

REFERENCE: BR-0094

PROJECT: 67094

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY ROCKINGHAM  
PROJECT DESCRIPTION BRIDGE 780069 ON NC 770  
OVER US 220

CONTENTS

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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0094	1	11

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:

- 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

BRECCIA

R. WESSINGER

D. HARRIS

INVESTIGATED BY F&ME CONSULTANTS

DRAWN BY R. LAWRENCE, P.E.

CHECKED BY A. SHANNON, P.E.

SUBMITTED BY A. SHANNON, P.E.

DATE AUGUST 2022

Prepared in the Office of:

**F&ME** CONSULTANTS, INC.  
1825 BLANDING STREET  
COLUMBIA, SC 29201



DocuSigned by:

Adam Shannon

08/17/2022

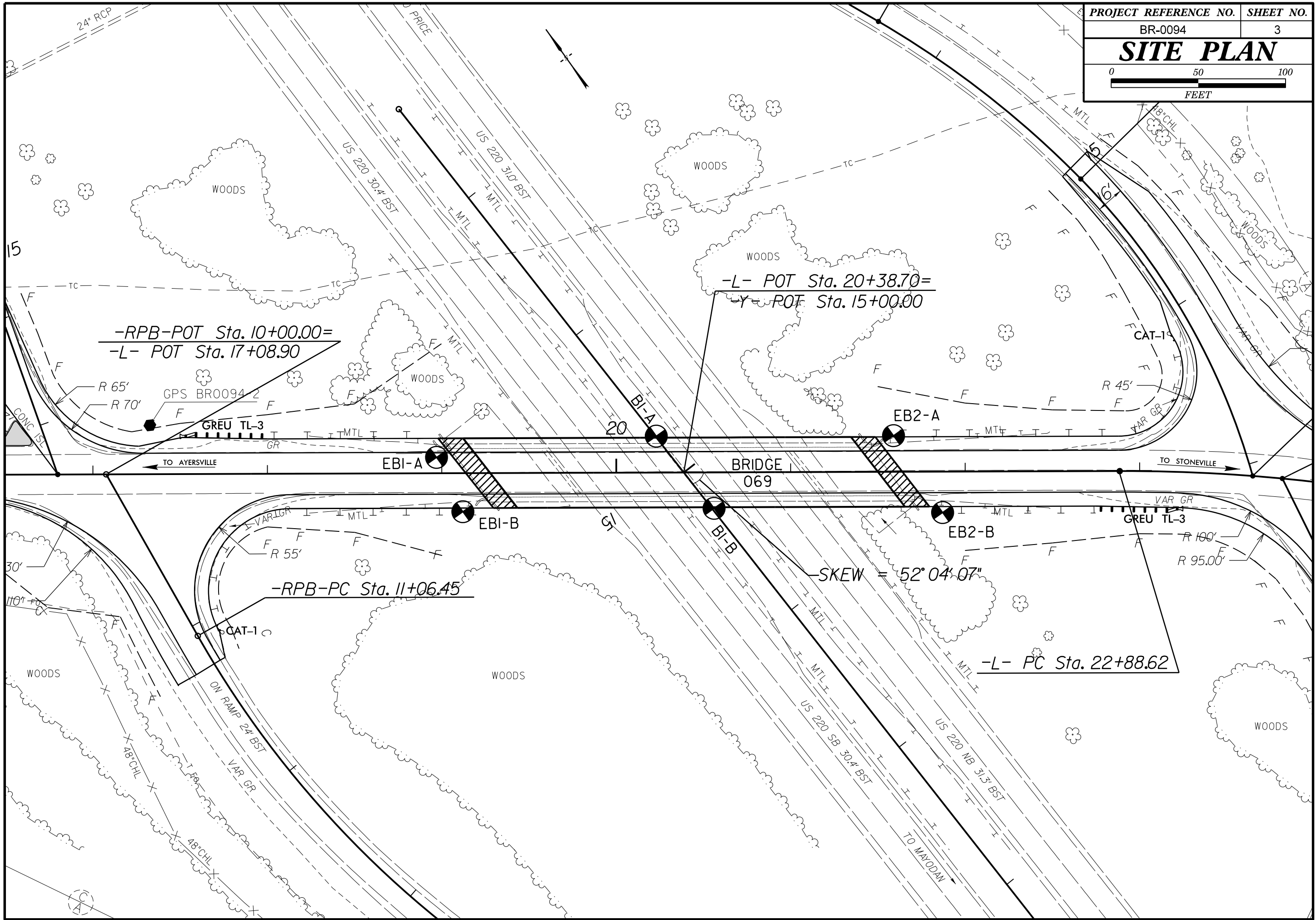
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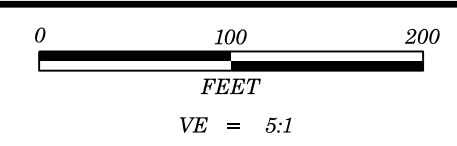
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DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

