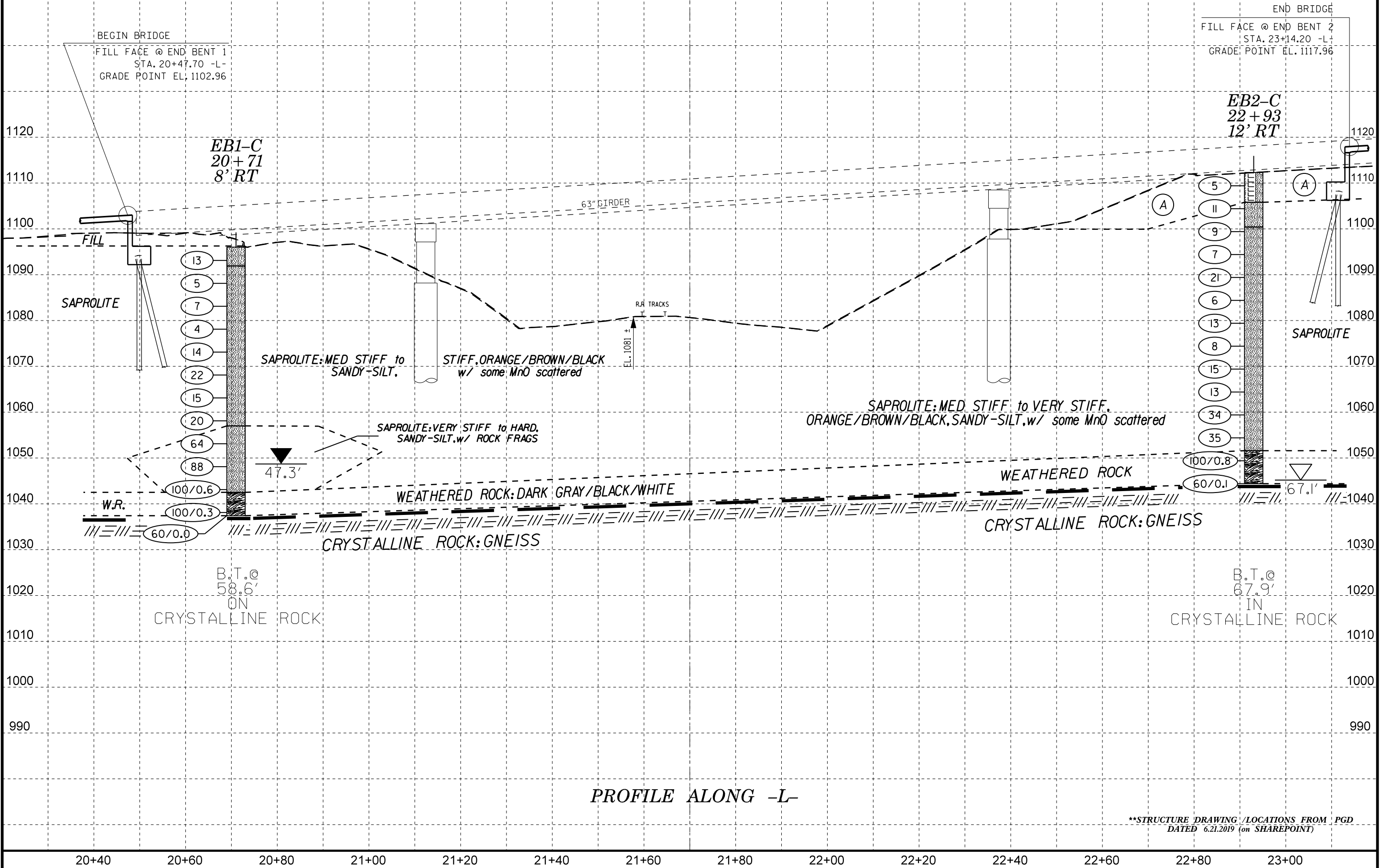
\*\*NOTE: THE BRIDGE DIMENSIONS PORTRAYED WERE DERIVED FROM FILE "B5869\_SMU\_PGD\_11099"



PROJECT REFERENCE NO.	SHEET NO.
B-5869	4

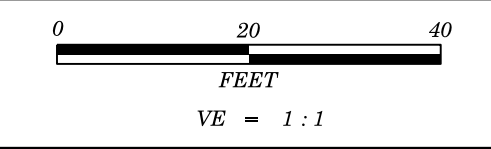
BRDG 0099 on US6470  
over SOUTHERN RAILROAD  
PROFILE ALONG -L- 20+20 to 23+20

