

REFERENCE: A-0009CB

PROJECT: 32572.1.FS10

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	A-0009CB	1	11

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	WALL ENVELOPE
5-8	CROSS SECTIONS
9-10	BORE LOGS
11	GEOPHYSICAL TEST RESULTS

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY GRAHAM  
PROJECT DESCRIPTION UPGRADE NC 143 FROM SR 1223 (BEECH CREEK ROAD) TO 0.5 MILES NORTH OF APPALACHIAN TRAIL  
SITE DESCRIPTION RETAINING WALL #20: SOIL NAIL WALL AND CAST-IN-PLACE CONCRETE WALL WITH ARCHITECTURAL FORM LINER FINISH ON -L- FROM 409+44 LT TO 411+75 LT

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  
D. GOODNIGHT  
GEL SOLUTIONS

INVESTIGATED BY CG2  
DRAWN BY M. BREWER, P.E.  
CHECKED BY R. KRAL, P.E.  
SUBMITTED BY M. BREWER, P.E.  
DATE MAY 2022

Prepared in the Office of:



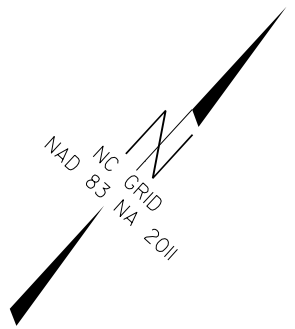
**CAROLINAS  
GEOTECHNICAL  
GROUP**  
2400 CROWNPOINT EXECUTIVE DRIVE  
SUITE 800  
CHARLOTTE, NC 28227  
(980) 339-8684



DocuSigned by:  
D. Matthew Brewer 6/7/2022  
386129C0A4C1462  
SIGNATURE DATE

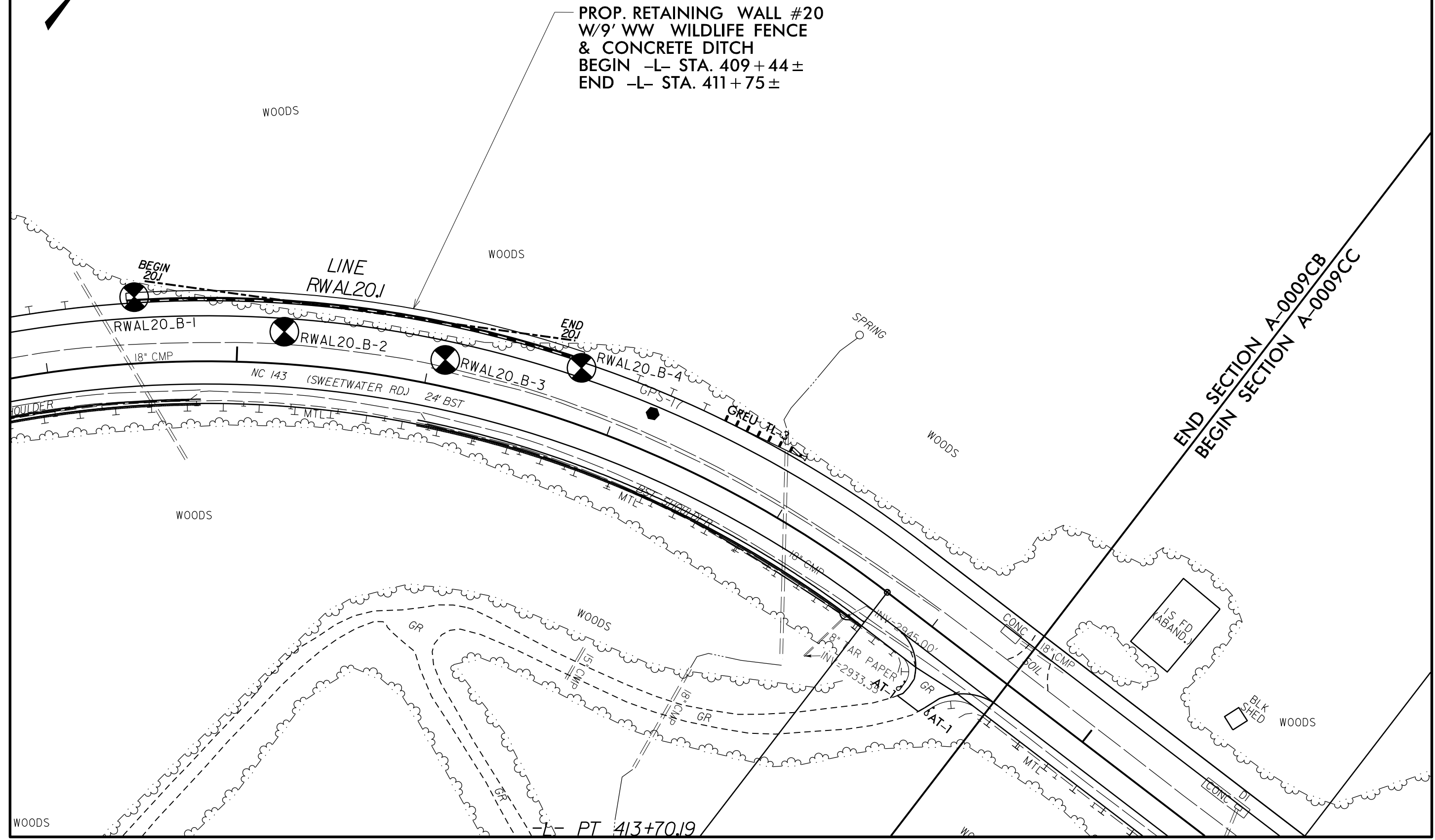
**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**