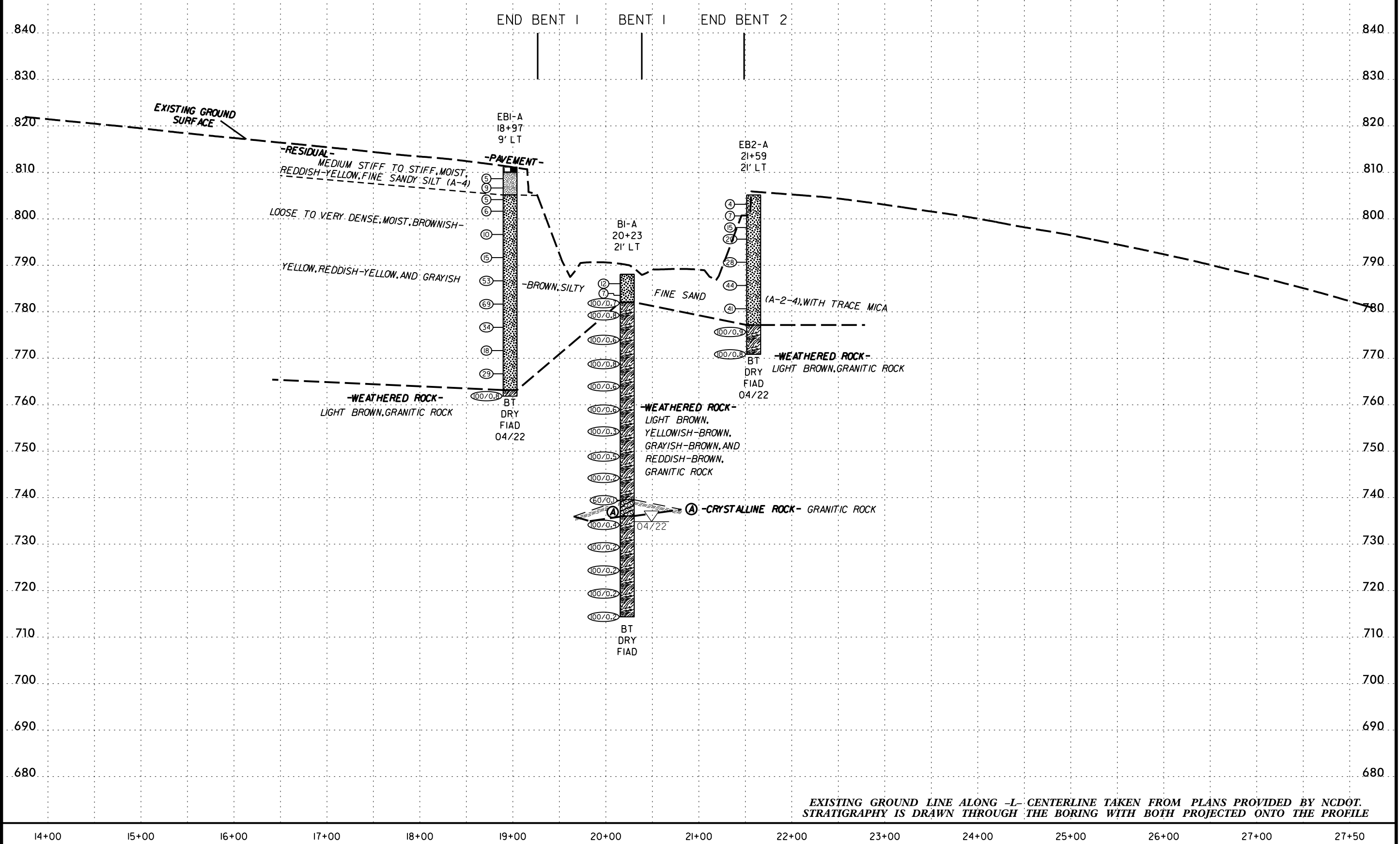




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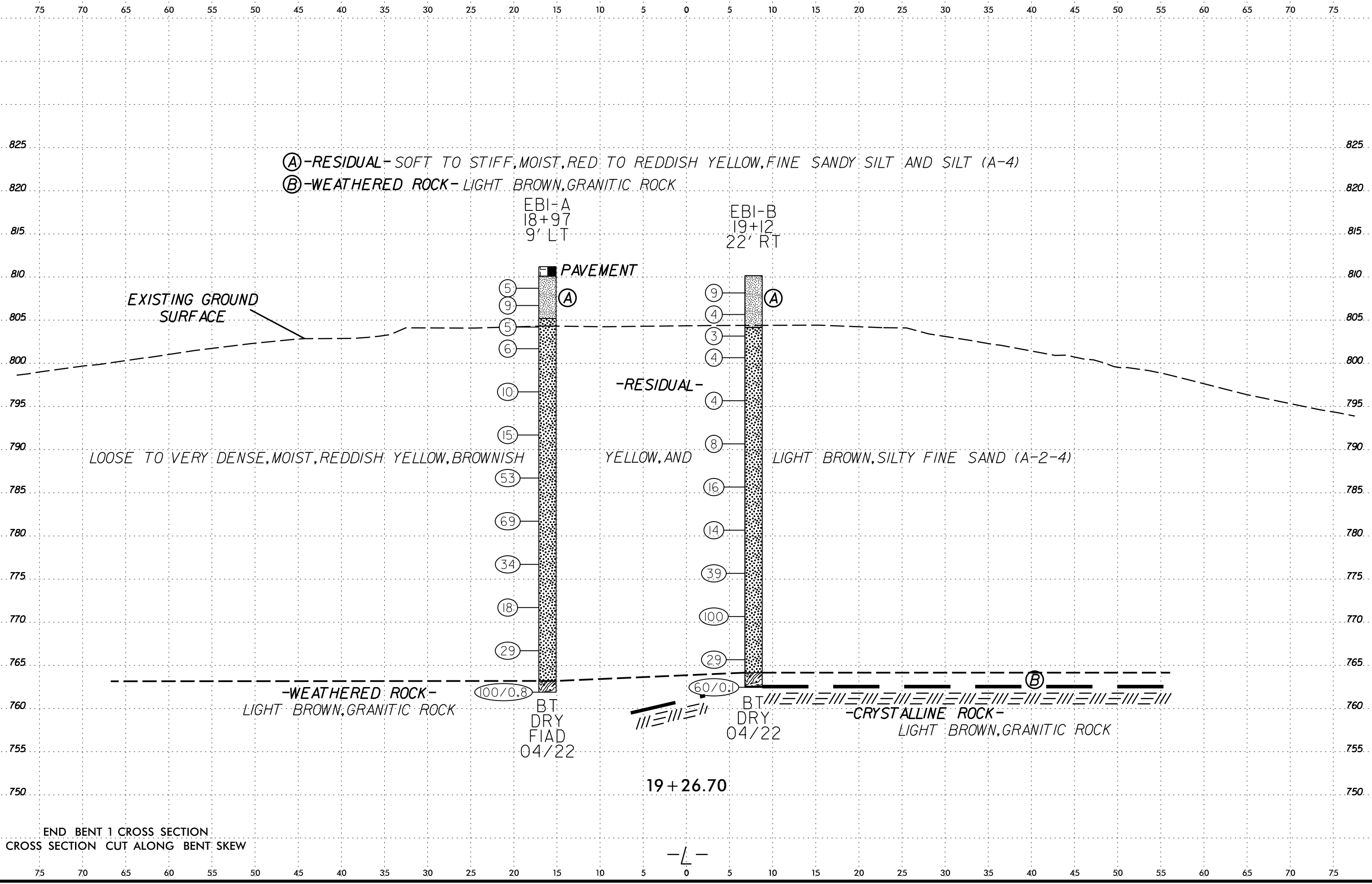


<b>PROJECT REFERENCE NO.</b>	<b>SHEET NO.</b>
BR-0094	4
BRIDGE 780069 ON NC 770 OVER US 220 SKEW = 52 DEGREES	

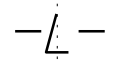


EXISTING GROUND LINE ALONG -L- CENTERLINE TAKEN FROM PLANS PROVIDED BY NCDOT.  
STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE PROFILE