(A) ROADWAY EMBANKMENT: MED STIFF, RED/BROWN SANDY-SILT, w/ trace CLAY & a few GRAVELS



PROFILE ALONG -L-

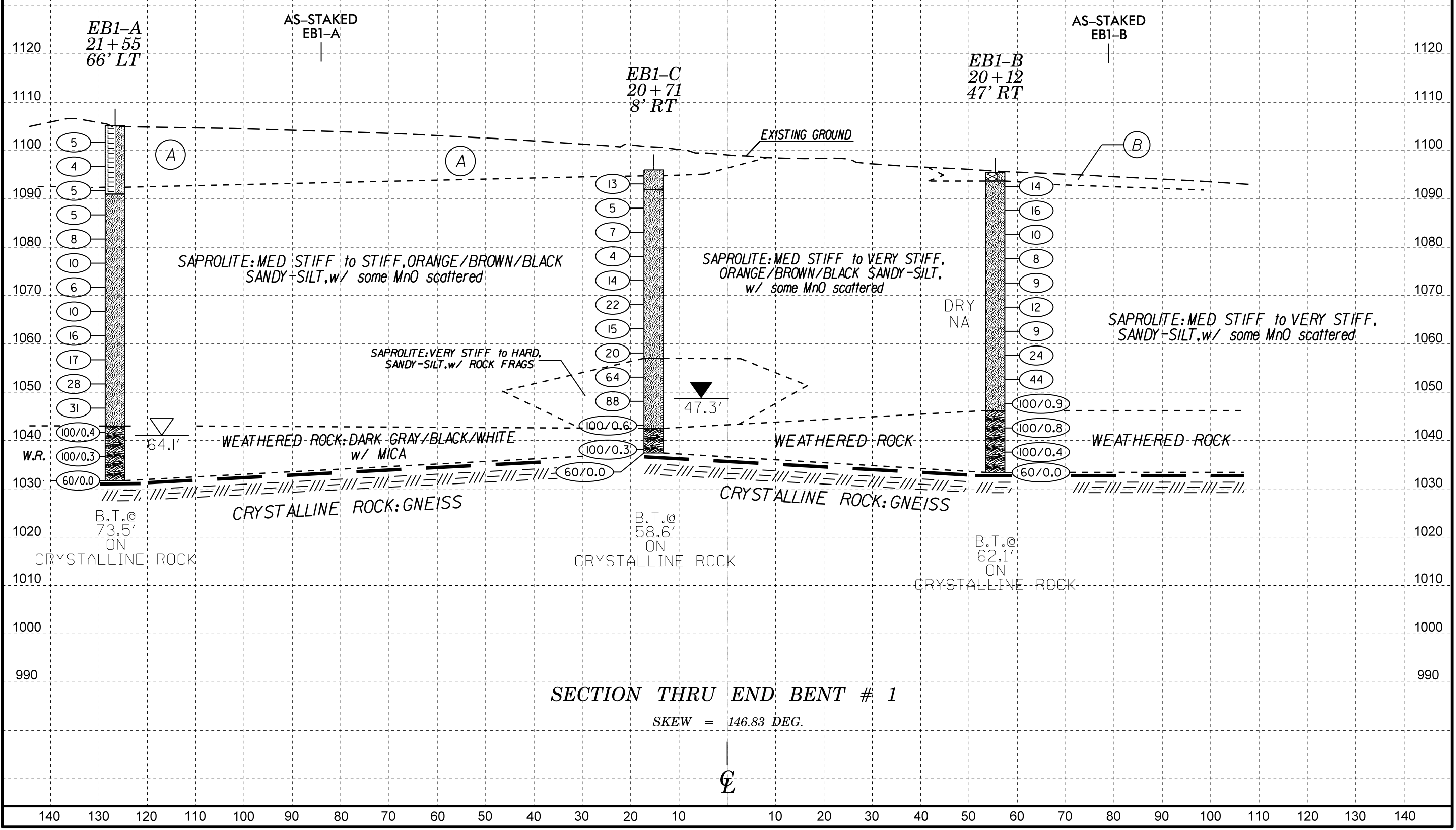
\*\*STRUCTURE DRAWING / LOCATIONS FROM PGD  
DATED 6.21.2019 (on SHAREPOINT)