410

PROP. RETAINING WALL #20  
 W/9' WW WILDLIFE FENCE  
 & CONCRETE DITCH  
 BEGIN -L- STA. 409+44±  
 END -L- STA. 411+75±



END SECTION A-0009CB  
 BEGIN SECTION A-0009CC

WOODS

PT 413+70.19

BLK SHED

1/2 FD (ABAND.)

8" AR PAPER  
 INV=2945.00'  
 AT=2933.33'

CONC. 18" CMP  
 POIL

GR

MTL

CONC. DI

BOULDER

NC 143 (SWEETWATER RD.)

24' BST

GPS-17

GREU-17

SPRING

WOODS

WOODS

WOODS

WOODS

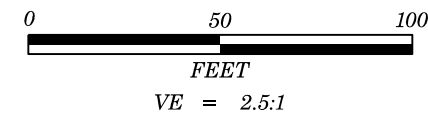
WOODS

WOODS

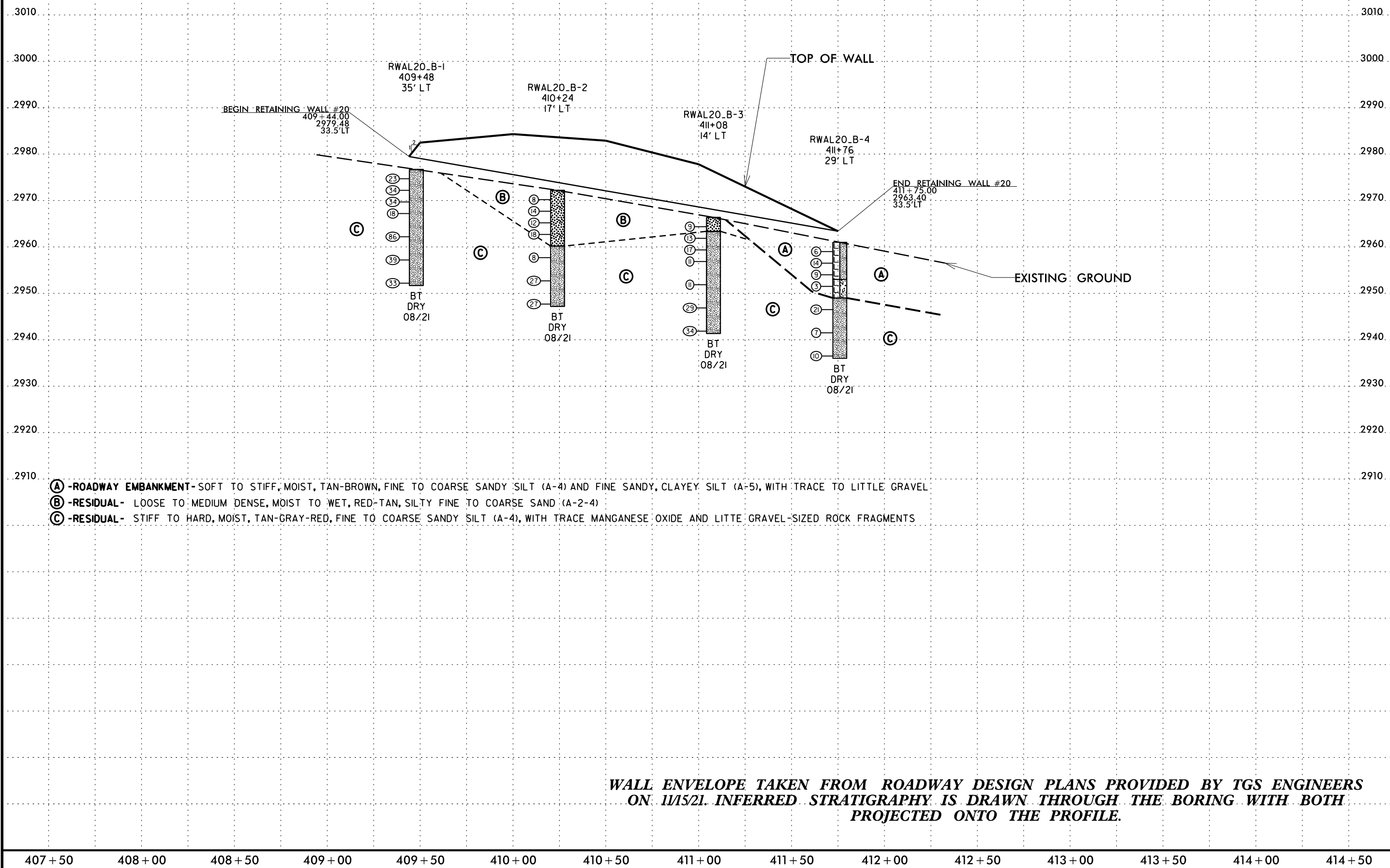


**NOTE:**  
**SOIL, WEATHERED ROCK, AND CRYSTALLINE ROCK**  
**LINES ARE BASED ON AN INTERPRETATION OF**  
**BORE HOLE AND SEISMIC REFRACTION DATA AND**  
**SHALL BE CONSIDERED AS APPROXIMATE.**

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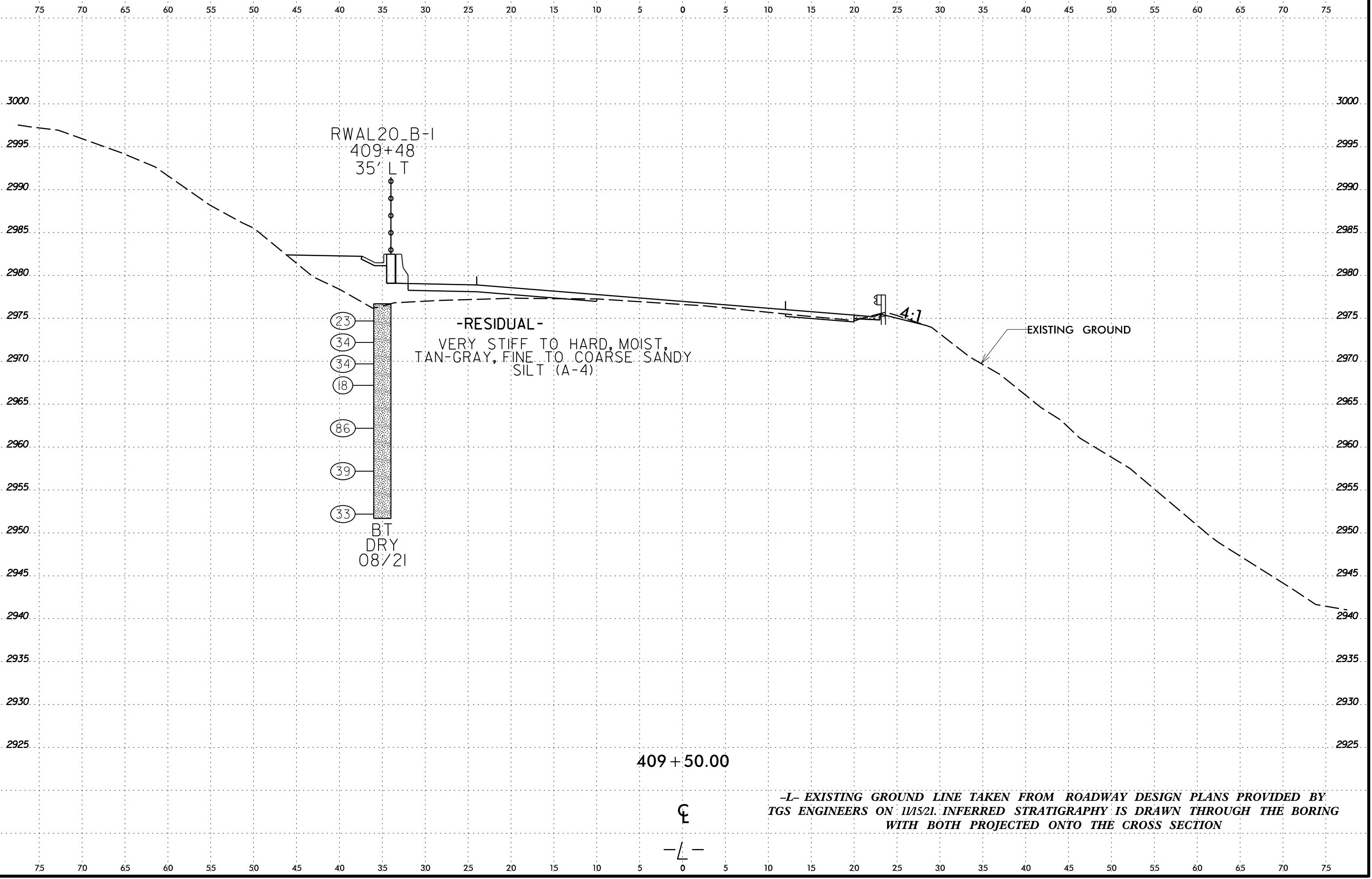
PROJECT REFERENCE NO.	SHEET NO.
A-0009CB	4
RETAINING WALL #20 PROFILE BORINGS PROJECTED ALONG WALL ENVELOPE	