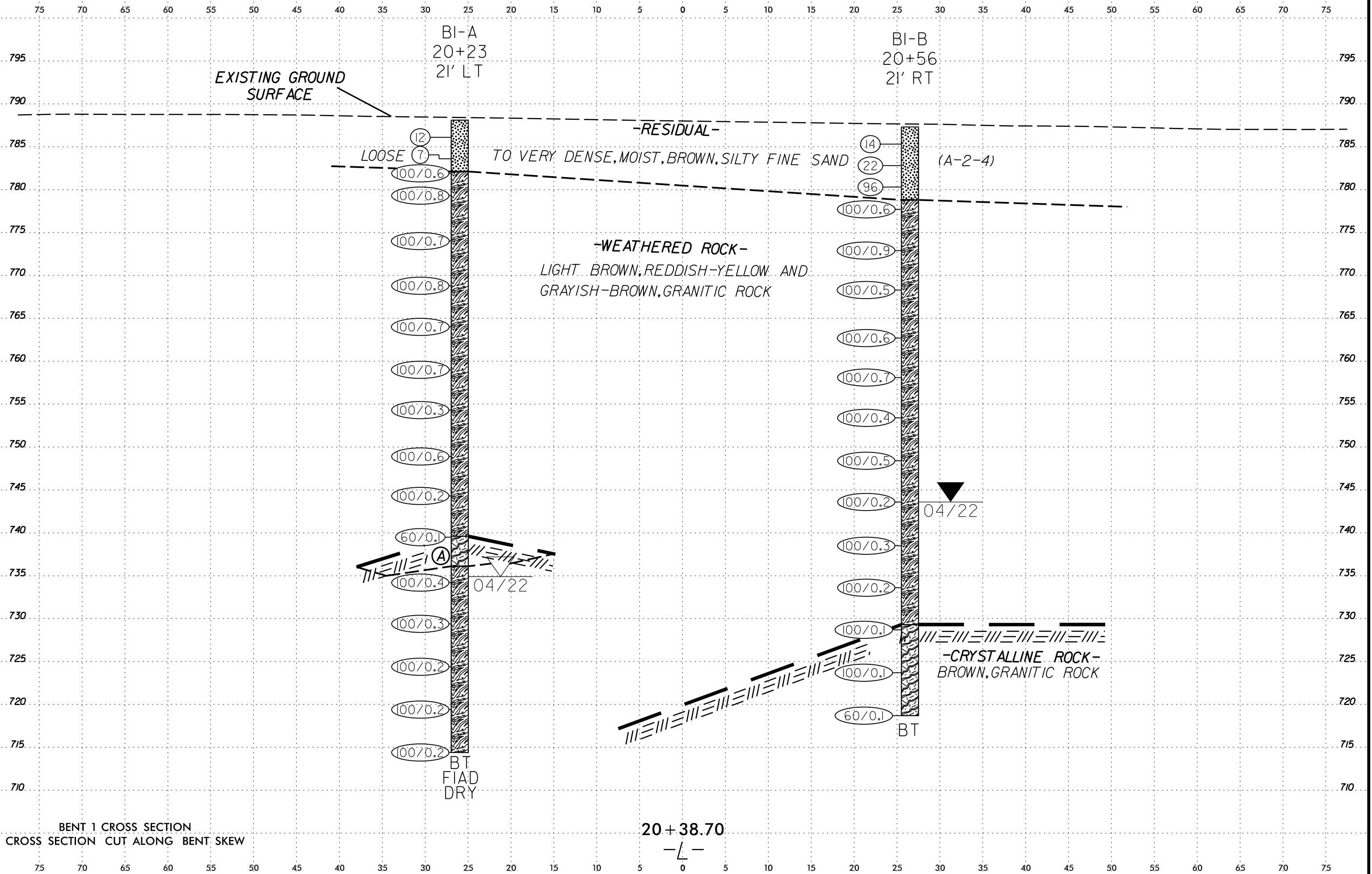
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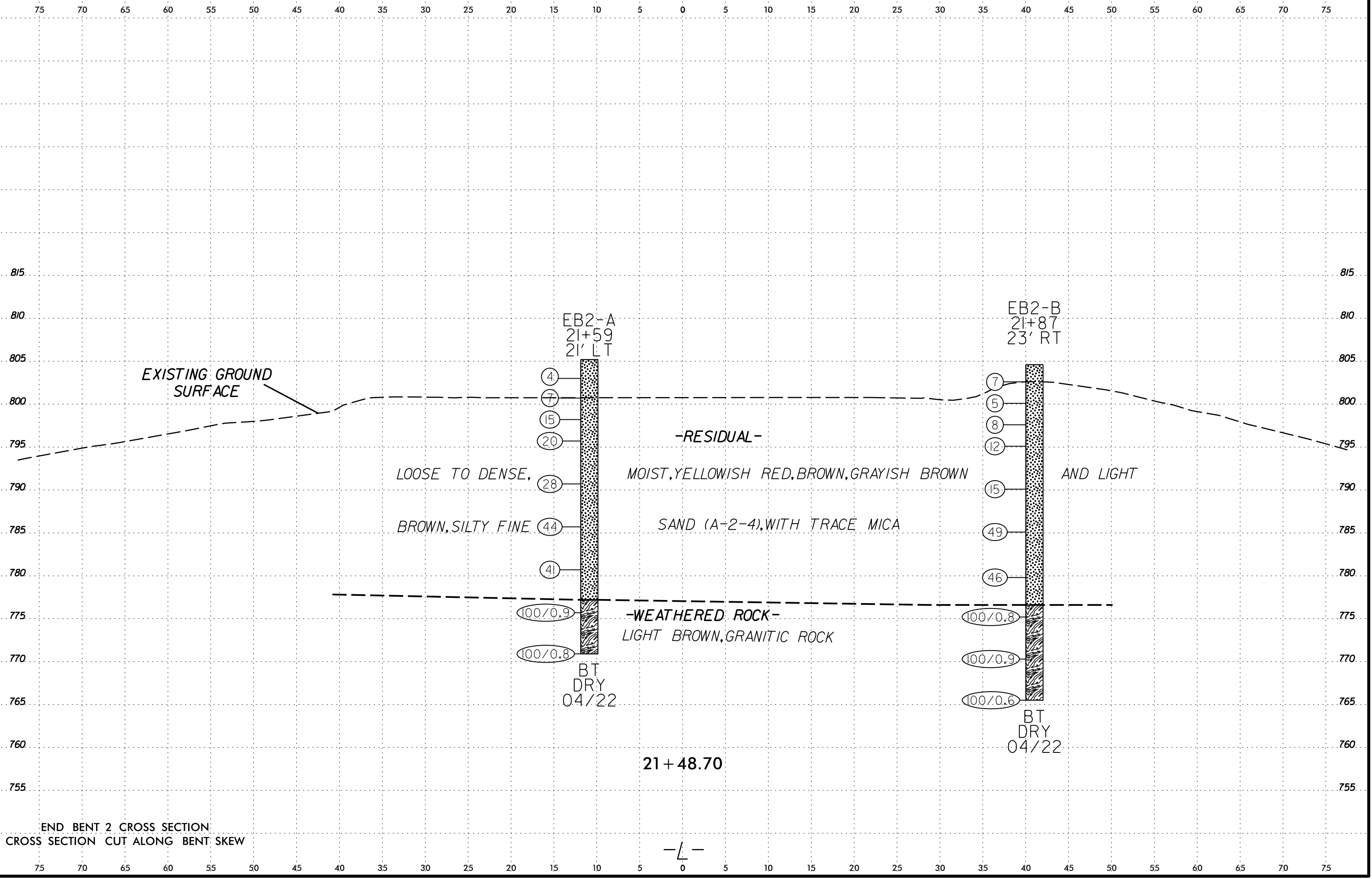
END BENT 1 CROSS SECTION  
CROSS SECTION CUT ALONG BENT SKEW