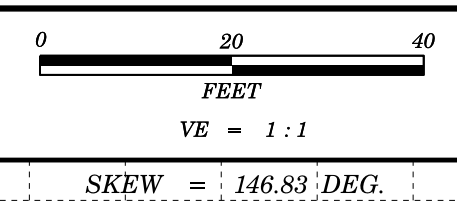


PROJECT REFERENCE NO.	SHEET NO.
B-5869	5
BRDG 0099 on US6470 over SOUTHERN RAILROAD	

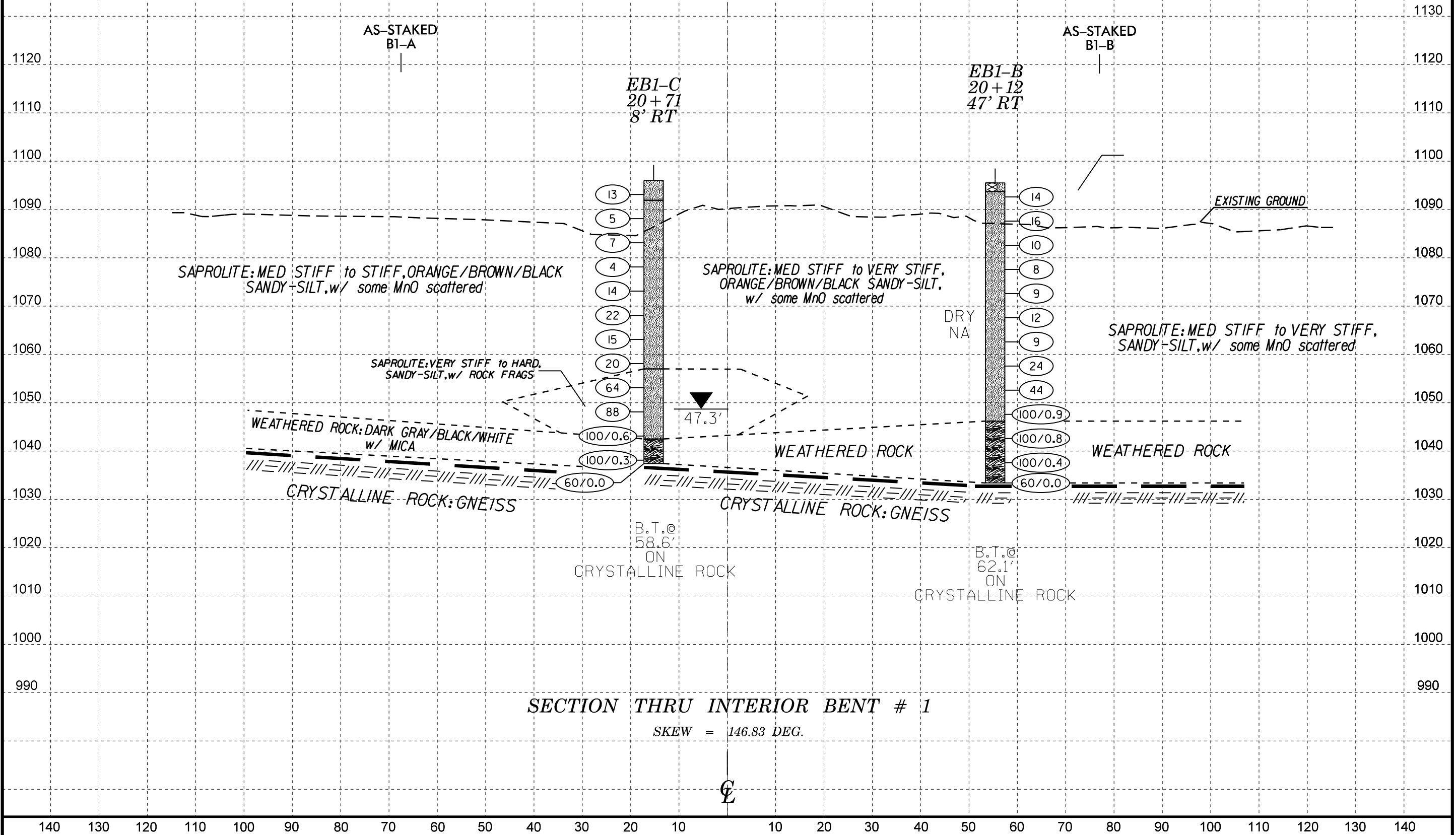
- (A) ROADWAY EMBANKMENT: MED STIFF, RED/BROWN SANDY-SILT, w/ trace CLAY & a few GRAVELS
- (B) ARTIFICIAL FILL: MED STIFF, RED/BROWN SANDY-SILT, w/ trace CLAY, some GRAVELS

SKEW = 146.83 DEG.

