

REFERENCE: SF-280246

PROJECT: BP9.R006.1

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY DAVIDSON

PROJECT DESCRIPTION BRIDGE NO. 246 ON SR 2351  
(FLAT SWAMP ROAD) OVER LICK CREEK

SITE DESCRIPTION BRIDGE STRUCTURE AT -L-  
STA. 15 + 80.00

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-280246	1	

**CAUTION NOTICE**

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. 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.

SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE. INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA AND BOREHOLE INFORMATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS. 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**

P.M. WEAVER

P.B. GONZALEZ

Summit Design &

Engineering

INVESTIGATED BY ESP Associates, Inc.

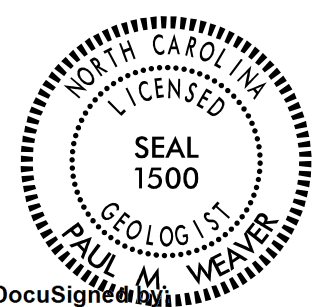
DRAWN BY P.B. GONZALEZ

CHECKED BY P.M. WEAVER

SUBMITTED BY ESP Associates, Inc.

DATE December 2022

 **ESP**  
 ESP ASSOCIATES, INC.  
 7011 ALBERT PICK RD  
 SUITE E  
 GREENSBORO, NC 27409  
 FIRM # C-0587  
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DocuSigned by  
Paul M. Weaver  
 12/07/2022

01847D3739AD49C...  
 SIGNATURE DATE

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



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

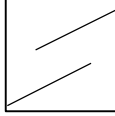

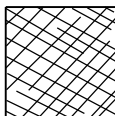
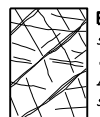




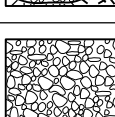
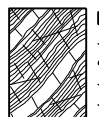
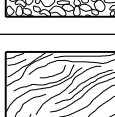




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**SUBSURFACE INVESTIGATION**

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

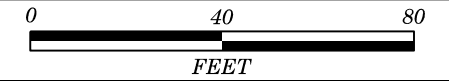
AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

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

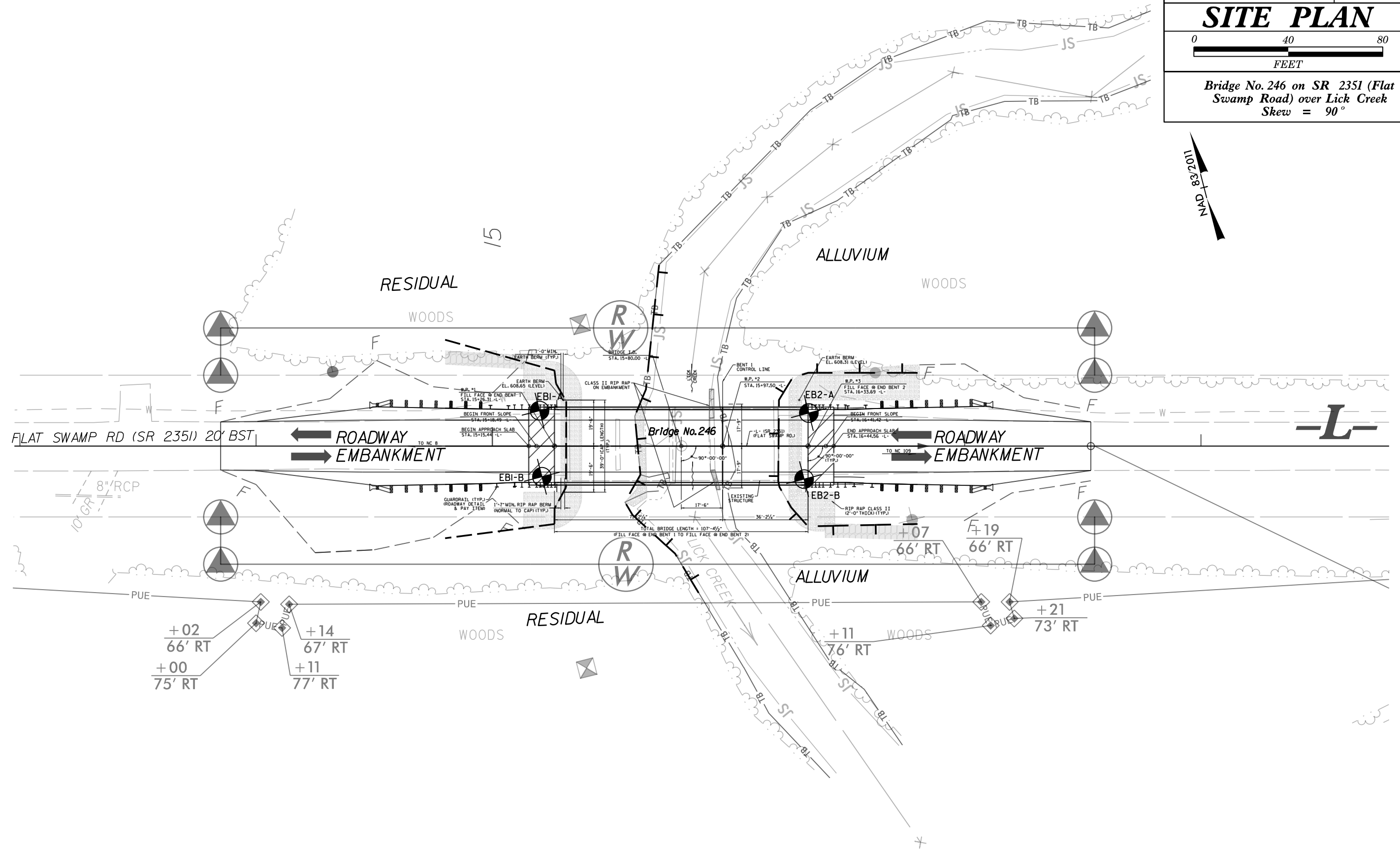
<b>GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000)</b>  From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. 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.	<b>SURFACE CONDITIONS</b>  DECREASING SURFACE QUALITY →					<b>GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000)</b>  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.	<b>SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)</b>  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				
STRUCTURE	DECREASING SURFACE QUALITY →					COMPOSITION AND STRUCTURE					
 INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities	90			N/A	N/A	 <b>A. Thick bedded, very blocky sandstone</b> 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.	70		A		
 BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets	80	70	60			 <b>B. Sandstone with thin inter-layers of siltstone</b>	60	50	B	C	D
 VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets		60	50	40		 <b>C. Sandstone and siltstone in similar amounts</b>	50	40	B	C	D
 BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity			40	30		 <b>D. Siltstone or silty shale with sandstone layers</b>	40	30	B	C	D
 DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces				20		 <b>E. Weak siltstone or clayey shale with sandstone layers</b>	30	20	B	C	D
 LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes	N/A	N/A		10		 <b>F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure</b>	20	10	B	C	D
						 <b>G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers</b>	10		G	H	I
						 <b>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.</b>			G	H	I

