

REFERENCE: DF18314.1075023

PROJECT: N/A

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4-9	CROSS SECTIONS
10-12	BORELOGS

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY POLK
PROJECT DESCRIPTION EMERGENCY DESIGN FOR
US 176

SITE DESCRIPTION SITE 314

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18314.1075023	1	

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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS 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

R. WELCH, G.I.T.

K. CLARK

CG2 EXPLORATION

INVESTIGATED BY CG2, PLLC

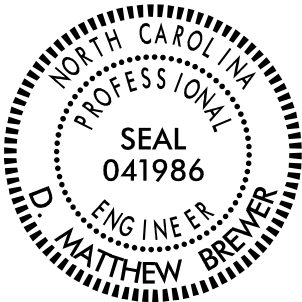
DRAWN BY P. PERRY, E.I.T.

CHECKED BY M. BREWER, P.E.

SUBMITTED BY CG2, PLLC

DATE JULY 2025

Prepared in the Office of:
 CAROLINAS
GEOTECHNICAL
GROUP
1805 SARDIS ROAD NORTH
SUITE 100
CHARLOTTE, NC 28270
(980) 339-8684



DocuSigned by:
 12/2/2025

386129C0A8C8 SIGNATURE DATE

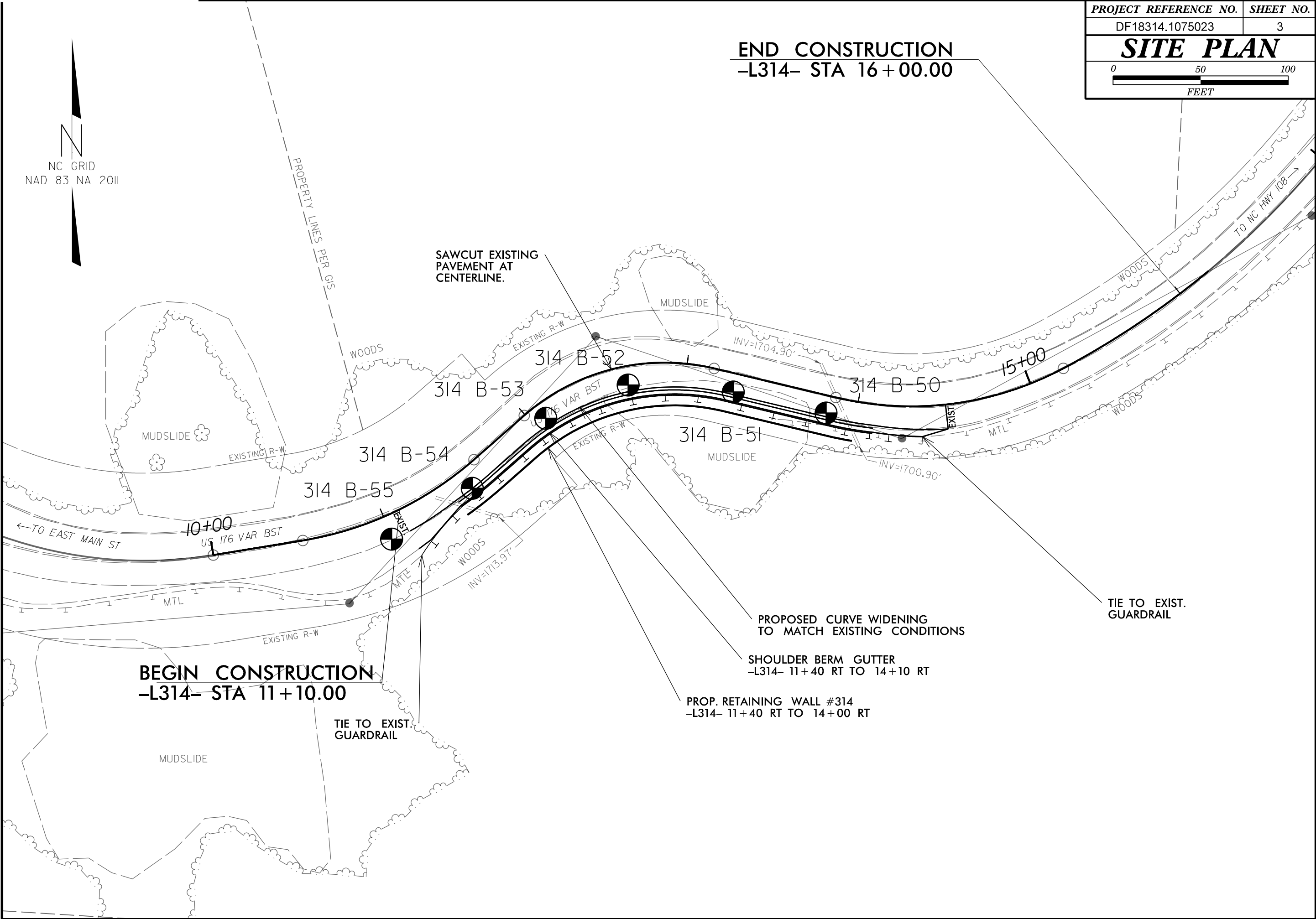
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
DF18314.1075023	3
SITE PLAN	
0 50 100 FEET	



END CONSTRUCTION
-L314- STA 16+00.00

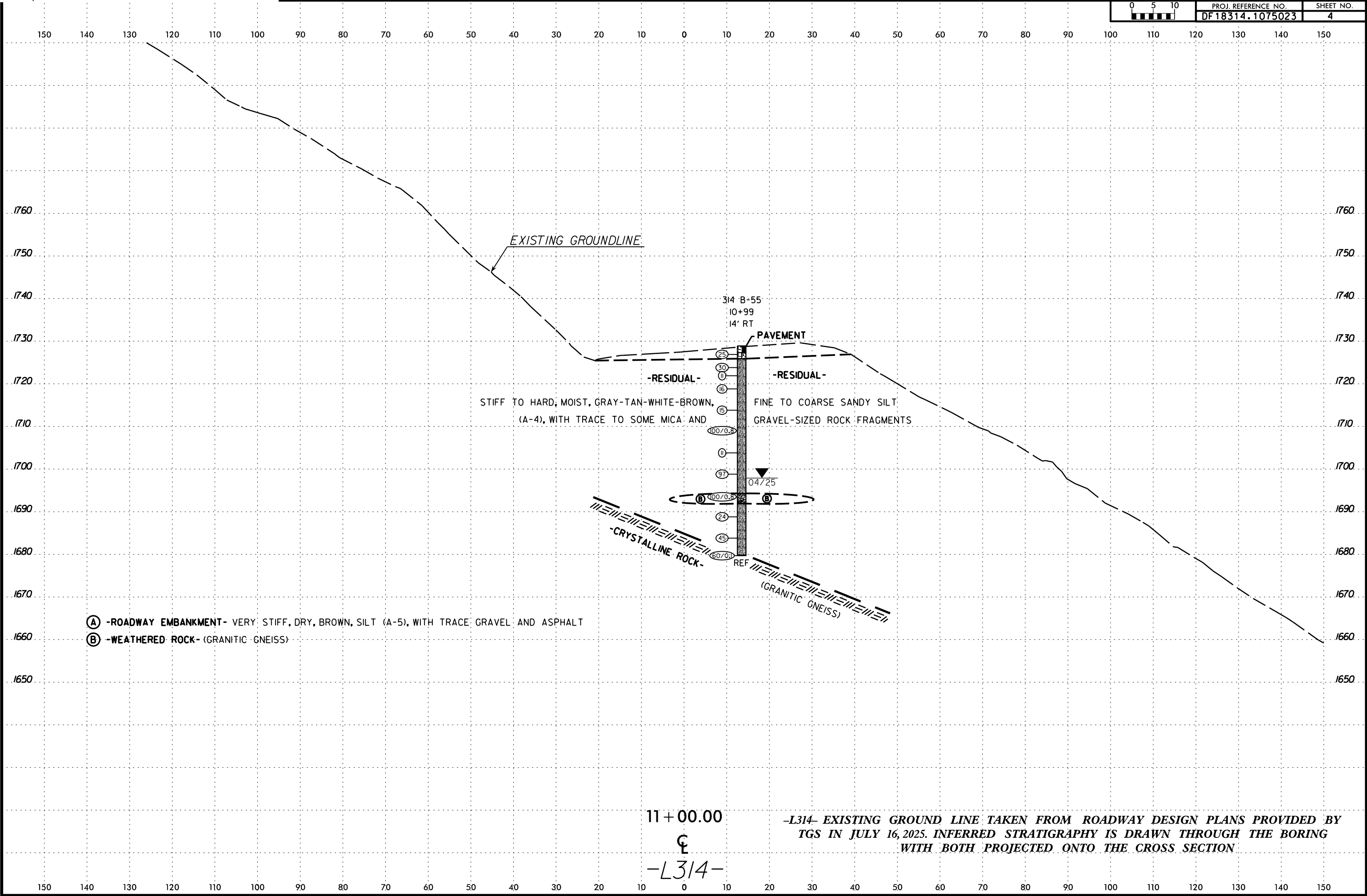
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-L314- STA 11+10.00



6/23/16

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DF18314.1075023	4

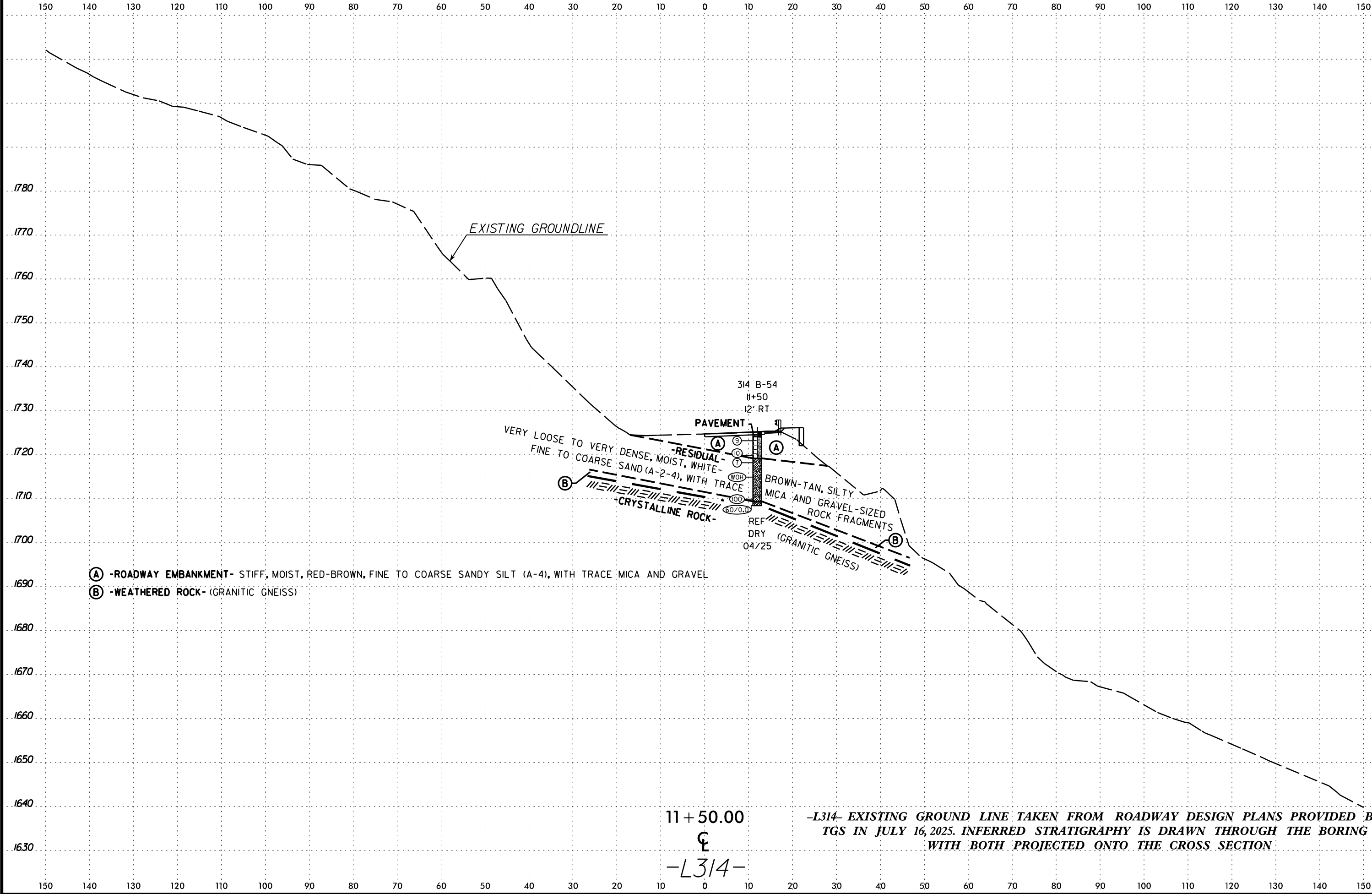


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DF18314.1075023

SHEET NO.
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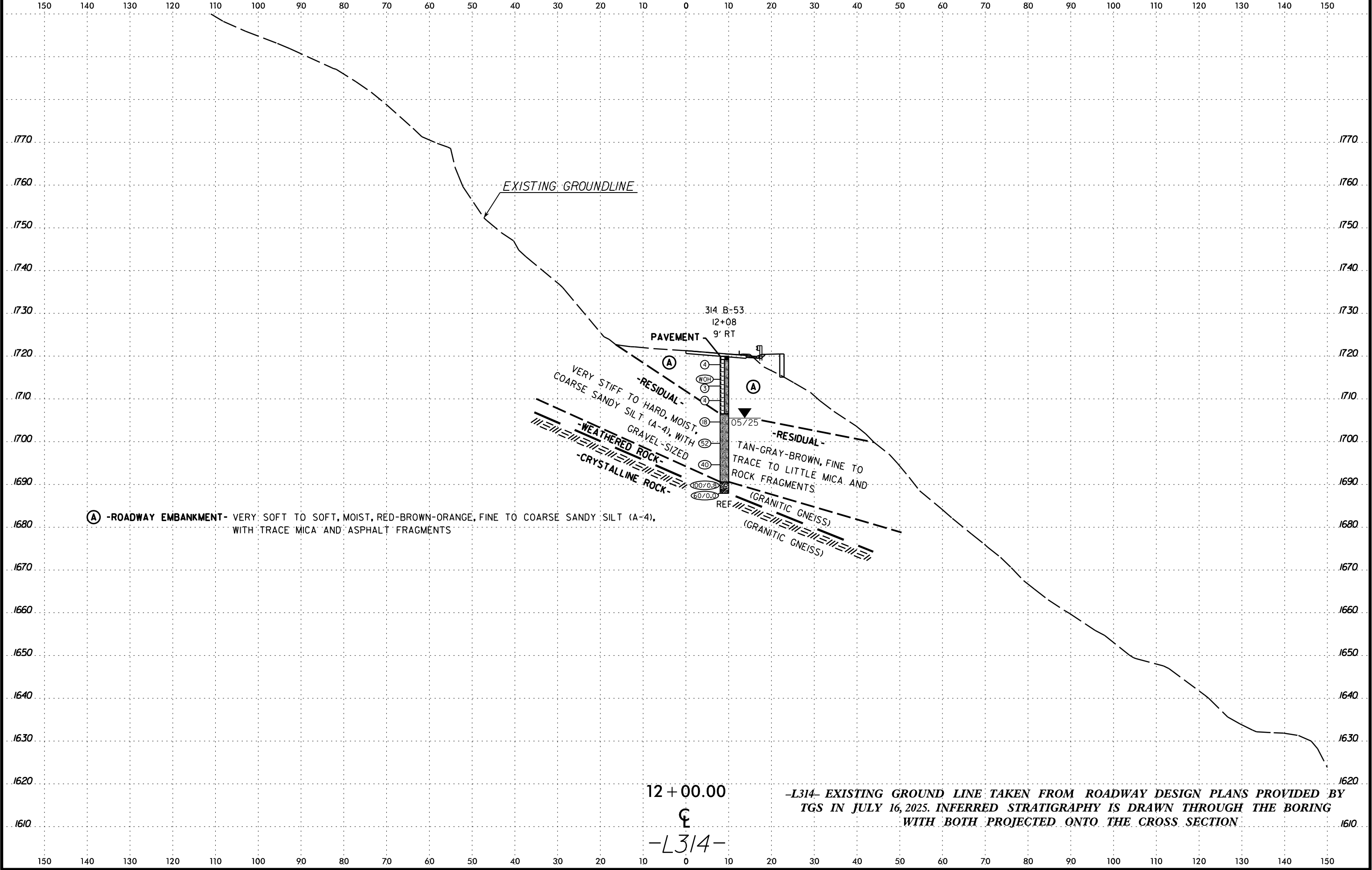


