

REFERENCE: BR-0043

PROJECT: 67043

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

STRUCTURE  
SUBSURFACE INVESTIGATION

COUNTY ROCKINGHAM

SITE DESCRIPTION RETAINING WALL NO.1 ON -W1-  
FROM 0+00 TO 2+04.14 AND RETAINING WALL  
ON -W2- FROM 0+00 TO 2+01.22

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
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10	SOIL TEST RESULTS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0043	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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- 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

C. Ranieri, GIT

S. Davis

T. Beard

INVESTIGATED BY F&R, Inc.

DRAWN BY T.T. Walker

CHECKED BY P. Alton P.E.

SUBMITTED BY C. Wang, P.E.

DATE September 2022

SINCE **Prepared in the Office of:**  

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DocuSigned by:

Cheng Wang

12/12/2022

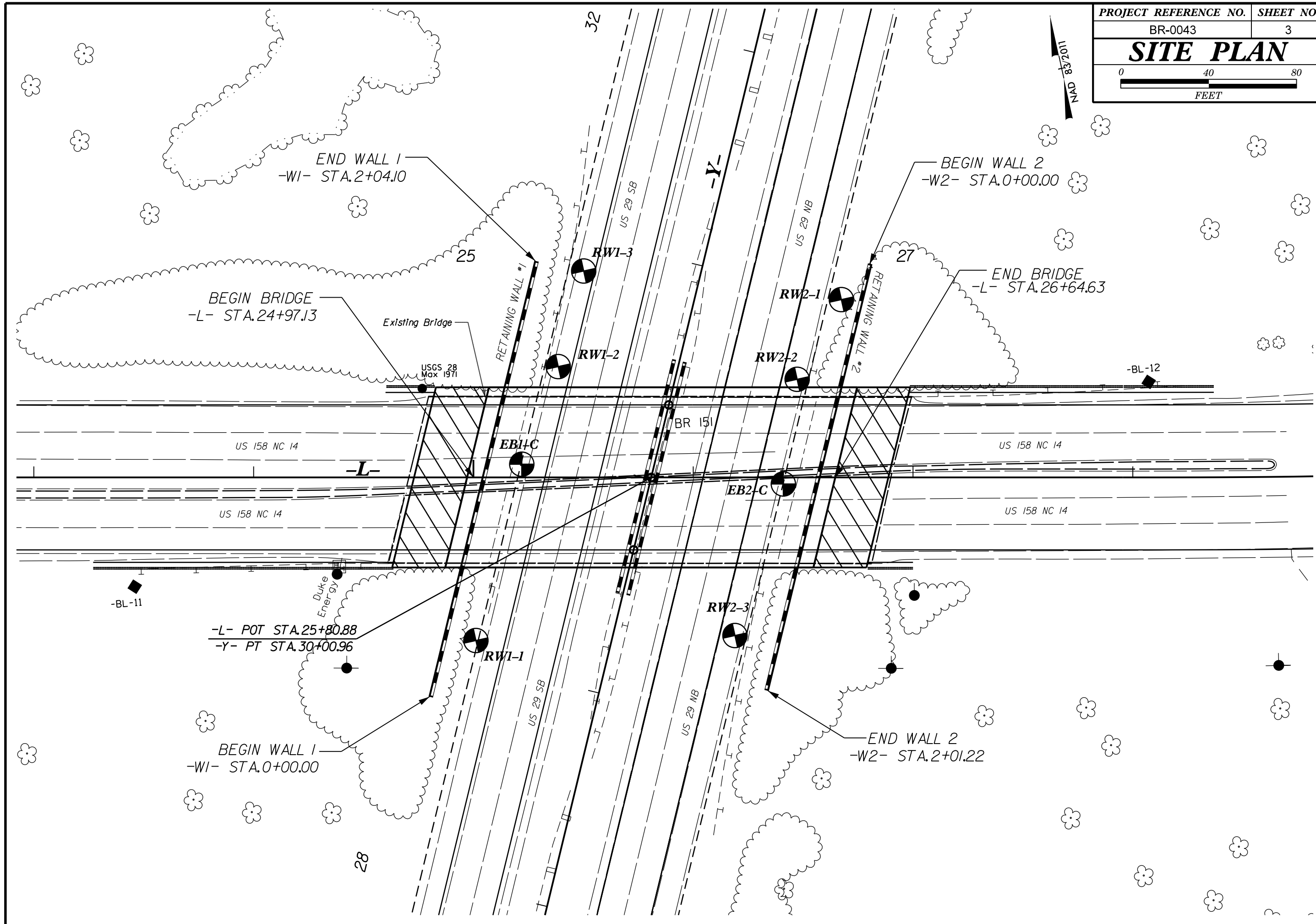
1711224BFB39468 SIGNATURE

DATE

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UNLESS ALL SIGNATURES COMPLETED