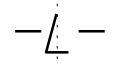
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END BENT 2 CROSS SECTION  
CROSS SECTION CUT ALONG BENT SKEW



# GEOTECHNICAL BORING REPORT

## BORE LOG

<b>WBS</b> 67094.1.1	<b>TIP</b> BR-0094	<b>COUNTY</b> ROCKINGHAM	<b>GEOLOGIST</b> R. Wessinger
<b>SITE DESCRIPTION</b> Bridge 780069 on NC 770 over US 220			<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> EB1-A	<b>STATION</b> 18+97	<b>OFFSET</b> 9 ft LT	<b>ALIGNMENT</b> L
<b>COLLAR ELEV.</b> 811.2 ft	<b>TOTAL DEPTH</b> 49.3 ft	<b>NORTHING</b> 990,429	<b>EASTING</b> 1,727,383
<b>DRILL RIGHAMMER EFF./DATE</b> BRE9553 CME-550X 85% 03/11/2022		<b>DRILL METHOD</b> H.S. Augers	<b>HAMMER TYPE</b> Automatic
<b>DRILLER</b> D. Harris	<b>START DATE</b> 04/14/22	<b>COMP. DATE</b> 04/14/22	<b>SURFACE WATER DEPTH</b> N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			
815													
810	810.1	1.1	2	3	2							M	GROUND SURFACE 811.2 ROADWAY EMBANKMENT ASPHALT & ABC 810.1
	807.7	3.5	2	4	5							M	RESIDUAL Medium Stiff to Stiff, Red, SILT (A-4)
805	805.2	6.0	2	2	3							M	805.2 Loose to Very Dense, Yellowish-Red to Brownish-Yellow, Silty Fine SAND (A-2-4)
	802.7	8.5	2	2	4							M	
800	797.7	13.5	4	4	6							M	
795	792.7	18.5	6	5	10							M	
790	787.7	23.5	13	24	29							M	
785	782.7	28.5	26	35	34							M	
780	777.7	33.5	10	14	20							M	
775	772.7	38.5	4	8	10							M	
770	767.7	43.5	15	12	17							M	
765	762.7	48.5	24	76/0.3								M	
													763.2 WEATHERED ROCK 48.0 761.9 Light Brown, GRANITIC ROCK 49.3 Boring Terminated at Elevation 761.9 ft In Weathered Rock (GRANITIC ROCK)