→ Means deformation after tectonic disturbance

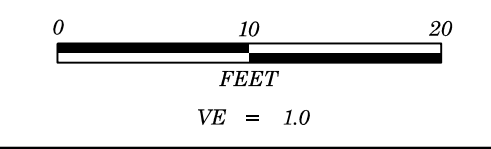
**SITE PLAN**



Bridge No. 246 on SR 2351 (Flat Swamp Road) over Lick Creek  
Skew = 90°



**-L-**



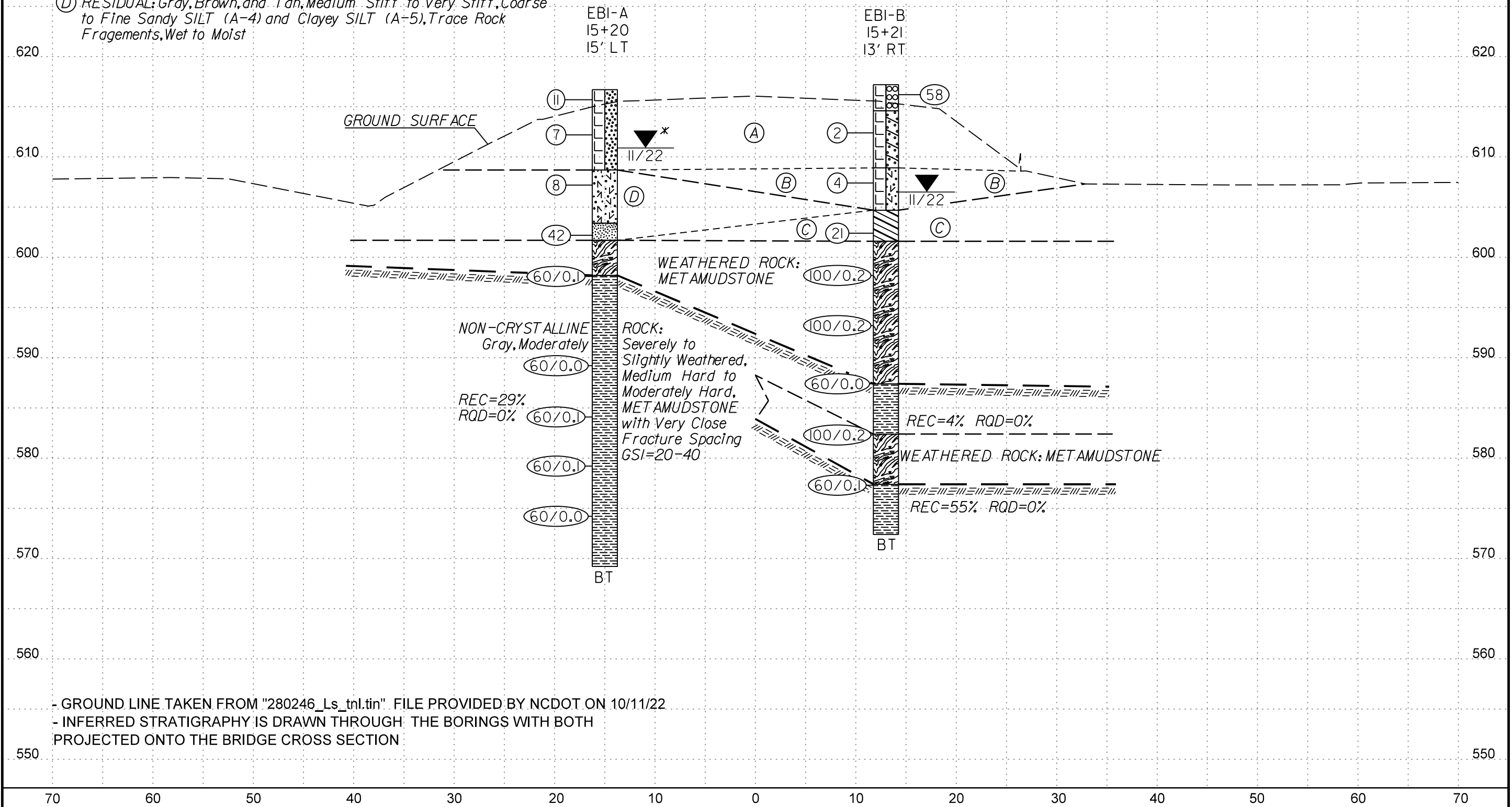
PROJECT REFERENCE NO.	SHEET NO.
SF-280246	4
CROSS SECTION AT END BENT 1	
-L- STATION 15+26.31	
SKEW = 90°00'00"	