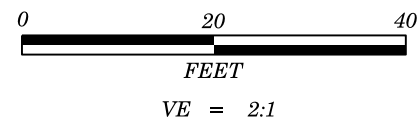
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with multiple columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, SOIL LEGEND AND AASHTO CLASSIFICATION, CONSISTENCY OR DENSENESS, TEXTURE OR GRAIN SIZE, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, COLOR, EQUIPMENT USED ON SUBJECT PROJECT, ROCK HARDNESS, FRACTURE SPACING, BEDDING, INDURATION.

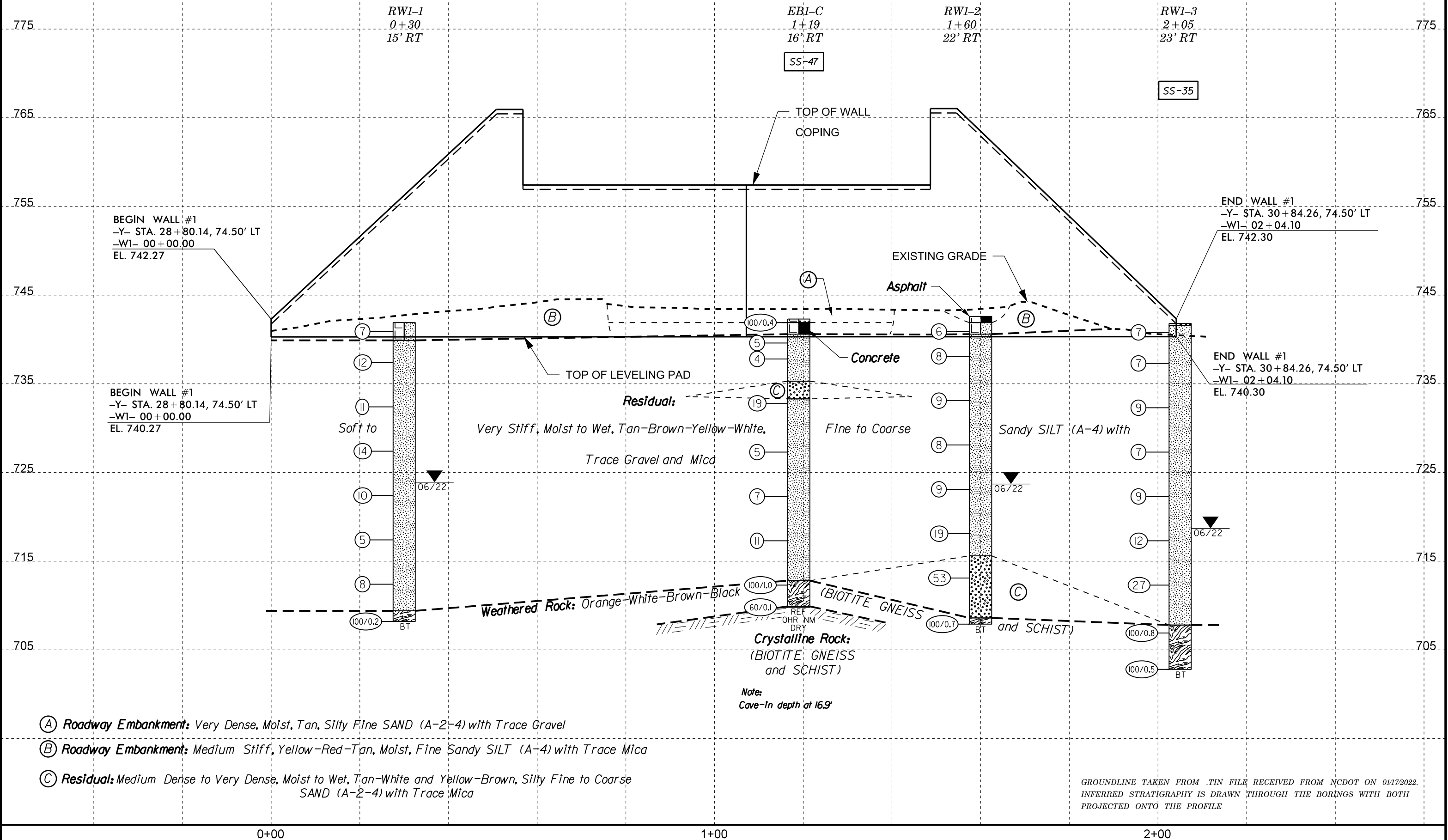


# WALL #1 ENVELOPE (AT END BENT 1)

(LOOKING AT FRONT FACE OF WALL)



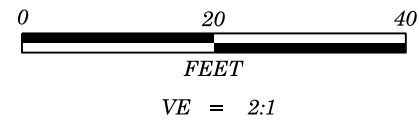
<b>PROJECT REFERENCE NO.</b>	<b>SHEET NO.</b>
BR-0043	4
<b>PROFILE BORINGS PROJECTED ALONG RETAINING WALL 1-W1-</b>	



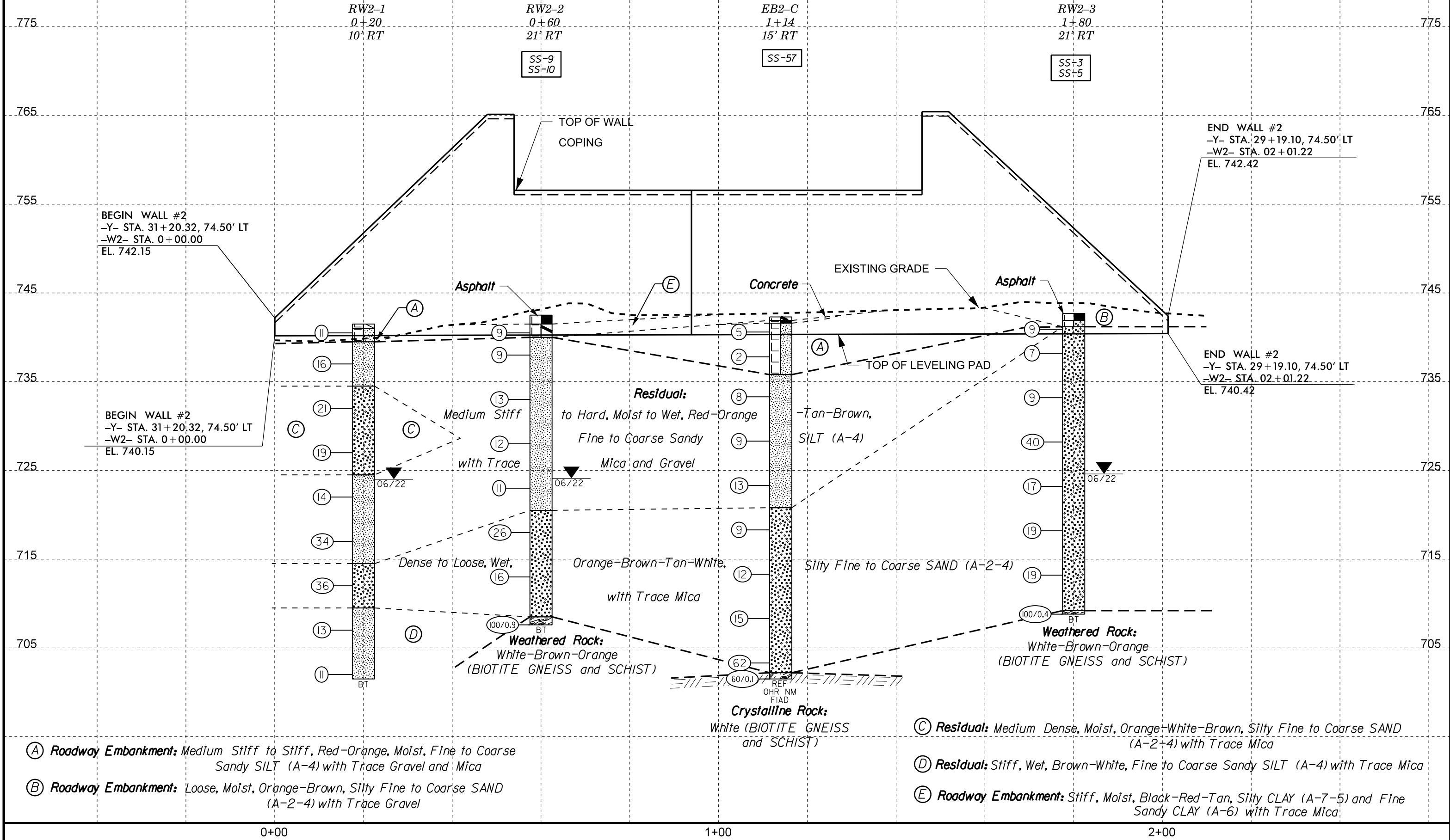
# WALL #2 ENVELOPE (AT END BENT 2)