<b>WBS</b> 67094.1.1	<b>TIP</b> BR-0094	<b>COUNTY</b> ROCKINGHAM	<b>GEOLOGIST</b> R. Wessinger
<b>SITE DESCRIPTION</b> Bridge 780069 on NC 770 over US 220			<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> EB1-B	<b>STATION</b> 19+12	<b>OFFSET</b> 22 ft RT	<b>ALIGNMENT</b> L
<b>COLLAR ELEV.</b> 810.2 ft	<b>TOTAL DEPTH</b> 47.7 ft	<b>NORTHING</b> 990,395	<b>EASTING</b> 1,727,377
<b>DRILL RIGHAMMER EFF./DATE</b> BRE9553 CME-550X 85% 03/11/2022		<b>DRILL METHOD</b> H.S. Augers	<b>HAMMER TYPE</b> Automatic
<b>DRILLER</b> D. Harris	<b>START DATE</b> 04/14/22	<b>COMP. DATE</b> 04/14/22	<b>SURFACE WATER DEPTH</b> N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			
815													
810	809.2	1.0	3	4	5							M	810.2 GROUND SURFACE
	806.7	3.5	2	2	2							M	RESIDUAL Stiff to Soft, Yellowish-Red, Fine Sandy SILT (A-4)
805	804.2	6.0	1	1	2							M	804.2 Very Loose to Very Dense, Light Brown and Reddish-Yellow to Brownish-Yellow, Silty Fine SAND (A-2-4)
	801.7	8.5	1	1	3							M	
800	796.7	13.5	2	1	3							M	
795	791.7	18.5	3	4	4							M	
790	786.7	23.5	4	7	9							M	
785	781.7	28.5	2	6	8							M	
780	776.7	33.5	11	17	22							M	
775	771.7	38.5	24	42	58							M	
770	766.7	43.5	19	16	13							M	
765												M	764.2 WEATHERED ROCK 46.0 762.6 Light Brown, GRANITIC ROCK 47.6 762.5 CRYSTALLINE ROCK 47.7 Light Brown, GRANITIC ROCK Boring Terminated with Standard Penetration Test Refusal at Elevation 762.5 ft In Crystalline Rock (GRANITIC ROCK)

NCDOT BORE DOUBLE BR0094\_GEO\_RDY\_BL\_REV1.GPJ\_NC\_DOT.GDT 8/8/22



# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 67094.1.1		TIP BR-0094		COUNTY ROCKINGHAM		GEOLOGIST R. Wessinger										
SITE DESCRIPTION Bridge 780069 on NC 770 over US 220							GROUND WTR (ft)									
BORING NO. B1-A		STATION 20+23		OFFSET 21 ft LT		ALIGNMENT L										
COLLAR ELEV. 788.1 ft		TOTAL DEPTH 73.7 ft		NORTHING 990,366		EASTING 1,727,492										
DRILL RIGHAMMER EFF./DATE BRE9553 CME-550X 85% 03/11/2022			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER D. Harris		START DATE 04/19/22		COMP. DATE 04/19/22		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						
790														788.1	0.0	GROUND SURFACE
	787.1	1.0	6	5	7											RESIDUAL Medium Dense to Loose, Brown, Silty Fine SAND (A-2-4)
785	784.6	3.5	9	3	4											
	782.1	6.0	36	64/0.2												
780	779.6	8.5	34	66/0.3												WEATHERED ROCK Yellowish-Brown to Grayish-Brown, GRANITIC ROCK
	774.6	13.5	54	46/0.1												
775	774.6	13.5	54	46/0.1												
770	769.6	18.5	38	62/0.4												
765	764.6	23.5	48	52/0.2												
760	759.6	28.5	42	58/0.2												
755	754.6	33.5	100/0.3													
750	749.6	38.5	86	14/0.1												
745	744.6	43.5	100/0.2													
740	739.6	48.5	60/0.1													CRYSTALLINE ROCK GRANITIC ROCK
735	734.6	53.5	100/0.4													WEATHERED ROCK Brown to Reddish-Brown, GRANITIC ROCK
730	729.6	58.5	100/0.3													
725	724.6	63.5	100/0.2													
720	719.6	68.5	100/0.2													
715	714.6	73.5	100/0.2													Boring Terminated at Elevation 714.4 ft In Weathered Rock (GRANITIC ROCK)