6/23/16



PROJ. REFERENCE NO.
DF18314.1075023

SHEET NO.
6



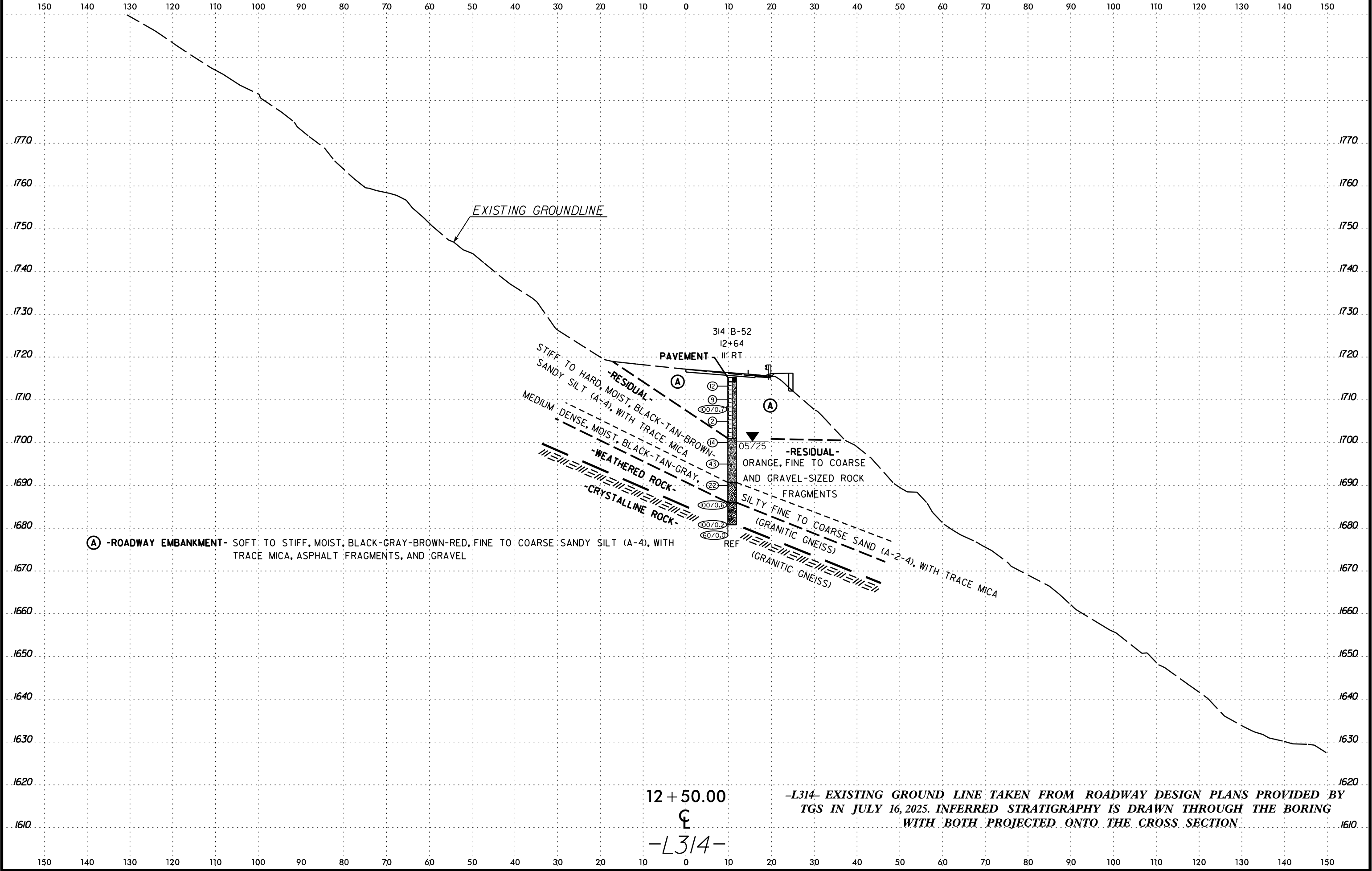
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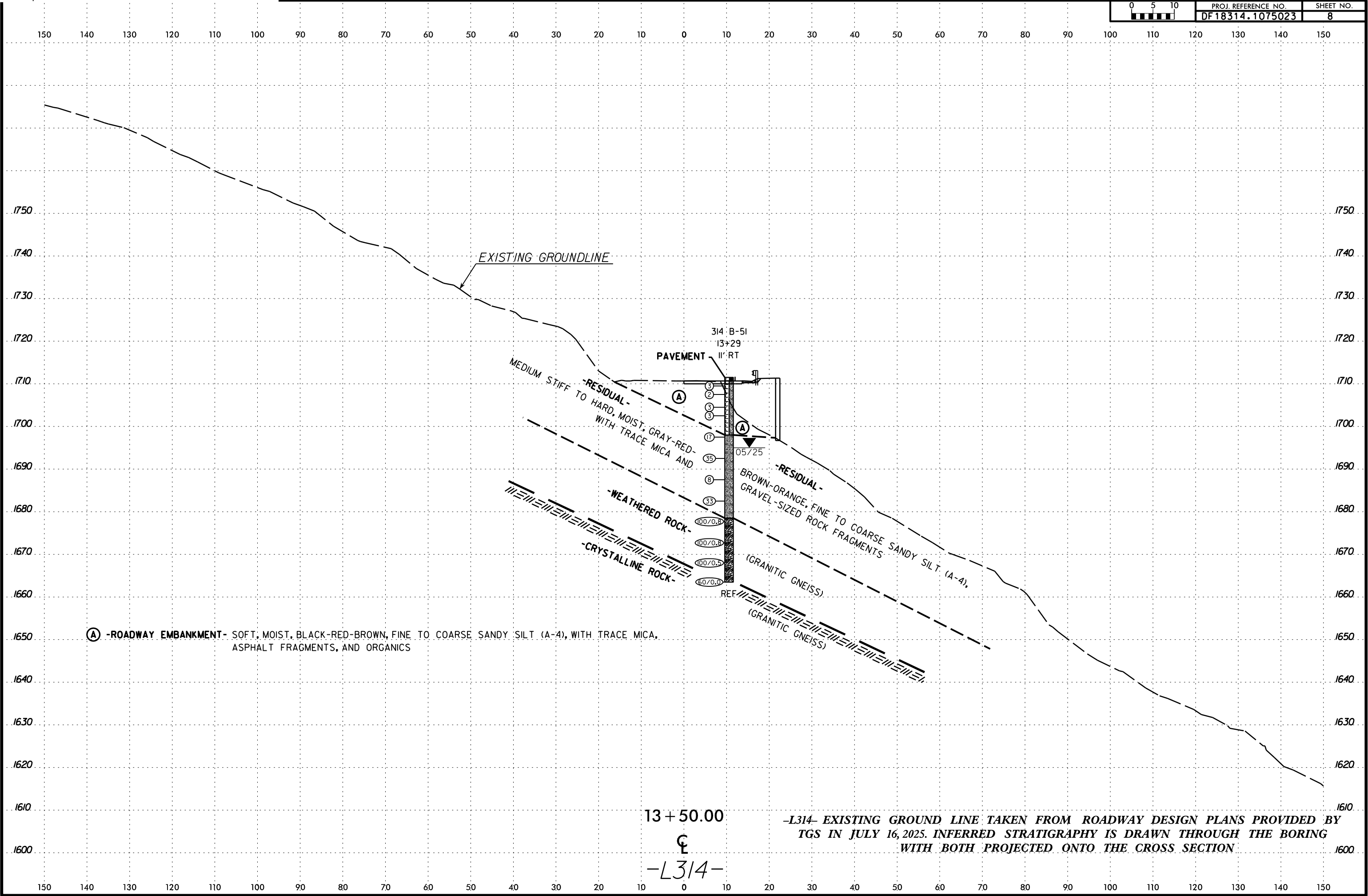
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DF18314.1075023

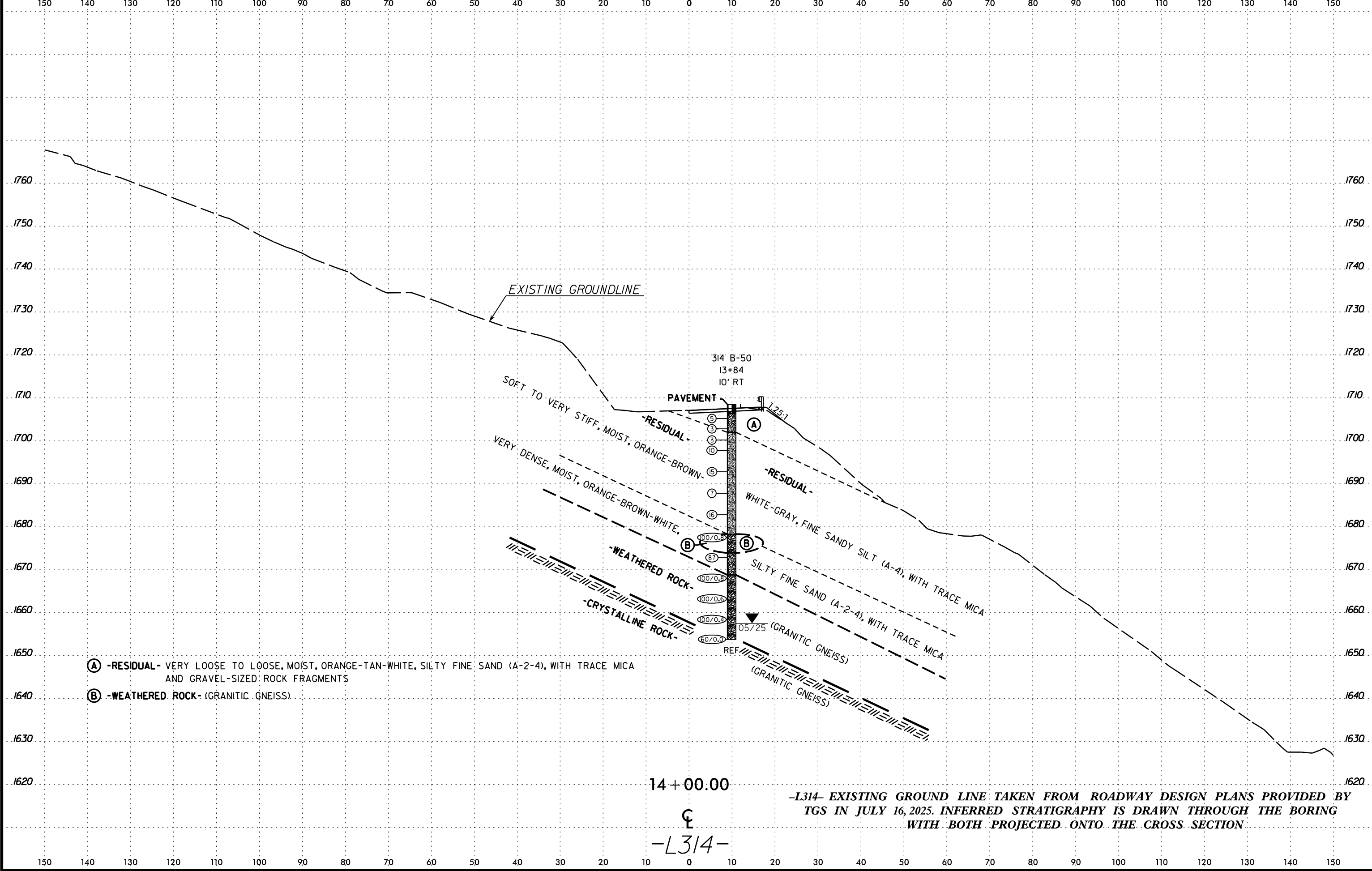
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7



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**-L314- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY
TGS IN JULY 16, 2025. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING
WITH BOTH PROJECTED ONTO THE CROSS SECTION**

14 + 00.00

...C

-L314-

16-JUL-2025 17:41
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GEOTECHNICAL BORING REPORT
BORE LOG

WBS DF18314.1075023				TIP N/A				COUNTY POLK				GEOLOGIST K.Clark					
SITE DESCRIPTION Road Repairs along US 176 Highway												GROUND WTR (ft)					
BORING NO. 314 B-55				STATION 10+99				OFFSET 14 ft RT				ALIGNMENT -L314-				0 HR. 33.2	
COLLAR ELEV. 1,728.9 ft				TOTAL DEPTH 49.2 ft				NORTHING 552,175				EASTING 1,005,760				24 HR. 31.0	
DRILL RIG/HAMMER EFF./DATE CG24113 CME-550X 78% 05/06/2024								DRILL METHOD H.S. Augers				HAMMER TYPE Automatic					
DRILLER L. Ard				START DATE 04/28/25				COMP. DATE 04/28/25				SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
1730																	
1725	1,727.9	1.0	13	13	12									1,728.9	0.0	GROUND SURFACE	
													D	1,727.3	1.6	ROADWAY EMBANKMENT	
	1,724.8	4.1	34	22	8									1,725.9	3.0	Asphalt (0.6), ABC (1.0')	
1720	1,722.9	6.0	8	5	6								M	Very Stiff, Brown, SILT (A-5), with trace gravel and asphalt			
													M	RESIDUAL			
	1,719.8	9.1	5	7	9								M	Stiff to Hard, Gray-Tan-White-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica and gravel-sized rock fragments			
1715													M				
	1,714.8	14.1	4	6	9								M				
													M				
1710	1,709.8	19.1	5	95/0.3									M	Boulder from approximately 19 to 20 feet			
1705													M				
	1,704.8	24.1	4	6	5								M				
													M				
1700	1,699.8	29.1	15	50	47												
1695																	
	1,694.8	34.1	45	65	35/0.3									1,694.3	34.6	WEATHERED ROCK	
														1,691.9	37.0	Gray, (Granitic Gneiss)	
1690	1,689.8	39.1	11	10	14								M	RESIDUAL			
1685													M	Very Stiff to Hard, Gray-Brown, Fine Sandy SILT (A-4), with trace to some mica and gravel-sized rock fragments			
	1,684.8	44.1	8	16	29								M				
1680	1,679.8	49.1	60/0.1											1,679.8	49.1	CRYSTALLINE ROCK	
														1,679.7	49.2	(Granitic Gneiss)	
														Boring Terminated with Standard Penetration Test Refusal at Elevation 1,679.7 ft In Crystalline Rock (Granitic Gneiss)			

NCDOT BORE DOUBLE GEO_US 176_SITE 314_GTM.GPJ NC_DOT.GDT 6/4/25

WBS			DF18314.1075023			TIP			N/A			COUNTY			POLK			GEOLOGIST			K. Clark																																
SITE DESCRIPTION																		Road Repairs along US 176 Highway																		GROUND WTR (ft)																	
BORING NO.						314 B-54						STATION						11+50						OFFSET						12 ft RT						ALIGNMENT						-L314-						0 HR.		Dry			
COLLAR ELEV.						1,725.2 ft						TOTAL DEPTH						16.8 ft						NORTHING						552,204						EASTING						1,005,806						24 HR.		Dry			
DRILL RIG/HAMMER EFF./DATE												CG24113 CME-550X 78% 05/06/2024												DRILL METHOD						H.S. Augers						HAMMER TYPE						Automatic											
DRILLER						L. Ard						START DATE						04/30/25						COMP. DATE						04/30/25						SURFACE WATER DEPTH												N/A					
ELEV (ft)		DRIVE ELEV (ft)		DEPTH (ft)		BLOW COUNT			BLOWS PER FOOT										SAMP. NO.		MOI		LOG		SOIL AND ROCK DESCRIPTION																												
						0.5ft 0.5ft 0.5ft			0 25 50 75 100																																												
1730																																																					
1725																																																					
		1,724.2		1.0		6 4 5			<																																												

GROUND SURFACE
ROADWAY EMBANKMENT
Asphalt (0.6), ABC (1.0')
Very Stiff, Brown, SILT (A-5), with trace gravel and asphalt
RESIDUAL
Stiff to Hard, Gray-Tan-White-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica and gravel-sized rock fragments
Boulder from approximately 19 to 20 feet
WEATHERED ROCK
Gray, (Granitic Gneiss)
RESIDUAL
Very Stiff to Hard, Gray-Brown, Fine Sandy SILT (A-4), with trace to some mica and gravel-sized rock fragments
CRYSTALLINE ROCK
(Granitic Gneiss)
Boring Terminated with Standard Penetration Test Refusal at Elevation 1,679.7 ft In Crystalline Rock (Granitic Gneiss)

GROUND SURFACE
ROADWAY EMBANKMENT
Asphalt (0.8'), Concrete (0.3')
Stiff, Red-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica and gravel
RESIDUAL
Very Loose to Very Dense, White-Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica and gravel-sized rock fragments
WEATHERED ROCK
Tan-Brown, (Granitic Gneiss)
Boring Terminated with Standard Penetration Test Refusal at Elevation 1,708.4 ft On Crystalline Rock (Granitic Gneiss)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS DF18314.1075023				TIP N/A		COUNTY POLK		GEOLOGIST K. Calrk							
SITE DESCRIPTION Road Repairs along US 176 Highway										GROUND WTR (ft)					
BORING NO. 314 B-53			STATION 12+08			OFFSET 9 ft RT			ALIGNMENT -L314-		0 HR. 18.2				
COLLAR ELEV. 1,720.0 ft			TOTAL DEPTH 32.1 ft			NORTHING 552,244			EASTING 1,005,848		24 HR. 14.5				
DRILL RIG/HAMMER EFF./DATE CG24113 CME-550X 78% 05/06/2024						DRILL METHOD H.S. Augers				HAMMER TYPE Automatic					
DRILLER L. Ard			START DATE 04/30/25			COMP. DATE 04/30/25			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼ MOI	LOG G	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
1725															
1720															
1715	1,719.0	1.0													
	1,715.6	4.4	3	2	2										
1710	1,714.0	6.0	1	1	WOH										
	1,710.6	9.4	1	1	2										
1705															
1700															
1695															
1690															