-L- STA. 15+26.31

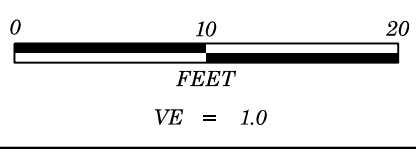


- (A) ROADWAY EMBANKMENT: Tan and Brown with Black, Very Loose to Medium Dense, Coarse to Fine SAND (A-1-b), Silty Coarse to Fine SAND (A-2-4), and Clayey Coarse to Fine SAND (A-2-6), Trace to Abundant Asphalt Fragments and Trace Gravel, Dry to Wet  
Note: Blow Count from 0.5' to 1.0' in EBI-B Influenced by Asphalt Fragments
- (B) ROADWAY EMBANKMENT: Tan and Brown, Soft to Medium Stiff, Clayey SILT (A-5), Moist
- (C) RESIDUAL: Brown and Tan with Gray, Very Stiff, Coarse to Fine Sandy CLAY (A-6), Trace Rock Fragments, Moist
- (D) RESIDUAL: Gray, Brown, and Tan, Medium Stiff to Very Stiff, Coarse to Fine Sandy SILT (A-4) and Clayey SILT (A-5), Trace Rock Fragments, Wet to Moist

\*NOTE: Heavy rain the previous day affected 24-hour water reading in EBI-A