WBS 67094.1.1		TIP BR-0094		COUNTY ROCKINGHAM		GEOLOGIST R. Wessinger										
SITE DESCRIPTION Bridge 780069 on NC 770 over US 220							GROUND WTR (ft)									
BORING NO. B1-B		STATION 20+56		OFFSET 21 ft RT		ALIGNMENT L										
COLLAR ELEV. 787.3 ft		TOTAL DEPTH 68.6 ft		NORTHING 990,313		EASTING 1,727,495										
DRILL RIGHAMMER EFF./DATE BRE9553 CME-550X 85% 03/11/2022			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER D. Harris		START DATE 04/18/22		COMP. DATE 04/19/22		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						
790														787.3	0.0	GROUND SURFACE
	786.3	1.0	4	6	8											RESIDUAL Medium Dense to Very Dense, Light Brown, Silty Fine SAND (A-2-4)
785	783.8	3.5	6	10	12											
	781.3	6.0	16	31	65											
780	778.8	8.5	17	80	20/0.1											WEATHERED ROCK Light Brown to Reddish-Yellow, GRANITIC ROCK
	773.8	13.5	23	71/0.4												
775	773.8	13.5	23	71/0.4												
770	768.8	18.5	84	16/0.0												
765	763.8	23.5	30	63	37/0.1											
760	758.8	28.5	49	50/0.2												
755	753.8	33.5	100/0.4													
750	748.8	38.5	100/0.5													
745	743.8	43.5	100/0.2													
740	738.8	48.5	100/0.3													
735	733.8	53.5	100/0.2													
730	728.8	58.5	100/0.1													
725	723.8	63.5	100/0.1													
720	718.8	68.5	60/0.1													
																Boring Terminated with Standard Penetration Test Refusal at Elevation 718.7 ft In Crystalline Rock (GRANITIC ROCK)