WBS DF18314.1075023				TIP N/A				COUNTY POLK				GEOLOGIST K. Clark					
SITE DESCRIPTION Road Repairs along US 176 Highway												GROUND WTR (ft)					
BORING NO. 314 B-52				STATION 12+64				OFFSET 11 ft RT				ALIGNMENT -L314-				0 HR. 13.3	
COLLAR ELEV. 1,715.2 ft				TOTAL DEPTH 34.4 ft				NORTHING 552,263				EASTING 1,005,895				24 HR. 15.0	
DRILL RIG/HAMMER EFF./DATE CG24113 CME-550X 78% 05/06/2024								DRILL METHOD H.S. Augers				HAMMER TYPE Automatic					
DRILLER L. Ard				START DATE 04/30/25				COMP. DATE 04/30/25				SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
1720																	
1715																	
1710	1,714.2	1.0	8	7	5										1,715.2 GROUND SURFACE 0.0		
	1,711.0	4.2	3	4	5										1,714.2 ROADWAY EMBANKMENT 1.0		
1705	1,709.2	6.0	1	99/0.2											Asphalt (1.0')		
	1,706.0	9.2	3	1	1										Soft to Stiff, Black-Gray-Brown-Red, Fine to Coarse Sandy SILT (A-4), with trace mica, asphalt fragments and gravel		
1700	1,701.0	14.2	6	6	8										Boulder from approximately 6 to 7 feet		
	1,696.0	19.2	25	29	14												
1695																	
1690	1,691.0	24.2	15	11	11										1,701.0 RESIDUAL 14.2		
	1,686.0	29.2	84	16/0.1											Stiff to Hard, Black-Tan-Brown-Orange, Fine to Coarse Sandy SILT (A-4), with trace mica and gravel-sized rock fragments		
1685	1,681.0	34.2	100/0.2														
	1,680.8	34.4	60/0.0												1,690.7 24.5		
															Medium Dense, Black-Tan-Gray, Silty Fine to Coarse SAND (A-2-4), with trace mica		
															1,686.0 WEATHERED ROCK 29.2		
															Pink-Black-White, (Granitic Gneiss)		
															1,680.8 34.4		
															Boring Terminated with Standard Penetration Test Refusal at Elevation 1,680.8 ft On Crystalline Rock (Granitic Gneiss)		

NCDOT BORE DOUBLE GEO_US 176_SITE 314_GTM.GPJ NC_DOT.GDT 6/4/25

WBS		DF18314.1075023		TIP		N/A		COUNTY		POLK		GEOLOGIST		K. Clark																									
SITE DESCRIPTION													Road Repairs along US 176 Highway			GROUND WTR (ft)																							
BORING NO.				314 B-51				STATION				13+29		OFFSET		11 ft RT		ALIGNMENT		-L314-		0 HR.		19.3															
COLLAR ELEV.				1,711.5 ft				TOTAL DEPTH				48.0 ft		NORTHING		552,259		EASTING		1,005,955		24 HR.		16.5															
DRILL RIG/HAMMER EFF./DATE										CG24113 CME-550X 78% 05/06/2024										DRILL METHOD				H.S. Augers				HAMMER TYPE				Automatic							
DRILLER						L. Ard						START DATE				04/30/25				COMP. DATE				04/30/25				SURFACE WATER DEPTH								N/A			
ELEV (ft)		DRIVE ELEV (ft)		DEPTH (ft)		BLOW COUNT			BLOWS PER FOOT					SAMP. NO.		MOI		LOG		SOIL AND ROCK DESCRIPTION																			
						0.5ft 0.5ft 0.5ft			0 25 50 75 100											ELEV. (ft) DEPTH (ft)																			
1715																																							
1710		1,710.5		1.0		4 2 1			1 3											GROUND SURFACE 0.0																			
		1,708.5		3.0		2 1 1			2 3											ROADWAY EMBANKMENT 0.8																			
		1,705.5		6.0		2 1 2			3 3											Soft, Black-Red-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica, asphalt fragments, and organics																			
		1,703.5		8.0		1 1 2			3 3																														
1700																																							
		1,698.5		13.0		7 9 8			17											1,698.0 13.5																			
1695																				RESIDUAL																			
		1,693.5		18.0		15 17 18			35											Medium Stiff to Hard, Gray-Red-Brown-Orange, Fine to Coarse Sandy SILT (A-4), with trace mica and gravel-sized rock fragments																			
1690																																							
		1,688.5		23.0		4 4 4			8																														
1685																																							
		1,683.5		28.0		7 12 21			33																														
1680																																							
		1,678.5		33.0		56 44/0.3			100/0.8											1,678.5 33.0																			
1675																				WEATHERED ROCK																			
		1,673.5		38.0		65 35/0.3			100/0.8											Orange-Brown-White, (Granitic Gneiss)																			
1670																																							
		1,668.5		43.0		100/0.5			100/0.5																														
1665																																							
		1,663.5		48.0		60/0.0			60/0.0											1,663.5 48.0																			
																				Boring Terminated with Standard Penetration Test Refusal at Elevation 1,663.5 ft On Crystalline Rock (Granitic Gneiss)																			

WBS DF18314.1075023			TIP N/A			COUNTY POLK			GEOLOGIST R. Welch				
SITE DESCRIPTION Road Repairs along US 176 Highway									GROUND WTR (ft)				
BORING NO. 314 B-50			STATION 13+84			OFFSET 10 ft RT			ALIGNMENT -L314-			0 HR. Dry	
COLLAR ELEV. 1,708.5 ft			TOTAL DEPTH 54.7 ft			NORTHING 552,247			EASTING 1,006,008			24 HR. 51.0	
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D-50 97% 04/30/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic				
DRILLER C. Odom			START DATE 05/01/25			COMP. DATE 05/01/25			SURFACE WATER DEPTH 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			
1710													
	1,706.2	2.3	4	2	3								1,708.5 GROUND SURFACE 0.0
1705	1,703.8	4.7	3	2	1							M	1,706.4 ROADWAY EMBANKMENT Asphalt (0.7'), ABC (1.4') 2.1
	1,701.2	7.3	1	1	2							M	RESIDUAL Very Loose to Loose, Orange-Tan-White, Silty Fine SAND (A-2-4), with trace mica and gravel-sized rock fragments 6.5
1700	1,698.8	9.7	2	4	6							M	Soft to Very Stiff, Orange-Brown-White-Gray, Fine Sandy SILT (A-4), with trace mica
1695	1,693.8	14.7	5	6	9							M	
1690	1,688.8	19.7	3	3	4							M	
1685	1,683.8	24.7	4	6	10							M	
1680	1,678.8	29.7	12	48	52/0.3								1,678.3 WEATHERED ROCK 30.2 Tan-White-Orange, (Granitic Gneiss)
1675	1,673.8	34.7	17	37	50							M	1,673.9 RESIDUAL Very Dense, Orange-Brown-White, Silty Fine SAND (A-2-4), with trace mica 34.6
1670	1,668.8	39.7	67	33/0.3									1,668.8 WEATHERED ROCK 39.7 Tan-Orange-White, (Granitic Gneiss)
1665	1,663.8	44.7	75	25/0.1									
1660	1,658.8	49.7	100/0.4										
1655	1,653.8	54.7	60/0.0										1,653.8 Boring Terminated with Standard Penetration Test Refusal at Elevation 1,653.8 ft On Crystalline Rock (Granitic Gneiss) 54.7

NCDOT BORE DOUBLE GEO US 176 SITE 314 GTM.GPJ NC DOT.GDT 7/28/25

REFERENCE: DF18314.1075025

PROJECT: N/A

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4-6	CROSS SECTIONS
7-8	BORELOGS

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY POLK
PROJECT DESCRIPTION EMERGENCY DESIGN FOR
US 176

SITE DESCRIPTION SITE 316

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18314.1075025	1	

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.

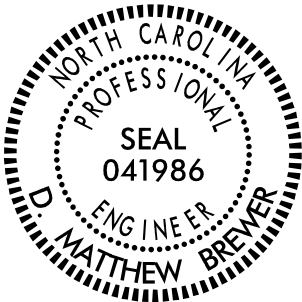
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT 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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS 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
R. WELCH, G.I.T.
CG2 EXPLORATION

INVESTIGATED BY CG2, PLLC
DRAWN BY P. PERRY, E.I.T.
CHECKED BY M. BREWER, P.E.
SUBMITTED BY CG2, PLLC
DATE JULY 2025

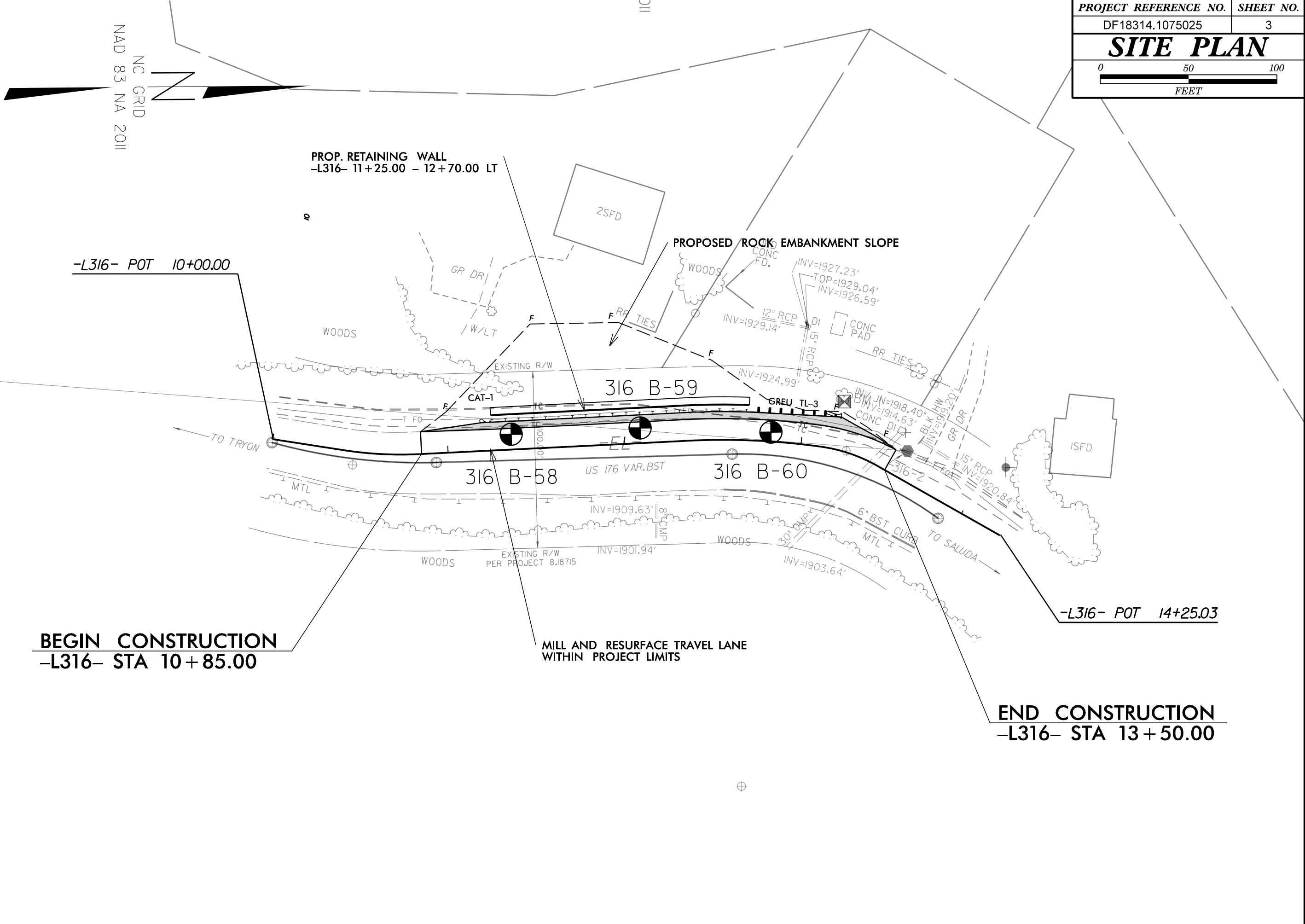
Prepared in the Office of:
 CAROLINAS
GEOTECHNICAL
GROUP
1805 SARDIS ROAD NORTH
SUITE 100
CHARLOTTE, NC 28270
(980) 339-8684



DocuSigned by:
Matthew Brewer 12/2/2025
386129C0A480A2... SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

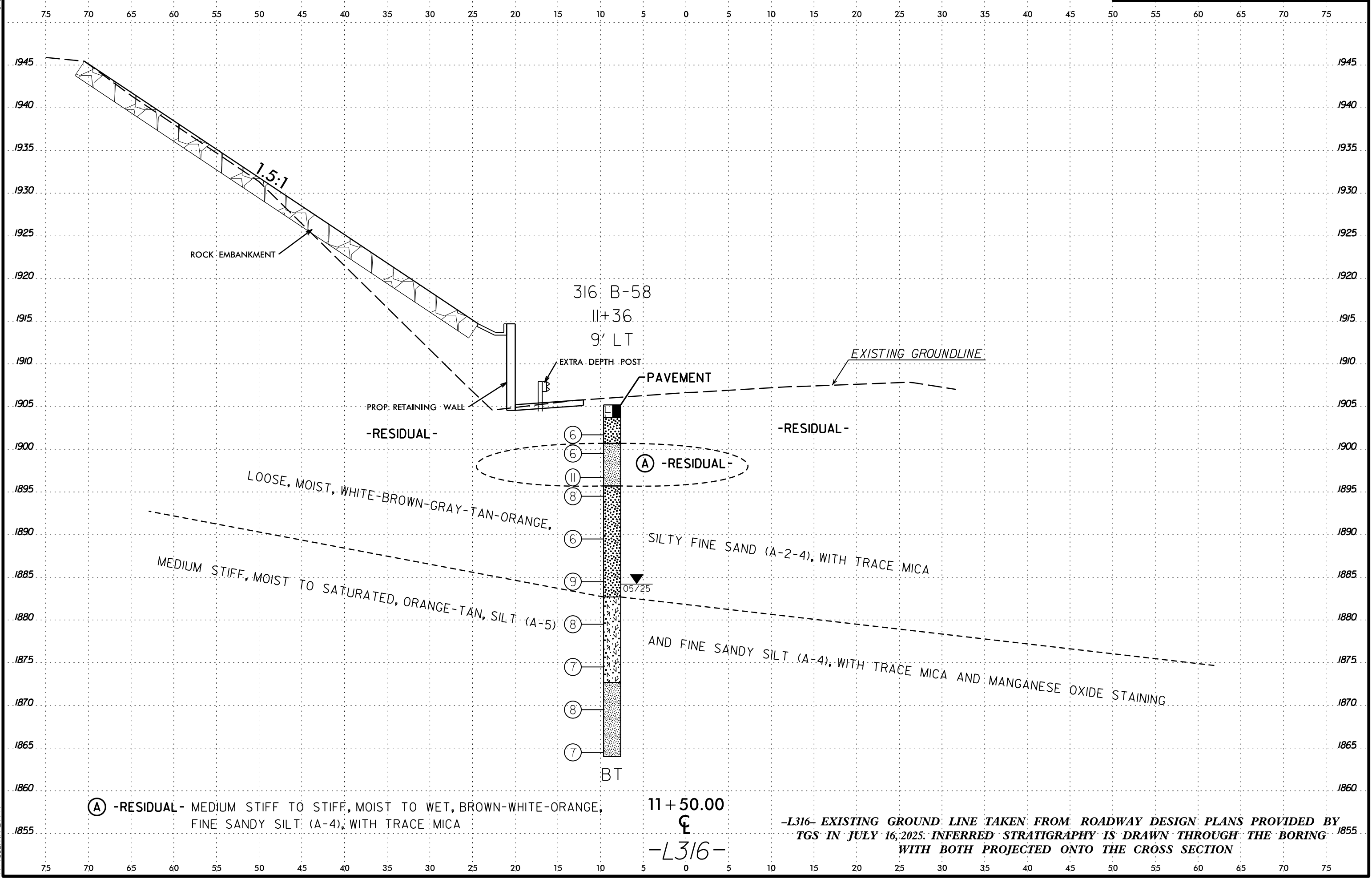
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DF18314.1075025	3
SITE PLAN	
0 50 100 FEET	

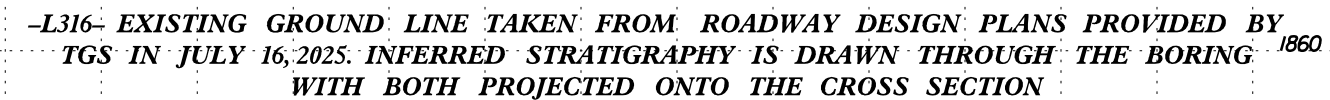


BEGIN CONSTRUCTION
-L316- STA 10+85.00

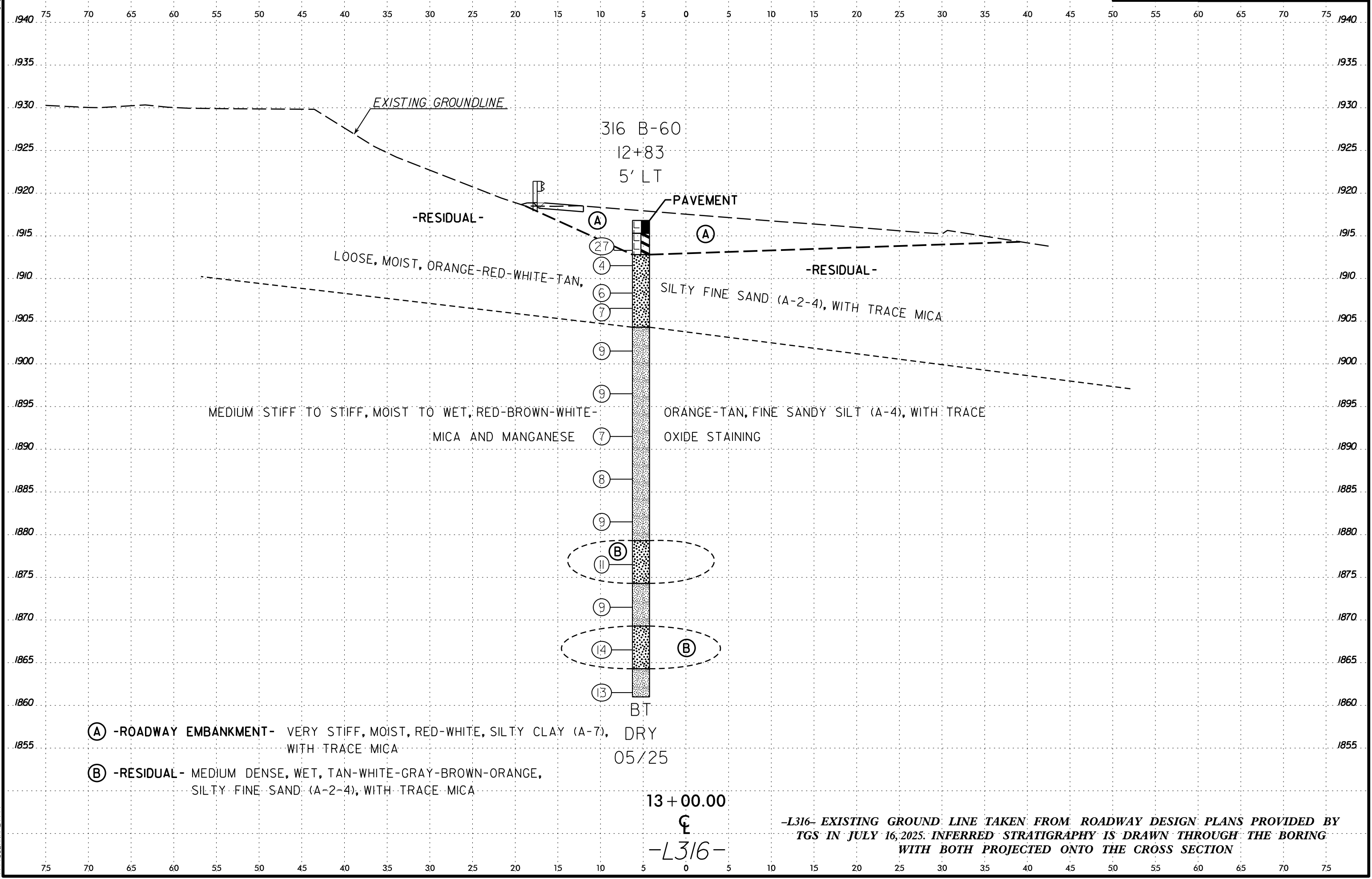
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-L316- STA 13+50.00