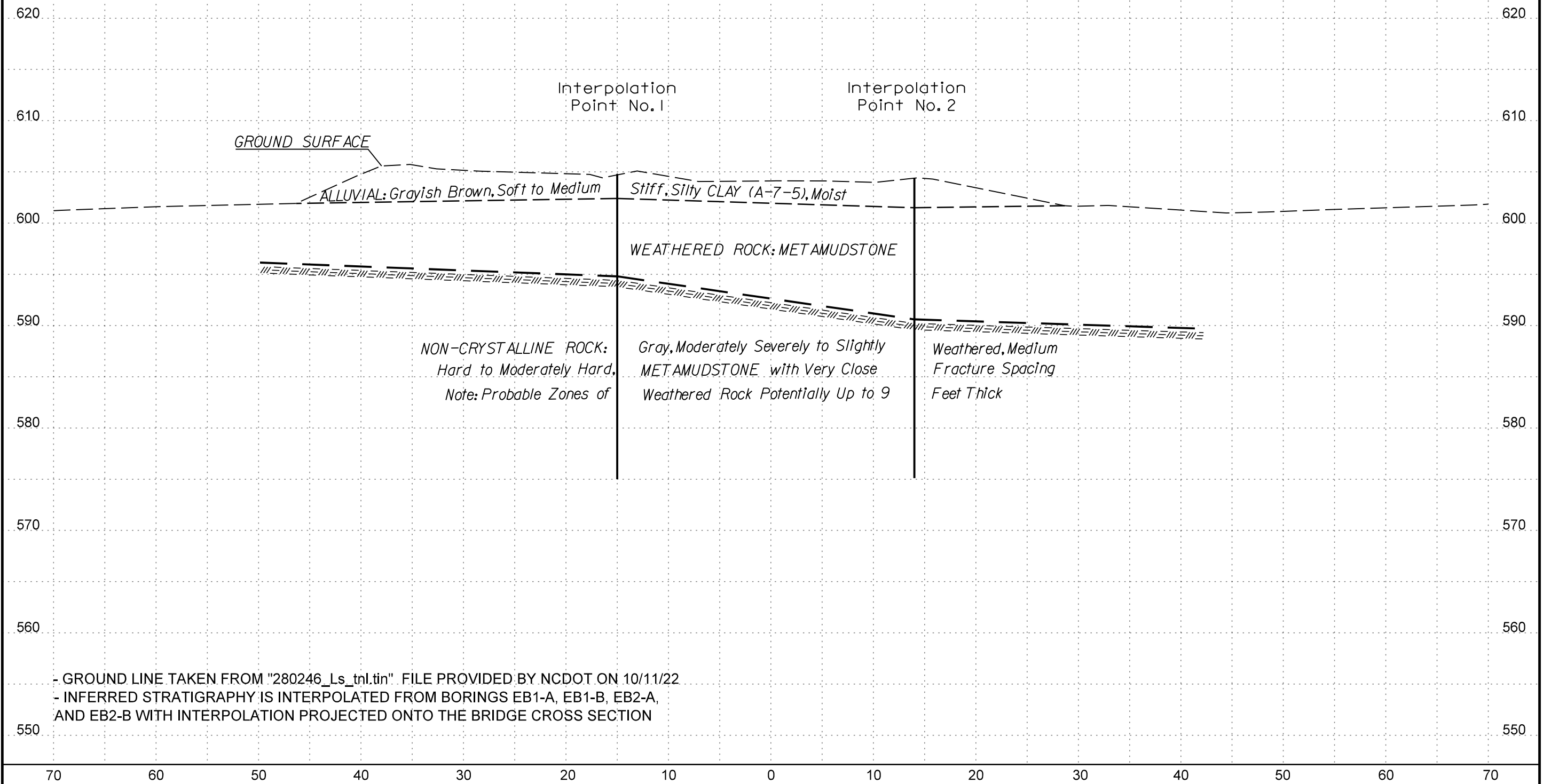


- GROUND LINE TAKEN FROM "280246\_Ls\_tnl.tin" FILE PROVIDED BY NCDOT ON 10/11/22  
- INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE BRIDGE CROSS SECTION

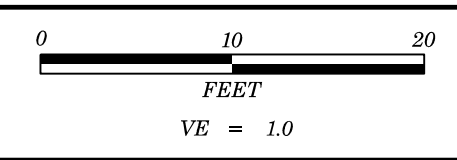


PROJECT REFERENCE NO.	SHEET NO.
SF-280246	5
<b>CROSS SECTION AT BENT 1</b> -L- STATION 15+97.50 SKEW = 90°00'00"	

-L- STA. 15+97.50



- GROUND LINE TAKEN FROM "280246\_Ls\_tnl.tin" FILE PROVIDED BY NCDOT ON 10/11/22  
 - INFERRED STRATIGRAPHY IS INTERPOLATED FROM BORINGS EB1-A, EB1-B, EB2-A, AND EB2-B WITH INTERPOLATION PROJECTED ONTO THE BRIDGE CROSS SECTION



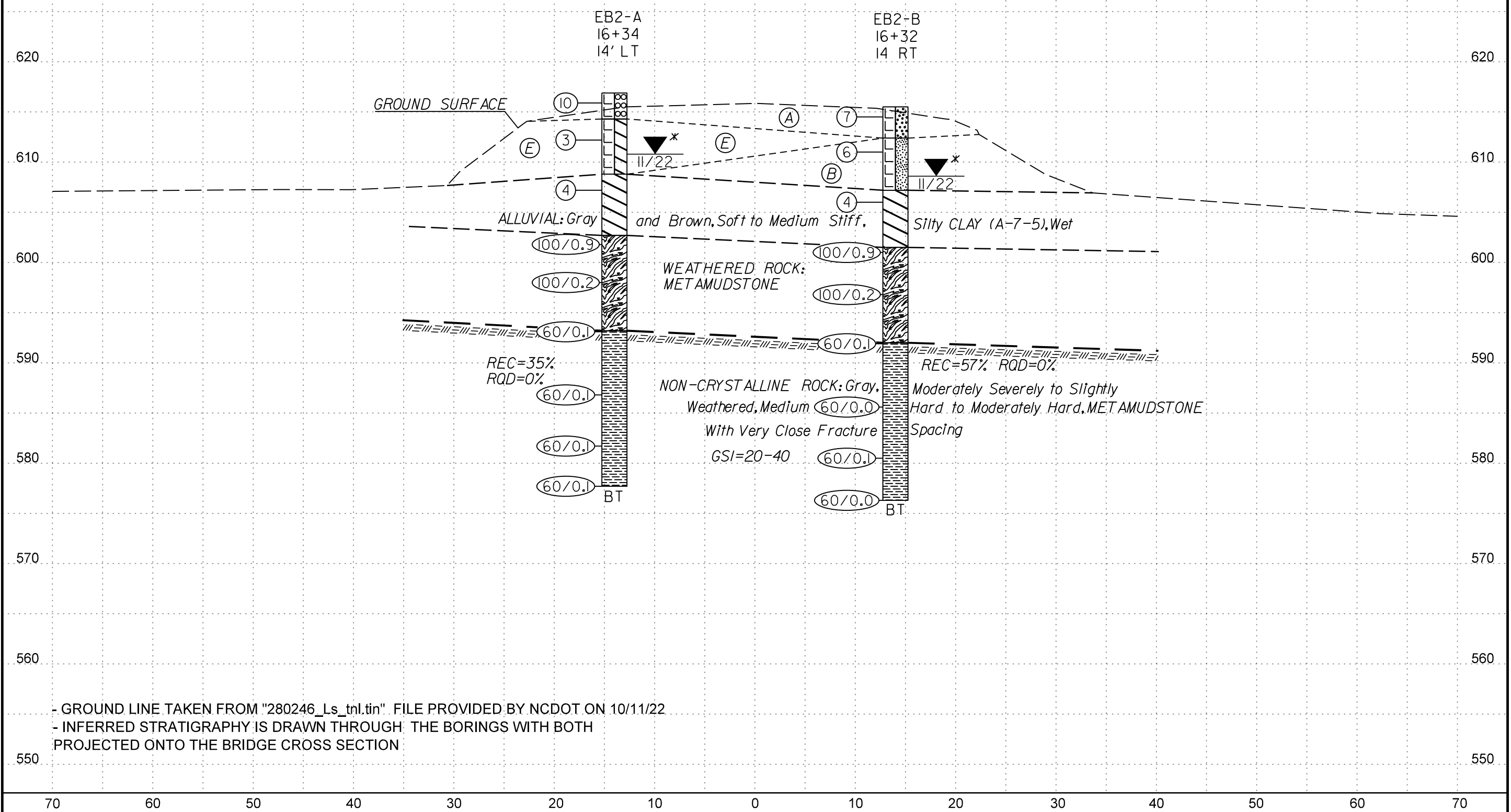
<b>PROJECT REFERENCE NO.</b>	<b>SHEET NO.</b>
SF-280246	6
<b>CROSS SECTION AT END BENT 2</b>	
<i>-L- STATION 16+33.69</i>	
<i>SKEW = 90°00'00"</i>	