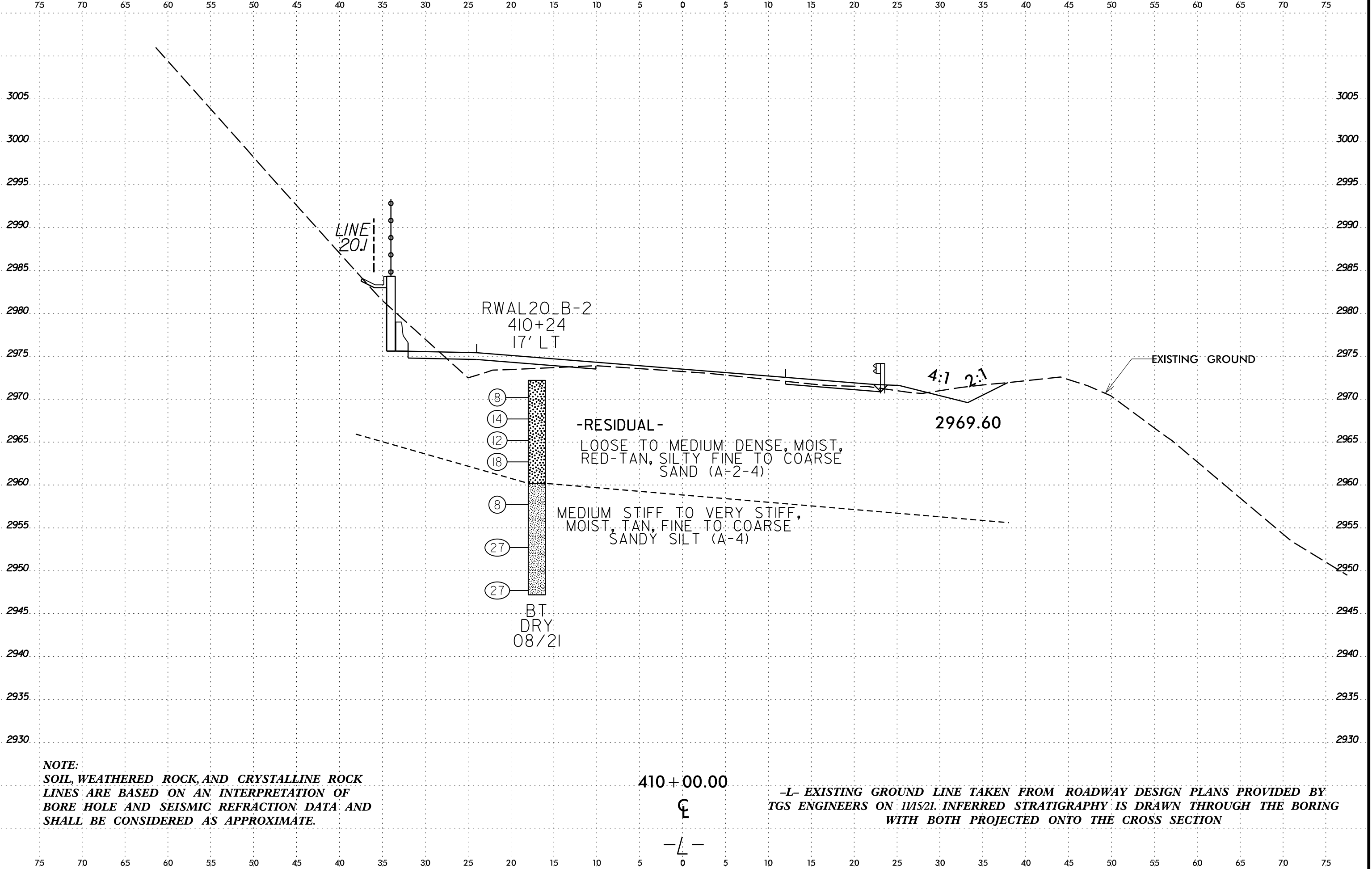
**WALL ENVELOPE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 1/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE PROFILE.**

407 + 50    408 + 00    408 + 50    409 + 00    409 + 50    410 + 00    410 + 50    411 + 00    411 + 50    412 + 00    412 + 50    413 + 00    413 + 50    414 + 00    414 + 50