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-L316- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS IN JULY 16, 2025. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

13 + 00.00
¢
-L316-

WBS			DF18314.1075025			TIP			N/A			COUNTY			POLK			GEOLOGIST			R. Welch																																
SITE DESCRIPTION																		Road Repairs along US 176 Highway																		GROUND WTR (ft)																	
BORING NO.						316 B-58						STATION						11+36						OFFSET						9 ft LT						ALIGNMENT						-L316-						0 HR.		24.8			
COLLAR ELEV.						1,905.2 ft						TOTAL DEPTH						41.2 ft						NORTHING						554,013						EASTING						1,005,009						24 HR.		21.0			
DRILL RIG/HAMMER EFF./DATE														CG20446 Diedrich D-50 97% 04/30/2024														DRILL METHOD						H.S. Augers						HAMMER TYPE						Automatic							
DRILLER						C. Odom						START DATE						05/01/25						COMP. DATE						05/01/25						SURFACE WATER DEPTH												N/A					
ELEV (ft)		DRIVE ELEV (ft)		DEPTH (ft)		BLOW COUNT			BLOWS PER FOOT										SAMP. NO.		MOI		LOG		SOIL AND ROCK DESCRIPTION																												
						0.5ft 0.5ft 0.5ft			0 25 50 75 100																ELEV. (ft) DEPTH (ft)																												
1910																																																					
1905																									1,905.2 GROUND SURFACE 0.0																												
																									1,903.7 ROADWAY EMBANKMENT 1.5																												
																									Asphalt (0.5'), ABC (1.0')																												
1900		1,902.7		2.5		5 4 2			6																RESIDUAL 4.5																												
		1,900.5		4.7		1 1 5			6																Loose, White-Brown, Silty Fine SAND (A-2-4), with trace mica																												
		1,897.7		7.5		5 7 4			11																Medium Stiff to Stiff, Brown-White-Orange, Fine Sandy SILT (A-4), with trace mica																												
1895		1,895.5		9.7		7 6 2			8																1,895.7 Loose, Gray-White-Tan-Orange, Silty Fine SAND (A-2-4), with trace mica 9.5																												
1890		1,890.5		14.7		3 4 2			6																																												
1885		1,885.5		19.7		3 4 5			9																																												
1880		1,880.5		24.7		3 4 4			8																1,882.7 Medium Stiff, Orange-Tan, SILT (A-5), with trace mica and Manganese Oxide staining 22.5																												
1875		1,875.5		29.7		1 3 4			7																1,872.7 Medium Stiff, Orange-Tan, Fine Sandy SILT (A-4), with trace mica and Manganese Oxide staining 32.5																												
1870		1,870.5		34.7		3 4 4			8																																												
1865		1,865.5		39.7		3 4 3			7																Sat. 1,864.0 41.2																												
																									Boring Terminated at Elevation 1,864.0 ft In Residual Sandy SILT (A-4)																												

[illegible]

GEOTECHNICAL BORING REPORT
BORE LOG

WBS DF18314.1075025			TIP N/A			COUNTY POLK			GEOLOGIST R. Welch						
SITE DESCRIPTION Road Repairs along US 176 Highway												GROUND WTR (ft)			
BORING NO. 316 B-60			STATION 12+83			OFFSET 5 ft LT			ALIGNMENT -L316-			0 HR.	Dry		
COLLAR ELEV. 1,916.8 ft			TOTAL DEPTH 55.8 ft			NORTHING 554,160			EASTING 1,005,009			24 HR.	Dry		
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D-50 97% 04/30/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER C. Odom			START DATE 05/01/25			COMP. DATE 05/01/25			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
1920															
1915														1,916.8	GROUND SURFACE 0.0
														1,915.3	ROADWAY EMBANKMENT 1.5
	1,914.3	2.5													
	1,912.5	4.3	3	12	15									1,912.8	Very Stiff, Red-White, Silty CLAY (A-7), with trace mica 4.0
1910															
	1,909.3	7.5													
	1,907.5	9.3	4	2	2										
1905															
1900															

NCDOT BORE DOUBLE GEO_US 176_SITE 316_GTM.GPJ NC DOT.GDT 6/4/25

REFERENCE: DF18314.1075027

PROJECT: N/A

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4-6	CROSS SECTIONS
7-9	BORELOGS

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY POLK

PROJECT DESCRIPTION EMERGENCY DESIGN FOR
US 176

SITE DESCRIPTION SITE 318

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18314.1075027	1	

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PERSONNEL

T. WENNER, P.G.

M. MALISHER, E.I.T.

CG2 EXPLORATION

INVESTIGATED BY CG2, PLLC

DRAWN BY K. DE MONTBRUN, P.E.

CHECKED BY M. BREWER, P.E.

SUBMITTED BY CG2, PLLC

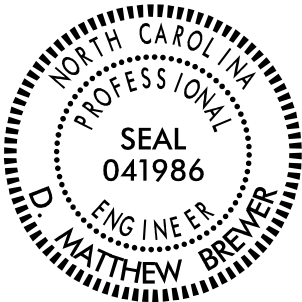
DATE JULY 2025

Prepared in the Office of:



CAROLINAS
GEOTECHNICAL
GROUP

1805 SARDIS ROAD NORTH
SUITE 100
CHARLOTTE, NC 28270
(980) 339-8684



DocuSigned by:

Matthew Brewer 12/2/2025

386129C0A48C4624 SIGNATURE DATE

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PROJECT REFERENCE NO.	SHEET NO.
DF18314.1075027	3
SITE PLAN	
050 100 FEET	

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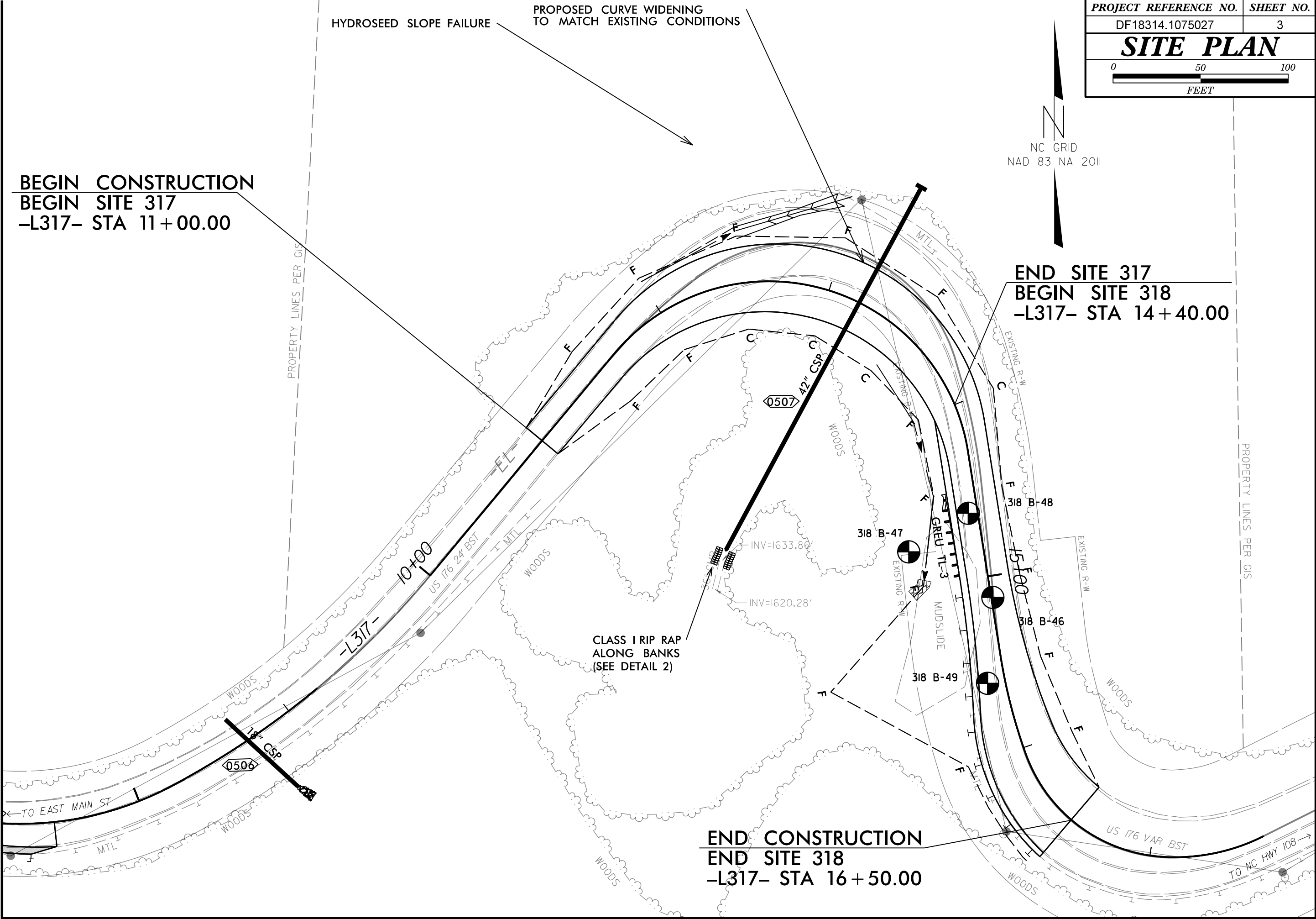
BEGIN CONSTRUCTION
BEGIN SITE 317
-L317- STA 11+00.00

END SITE 317
BEGIN SITE 318
-L317- STA 14+40.00

END CONSTRUCTION
END SITE 318
-L317- STA 16+50.00

HYDROSEED SLOPE FAILURE
PROPOSED CURVE WIDENING
TO MATCH EXISTING CONDITIONS

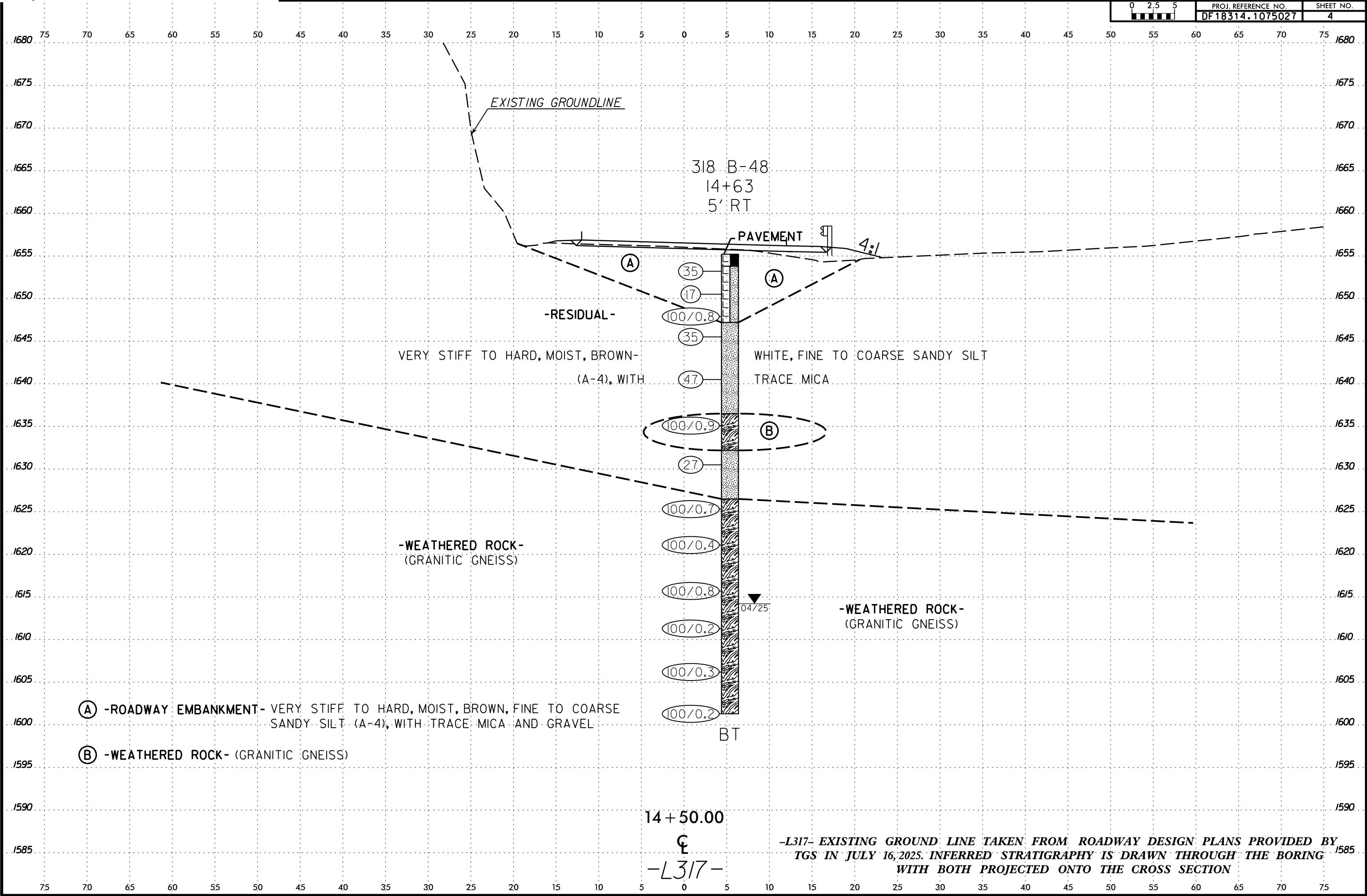
CLASS I RIP RAP
ALONG BANKS
(SEE DETAIL 2)