-L- STA. 16+33.69



- (A) ROADWAY EMBANKMENT: Brown and Black, Loose to Medium Dense, Coarse to Fine SAND (A-1-b) and Silty Coarse to Fine SAND (A-2-4), Abundant Asphalt in EB2-A and Trace Asphalt in EB2-B, Trace Gravel, Dry to Moist
- (B) ROADWAY EMBANKMENT: Brown, Medium Stiff, Coarse to Fine Sandy SILT (A-4), Trace Gravel, Wet
- (E) ROADWAY EMBANKMENT: Tan, Soft, Silty CLAY (A-7-5), Wet

\*NOTE: Heavy rain the previous day affected 24-hour water reading in EB2-A and EB2-B



- GROUND LINE TAKEN FROM "280246\_Ls\_tnl.tin" FILE PROVIDED BY NCDOT ON 10/11/22  
 - INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE BRIDGE CROSS SECTION

# GEOTECHNICAL BORING REPORT BORE LOG

WBS BP9.R006.1		TIP SF-280246		COUNTY DAVIDSON		GEOLOGIST Barrera Gonzalez, P.											
SITE DESCRIPTION Bridge No. 246 on SR 2351 (Flat Swamp Road) Over Lick Creek						GROUND WTR (ft)											
BORING NO. EB1-A		STATION 15+20		OFFSET 15 ft LT		ALIGNMENT -L-											
COLLAR ELEV. 616.7 ft		TOTAL DEPTH 47.5 ft		NORTHING 688,801		EASTING 1,657,986											
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic													
DRILLER Moseley, M.		START DATE 11/08/22		COMP. DATE 11/08/22		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	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
620																	
	616.7	0.0	4	5	6										616.7	GROUND SURFACE	0.0
615	613.2	3.5	3	3	4											<b>ROADWAY EMBANKMENT</b> Tan and Brown with Black, Silty Coarse to Fine SAND, Trace Asphalt and Gravel	
610	608.2	8.5	2	4	4										608.7	<b>RESIDUAL</b> Tan, Clayey SILT	8.0
605	603.2	13.5	9	13	29										603.4	Tan, Gray, and Brown, Coarse to Fine Sandy SILT, Trace Rock Fragments	13.3
600	598.2	18.5													601.7	<b>WEATHERED ROCK</b> METAMUDSTONE	15.0
595															598.2	<b>NON-CRYSTALLINE ROCK</b> METAMUDSTONE	18.5
590	589.2	27.5													598.1	<b>NON-CRYSTALLINE ROCK</b> METAMUDSTONE	18.6
585	584.2	32.5															
580	579.2	37.5															
575	574.2	42.5															
570																	
															569.2		47.5
Boring Terminated at Elevation 569.2 ft in Non-Crystalline Rock: METAMUDSTONE																	
Note: Heavy rain the previous day affected the 24-hour water reading																	

NCDOT BORE SINGLE\_SF280246\_GEO\_BRDG0246\_GINT.GPJ\_NC\_DOT.GDT\_12/6/22

# GEOTECHNICAL BORING REPORT CORE LOG

WBS BP9.R006.1		TIP SF-280246		COUNTY DAVIDSON		GEOLOGIST Barrera Gonzalez, P.						
SITE DESCRIPTION Bridge No. 246 on SR 2351 (Flat Swamp Road) Over Lick Creek						GROUND WTR (ft)						
BORING NO. EB1-A		STATION 15+20		OFFSET 15 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 616.7 ft		TOTAL DEPTH 47.5 ft		NORTHING 688,801		EASTING 1,657,986						
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic								
DRILLER Moseley, M.		START DATE 11/08/22		COMP. DATE 11/08/22		SURFACE WATER DEPTH N/A						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
598.1	598.1	18.6	3.9	0:53/0.9 0:33/1.0 1:45/1.0 5:47/1.0	(0.0)	(0.0)		(8.4)	(0.0)			18.6
595	594.2	22.5	5.0	3:51/1.0 5:18/1.0 5:54/1.0 6:12/1.0 4:40/1.0	(1.8)	(0.0)						
590	589.2	27.5	5.0	2:11/1.0 6:11/1.0 6:55/1.0 6:23/1.0 7:07/1.0	(1.8)	(0.0)						
585	584.2	32.5	4.9	N=60/0.1 1:32/0.9 8:44/1.0 2:32/1.0 3:49/1.0 5:49/1.0	(1.5)	(0.0)						
580	579.2	37.5	4.9	2:34/0.9 2:39/1.0 1:44/1.0 2:29/1.0 3:04/1.0	(1.6)	(0.0)						
575	574.2	42.5	5.0	2:12/1.0 4:56/1.0 2:44/1.0 4:52/1.0	(1.7)	(0.0)						
570	569.2	47.5		5:25/1.0								
Boring Terminated at Elevation 569.2 ft in Non-Crystalline Rock: METAMUDSTONE												
Note: Heavy rain the previous day affected the 24-hour water reading												