6/23/16  
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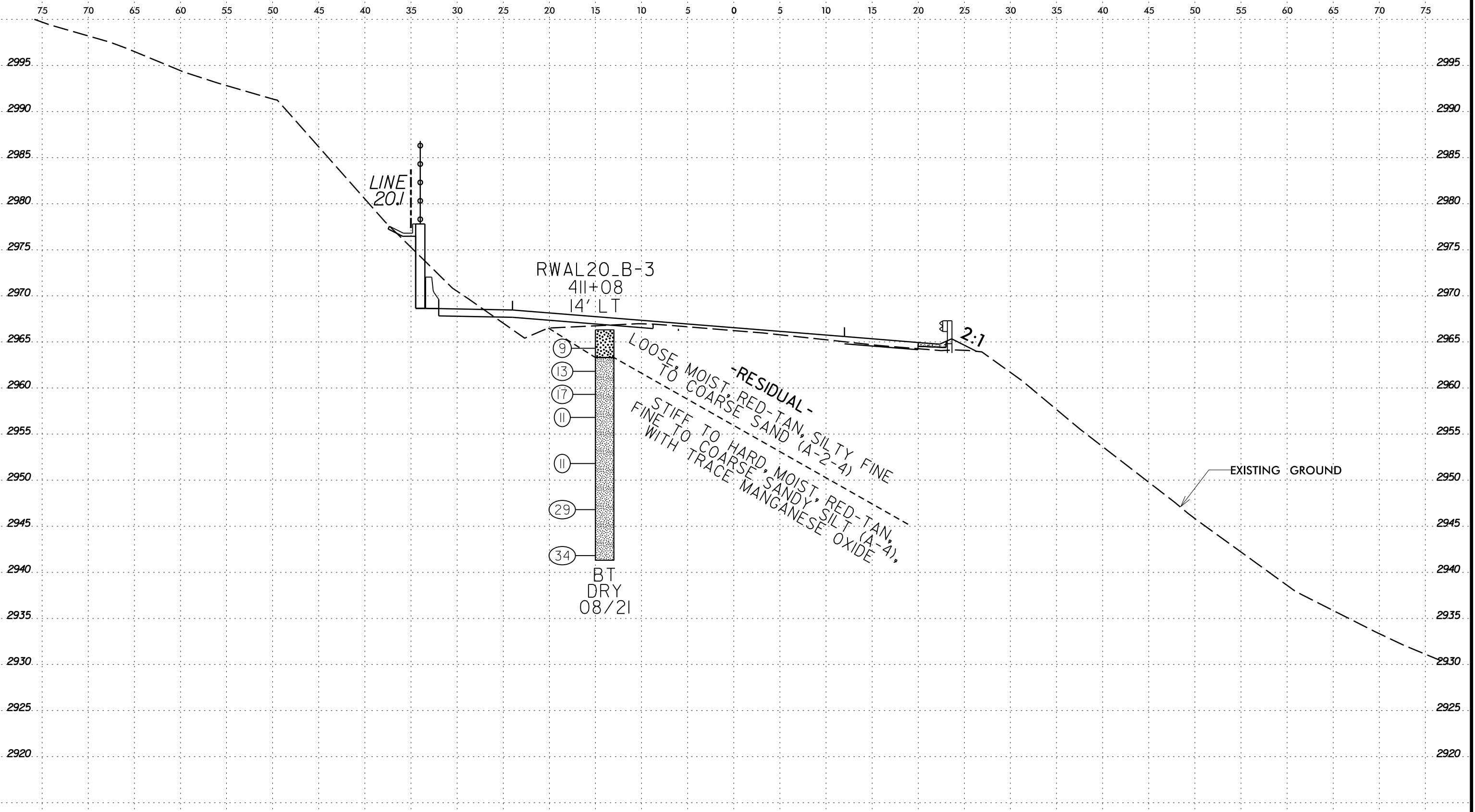


**NOTE:**  
 SOIL, WEATHERED ROCK, AND CRYSTALLINE ROCK  
 LINES ARE BASED ON AN INTERPRETATION OF  
 BORE HOLE AND SEISMIC REFRACTION DATA AND  
 SHALL BE CONSIDERED AS APPROXIMATE.