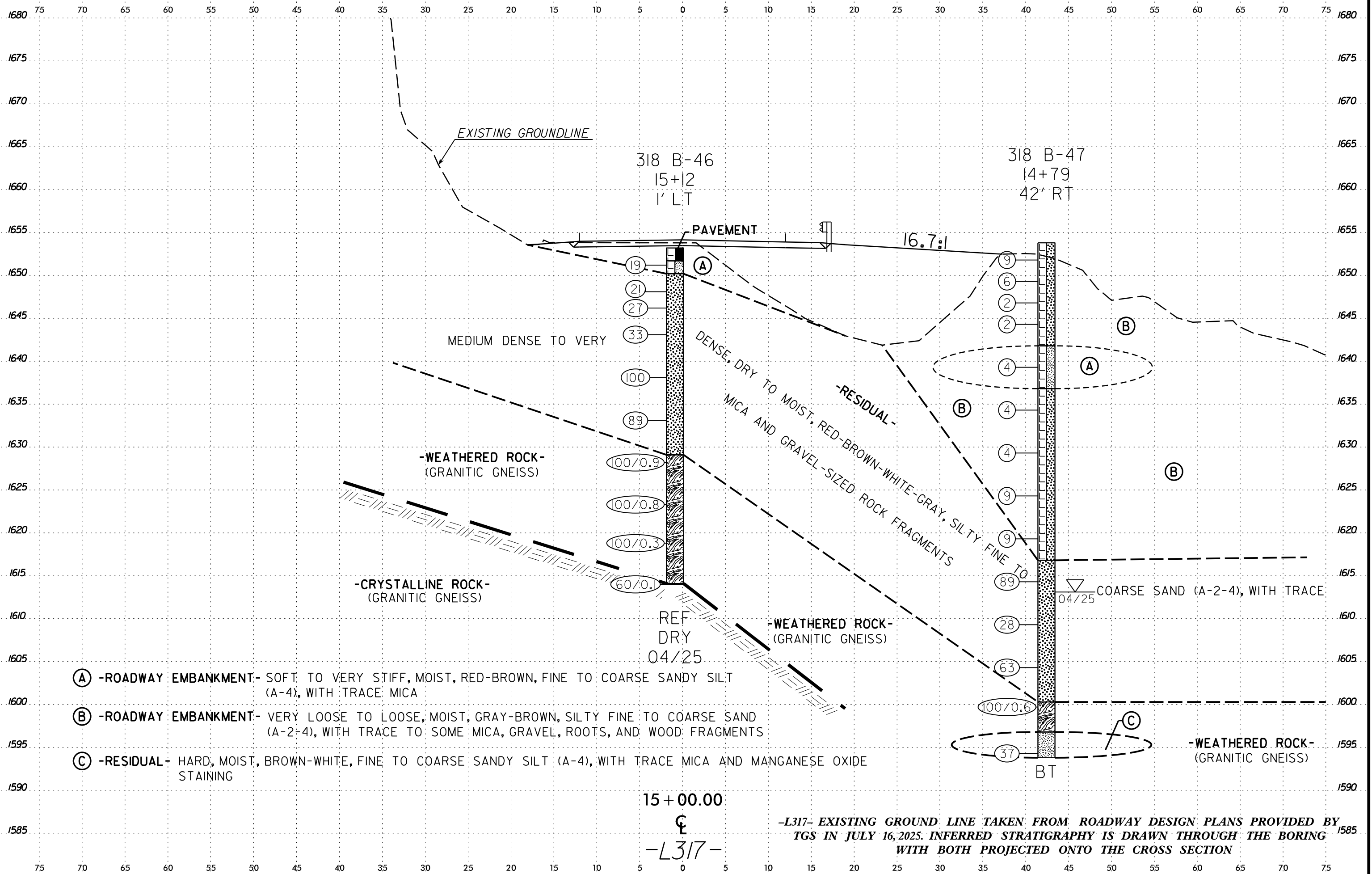
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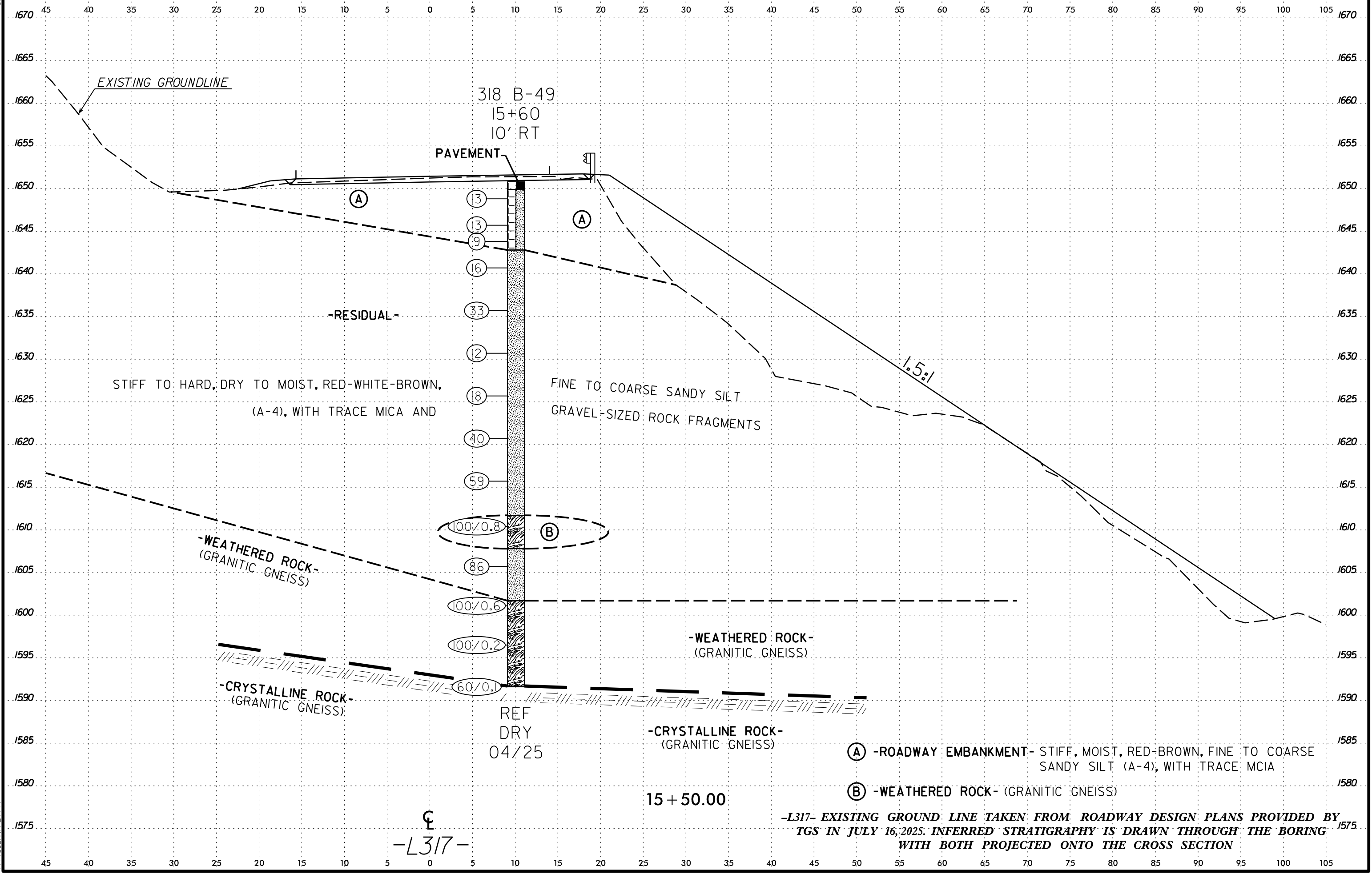


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-L317- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS IN JULY 16, 2025. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

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28-JUL-2025 10:22
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WBS		DF18314.1075026		TIP		N/A		COUNTY		POLK		GEOLOGIST		T. Wenner																																	
SITE DESCRIPTION												Road Repairs along US 176 Highway				GROUND WTR (ft)																															
BORING NO.				318 B-48				STATION				14+63				OFFSET				5 ft RT				ALIGNMENT				-L317-				0 HR.		52.0													
COLLAR ELEV.				1,655.2 ft				TOTAL DEPTH				53.9 ft				NORTHING				552,428				EASTING				1,006,598				24 HR.		41.0													
DRILL RIG/HAMMER EFF./DATE												CG24113 CME-550X 74% 04/08/2022												DRILL METHOD				H.S. Augers				HAMMER TYPE				Automatic											
DRILLER						L. Ard						START DATE						04/28/25						COMP. DATE						04/28/25						SURFACE WATER DEPTH						N/A					
ELEV (ft)		DRIVE ELEV (ft)		DEPTH (ft)		BLOW COUNT			BLOWS PER FOOT					SAMP. NO.		MOI		LOG		SOIL AND ROCK DESCRIPTION																											
						0.5ft 0.5ft 0.5ft			0 25 50 75 100											ELEV. (ft) DEPTH (ft)																											
1660																																															
1655																																															
		1,654.2		1.0		12 20 15														1,655.2 GROUND SURFACE 0.0																											
																				1,653.8 ROADWAY EMBANKMENT 1.4																											
																				Asphalt (0.7'), ABC (0.7')																											
		1,651.5		3.7		12 10 7														Very Stiff to Hard, Brown, Fine to Coarse Sandy SILT (A-4), with trace mica and gravel																											
1650																				Boulder from approximatley 6.5 to 7.5 feet																											
		1,649.2		6.0		25 50 50/0.3														1,647.2 8.0																											
																				RESIDUAL																											
1645						24 15 20														Hard, Brown-White, Fine to Coarse Sandy SILT (A-4), with trace mica																											
		1,646.5		8.7																																											
1640						58 21 26																																									
		1,641.5		13.7																																											
1635						26 46 54/0.4														1,636.0 19.2																											
																				WEATHERED ROCK																											
		1,631.5		23.7		14 13 14														Brown-White, (Granitic Gneiss)																											
1630																				1,632.2 23.0																											
																				RESIDUAL																											
																				Very Stiff, Brown, Fine to Coarse Sandy SILT (A-4), with trace mica																											
1625						26 68 32/0.2														1,626.0 29.2																											
																				WEATHERED ROCK																											
		1,621.5		33.7		100/0.4														Brown-White, (Granitic Gneiss)																											
1620																																															
		1,616.5		38.7		36 64/0.3																																									
1615																																															
		1,611.5		43.7		100/0.2																																									
1610																																															
		1,606.5		48.7		100/0.3																																									
1605																																															
		1,601.5		53.7		100/0.2														1,601.3 53.9																											
																				Boring Terminated at Elevation 1,601.3 ft In Weathered Rock (Granitic Gneiss)																											

NCDOT BORE DOUBLE GEO_US 176 SITE 318 GTM.GPJ NC DOT.GDT 7/28/25

WBS		DF18314.1075026		TIP		N/A		COUNTY		POLK		GEOLOGIST		T. Wenner	
SITE DESCRIPTION Road Repairs along US 176 Highway													GROUND WTR (ft)		
BORING NO.		318 B-46		STATION		15+12		OFFSET		1 ft LT		ALIGNMENT		-L317-	
COLLAR ELEV.		1,653.2 ft		TOTAL DEPTH		39.2 ft		NORTHING		552,380		EASTING		1,006,612	
DRILL RIG/HAMMER EFF./DATE CG24113 CME-550X 78% 05/06/2024								DRILL METHOD H.S. Augers				HAMMER TYPE Automatic			
DRILLER L. Ard				START DATE 04/28/25				COMP. DATE 04/28/25				SURFACE WATER DEPTH N/A			
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	L O G	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
1655															
1650	1,652.2	1.0		10	10	9						M		1,653.2	GROUND SURFACE 0.0
	1,649.1	4.1		7	6	15						M		1,651.7	ROADWAY EMBANKMENT 1.5
	1,647.2	6.0		14	14	13						M		1,650.2	Asphalt (1.0'), ABC (0.5') -3.0
1645	1,644.1	9.1		13	16	17						M			Very Stiff, Red-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica
1640	1,639.1	14.1		21	50	50						M			RESIDUAL Medium Dense to Very Dense, Red-Brown-White-Gray, Silty Fine to Coarse SAND (A-2-4), with trace mica and gravel-sized rock fragments
1635	1,634.1	19.1		32	37	52						M			Boulder from approximately 14.5 to 15.5 feet
1630	1,629.1	24.1		23	77	0.4						M			
1625	1,624.1	29.1		60	40	0.3								1,629.1	WEATHERED ROCK 24.1
1620	1,619.1	34.1		100	0.3										Brown-White-Gray, (Granitic Gneiss)
1615	1,614.1	39.1		60	0.1									1,614.1	CRYSTALLINE ROCK 39.1
														1,614.0	Brown-White-Gray, (Granitic Gneiss) 39.2
															Boring Terminated with Standard Penetration Test Refusal at Elevation 1,614.0 ft In Crystalline Rock (Granitic Gneiss)

[illegible]

NCDOT BORE DOUBLE GEO US 176 SITE 318 GTM.GPJ NC DOT.GDT 7/28/25

GEOTECHNICAL BORING REPORT
BORE LOG

WBS DF18314.1075026			TIP N/A			COUNTY POLK			GEOLOGIST T. Wenner						
SITE DESCRIPTION Road Repairs along US 176 Highway										GROUND WTR (ft)					
BORING NO. 318 B-49			STATION 15+60			OFFSET 10 ft RT			ALIGNMENT -L317-		0 HR. Dry				
COLLAR ELEV. 1,650.8 ft			TOTAL DEPTH 59.2 ft			NORTHING 552,331			EASTING 1,006,609		24 HR. Dry				
DRILL RIG/HAMMER EFF./DATE CG24113 CME-550X 78% 05/06/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER L. Ard			START DATE 04/28/25			COMP. DATE 04/28/25			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	L O G	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
1655															
1650	1,649.8	1.0	7	7	6									1,650.8	0.0
														1,649.9	0.9
	1,646.7	4.1											M	ROADWAY EMBANKMENT	
														Asphalt (0.6'), Concrete (0.3')	
	1,644.8	6.0	6	6	7								M	Stiff, Red-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica	
1645			2	3	6								M		
	1,641.7	9.1	5	8	8								M		
1640														1,642.8	8.0
	1,636.7	14.1	13	16	17								M	RESIDUAL	
1635															Stiff to Hard, Red-White-Brown, Fine to Coarse Sandy SILT (A-4), with trace mica and gravel-sized rock fragments
	1,631.7	19.1	5	6	6								M		
1630															
	1,626.7	24.1	5	8	10								M		
1625															
	1,621.7	29.1	12	16	24								M		
1620															
	1,616.7	34.1	23	30	29								M		
1615															
	1,611.7	39.1	21	59	41/0.3									1,611.2	39.6
1610															
	1,606.7	44.1	30	36	50								D	1,607.8	43.0
1605															
	1,601.7	49.1	85	15/0.1										1,601.7	49.1
1600															
	1,596.7	54.1	100/0.2												
1595															
	1,591.7	59.1	60/0.1											1,591.7	59.1
														1,591.6	59.2
														CRYSTALLINE ROCK	
														Brown-White, (Granitic Gneiss)	
														Boring Terminated with Standard Penetration Test Refusal at Elevation 1,591.6 ft In Crystalline Rock (Granitic Gneiss)	

NCDOT BORE DOUBLE GEO_US 176_SITE 318_GTM.GPJ NC DOT.GDT 7/28/25

REFERENCE: DF18314.1075028

PROJECT: N/A

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
2A	SUPPLEMENTAL LEGEND (GSI)
3	SITE PLAN
4-6	CROSS SECTIONS
7-8	BORELOGS

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY POLK
PROJECT DESCRIPTION EMERGENCY DESIGN FOR
US 176

SITE DESCRIPTION SITE 319

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18314.1075028	1	

CAUTION NOTICE

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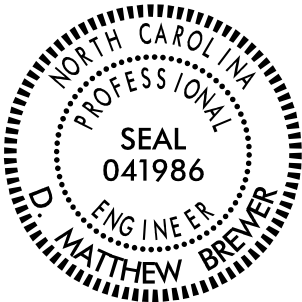
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PERSONNEL
R. WELCH, G.I.T.
CG2 EXPLORATION

INVESTIGATED BY CG2, PLLC
DRAWN BY P. PERRY, E.I.T.
CHECKED BY M. BREWER, P.E.
SUBMITTED BY CG2, PLLC
DATE JULY 2025

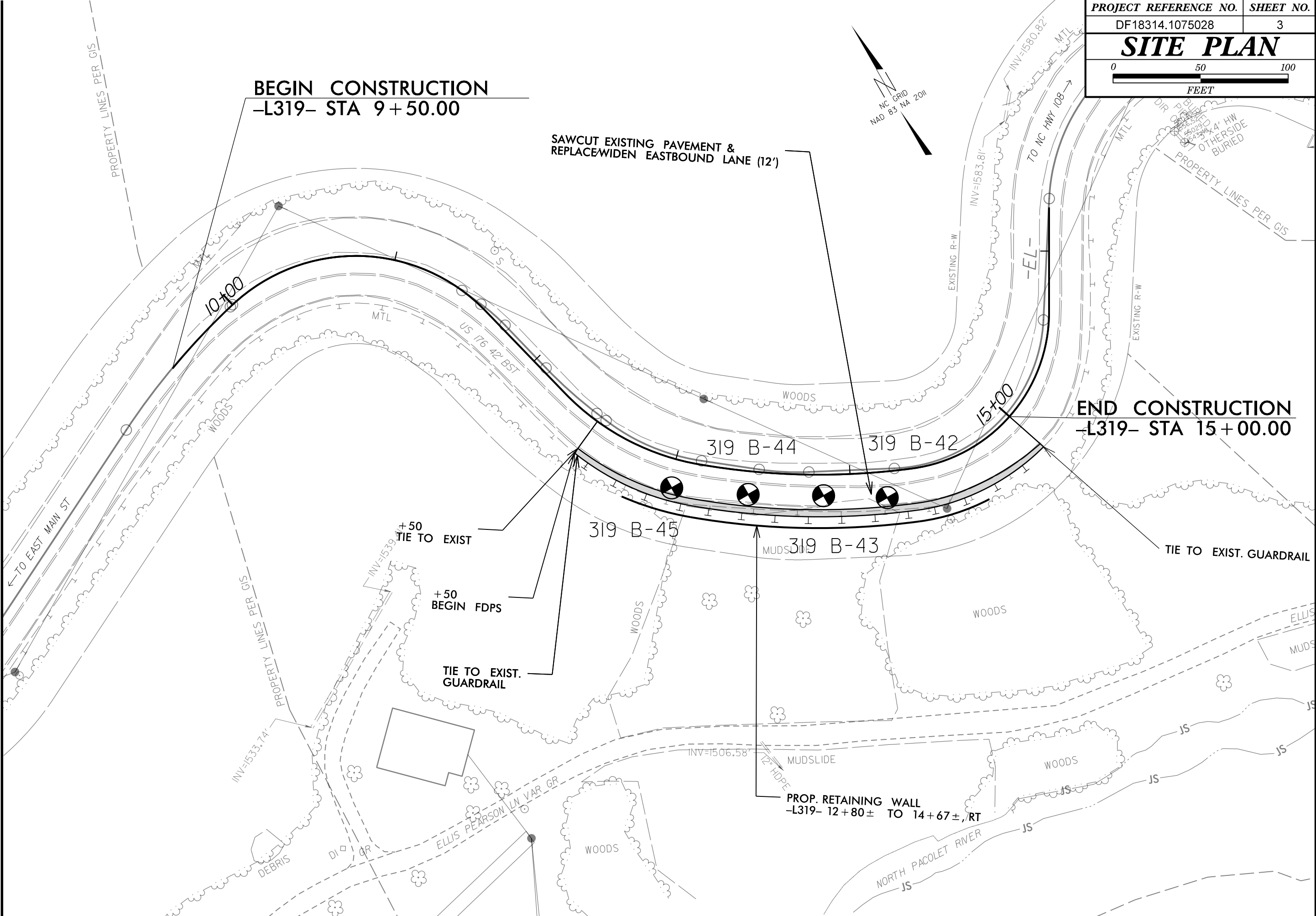
Prepared in the Office of:
 CAROLINAS
GEOTECHNICAL
GROUP
1805 SARDIS ROAD NORTH
SUITE 100
CHARLOTTE, NC 28270
(980) 339-8684