NCDOT CORE SINGLE\_SF280246\_GEO\_BRDG0246\_GINT.GPJ\_NC\_DOT.GDT\_12/6/22



# CORE PHOTOGRAPHS

## EB1-A 22.5 FEET - 47.5 FEET



# GEOTECHNICAL BORING REPORT BORE LOG

WBS BP9.R006.1		TIP SF-280246		COUNTY DAVIDSON		GEOLOGIST Barrera Gonzalez, P.									
SITE DESCRIPTION Bridge No. 246 on SR 2351 (Flat Swamp Road) Over Lick Creek							GROUND WTR (ft)								
BORING NO. EB1-B		STATION 15+21		OFFSET 13 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 617.2 ft		TOTAL DEPTH 44.8 ft		NORTHING 688,774		EASTING 1,657,980									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic											
DRILLER Moseley, M.		START DATE 11/09/22		COMP. DATE 11/09/22		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					
620															
	617.2	0.0												617.2	0.0
			4	46	12									614.6	2.6
615	613.4	3.8	1	1	1									608.9	8.3
610														604.7	12.5
	608.4	8.8	2	1	3									601.6	15.6
605															
	603.4	13.8	6	10	11										
600															
	598.4	18.8													
595															
	593.4	23.8													
590															
	587.4	29.8													
585															
	582.4	34.8													
580															
	577.4	39.8													
575															

NCDOT BORE SINGLE\_SF280246\_GEO\_BRDG0246\_GINT.GPJ\_NC\_DOT.GDT\_12/6/22

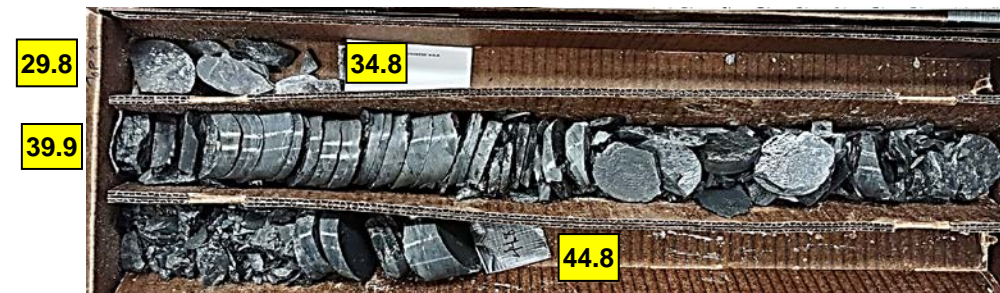
# GEOTECHNICAL BORING REPORT CORE LOG

WBS BP9.R006.1		TIP SF-280246		COUNTY DAVIDSON		GEOLOGIST Barrera Gonzalez, P.						
SITE DESCRIPTION Bridge No. 246 on SR 2351 (Flat Swamp Road) Over Lick Creek							GROUND WTR (ft)					
BORING NO. EB1-B		STATION 15+21		OFFSET 13 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 617.2 ft		TOTAL DEPTH 44.8 ft		NORTHING 688,774		EASTING 1,657,980						
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic								
DRILLER Moseley, M.		START DATE 11/09/22		COMP. DATE 11/09/22		SURFACE WATER DEPTH N/A						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	TOTAL RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
587.4												
	587.4	29.8	5.0	8:09/1.0 9:46/1.0 9:38/1.0 12:26/1.0 8:16/1.0 N=100/0.2	(0.2)	(0.0)		(0.2)	(0.0)		587.4	29.8
585												
	582.4	34.8									582.4	34.8
580												
	577.3	39.9									577.4	39.8
575			4.9	N=60/0.1 6:15/0.9 6:21/1.0 4:23/1.0 3:50/1.0 4:55/1.0	(2.7)	(0.0)		(2.7)	(0.0)		577.3	39.9
	572.4	44.8									572.4	44.8