410+00.00  
 ⊕  
 —L—

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY  
 TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING  
 WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16  
19-MAY-2022 16:33  
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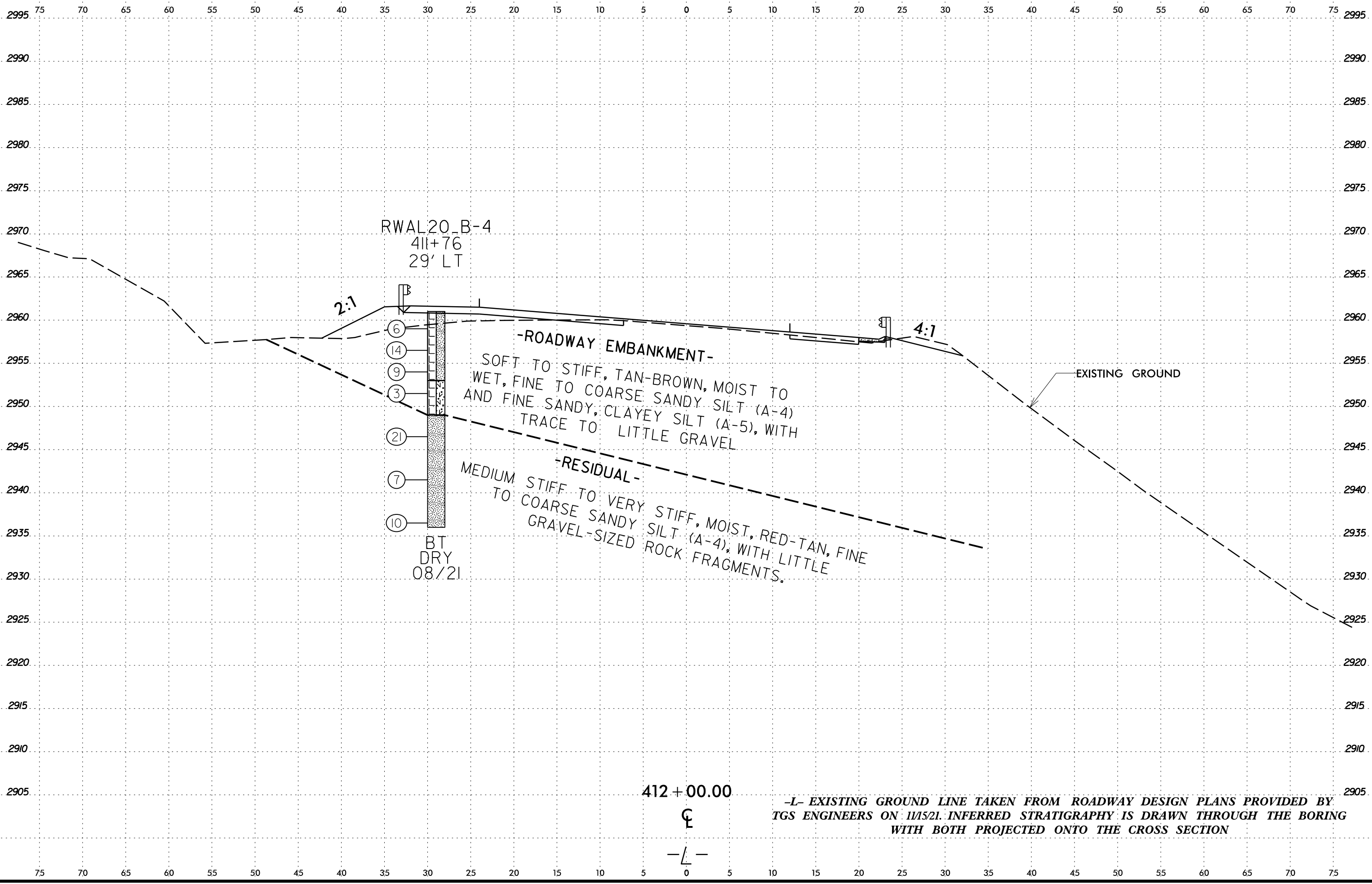
**NOTE:**  
SOIL, WEATHERED ROCK, AND CRYSTALLINE ROCK  
LINES ARE BASED ON AN INTERPRETATION OF  
BORE HOLE AND SEISMIC REFRACTION DATA AND  
SHALL BE CONSIDERED AS APPROXIMATE.

411 + 00.00  
⊕  
—L—

-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY  
TGS ENGINEERS ON 1/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING  
WITH BOTH PROJECTED ONTO THE CROSS SECTION

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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RWAL20\_B-4  
411+76  
29' LT

2:1

4:1

- 6
- 14
- 9
- 3
- 21
- 7
- 10

**-ROADWAY EMBANKMENT-**

SOFT TO STIFF, TAN-BROWN, MOIST TO WET, FINE TO COARSE SANDY SILT (A-4) AND FINE SANDY, CLAYEY SILT (A-5), WITH TRACE TO LITTLE GRAVEL

**-RESIDUAL-**

MEDIUM STIFF TO VERY STIFF, MOIST, RED-TAN, FINE TO COARSE SANDY SILT (A-4), WITH LITTLE GRAVEL-SIZED ROCK FRAGMENTS.