(LOOKING AT FRONT FACE OF WALL)

GROUNDLINE TAKEN FROM TIN FILE RECEIVED FROM NCDOT ON 01/17/2022.  
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH  
 PROJECTED ONTO THE PROFILE



<b>PROJECT REFERENCE NO.</b>	<b>SHEET NO.</b>
BR-0043	5
<b>PROFILE BORINGS PROJECT ALONG RETAINING WALL 2 -W2-</b>	



Ⓐ **Roadway Embankment:** Medium Stiff to Stiff, Red-Orange, Moist, Fine to Coarse Sandy SILT (A-4) with Trace Gravel and Mica

Ⓑ **Roadway Embankment:** Loose, Moist, Orange-Brown, Silty Fine to Coarse SAND (A-2-4) with Trace Gravel

Ⓒ **Residual:** Medium Dense, Moist, Orange-White-Brown, Silty Fine to Coarse SAND (A-2-4) with Trace Mica

Ⓓ **Residual:** Stiff, Wet, Brown-White, Fine to Coarse Sandy SILT (A-4) with Trace Mica

Ⓔ **Roadway Embankment:** Stiff, Moist, Black-Red-Tan, Silty CLAY (A-7-5) and Fine Sandy CLAY (A-6) with Trace Mica

0+00

1+00

2+00

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 67043.1.1		TIP BR-0043		COUNTY ROCKINGHAM		GEOLOGIST C. Ranieri										
SITE DESCRIPTION Retaining Wall No. 1 from 0+00 to 2+04.14							GROUND WTR (ft)									
BORING NO. RW1-1		STATION 0+30		OFFSET 15 ft RT		ALIGNMENT -W1-										
COLLAR ELEV. 741.9 ft		TOTAL DEPTH 33.7 ft		NORTHING 950,574		EASTING 1,815,132										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 97% 04/30/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 06/21/22		COMP. DATE 06/21/22		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						
745																
	741.9	0.0	4	3	4										741.9	0.0
740															739.9	2.0
	738.4	3.5	4	5	7											
735																
	733.4	8.5	3	4	7											
730																
	728.4	13.5	7	6	8											
725																
	723.4	18.5	4	5	5											
720																
	718.4	23.5	2	2	3											
715																
	713.4	28.5	2	4	4											
710																
	708.4	33.5	100/0.2												708.2	33.7

WBS 67043.1.1		TIP BR-0043		COUNTY ROCKINGHAM		GEOLOGIST C. Ranieri										
SITE DESCRIPTION Retaining Wall No. 1 from 0+00 to 2+04.14							GROUND WTR (ft)									
BORING NO. RW1-2		STATION 1+60		OFFSET 22 ft RT		ALIGNMENT -W1-										
COLLAR ELEV. 742.6 ft		TOTAL DEPTH 34.7 ft		NORTHING 950,688		EASTING 1,815,196										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 97% 04/30/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 06/21/22		COMP. DATE 06/21/22		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						
745																
	741.9	0.7	6	3	3										741.9	0.7
740															740.6	2.0
	739.1	3.5	4	4	4											
735																
	734.1	8.5	4	4	5											
730																
	729.1	13.5	4	3	5											
725																
	724.1	18.5	3	4	5											
720																
	719.1	23.5	6	7	12											
715																
	714.1	28.5	12	18	35											
710																
	709.1	33.5	18	61	39/0.2										707.9	34.7