NCDOT CORE SINGLE\_SF280246\_GEO\_BRDG0246\_GINT.GPJ\_NC\_DOT.GDT\_12/6/22

# CORE PHOTOGRAPHS

## EB1-B 29.8 FEET - 44.8 FEET



**GEOTECHNICAL BORING REPORT**  
**BORE LOG**

SHEET 11

WBS BP9.R006.1		TIP SF-280246		COUNTY DAVIDSON		GEOLOGIST Barrera Gonzalez, P.								
SITE DESCRIPTION Bridge No. 246 on SR 2351 (Flat Swamp Road) Over Lick Creek						GROUND WTR (ft)								
BORING NO. EB2-A		STATION 16+34		OFFSET 14 ft LT		ALIGNMENT -L-								
COLLAR ELEV. 616.9 ft		TOTAL DEPTH 39.2 ft		NORTHING 688,772		EASTING 1,658,096								
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic								
DRILLER Moseley, M.		START DATE 11/14/22		COMP. DATE 11/14/22		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75					100
620														
	616.9	0.0										616.9	GROUND SURFACE	0.0
615			12	7	3								ROADWAY EMBANKMENT Black with Brown, Coarse to Fine SAND, Abundant Asphalt, Trace Gravel Tan, Silty CLAY	2.6
	613.2	3.7	WOH	2	1									
610													ALLUVIAL Grayish Brown, Silty CLAY	8.1
	608.2	8.7												
605			1	2	2									
	603.2	13.7	8	25	75/0.4								WEATHERED ROCK METAMUDSTONE	14.2
600														
	598.2	18.7	100/0.2											
595														
	593.2	23.7	60/0.0										NON-CRYSTALLINE ROCK Gray, Moderately Severely to Slightly Weathered, Medium Hard to Moderately Hard, METAMUDSTONE with Very Close Fracture Spacing	23.7
590														
	586.9	30.0	60/0.1											
585														
	581.8	35.1	60/0.1											
580														
	577.8	39.1	60/0.1										Boring Terminated at Elevation 577.7 ft in Non-Crystalline Rock: METAMUDSTONE	39.2
													Note: Heavy rain the previous day affected the 24-hour water reading	

NCDOT BORE SINGLE\_SF280246\_GEO\_BRDG0246\_GINT.GPJ\_NC\_DOT.GDT\_12/6/22

**GEOTECHNICAL BORING REPORT**  
**CORE LOG**

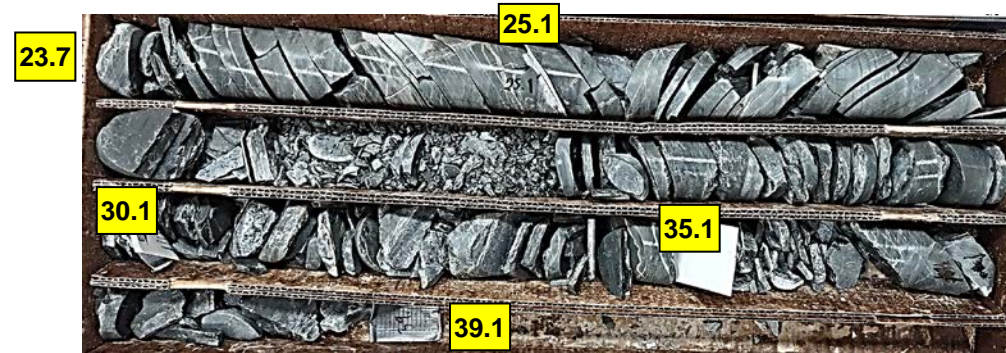
SHEET 11

WBS BP9.R006.1		TIP SF-280246		COUNTY DAVIDSON		GEOLOGIST Barrera Gonzalez, P.						
SITE DESCRIPTION Bridge No. 246 on SR 2351 (Flat Swamp Road) Over Lick Creek						GROUND WTR (ft)						
BORING NO. EB2-A		STATION 16+34		OFFSET 14 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 616.9 ft		TOTAL DEPTH 39.2 ft		NORTHING 688,772		EASTING 1,658,096						
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic						
DRILLER Moseley, M.		START DATE 11/14/22		COMP. DATE 11/14/22		SURFACE WATER DEPTH N/A						
ELEV (ft)	RIN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	TOTAL RUN		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %		REC. (ft) %	RQD (ft) %			
593.2												
	593.2	23.7	1.4	7:19/1.0 5:02/0.4	(0.9)	(0.0)		(5.5)	(0.0)			
590			5.0	6:15/1.0 6:36/1.0 12:37/1.0 3:08/1.0 4:10/1.0	(2.6)	(0.0)						
	586.8	30.2			52%	0%						
585			4.9	5:11/0.9 7:35/1.0 6:55/1.0 6:30/1.0 6:59/1.0	(1.1)	(0.0)						
	581.8	35.1			22%	0%						
580			3.9	6:37/0.9 6:48/1.0 10:07/1.0 14:20/1.0	(0.9)	(0.0)						
	577.8	39.1			23%	0%						
												Boring Terminated at Elevation 577.7 ft in Non-Crystalline Rock: METAMUDSTONE
												Note: Heavy rain the previous day affected the 24-hour water reading