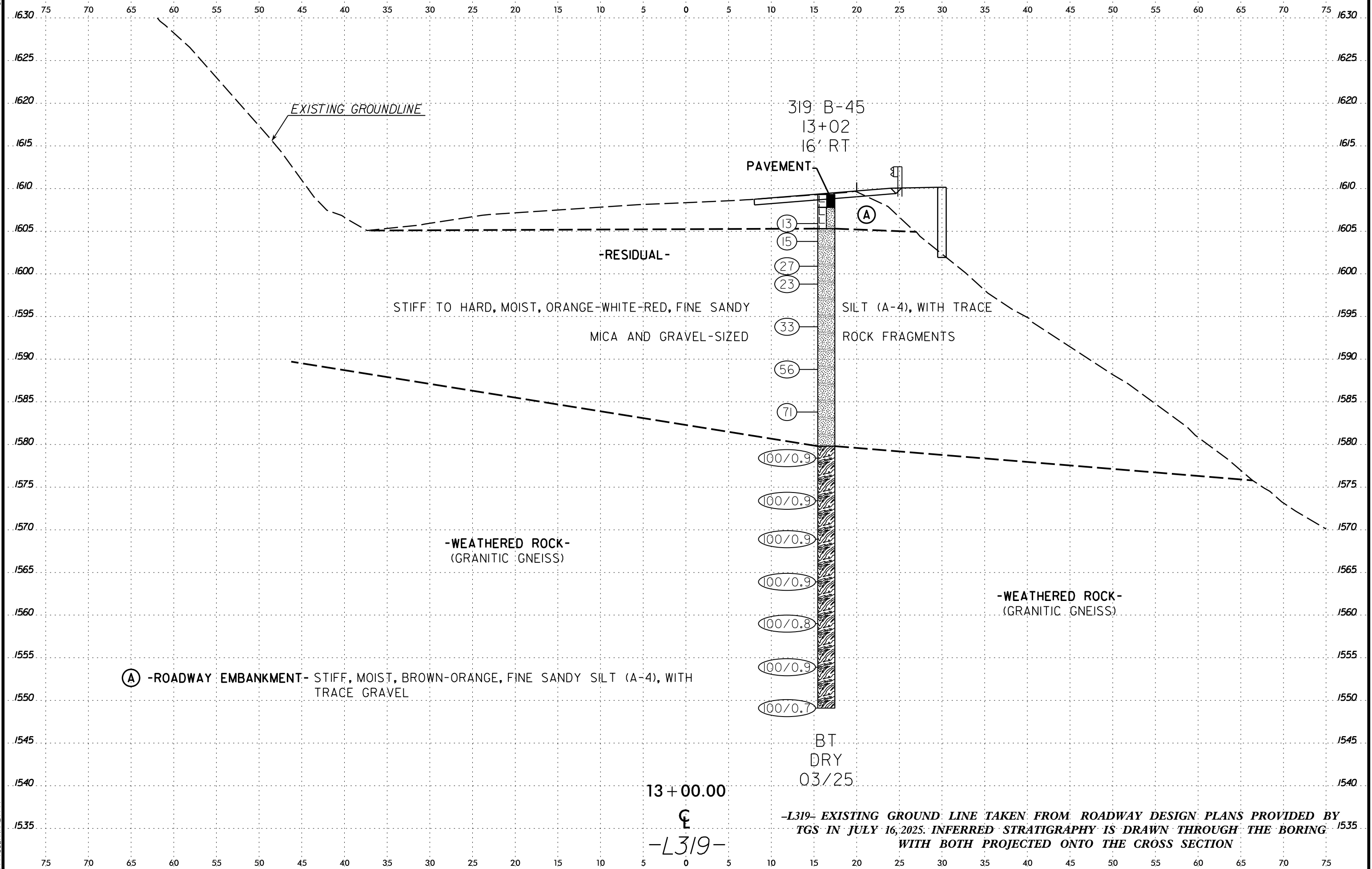
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Matthew Brewer 12/2/2025
386129C0A4810A... SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
DF18314.1075028	3
SITE PLAN	
0 50 100 FEET	

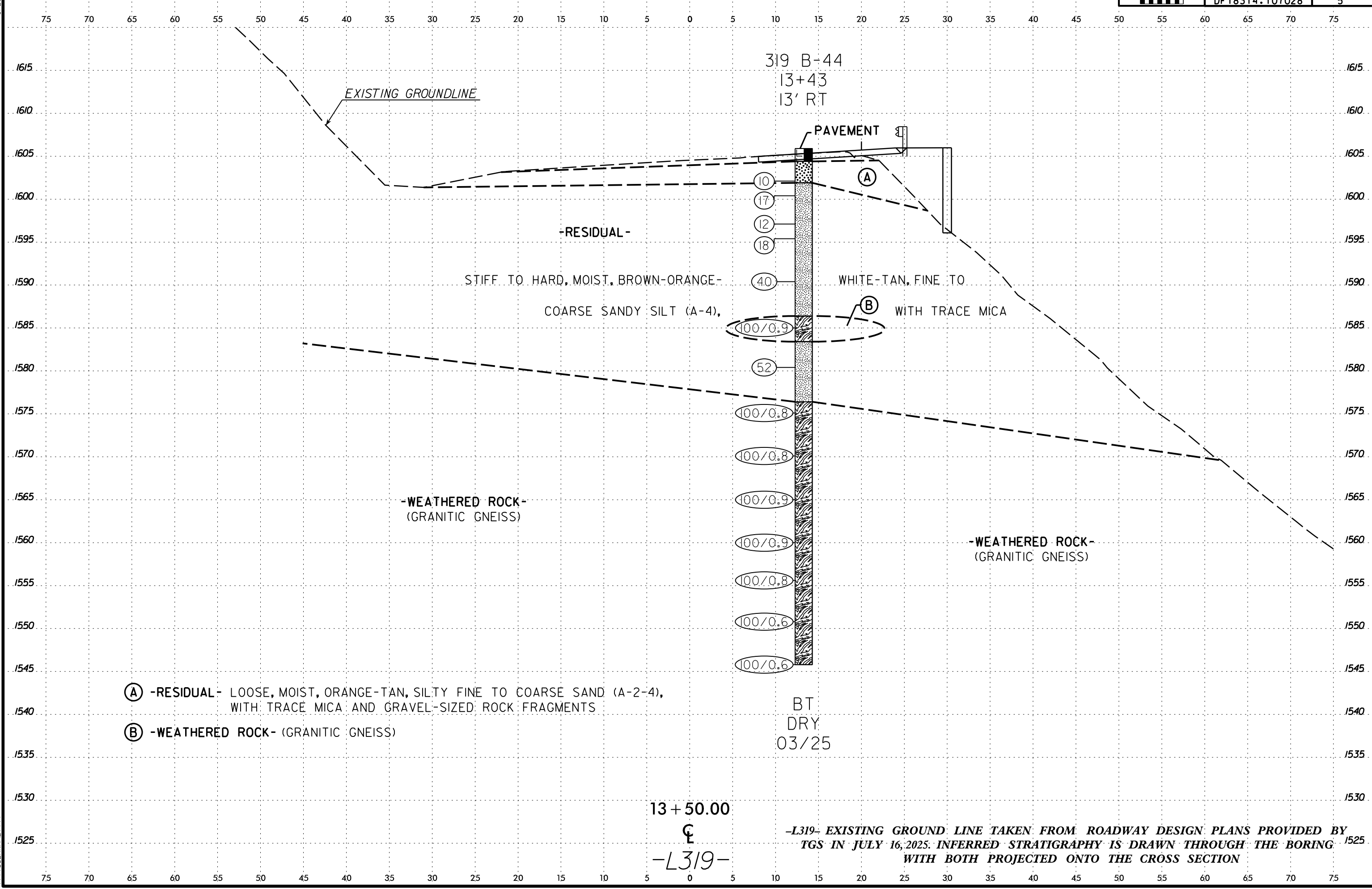


6/23/16
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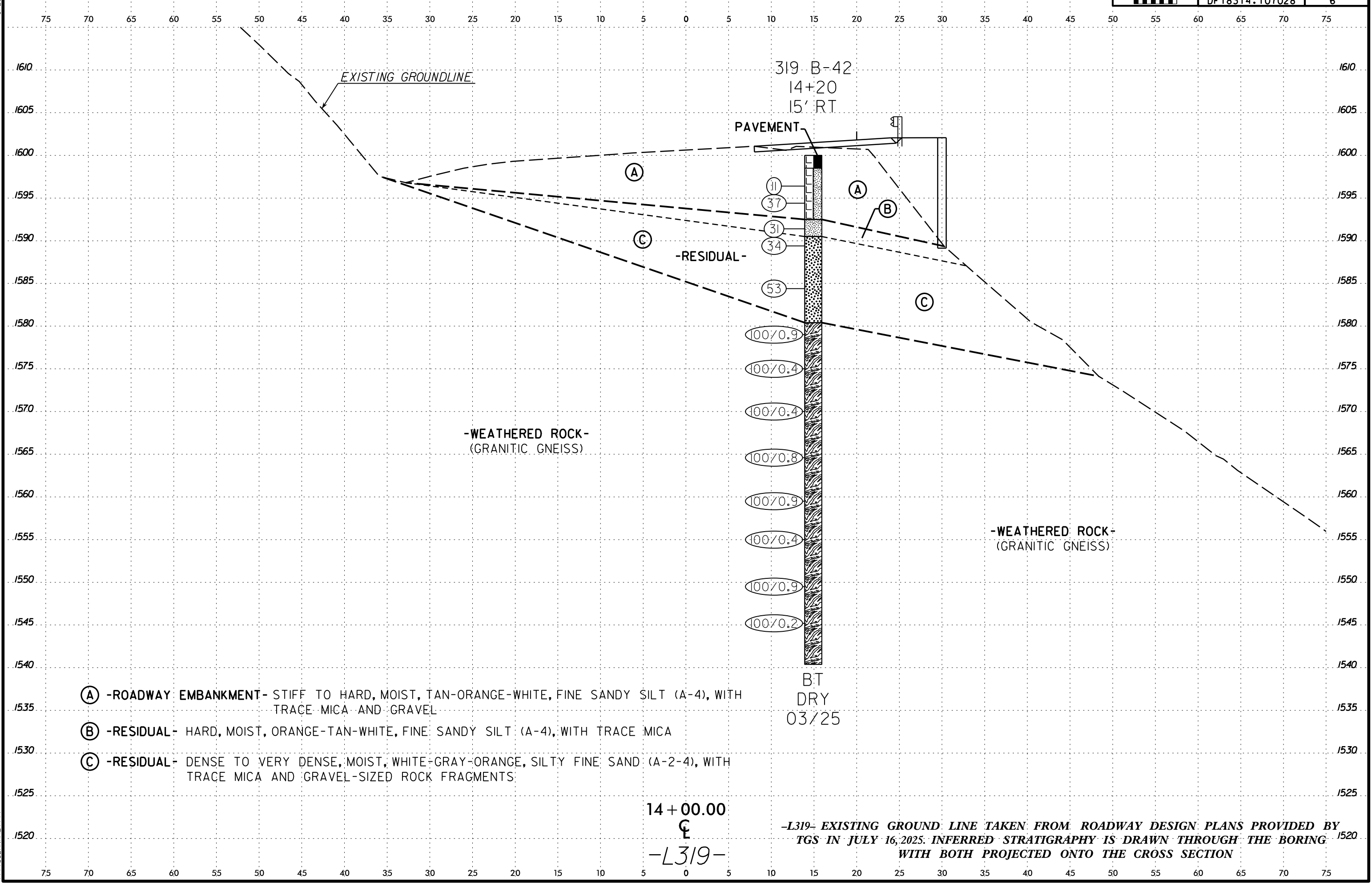


-L319- EXISTING GROUND LINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY TGS IN JULY 16, 2025. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING WITH BOTH PROJECTED ONTO THE CROSS SECTION

6/23/16
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GEOTECHNICAL BORING REPORT
BORE LOG

WBS DF18314.1075028			TIP N/A			COUNTY POLK			GEOLOGIST R. Welch						
SITE DESCRIPTION Road Repairs along US 176 Highway									GROUND WTR (ft)						
BORING NO. 319 B-45			STATION 13+02			OFFSET 16 ft RT			ALIGNMENT -L319-			0 HR. Dry			
COLLAR ELEV. 1,609.3 ft			TOTAL DEPTH 60.2 ft			NORTHING 552,128			EASTING 1,007,155			24 HR. Dry			
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D-50 97% 04/30/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER C. Odom			START DATE 03/25/25			COMP. DATE 03/25/25			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
1610														1,609.3	GROUND SURFACE 0.0
1605	1,606.9	2.4												1,607.8	ROADWAY EMBANKMENT 1.5
	1,604.8	4.5	5	5	8										Asphalt (0.9), ABC (0.6')
1600	1,601.9	7.4	6	9	6									1,605.3	Stiff, Brown-Orange, Fine Sandy SILT (A-4), with trace gravel 4.0
	1,599.8	9.5	10	13	14										RESIDUAL
1595	1,594.8	14.5	7	10	13										Stiff to Hard, Orange-White-Red, Fine Sandy SILT (A-4), with trace mica and gravel-sized rock fragments
			11	16	17										
1590	1,589.8	19.5	20	25	31										
1585	1,584.8	24.5	20	28	43										
1580	1,579.8	29.5	20	40	60/0.4									1,579.3	WEATHERED ROCK 30.0
1575	1,574.8	34.5	25	45	55/0.4										White-Tan-Orange, (Granitic Gneiss)
1570	1,569.8	39.5	40	60/0.4											
1565	1,564.8	44.5	40	60/0.4											
1560	1,559.8	49.5	46	54/0.3											
1555	1,554.8	54.5	52	48/0.4											
1550	1,549.8	59.5	50	50/0.2										1,549.1	Boring Terminated at Elevation 1,549.1 ft In Weathered Rock (Granitic Gneiss) 60.2

WBS DF18314.1075028			TIP N/A		COUNTY POLK		GEOLOGIST R. Welch							
SITE DESCRIPTION Road Repairs along US 176 Highway										GROUND WTR (ft)				
BORING NO. 319 B-44			STATION 13+43			OFFSET 13 ft RT			ALIGNMENT -L319-		0 HR. Dry			
COLLAR ELEV. 1,605.9 ft			TOTAL DEPTH 60.1 ft			NORTHING 552,103			EASTING 1,007,191		24 HR. Dry			
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D-50 97% 04/30/2024						DRILL METHOD H.S. Augers				HAMMER TYPE Automatic				
DRILLER C. Odom			START DATE 03/26/25			COMP. DATE 03/26/25			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
1610														
1605														1,605.9 GROUND SURFACE 0.0
1600	1,603.1	2.8												1,604.4 ROADWAY EMBANKMENT 1.5
	1,601.4	4.5	6	5	5									Asphalt (0.9'), ABC (0.6')
			5	6	11									RESIDUAL 4.0
1595	1,598.1	7.8												Loose, Orange-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica and gravel-sized rock fragments
	1,596.4	9.5	3	6	6									Stiff to Hard, Brown-Orange-White, Fine Sandy SILT (A-4), with trace mica
1590			6	7	11									
	1,591.4	14.5	7	18	22									
1585														1,585.9 WEATHERED ROCK 20.0
	1,586.4	19.5	23	50	50/0.4									White-Tan, (Granitic Gneiss)
1580														1,583.4 RESIDUAL 22.5
	1,581.4	24.5	20	22	30									Hard, White-Orange-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica
1575														1,575.9 WEATHERED ROCK 30.0
	1,576.4	29.5	42	52	48/0.3									Orange-Tan-White, (Granitic Gneiss)
1570														
	1,571.4	34.5	16	55	45/0.3									
1565														
	1,566.4	39.5	12	40	60/0.4									
1560														
	1,561.4	44.5	31	57	43/0.4									
1555														
	1,556.4	49.5	40	60/0.3										
1550														
	1,551.4	54.5	78	22/0.1										
	1,546.4	59.5	75	25/0.1										1,545.8 Boring Terminated at Elevation 1,545.8 ft In Weathered Rock (Granitic Gneiss) 60.1

NCDOT BORE DOUBLE GEO_US 176_SITE 319_GTM.GPJ NC DOT.GDT 7/24/25

WBS		DF18314.1075028		TIP		N/A		COUNTY		POLK		GEOLOGIST		R. Welch																																									
SITE DESCRIPTION												Road Repairs along US 176 Highway				GROUND WTR (ft)																																							
BORING NO.				319 B-42				STATION				14+20				OFFSET				15 ft RT				ALIGNMENT				-L319-				0 HR.		Dry																					
COLLAR ELEV.				1,600.0 ft				TOTAL DEPTH				59.8 ft				NORTHING				552,062				EASTING				1,007,259				24 HR.		Dry																					
DRILL RIG/HAMMER EFF./DATE										CG20446 Diedrich D-50 97% 04/30/2024										DRILL METHOD					H.S. Augers					HAMMER TYPE					Automatic																				
DRILLER						C. Odom						START DATE						03/27/25						COMP. DATE						03/27/25						SURFACE WATER DEPTH										N/A									
ELEV (ft)		DRIVE ELEV (ft)		DEPTH (ft)		BLOW COUNT			BLOWS PER FOOT										SAMP. NO.		MOI		LOG		SOIL AND ROCK DESCRIPTION																														
0.5ft		0.5ft		0.5ft		0		25		50		75		100																																									
1605																																																							
1600																																																							
1595		1,597.4		2.6		5			6			5																																											
1590		1,595.4		4.6		5			18			19																																											
1585		1,592.4		7.6		13			13			18																																											
1580		1,590.4		9.6		14			14			20																																											
1575		1,585.4		14.6		13			26			27																																											
1570		1,580.4		19.6		17			32			68/0.4																																											
1565		1,575.4		24.6		100/0.4																																																	
1560		1,570.4		29.6		100/0.4																																																	
1555		1,565.4		34.6		50			50/0.3																																														
1550		1,560.4		39.6		29			38			62/0.4																																											
1545		1,555.4		44.6		100/0.4																																																	
1540		1,550.4		49.6		71			29/0.4																																														
1535		1,545.4		54.6		100/0.2																																																	
1530		1,540.4		59.6		100/0.2																																																	
1525																																																							
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NCDOT BORE DOUBLE GEO US 176 SITE 319 GTM.GPJ NC DOT.GDT 7/24/25

REFERENCE: DF18314.1075029

PROJECT: N/A

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
2A	SUPPLEMENTAL LEGEND (GSI)
3	SITE PLAN
4-7	CROSS SECTIONS
8-15	BORELOGS, CORE REPORT(S), & CORE PHOTOGRAPH(S)

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY POLK
PROJECT DESCRIPTION EMERGENCY DESIGN FOR
US 176

SITE DESCRIPTION SITE 320

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	DF18314.1075029	1	

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PERSONNEL

R. WELCH, G.I.T.

CG2 EXPLORATION

INVESTIGATED BY CG2, PLLC

DRAWN BY P. PERRY, E.I.T.