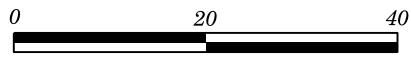




PROJECT REFERENCE NO.	SHEET NO.
B-5869	6
BRDG 0099 on US6470 over SOUTHERN RAILROAD	



140 130 120 110 100 90 80 70 60 50 40 30 20 10 10 20 30 40 50 60 70 80 90 100 110 120 130 140



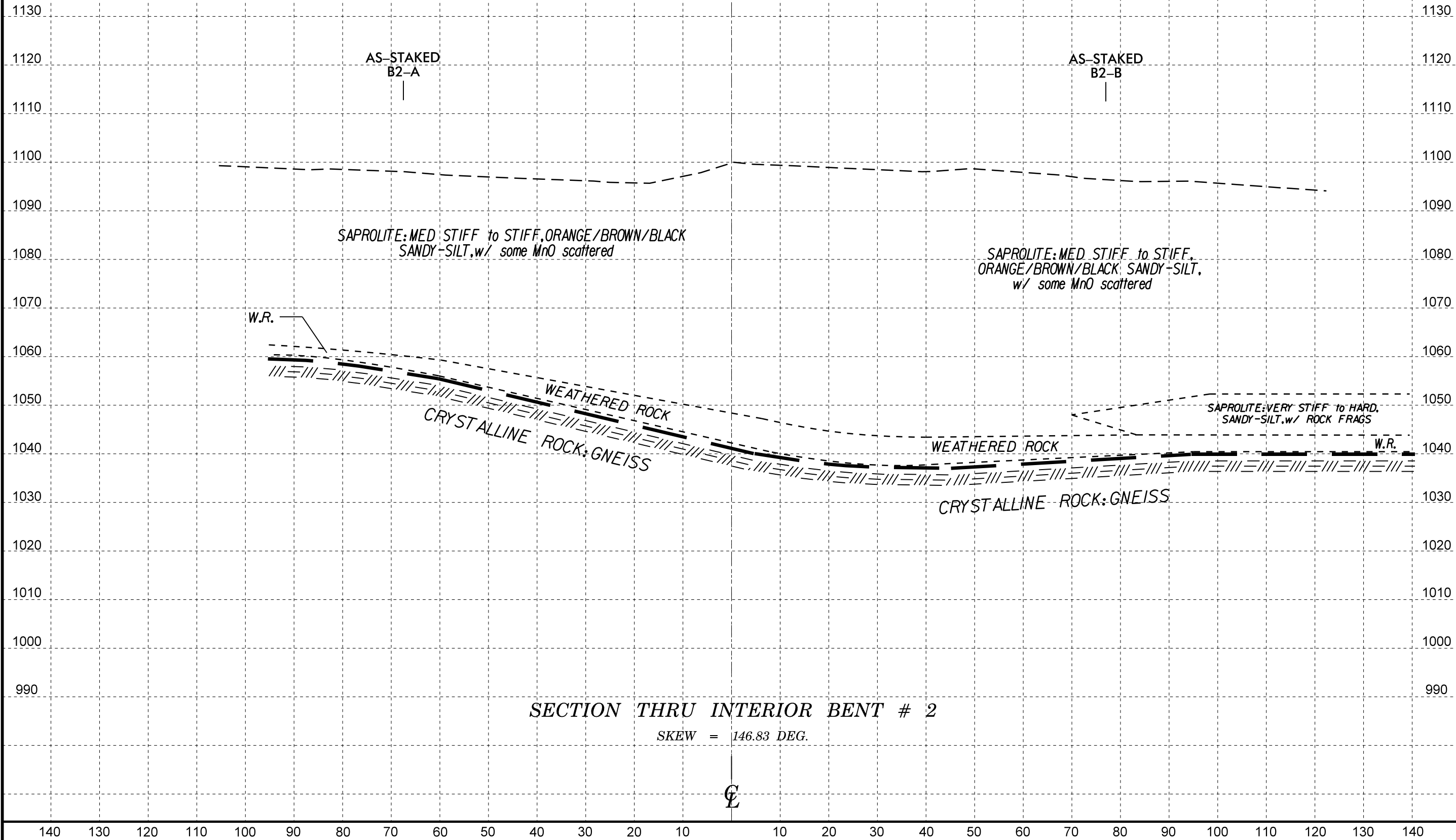
FEET  
VE = 1:1

PROJECT REFERENCE NO. SHEET NO.