NCDOT CORE SINGLE\_SF280246\_GEO\_BRDG0246\_GINT.GPJ\_NC\_DOT.GDT\_12/6/22

# CORE PHOTOGRAPHS

## EB2-A 23.7 FEET - 39.1 FEET



# GEOTECHNICAL BORING REPORT BORE LOG

SHEET 13

WBS BP9.R006.1		TIP SF-280246		COUNTY DAVIDSON		GEOLOGIST Barrera Gonzalez, P.							
SITE DESCRIPTION Bridge No. 246 on SR 2351 (Flat Swamp Road) Over Lick Creek							GROUND WTR (ft)						
BORING NO. EB2-B		STATION 16+32		OFFSET 14 ft RT		ALIGNMENT -L-							
COLLAR ELEV. 615.5 ft		TOTAL DEPTH 39.2 ft		NORTHING 688,745		EASTING 1,658,087							
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic							
DRILLER Moseley, M.		START DATE 11/10/22		COMP. DATE 11/10/22		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				
620													
615	615.5	0.0	5	4	3						M	GROUND SURFACE	0.0
610	612.0	3.5	2	2	4						W	ROADWAY EMBANKMENT Brown with Black, Silty Coarse to Fine SAND, Trace Gravel, Trace Asphalt Fragments	3.1
605	607.0	8.5	2	2	2						W	Brown, Coarse to Fine Sandy SILT, Trace Gravel	8.3
600	602.0	13.5	5	29	71/0.4						W	ALLUVIAL Gray and Brown, Silty CLAY	14.0
595	597.0	18.5										WEATHERED ROCK METAMUDSTONE	100/0.9
590	592.0	23.5										NON-CRYSTALLINE ROCK METAMUDSTONE	100/0.2
585	585.6	29.9										NON-CRYSTALLINE ROCK Gray, Moderately Severely to Slightly Weathered, Medium Hard to Moderately Hard, METAMUDSTONE with Very Close Fracture Spacing	60/0.1
580	580.6	34.9										NON-CRYSTALLINE ROCK METAMUDSTONE	60/0.1
	576.3	39.2										Boring Terminated at Elevation 576.3 ft in Non-Crystalline Rock: METAMUDSTONE	60/0.0
													39.2

NCDOT BORE SINGLE SF280246\_GEO\_BRDG0246\_GINT.GPJ\_NC\_DOT.GDT 12/6/22

# GEOTECHNICAL BORING REPORT CORE LOG

SHEET 13

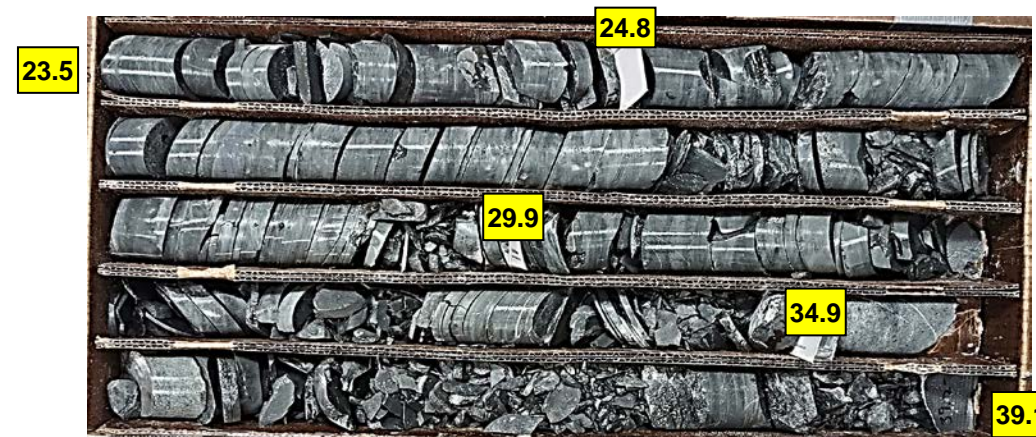
WBS BP9.R006.1		TIP SF-280246		COUNTY DAVIDSON		GEOLOGIST Barrera Gonzalez, P.						
SITE DESCRIPTION Bridge No. 246 on SR 2351 (Flat Swamp Road) Over Lick Creek							GROUND WTR (ft)					
BORING NO. EB2-B		STATION 16+32		OFFSET 14 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 615.5 ft		TOTAL DEPTH 39.2 ft		NORTHING 688,745		EASTING 1,658,087						
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 86% 11/2/2021				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic						
DRILLER Moseley, M.		START DATE 11/10/22		COMP. DATE 11/10/22		SURFACE WATER DEPTH N/A						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft)	RQD (ft)		REC. (ft)	RQD (ft)			
591.9	591.9	23.6	1.3	4:57/1.0	(1.1)	(0.0)		(8.9)	(0.0)		Begin Coring @ 23.6 ft	23.6
590	590.8	24.9	5.0	1:42/0.3	85%	0%		57%	0%		NON-CRYSTALLINE ROCK Gray, Moderately Severely to Slightly Weathered, Medium Hard to Moderately Hard, METAMUDSTONE with Very Close Fracture Spacing Fractures at 10 degrees to 30 degrees GSI=20-40	
585	585.6	29.9	5.0	6:38/1.0 5:44/1.0 9:45/1.0 8:36/1.0 16:21/1.0	(3.5)	(0.0)						
580	580.6	34.9	4.2	4:45/1.0 4:33/1.0 4:49/1.0 6:31/1.0 7:16/1.0	(2.3)	(0.0)						
	576.3	39.2		5:05/0.9 4:54/1.0 8:37/1.0 6:51/1.0 9:33/0.3 N=60/0.0	46%	0%						
												39.2

NCDOT CORE SINGLE SF280246\_GEO\_BRDG0246\_GINT.GPJ\_NC\_DOT.GDT 12/6/22

Note: Heavy rain the previous day affected the 24-hour water reading

# CORE PHOTOGRAPHS

## EB2-B 23.7 FEET - 39.1 FEET



**SITE PHOTOGRAPHS**  
Bridge No. 246 on SR 2351 (Flat Swamp Road) over Lick Creek

View Along Bridge 246 Looking Upstation



View Looking Upstream from Bridge 246



View of Along Bridge 246 Looking Downstation



View Looking Downstream from Bridge 246