EXISTING GROUND

BT  
DRY  
08/21

412 + 00.00



**-L- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS ENGINEERS ON 11/15/21. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION**



# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 32572.1.FS10		TIP A-0009CB		COUNTY GRAHAM		GEOLOGIST D. Goodnight									
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail							GROUND WTR (ft)								
BORING NO. RWAL20_B-1		STATION 409+48		OFFSET 35 ft LT		ALIGNMENT L									
COLLAR ELEV. 2,976.7 ft		TOTAL DEPTH 25.0 ft		NORTHING 620,864		EASTING 595,113									
DRILL RIGHAMMER EFF./DATE FIVE9553 CME-550X 80% 03/12/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER J. Phillips		START DATE 08/19/21		COMP. DATE 08/19/21		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					
2980															
2975	2,975.7	1.0	5	8	15									2,976.7	0.0
	2,973.2	3.5	11	19	15										
2970	2,970.7	6.0	12	12	22										
	2,968.2	8.5	12	11	7										
2965	2,963.2	13.5	8	32	54										
2960	2,958.2	18.5	22	19	20										
2955	2,953.2	23.5	18	15	18									2,951.7	25.0
Boring Terminated at Elevation 2,951.7 ft In Residual Sandy Silt (A-4)															

WBS 32572.1.FS10		TIP A-0009CB		COUNTY GRAHAM		GEOLOGIST D. Goodnight									
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail							GROUND WTR (ft)								
BORING NO. RWAL20_B-2		STATION 410+24		OFFSET 17 ft LT		ALIGNMENT L									
COLLAR ELEV. 2,972.2 ft		TOTAL DEPTH 25.0 ft		NORTHING 620,904		EASTING 595,183									
DRILL RIGHAMMER EFF./DATE FIVE9553 CME-550X 80% 03/12/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER J. Phillips		START DATE 08/19/21		COMP. DATE 08/19/21		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					
2975															
	2,971.2	1.0	2	3	5									2,972.2	0.0
2970	2,968.7	3.5	4	6	8										
	2,966.2	6.0	5	6	6										
2965	2,963.7	8.5	6	7	11										
2960	2,958.7	13.5	3	3	5									2,960.2	12.0
2955	2,953.7	18.5	9	11	16										
2950	2,948.7	23.5	8	11	16									2,947.2	25.0
Boring Terminated at Elevation 2,947.2 ft In Residual Sandy Silt (A-4)															