B-5869 7

BRDG 0099 on US6470  
over SOUTHERN RAILROAD

SKEW = 146.83 DEG.



AS-STAKED  
B2-A

AS-STAKED  
B2-B

SAPROLITE: MED STIFF to STIFF, ORANGE/BROWN/BLACK  
SANDY-SILT, w/ some MnO scattered

SAPROLITE: MED STIFF to STIFF,  
ORANGE/BROWN/BLACK SANDY-SILT,  
w/ some MnO scattered

W.R.

WEATHERED ROCK

CRYSTALLINE ROCK: GNEISS

WEATHERED ROCK

CRYSTALLINE ROCK: GNEISS

SAPROLITE: VERY STIFF to HARD,  
SANDY-SILT, w/ ROCK FRAGS

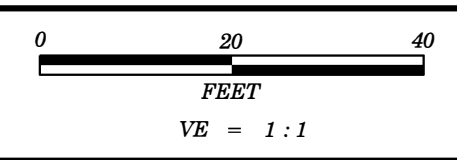
W.R.

SECTION THRU INTERIOR BENT # 2

SKEW = 146.83 DEG.

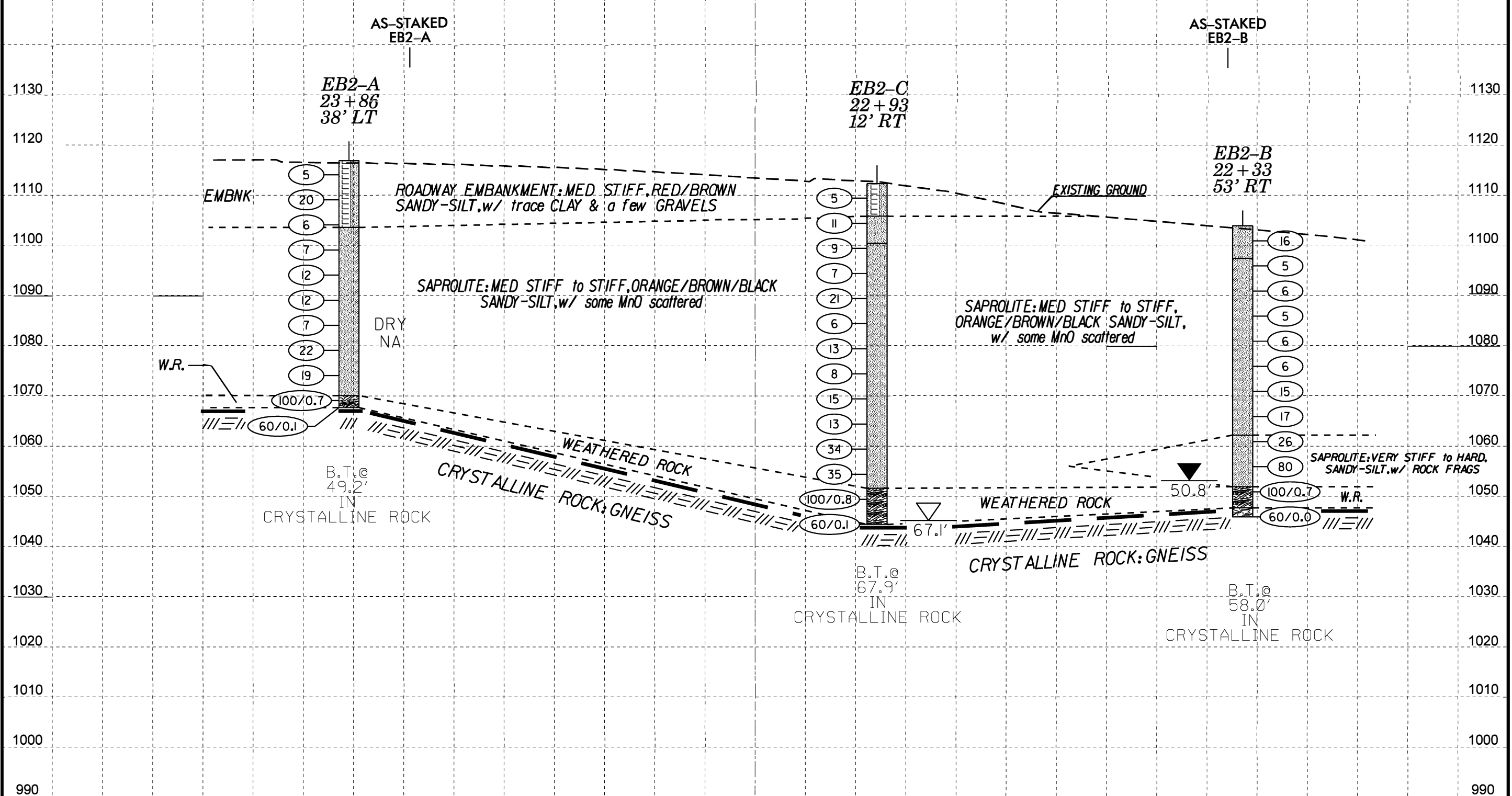


140 130 120 110 100 90 80 70 60 50 40 30 20 10 10 20 30 40 50 60 70 80 90 100 110 120 130 140



PROJECT REFERENCE NO.	SHEET NO.
B-5869	8
BRDG 0099 on US64/70 over SOUTHERN RAILROAD	

SKEW = 146.83 DEG.



SECTION THRU END BENT # 2

SKEW = 146.83 DEG.



140 130 120 110 100 90 80 70 60 50 40 30 20 10 10 20 30 40 50 60 70 80 90 100 110 120 130 140



# GEOTECHNICAL BORING REPORT BORE LOG

WBS 48063.1.FR1			TIP B-5869			COUNTY BURKE			GEOLOGIST Johnson, C. D.							
SITE DESCRIPTION Replace Bridge No. 110099 on US 64/US70 (Fleming Drive) over Southern Railroad								GROUND WTR (ft)								
BORING NO. EB1-A		STATION 21+55		OFFSET 66 ft LT		ALIGNMENT -L-		0 HR. 64.1								
COLLAR ELEV. 1,105.2		TOTAL DEPTH 73.5 ft		NORTHING 731780.4		EASTING 1197716.04		24 HR. FIAD								
DRILL RIG/HAMMER EFF./DATE AFO6744 CME - 45C 92% 07/31/2017				DRILL METHOD H.S. Augers				HAMMER TYPE Automatic								
DRILLER Cheek, D. O.			START DATE 08/28/19		COMP. DATE 08/28/19		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						
														1,105.2	GROUND SURFACE	0.0
		3.5	2	2	3							M			ROADWAY EMBANKMENT RED/BROWN, MED STIFF, SANDY-SILT, w/ trace CLAY, a few GRAVELS	
		8.5	1	2	2							M				
		13.5	1	2	3							M		1,091.0	SAPROLITE ORANGE/BROWN/BLACK, MED STIFF to STIFF, SANDY-SILT, some MnO scattered	14.2
		18.5	1	2	3							M				
		23.5	2	4	4							M				
		28.5	4	4	6							M				
		33.5	3	2	4							M				