NCDOT BORE DOUBLE BR0043\_GEO\_BH\_WALL.GPJ NC\_DOT.GDT 9/21/22

Notes:  
 1. Surficial Organic Soil: 0.0'-0.3'  
 2. Hard Drilling Indicated by Driller at 32.5'

Boring Terminated at Elevation 707.9 ft in Weathered Rock (BIOTITE GNEISS and SCHIST)



# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 67043.1.1		TIP BR-0043		COUNTY ROCKINGHAM		GEOLOGIST C. Ranieri									
SITE DESCRIPTION Retaining Wall No. 2 from 0+00 to 2+01.22							GROUND WTR (ft)								
BORING NO. RW2-1		STATION 0+20		OFFSET 10 ft RT		ALIGNMENT -W2-									
COLLAR ELEV. 741.5 ft		TOTAL DEPTH 40.0 ft		NORTHING 950,690		EASTING 1,815,328									
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 97% 04/30/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER S. Davis		START DATE 06/20/22		COMP. DATE 06/20/22		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
745															
740	741.5	0.0	2	5	6								M	GROUND SURFACE ROADWAY EMBANKMENT Red-Brown, Fine to Coarse Sandy CLAY (A-6) with Trace Roots	0.0 2.0
	738.0	3.5	6	7	9								M	Red-Orange, Fine to Coarse Sandy SILT (A-4) with Trace Gravel and Mica	
735	733.0	8.5	12	9	12								M	RESIDUAL Red-Orange, Fine to Coarse Sandy SILT (A-4) with Trace Mica	7.0
730	728.0	13.5	8	9	10								M	Orange-White-Brown, Silty Fine to Coarse SAND (A-2-4) with Trace Mica	
725	723.0	18.5	5	6	8								W	Brown-White, Fine to Coarse Sandy SILT (A-4) with Trace Mica	17.0
720	718.0	23.5	14	14	20								W		
715	713.0	28.5	11	14	22								W	Orange-Brown-White, Silty Fine to Coarse SAND (A-2-4) with Trace Mica	27.0
710	708.0	33.5	3	6	7								W	Brown-White, Fine to Coarse Sandy SILT (A-4) with Trace Mica	32.0
705	703.0	38.5	3	3	8								W		40.0
Boring Terminated at Elevation 701.5 ft in Residual (SILT)															
Notes: 1. Surficial Organic Soil: 0.0'-0.2'															

WBS 67043.1.1		TIP BR-0043		COUNTY ROCKINGHAM		GEOLOGIST C. Ranieri										
SITE DESCRIPTION Retaining Wall No. 2 from 0+00 to 2+01.22							GROUND WTR (ft)									
BORING NO. RW2-2		STATION 0+60		OFFSET 21 ft RT		ALIGNMENT -W2-										
COLLAR ELEV. 742.5 ft		TOTAL DEPTH 34.9 ft		NORTHING 950,659		EASTING 1,815,300										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 97% 04/30/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 06/20/22		COMP. DATE 06/20/22		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
745																
740	741.5	1.0	2	4	5								SS-9	29%	GROUND SURFACE ASPHALT	0.0 1.0
	739.0	3.5	3	4	5								SS-10	30%	ROADWAY EMBANKMENT Red, Fine Sandy Silty CLAY (A-7-5) with Trace Mica	2.5
735	734.0	8.5	4	6	7								W	RESIDUAL Orange-White-Tan, Clayey Fine to Coarse Sandy SILT (A-4) with Trace Mica		
730	729.0	13.5	5	6	6								W			
725	724.0	18.5	3	4	7								W			
720	719.0	23.5	10	13	13								W	Tan-Brown, Silty Fine to Coarse SAND (A-2-4) with Trace Mica	22.0	
715	714.0	28.5	4	7	9								W			
710	709.0	33.5	11	35	65/0.4								W			
Boring Terminated at Elevation 707.6 ft in Weathered Rock (BIOTITE GNEISS and SCHIST)																