NCDOT BORE DOUBLE BR0094\_GEO\_RDY\_BL\_REV1.GPJ NC\_DOT.GDT 8/8/22

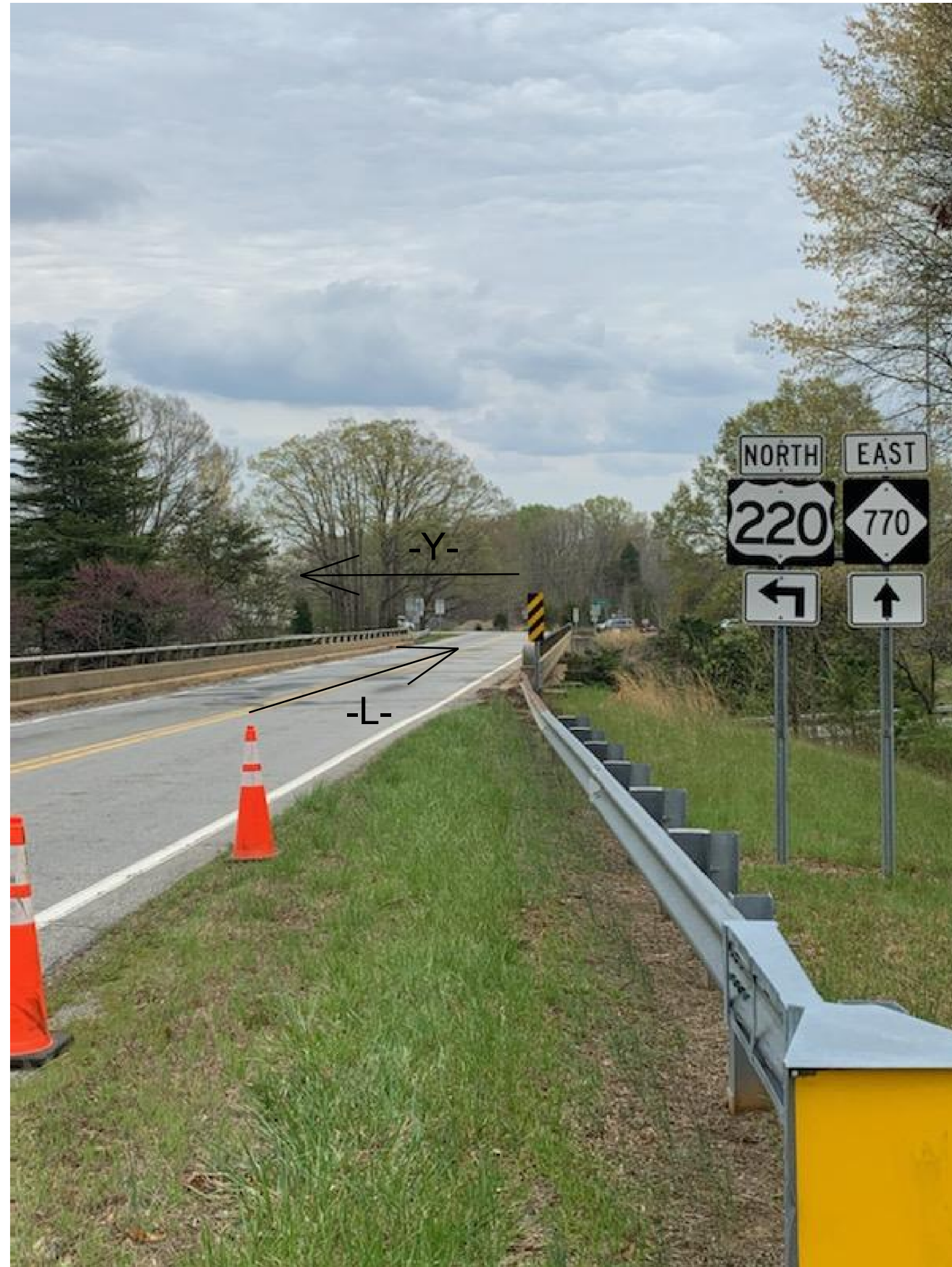
# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 67094.1.1		TIP BR-0094		COUNTY ROCKINGHAM		GEOLOGIST R. Wessinger											
SITE DESCRIPTION Bridge 780069 on NC 770 over US 220							GROUND WTR (ft)										
BORING NO. EB2-A		STATION 21+59		OFFSET 21 ft LT		ALIGNMENT L											
COLLAR ELEV. 805.2 ft		TOTAL DEPTH 34.3 ft		NORTHING 990,287		EASTING 1,727,603											
DRILL RIG/HAMMER EFF./DATE BRE9553 CME-550X 85% 03/11/2022		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic													
DRILLER D. Harris		START DATE 04/18/22		COMP. DATE 04/18/22		SURFACE WATER DEPTH 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							
810																	
805	804.2	1.0	1	1	3								M		805.2	GROUND SURFACE 0.0	
	801.7	3.5	1	3	4								M	RESIDUAL Loose to Dense, Yellowish-Red to Grayish-Brown, Silty Fine SAND (A-2-4), with Trace Mica			
800	799.2	6.0	4	6	9								M				
	796.7	8.5	6	9	11								M				
795	791.7	13.5	9	13	15								M				
	786.7	18.5	13	19	25								M				
785	781.7	23.5	13	17	24								M				
780	776.7	28.5	18	22	24								M				
	771.7	33.5	39	61	0.3								M				
775											100/0.9					777.2	WEATHERED ROCK 28.0
																770.9	WEATHERED ROCK 34.3
																Boring Terminated at Elevation 770.9 ft In Weathered Rock (GRANITIC ROCK)	

WBS 67094.1.1		TIP BR-0094		COUNTY ROCKINGHAM		GEOLOGIST R. Wessinger										
SITE DESCRIPTION Bridge 780069 on NC 770 over US 220							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 21+87		OFFSET 23 ft RT		ALIGNMENT L										
COLLAR ELEV. 804.6 ft		TOTAL DEPTH 39.1 ft		NORTHING 990,235		EASTING 1,727,600										
DRILL RIG/HAMMER EFF./DATE BRE9553 CME-550X 85% 03/11/2022		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER D. Harris		START DATE 04/14/22		COMP. DATE 04/14/22		SURFACE WATER DEPTH 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						
805																
	803.6	1.0	1	2	5								M	RESIDUAL Loose to Dense, Brownish-Yellow to Grayish-Brown, Silty Fine SAND (A-2-4) with Trace Gravel Sized Rock Fragments	804.6	GROUND SURFACE 0.0
800	801.1	3.5	2	2	3								M			
	798.6	6.0	2	4	4								M			
795	796.1	8.5	4	6	6								M			
	791.1	13.5	4	6	9								M			
790	786.1	18.5	7	18	31								M			
	781.1	23.5	15	18	28								M			
785	776.1	28.5	13	39	61/0.3								M			
780	771.1	33.5	38	62	0.4								M			
775	766.1	38.5	68	32	0.1								M			
											100/0.8				776.6	WEATHERED ROCK 28.0
															765.5	WEATHERED ROCK 39.1
																Boring Terminated at Elevation 765.5 ft In Weathered Rock (GRANITIC ROCK)

NCDOT BORE DOUBLE BR0094\_GEO\_RDY\_BL\_REV1.GPJ NC\_DOT.GDT 8/8/22



BRIDGE 780069 ON NC 770 OVER US 220  
END BENT 1 LOOKING AT END BENT 2