		38.5	3	4	6							M				
		43.5	6	7	9							M				
		48.5	7	8	9							M				
		53.5	9	16	12							M				
		58.5	10	15	16							M				
		63.5	100/0.4									M				
		68.5	100/0.3									M				
		73.5	60/0.0									M				
														1,043.0	WEATHERED ROCK BROWN/BLACK	62.2
														1,031.7	Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Depth 73.5 ft (ELEVATION 1,031.7 ft) ON CRYSTALLINE ROCK (GNEISS)	73.5

WBS 48063.1.FR1			TIP B-5869			COUNTY BURKE			GEOLOGIST Johnson, C. D.							
SITE DESCRIPTION Replace Bridge No. 110099 on US 64/US70 (Fleming Drive) over Southern Railroad								GROUND WTR (ft)								
BORING NO. EB1-C		STATION 20+71		OFFSET 8 ft RT		ALIGNMENT -L-		0 HR. 49.0								
COLLAR ELEV. 1,096.0 ft		TOTAL DEPTH 58.6 ft		NORTHING 731797.9		EASTING 1197604.9		24 HR. 47.3								
DRILL RIG/HAMMER EFF./DATE AFO6744 CME - 45C 92% 07/31/2017				DRILL METHOD H.S. Augers				HAMMER TYPE Automatic								
DRILLER Cheek, D. O.			START DATE 08/27/19		COMP. DATE 08/27/19		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						
														1,096.0	GROUND SURFACE	0.0
1100															RESIDUAL RED/BROWN, MED STIFF, SANDY-SILT, w/ trace CLAY, a few GRAVELS	
	1,093.1	2.9	3	5	8							M		1,091.9	SAPROLITE ORANGE/PINK/TAN to LIGHT BROWN/BLACK, MED STIFF to STIFF, SANDY-SILT, some slight MnO scattered	4.1
	1,088.1	7.9	2	2	3							M				
	1,083.1	12.9	2	4	3							M				
	1,078.1	17.9	1	2	2							M				
	1,073.1	22.9	4	7	7							M				
	1,068.1	27.9	5	11	11							M				
	1,063.1	32.9	4	4	11							M				
	1,058.1	37.9	4	8	12							M		1,057.0	SAPROLITE WHITE/BLACK, VERY STIFF to HARD, SANDY-SILT, w/ several WR seams	39.0
	1,053.1	42.9	12	29	35							M				
	1,048.1	47.9	41	46	42							M				
	1,043.1	52.9	40	60/0.1								M		1,042.5	WEATHERED ROCK DARK GRAY/BLACK/WHITE	53.5
	1,038.1	57.9												1,037.4	Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,037.4 ft ON CRYSTALLINE ROCK (GNEISS)	58.6
	1,037.4	58.6	100/0.3													
			60/0.0													