NCDOT BORE DOUBLE BR0043 GEO\_BH\_WALL.GPJ NC\_DOT.GDT 9/21/22



# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 67043.1.1		TIP BR-0043		COUNTY ROCKINGHAM		GEOLOGIST C. Ranieri										
SITE DESCRIPTION Retaining Wall No. 2 from 0+00 to 2+01.22							GROUND WTR (ft)									
BORING NO. RW2-3		STATION 1+80		OFFSET 21 ft RT		ALIGNMENT -W2-										
COLLAR ELEV. 742.7 ft		TOTAL DEPTH 33.9 ft		NORTHING 950,551		EASTING 1,815,248										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 97% 04/30/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 06/20/22		COMP. DATE 06/20/22		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						
745																
	741.9	0.8	7	5	4											
740	739.2	3.5	3	3	4											
	734.2	8.5	4	4	5											
735	729.2	13.5	10	11	29											
	724.2	18.5	7	7	10											
730	719.2	23.5	6	8	11											
	714.2	28.5	6	8	11											
725	709.2	33.5	100/0.4													
720																
715																
710																

WBS 67043.1.1		TIP BR-0043		COUNTY ROCKINGHAM		GEOLOGIST C. Ranieri										
SITE DESCRIPTION Replace Bridge 780151 on US 158/NC14 over US 29							GROUND WTR (ft)									
BORING NO. EB2-C		STATION 1+14		OFFSET 15 ft RT		ALIGNMENT -W2-										
COLLAR ELEV. 742.3 ft		TOTAL DEPTH 40.8 ft		NORTHING 950,613		EASTING 1,815,284										
DRILL RIG/HAMMER EFF./DATE F&R2175 CME-55 97% 04/30/2021				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER S. Davis		START DATE 06/29/22		COMP. DATE 06/29/22		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						
745																
	741.6	0.7	3	2	3											
740	738.8	3.5	WOH	1	1											
	734.3	8.0	3	3	5											
735	729.3	13.0	4	4	5											
	724.3	18.0	6	5	8											
730	719.3	23.0	3	3	6											
	714.3	28.0	4	5	7											
725	709.3	33.0	6	5	10											
	704.3	38.0	21	28	34											
720	701.6	40.7	60/0.1													
715																
710																

NCDOT BORE DOUBLE BR0043\_GEO\_BH\_WALL.GPJ NC\_DOT.GDT 9/21/22

- Notes:
1. Hard Drilling Indicated by Driller from 40.1'-40.7'
  2. Tricone Bit Refusal at 40.7'
  3. Casing Advancer was used to Break Through Concrete Near Ground Surface



PROJECT REFERENCE NO.	SHEET NO.
67043.1.1	10

County: Rockingham

Description: Retaining Wall No. 1 from 0+00 to 2+04.14 and Retaining Wall No. 2 from 0+00 to 2+01.22

SOIL TEST RESULTS																
SAMPLE NO.	STATION	LOCATION	OFFSET	DEPTH INTERVAL(ft)	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
								C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-47	-W1- 1+19	EB1-C	16' RT	3.5-5.0	A-4 (0)	NP	NP	22.4	30.7	18.6	28.3	94.8	81.7	51	37.2	NT
SS-35	-W1- 2+05	RW1-3	23' RT	0.2-0.8	A-4 (0)	NP	NP	28.7	34.8	21.3	15.2	96.3	78.6	42.2	15.3	NT
SS-9	-W2- 0+60	RW2-2	21' RT	1.0-2.5	A-7-5 (18)	67	21	7.8	25.4	21.5	45.3	99.7	95.9	72.1	29.3	NT
SS-10	-W2- 0+60	RW2-2	21' RT	3.5-5.0	A-4 (0)	NP	NP	10.4	51.5	16.3	21.8	99.9	95.3	46.6	30.1	NT
SS-57	-W2- 1+14	EB2- C	15' RT	3.5-5.0	A-4 (0)	NP	NP	27.7	25.3	19.4	27.6	96.1	77.3	48.9	35.6	NT
SS-3	-W2- 1+80	RW2-3	21' RT	3.5-5.0	A-2-4	NP	NP	15.3	63.3	14.4	7.0	100.0	94.6	33.2	15.6	NT
SS-5	-W2- 1+80	RW2-3	21' RT	13.5-15.0	ND	NP	NP	NT	NT	NT	NT	NT	NT	14.3	11.6	NT

NP = Not Plastic  
 NT = Not Tested  
 ND = Not Determined

D. Council  
 Lab Manager, Certification No. 101-02-0603

C.Wang, P.E.  
 Soils Engineer