CHECKED BY M. BREWER, P.E.

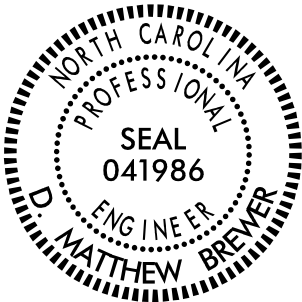
SUBMITTED BY CG2, PLLC

DATE JULY 2025

Prepared in the Office of:

 CAROLINAS
GEOTECHNICAL
GROUP

1805 SARDIS ROAD NORTH
SUITE 100
CHARLOTTE, NC 28270
(980) 339-8684



DocuSigned by:

 12/2/2025

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SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

DATE: 8-15-14

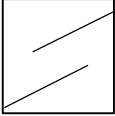
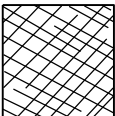
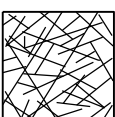
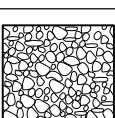
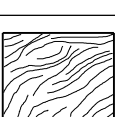
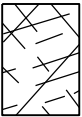
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES
FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

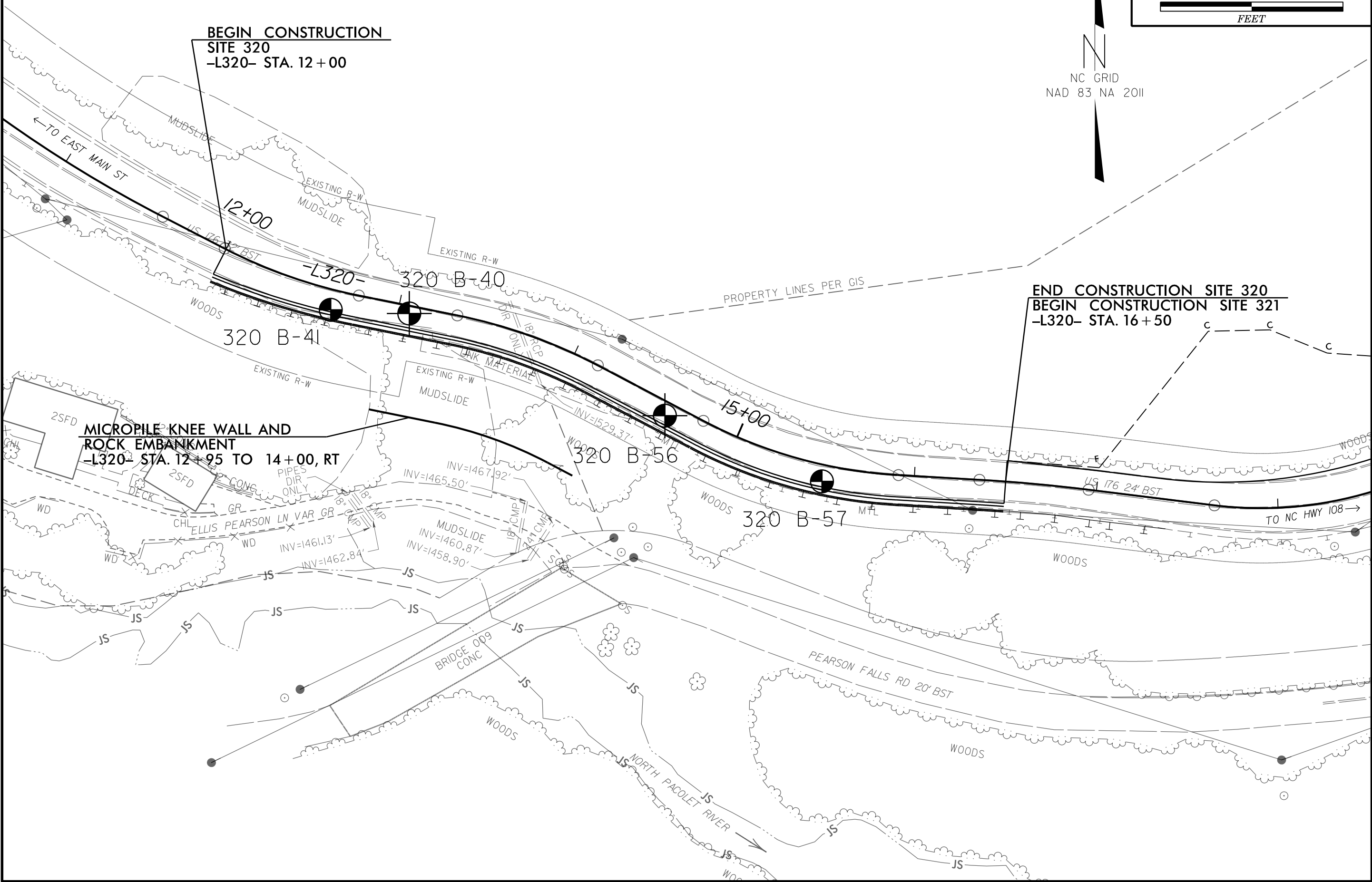
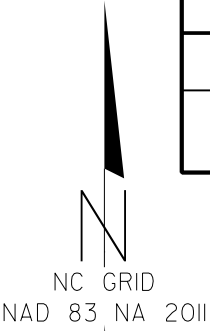
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

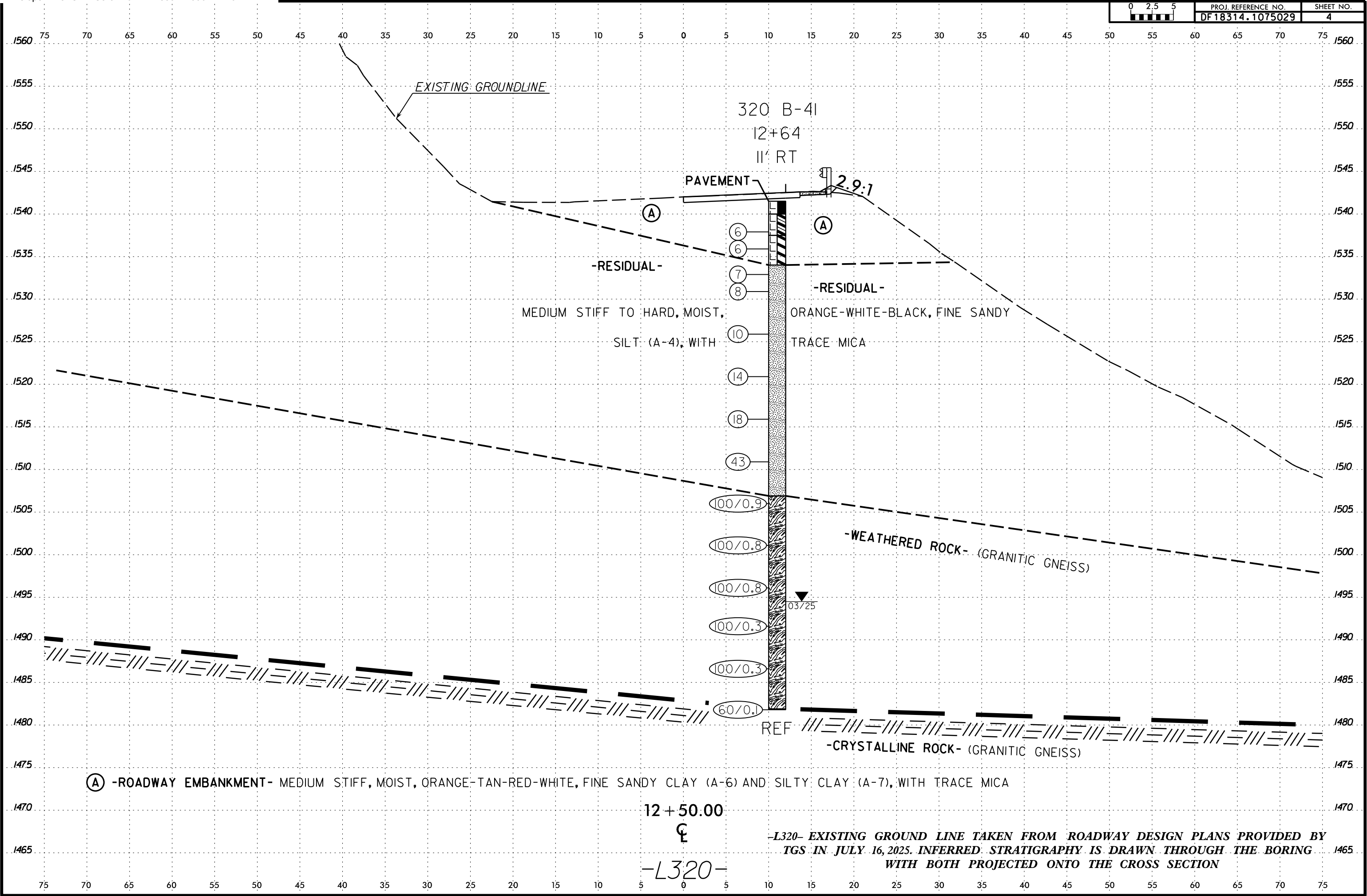
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000) From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. Note that the table does not apply to structurally controlled failures. Where weak planar structural planes are present in an unfavorable orientation with respect to the excavation face, these will dominate the rock mass behaviour. The shear strength of surfaces in rocks that are prone to deterioration as a result of changes in moisture content will be reduced if water is present. When working with rocks in the fair to very poor categories, a shift to the right may be made for wet conditions. Water pressure is dealt with by effective stress analysis. STRUCTURE	SURFACE CONDITIONS VERY GOOD Very rough, fresh unweathered surfaces GOOD Rough, slightly weathered, iron stained surfaces FAIR Smooth, moderately weathered and altered surfaces POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments VERY POOR Slickensided, highly weathered surfaces with soft clay coatings or fillings	DECREASING SURFACE QUALITY ➡	GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000) From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis. SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes) VERY GOOD - Very Rough, fresh unweathered surfaces GOOD - Rough, slightly weathered surfaces FAIR - Smooth, moderately weathered and altered surfaces POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments VERY POOR - Very smooth, slickensided or highly weathered surfaces with soft clay coatings or fillings	COMPOSITION AND STRUCTURE
 INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities  BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets  VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets  BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity  DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces  LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes	DECREASING INTERLOCKING OF ROCK PIECES ⬇	90 80 70 60 50 40 30 20 10 N/A N/A	 A. Thick bedded, very blocky sandstone The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass. In shallow tunnels or slopes these bedding planes may cause structurally controlled instability.  B. Sandstone with thin inter-layers of siltstone  C. Sandstone and siltstone in similar amounts  D. Siltstone or silty shale with sandstone layers  E. Weak siltstone or clayey shale with sandstone layers C, D, E, and G - may be more or less folded than illustrated but this does not change the strength. Tectonic deformation, faulting and loss of continuity moves these categories to F and H.  G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers  H. Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces.  F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure	70 60 50 40 30 20 10