NCDOT BORE DOUBLE B5869\_BURKE\_BOREHOLES.GPJ\_NC\_DOT.GDT 9/18/19

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 48063.1.FR1		TIP B-5869		COUNTY BURKE		GEOLOGIST Johnson, C. D.	
SITE DESCRIPTION Replace Bridge No. 110099 on US 64/US70 (Fleming Drive) over Southern Railroad							GROUND WTR (ft)
BORING NO. EB1-B		STATION 20+12		OFFSET 47 ft RT		ALIGNMENT -L-	
COLLAR ELEV. 1,095.5 ft		TOTAL DEPTH 62.1 ft		NORTHING 731818.5		EASTING 1197537.3	
DRILL RIG/HAMMER EFF./DATE AFO6744 CME - 45C 92% 07/31/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Cheek, D. O.		START DATE 08/27/19		COMP. DATE 08/27/19		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					
1100															
1095															
	1,092.6	2.9		4	5	9									
1090															
	1,087.6	7.9		5	7	9									
1085															
	1,082.6	12.9		3	4	6									
1080															
	1,077.6	17.9		3	4	4									
1075															
	1,072.6	22.9		4	4	5									
1070															
	1,067.6	27.9		2	6	6									
1065															
	1,062.6	32.9		3	3	6									
1060															
	1,057.6	37.9		5	10	14									
1055															
	1,052.6	42.9		11	14	30									
1050															
	1,047.6	47.9		17	30	70/0.4									
1045															
	1,042.6	52.9		33	67/0.3										
1040															
	1,037.6	57.9		100/0.4											
1035															
	1,033.4	62.1		60/0.0											

WBS 48063.1.FR1		TIP B-5869		COUNTY BURKE		GEOLOGIST Johnson, C. D.	
SITE DESCRIPTION Replace Bridge No. 110099 on US 64/US70 (Fleming Drive) over Southern Railroad							GROUND WTR (ft)
BORING NO. EB2-A		STATION 23+86		OFFSET 38 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 1,116.9 ft		TOTAL DEPTH 49.3 ft		NORTHING 731585.6		EASTING 1197841.8	
DRILL RIG/HAMMER EFF./DATE AFO6744 CME - 45C 92% 07/31/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Cheek, D. O.		START DATE 08/28/19		COMP. DATE 08/28/19		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					
1120															
	1,116.9														
1115															
	1,114.1	2.8		2	2	3									
1110															
	1,109.1	7.8		4	11	9									
1105															
	1,104.1	12.8		3	3	3									
1100															
	1,099.1	17.8		2	3	4									
1095															
	1,094.1	22.8		2	5	7									
1090															
	1,089.1	27.8		6	6	6									
1085															
	1,084.1	32.8		3	4	3									
1080															
	1,079.1	37.8		8	10	12									
1075															
	1,074.1	42.8		7	12	7									
1070															
	1,069.1	47.8		4	18	82/0.2									
	1,067.7	49.2		60/0.1											