NCDOT BORE DOUBLE A-0009CB\_GEO\_RDY\_GTM.GPJ NC\_DOT.GDT 5/10/22

# GEOTECHNICAL BORING REPORT

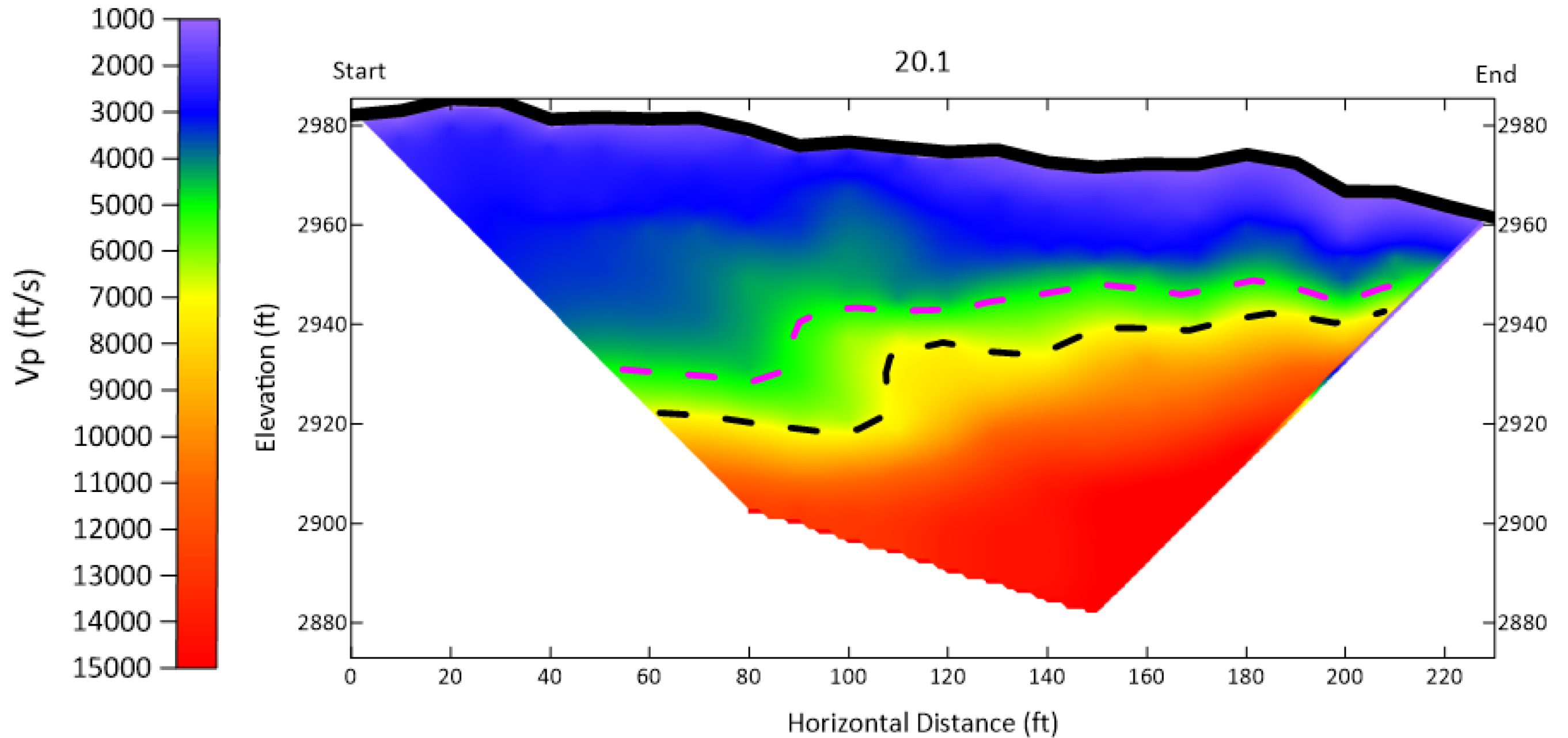
## BORE LOG

WBS 32572.1.FS10		TIP A-0009CB		COUNTY GRAHAM		GEOLOGIST D. Goodnight									
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail							GROUND WTR (ft)								
BORING NO. RWAL20_B-3		STATION 411+08		OFFSET 14 ft LT		ALIGNMENT L									
COLLAR ELEV. 2,966.4 ft		TOTAL DEPTH 25.0 ft		NORTHING 620,950		EASTING 595,256									
DRILL RIGHAMMER EFF./DATE FIVE9553 CME-550X 80% 03/12/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER J. Phillips		START DATE 08/19/21		COMP. DATE 08/19/21		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					
2970															
2965	2,965.4	1.0	3	4	5									2,966.4	0.0
	2,962.9	3.5	4	6	7									2,963.4	3.0
2960	2,960.4	6.0	4	7	10										
	2,957.9	8.5	4	6	5										
2955	2,952.9	13.5	4	5	6										
2950	2,947.9	18.5	7	15	14										
2945	2,942.9	23.5	11	14	20									2,941.4	25.0
Boring Terminated at Elevation 2,941.4 ft In Residual Sandy Silt (A-4)															

WBS 32572.1.FS10		TIP A-0009CB		COUNTY GRAHAM		GEOLOGIST D. Goodnight									
SITE DESCRIPTION Upgrade NC 143 from SR 1223 (Beech Creek Road) to 0.5 Miles North of Appalachian Trail							GROUND WTR (ft)								
BORING NO. RWAL20_B-4		STATION 411+76		OFFSET 29 ft LT		ALIGNMENT L									
COLLAR ELEV. 2,961.0 ft		TOTAL DEPTH 25.0 ft		NORTHING 620,996		EASTING 595,312									
DRILL RIGHAMMER EFF./DATE FIVE9553 CME-550X 80% 03/12/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER J. Phillips		START DATE 08/19/21		COMP. DATE 08/19/21		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					
2965															
2960	2,960.0	1.0	3	1	5									2,961.0	0.0
	2,957.5	3.5	3	5	9										
2955	2,955.0	6.0	3	5	4										
	2,952.5	8.5	2	1	2									2,953.0	8.0
2950	2,947.5	13.5	16	11	10									2,949.0	12.0
2945	2,942.5	18.5	3	3	4										
2940	2,937.5	23.5	2	4	6									2,936.0	25.0
Boring Terminated at Elevation 2,936.0 ft In Residual Sandy Silt (A-4)															

NCDOT BORE DOUBLE A-0009CB\_GEO\_RDY\_GTM.GPJ NC\_DOT.GDT 5/10/22

## GEOPHYSICAL TEST RESULTS – SEISMIC REFRACTION LINE 20.1



GEOPHYSICAL TESTING PERFORMED BY GEL SOLUTIONS. REFERENCE "SEISMIC REFRACTION SURVEY FOR EVALUATION OF ROCK" DATED 10/01/2021  
 CG2 ESTIMATED WAVE SPEED FOR WEATHERED ROCK: 4,500 FT/SEC  
 CG2 ESTIMATED WAVE SPEED FOR CRYSTALLINE ROCK: 7,500 FT/SEC