➡ Means deformation after tectonic disturbance

PROJECT REFERENCE NO.	SHEET NO.
DF18314.1075029	3
SITE PLAN	
0 50 100 FEET	

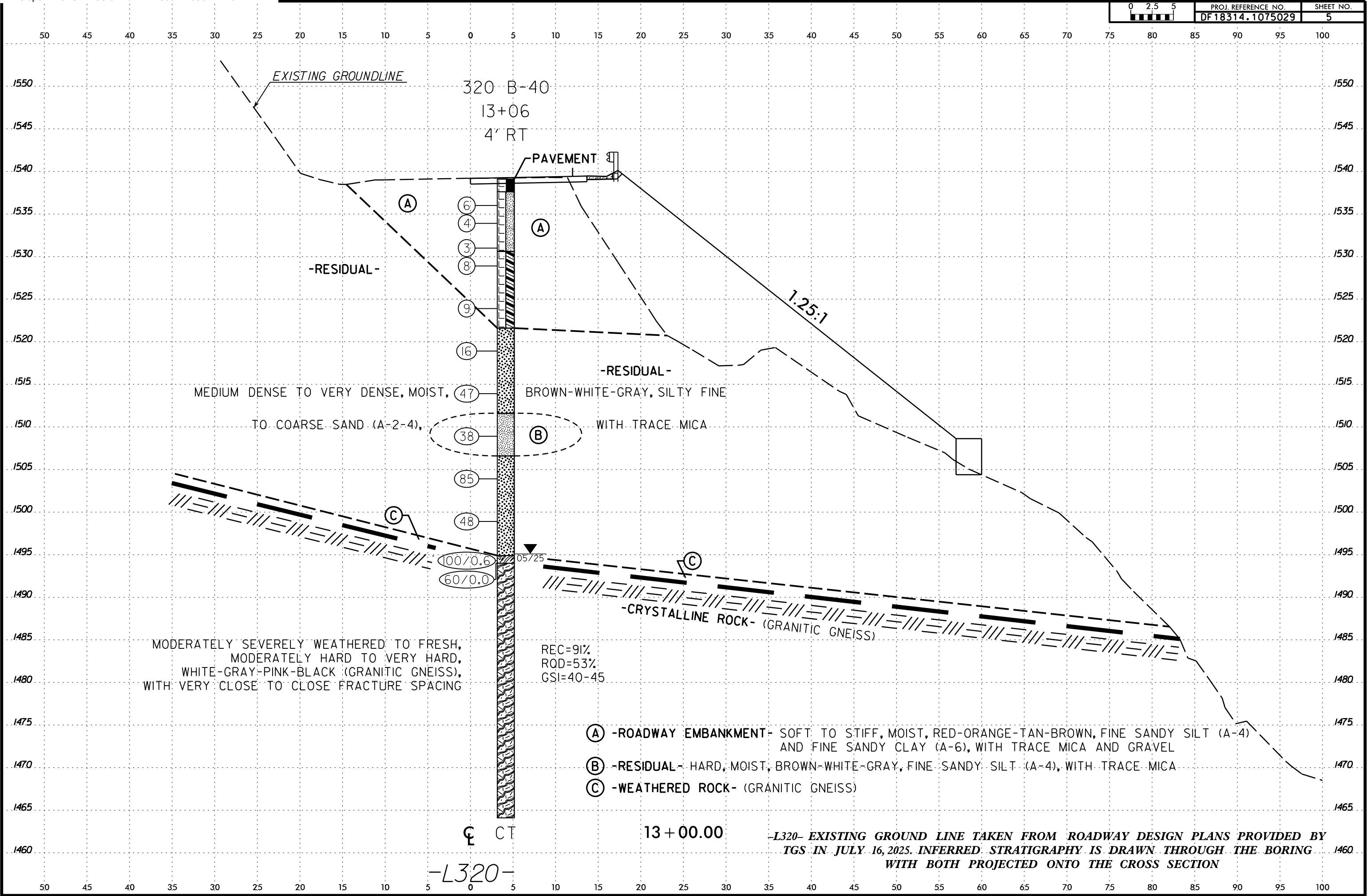


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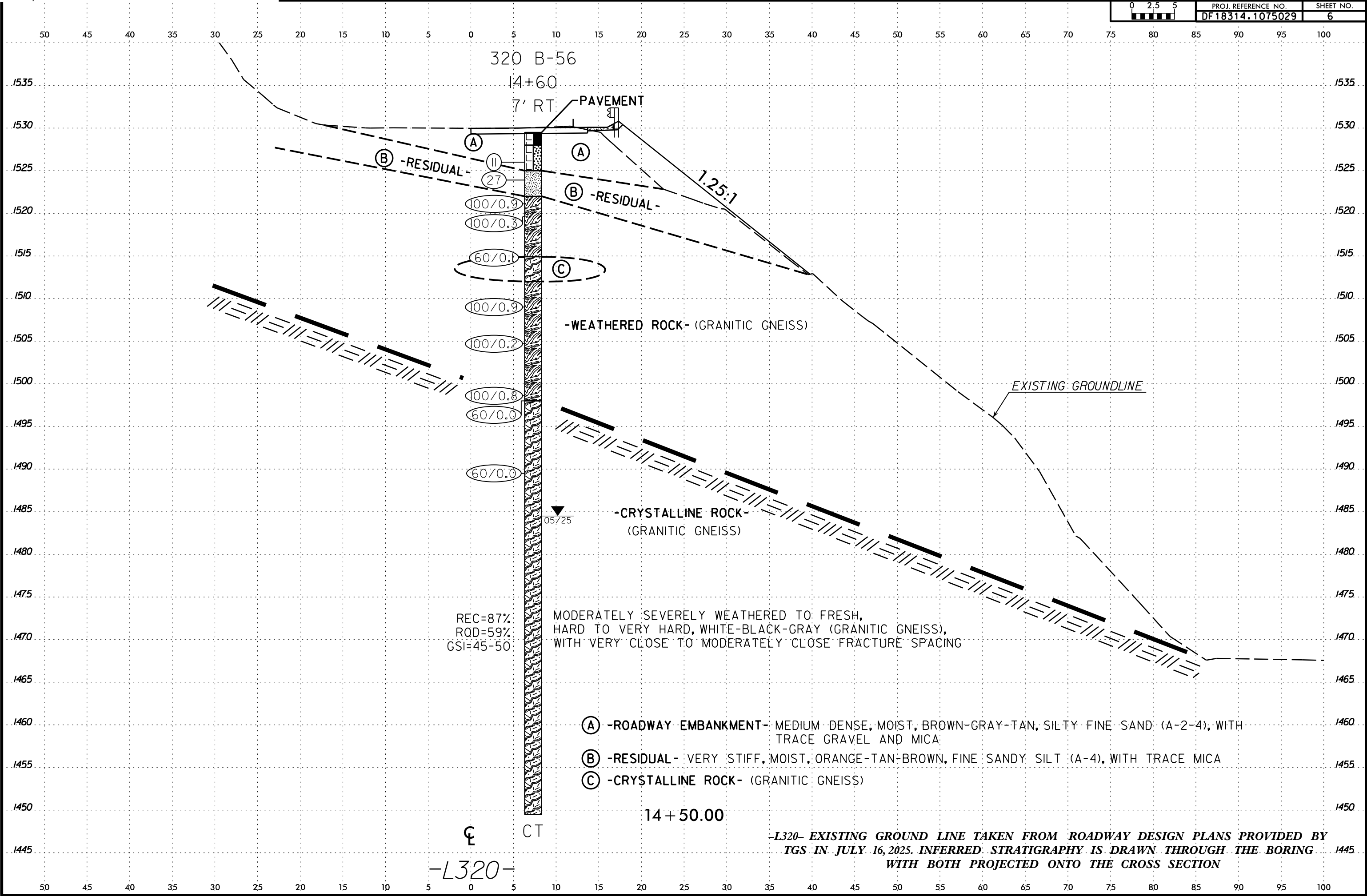
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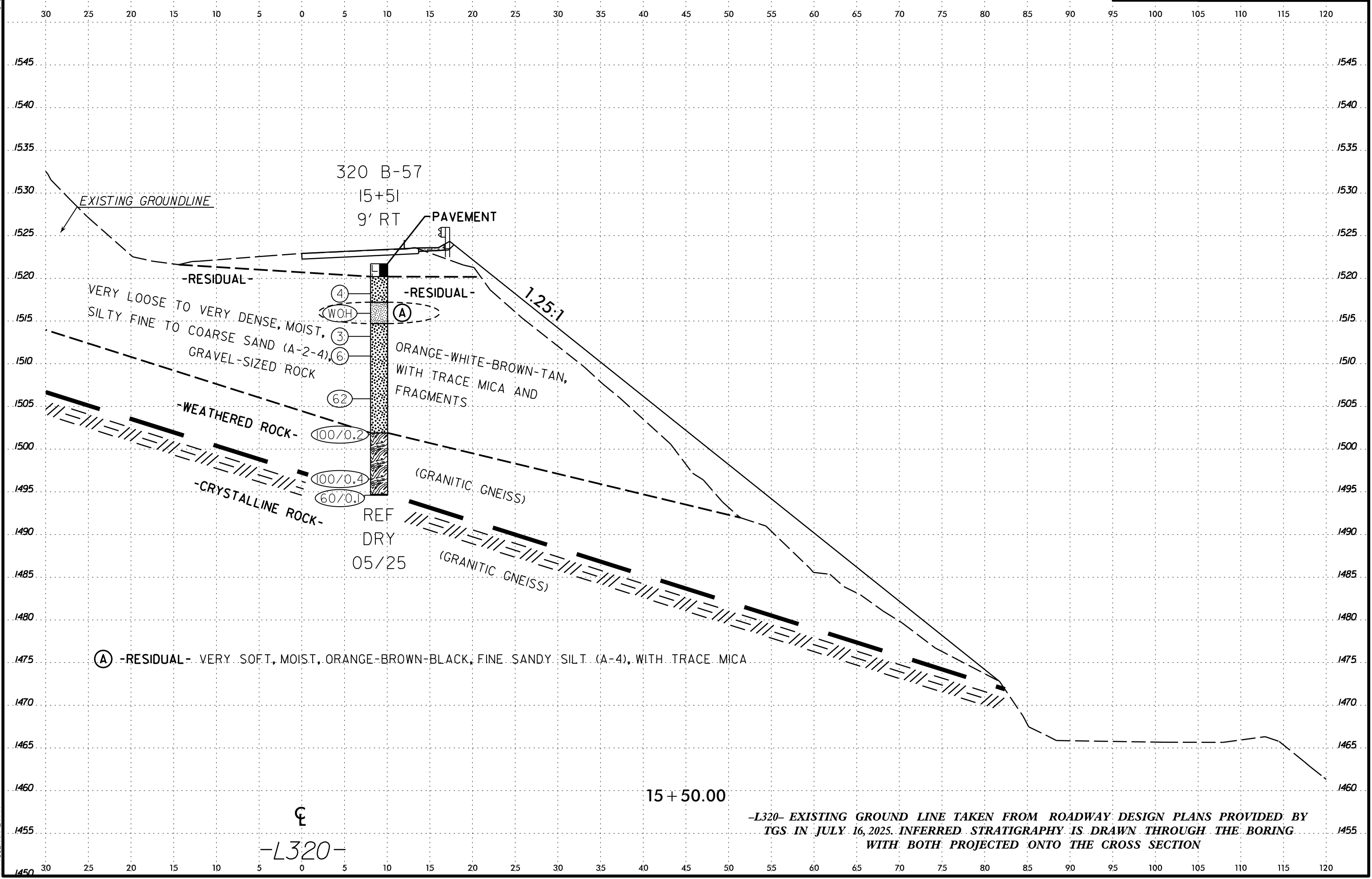


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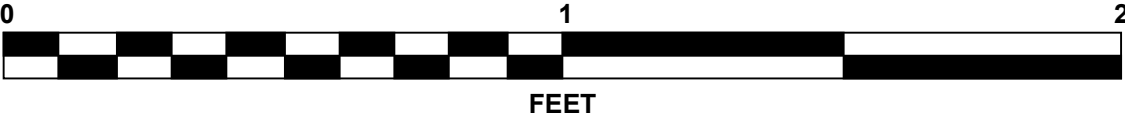
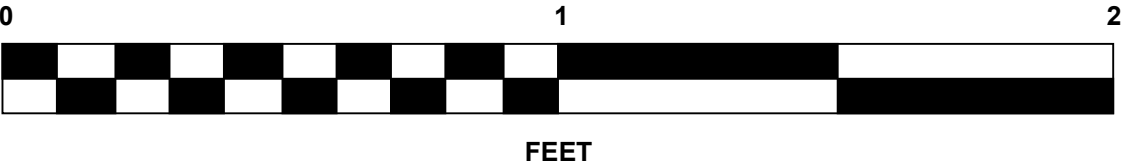


NCDOT BORE DOUBLE GEO US 176 SITE 320 GTM.GPJ NC DOT.GDT 7/24/25

NCDOT CORE DOUBLE GEO US 176 SITE 320 GTM.GPJ NC DOT.GDT 7/24/25



Road Repairs along US 176 Highway
Polk County, North Carolina
Rock Core Photographs
Boring: 320 B-40
45.1 to 75.0 Feet



GEOTECHNICAL BORING REPORT
BORE LOG

WBS DF18314.1075029			TIP N/A			COUNTY POLK			GEOLOGIST R. Welch						
SITE DESCRIPTION Road Repairs along US 176 Highway										GROUND WTR (ft)					
BORING NO. 320 B-41			STATION 12+64			OFFSET 11 ft RT			ALIGNMENT -L320-		0 HR. 35.9				
COLLAR ELEV. 1,541.5 ft			TOTAL DEPTH 59.7 ft			NORTHING 551,886			EASTING 1,007,955		24 HR. 47.0				
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D-50 97% 04/30/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER C. Odom			START DATE 03/27/25			COMP. DATE 03/27/25			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	L O G	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
1545															
1540														1,541.5	GROUND SURFACE 0.0
														1,540.0	ROADWAY EMBANKMENT 1.5
	1,538.9	2.6													Asphalt (0.9'), ABC (0.6')
	1,536.9	4.6	3	4	2								M		Medium Stiff, Orange-Tan-White, Fine Sandy CLAY (A-6), with trace mica 4.0
1535			2	2	4								M		Medium Stiff, Red-Orange-Tan, Silty CLAY (A-7) with trace mica
	1,533.9	7.6												1,534.0	RESIDUAL 7.5
	1,531.9	9.6	2	4	3								M		Medium Stiff to Hard, Orange-White-Black, Fine Sandy SILT (A-4), with trace mica
1530			3	4	4								M		
	1,526.9	14.6	3	4	6								M		
1525															
	1,521.9	19.6	6	7	7								M		
1520															
	1,516.9	24.6	6	8	10								M		
1515															
	1,511.9	29.6	11	17	26								M		
1510															
	1,506.9	34.6	31	69/0.4							100/0.9			1,506.9	WEATHERED ROCK 34.6
1505															Orange-White-Black, (Granitic Gneiss)
	1,501.9	39.6	50	50/0.3							100/0.8				
1500															
	1,496.9	44.6	75	25/0.3							100/0.8				
1495															
	1,491.9	49.6	100/0.3								100/0.3				
1490															
	1,486.9	54.6	100/0.3								100/0.3				
1485															
	1,481.9	59.6	60/0.1								60/0.1			1,481.9	CRYSTALLINE ROCK 59.6
														1,481.8	CRYSTALLINE ROCK 59.7
															(Granitic Gneiss)
															Boring Terminated with Standard Penetration Test Refusal at Elevation 1,481.8 ft On Crystalline Rock (Granitic Gneiss)

NCDOT BORE DOUBLE GEO_US 176_SITE 320_GTM.GPJ NC DOT.GDT 7/24/25

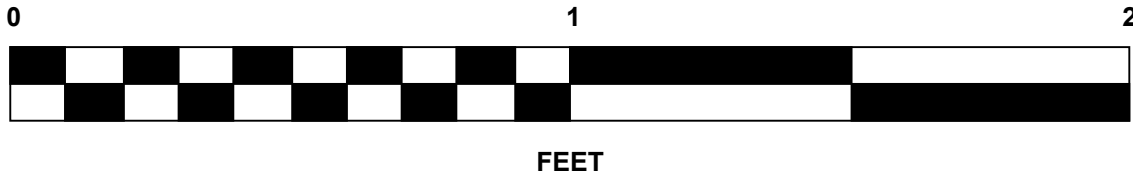
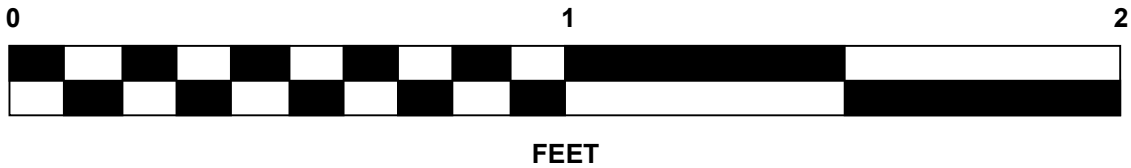
SHEET 11

WBS DF18314.1075029				TIP N/A				COUNTY POLK				GEOLOGIST R. Welch					
SITE DESCRIPTION Road Repairs along US 176 Highway												GROUND WTR (ft)					
BORING NO. 320 B-56				STATION 14+60				OFFSET 7 ft RT				ALIGNMENT -L320-				0 HR. N/A	
COLLAR ELEV. 1,529.5 ft				TOTAL DEPTH 80.0 ft				NORTHING 551,828				EASTING 1,008,138				24 HR. 45.0	
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D-50 97% 04/30/2024								DRILL METHOD SPT Core Boring				HAMMER TYPE Automatic					
DRILLER C. Odom				START DATE 05/08/25				COMP. DATE 05/09/25				SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
1450						Match Line								1,449.5	Boring Terminated at Elevation 1,449.5 ft In Crystalline Rock (Granitic Gneiss)	80.0	

WBS DF18314.1075029				TIP N/A				COUNTY POLK				GEOLOGIST R. Welch					
SITE DESCRIPTION Road Repairs along US 176 Highway												GROUND WTR (ft)					
BORING NO. 320 B-56				STATION 14+60				OFFSET 7 ft RT				ALIGNMENT -L320-				0 HR.	N/A
COLLAR ELEV. 1,529.5 ft				TOTAL DEPTH 80.0 ft				NORTHING 551,828				EASTING 1,008,138				24 HR.	45.0
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D-50 97% 04/30/2024								DRILL METHOD SPT Core Boring				HAMMER TYPE Automatic					
DRILLER C. Odom				START DATE 05/08/25				COMP. DATE 05/09/25				SURFACE WATER DEPTH N/A					
CORE SIZE NQ				TOTAL RUN 48.5 ft													
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS						
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %								
1498.02	1,498.0	31.5	3.5	N=60/0.0 8:18/1.0 5:27/1.0 7:04/1.0 2:21/0.5	(1.5) 43%	(0.0) 0%		(42.3) 87%	(28.6) 59%		Begin Coring @ 31.5 ft						
1495	1,494.5	35.0	5.0	3:57/1.0 2:33/1.0 4:04/1.0 3:02/1.0 4:37/1.0	(2.0) 40%	(0.0) 0%					CRISTALLINE ROCK 31.5						
1490	1,489.5	40.0	5.0	N=60/0.0 3:23/1.0 4:04/1.0 3:57/1.0 4:23/1.0 4:30/1.0	(4.7) 94%	(4.4) 88%					Moderately Severely Weathered to Fresh, Hard to Very Hard, White-Black-Gray, (Granitic Gneiss), with Very Close to Moderately Close Fracture Spacing						
1485	1,484.5	45.0	5.0	3:25/1.0 2:29/1.0 2:38/1.0 2:44/1.0 2:30/1.0	(4.9) 98%	(4.2) 84%					GSI = 45-50						
1480	1,479.5	50.0	5.0	2:35/1.0 2:03/1.0 2:50/1.0 2:38/1.0 2:58/1.0	(4.9) 98%	(3.9) 78%											
1475	1,474.5	55.0	5.0	3:13/1.0 2:59/1.0 3:32/1.0 3:45/1.0 5:05/1.0	(5.0) 100%	(3.3) 66%											
1470	1,469.5	60.0	5.0	4:15/1.0 3:47/1.0 3:35/1.0 5:01/1.0 5:00/1.0	(5.0) 100%	(2.7) 54%											
1465	1,464.5	65.0	5.0	4:19/1.0 4:38/1.0 5:12/1.0 6:49/1.0 5:57/1.0	(4.7) 94%	(2.7) 54%											
1460	1,459.5	70.0	5.0	5:45/1.0 4:45/1.0 3:45/1.0 3:07/1.0 3:48/1.0	(4.9) 98%	(4.3) 86%											
1455	1,454.5	75.0	5.0	3:18/1.0 2:39/1.0 3:39/1.0 3:18/1.0 1:45/1.0	(4.7) 94%	(3.1) 62%											
1450	1,449.5	80.0									Boring Terminated at Elevation 1,449.5 ft In Crystalline Rock (Granitic Gneiss)						

NCDOT CORE DOUBLE GEO_US 176 SITE 320 GTM.GPJ NC_DOT.GDT 7/24/25

Road Repairs along US 176 Highway
Polk County, North Carolina
Rock Core Photographs
Boring: 320 B-56
31.5 to 80.0 Feet



GEOTECHNICAL BORING REPORT
BORE LOG

WBS		DF18314.1075029		TIP		N/A		COUNTY		POLK		GEOLOGIST		R. Welch							
SITE DESCRIPTION												Road Repairs along US 176 Highway				GROUND WTR (ft)					
BORING NO.		320 B-57		STATION		15+51		OFFSET		9 ft RT		ALIGNMENT		-L320-		0 HR.	Dry				
COLLAR ELEV.		1,521.7 ft		TOTAL DEPTH		27.1 ft		NORTHING		551,792		EASTING		1,008,224		24 HR.	Dry				
DRILL RIG/HAMMER EFF./DATE								CG20446 Diedrich D-50 97% 04/30/2024				DRILL METHOD			H.S. Augers			HAMMER TYPE		Automatic	
DRILLER				C. Odom				START DATE		04/30/25		COMP. DATE		04/30/25		SURFACE WATER DEPTH				N/A	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼ MOI	L O G	SOIL AND ROCK DESCRIPTION							
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)						
1525																					
1520	1,519.2	2.5												1,521.7	GROUND SURFACE 0.0						
														1,520.2	ROADWAY EMBANKMENT 1.5						
	1,516.9	4.8	5	2	2								M	1,517.2	RESIDUAL 4.5						
1515			WOH	WOH	WOH								M								
	1,514.2	7.5												1,514.7	Loose, Orange-White, Silty Fine to Coarse SAND (A-2-4), with trace mica 4.5						
	1,511.9	9.8	1	1	2								M		Very Soft, Orange-Brown-Black, Fine Sandy SILT (A-4), with trace mica 7.0						
1510																					
			4	3	3								M		Very Loose to Very Dense, Orange-Brown-Tan-White, Silty Fine SAND (A-2-4), with trace mica and gravel-sized rock fragments						
1505	1,506.9	14.8	42	40	22								M								
	1,501.9	19.8												1,501.9	WEATHERED ROCK 19.8						
1500			100/0.2												Tan-White-Brown, (Granitic Gneiss)						
	1,496.9	24.8																			
1495			100/0.4																		
	1,494.7	27.0												1,494.7	CRYSTALLINE ROCK 27.0						
			60/0.1											1,494.6	Black-Gray, (Granitic Gneiss) 27.1						
															Boring Terminated with Standard Penetration Test Refusal at Elevation 1,494.6 ft In Crystalline Rock (Granitic Gneiss)						

NCDOT BORE DOUBLE GEO_US 176_SITE 320_GTM.GPJ NC_DOT.GDT 7/24/25