NCDOT BORE DOUBLE\_B5869\_GEO\_BRDG0099\_BURKE\_BOREHOLES.GPJ\_NC\_DOT.GDT 9/18/19

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 48063.1.FR1		TIP B-5869		COUNTY BURKE		GEOLOGIST Johnson, C. D.	
SITE DESCRIPTION Replace Bridge No. 110099 on US 64/US70 (Fleming Drive) over Southern Railroad							GROUND WTR (ft)
BORING NO. EB2-C		STATION 22+93		OFFSET 12 ft RT		ALIGNMENT -L-	0 HR. 67.1
COLLAR ELEV. 1,112.3 ft		TOTAL DEPTH 68.0 ft		NORTHING 731624.971		EASTING 1197743.9	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE AFC6744 CME - 45C 92% 07/31/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Cheek, D. O.		START DATE 08/26/19		COMP. DATE 08/26/19		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					
1115															
															1,112.3 GROUND SURFACE 0.0
1110	1,109.4	2.9	4	2	3							M		ROADWAY EMBANKMENT RED/BROWN, MED STIFF, SANDY-SILT, w/ trace CLAY & MICA, a few GRAVELS	
1105	1,104.4	7.9	4	5	6							M		SAPROLITE RED/ORANGE/BROWN, STIFF, SANDY-SILT, w/ trace CLAY & MICA, some MnO scattered	6.5
1100	1,099.4	12.9	3	3	6							M		SAPROLITE LIGHT BROWN & GRAY, MED STIFF to STIFF, FINE-to-COURSE SANDY-SILT, w/ trace CLAY & MICA, some MnO scattered; becoming HARD consistency @ 51.5'	11.9
1095	1,094.4	17.9	1	4	3							M			
1090	1,089.4	22.9	2	10	11							M			
1085	1,084.4	27.9	2	3	3							M			
1080	1,079.4	32.9	3	6	7							M			
1075	1,074.4	37.9	2	4	4							M			
1070	1,069.4	42.9	3	6	9							M			
1065	1,064.4	47.9	4	7	6							M			
1060	1,059.4	52.9	8	18	16							M			
1055	1,054.4	57.9	7	13	22							M			
1050	1,049.4	62.9	13	24	76/0.3							M			
1045	1,044.4	67.9			60/0.1							M			
															1,051.6 WEATHERED ROCK WHITE/GRAY/BLACK 60.7
															1,044.4 WEATHERED ROCK WHITE/GRAY/BLACK 67.9
															Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,044.3 ft IN CRYSTALLINE ROCK (GNEISS)

WBS 48063.1.FR1		TIP B-5869		COUNTY BURKE		GEOLOGIST Johnson, C. D.	
SITE DESCRIPTION Replace Bridge No. 110099 on US 64/US70 (Fleming Drive) over Southern Railroad							GROUND WTR (ft)
BORING NO. EB2-B		STATION 22+33		OFFSET 53 ft RT		ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 1,103.9 ft		TOTAL DEPTH 58.0 ft		NORTHING 731644.9		EASTING 1197673.8	24 HR. 50.8
DRILL RIG/HAMMER EFF./DATE AFC6744 CME - 45C 92% 07/31/2017				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Cheek, D. O.		START DATE 08/26/19		COMP. DATE 08/26/19		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					
1105															1,103.9 GROUND SURFACE 0.0
1100	1,100.9	3.0	3	6	10							M		RESIDUAL RED/ORANGE, STIFF, SANDY-SILT, w/ trace CLAY, some ORGANICS	
1095	1,095.9	8.0	1	2	3							M		SAPROLITE BROWN/ORANGE, MED STIFF to STIFF, SANDY-SILT, trace ROCK FRAGS & some slight MnO scattered	6.5
1090	1,090.9	13.0	3	2	4							M			
1085	1,085.9	18.0	2	2	3							M			
1080	1,080.9	23.0	3	3	3							M			
1075	1,075.9	28.0	1	3	3							M			
1070	1,070.9	33.0	3	9	6							M			
1065	1,065.9	38.0	4	8	9							M			
1060	1,060.9	43.0	10	12	14							M			
1055	1,055.9	48.0	14	35	45							M			
1050	1,050.9	53.0	44	56/0.2								M			
	1,045.9	58.0			60/0.0							M			
															1,062.2 SAPROLITE 41.7
															GRAY w/ BLACK/WHITE, VERY STIFF becoming HARD, SANDY-SILT, some ROCK FRAGMENTS, trace MnO
															1,051.9 WEATHERED ROCK DARK GRAY/BLACK/WHITE 52.0
															1,047.7 CRYSTALLINE ROCK 56.2
															1,045.9 CRYSTALLINE ROCK 58.0
															Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,045.9 ft ON CRYSTALLINE ROCK (GNEISS)

NCDOT BORE DOUBLE B5869\_GEO\_BRDG0099\_BURKE\_BOREHOLES.GPJ\_NC\_DOT.GDT 9/18/19