

REFERENCE: SF-920077

PROJECT: 17BP.5.R.77

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY WARREN  
PROJECT DESCRIPTION BRIDGE NO. 77 ON SR 1640  
(RICHARDSON ROAD) OVER FISHING CREEK

**CONTENTS**

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5	CROSS SECTIONS
6-8	BORE LOGS
9	SITE PHOTOGRAPH

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-920077	1	9

**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:
1. 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.
  2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

C.T. TANG, EI

CAROLINA DRILLING

G. EISTER

T. BLYTHE

INVESTIGATED BY C.T. TANG, EI

DRAWN BY C.T. TANG, EI

CHECKED BY D. BROWN, PE

SUBMITTED BY D. BROWN, PE

DATE JANUARY 2018



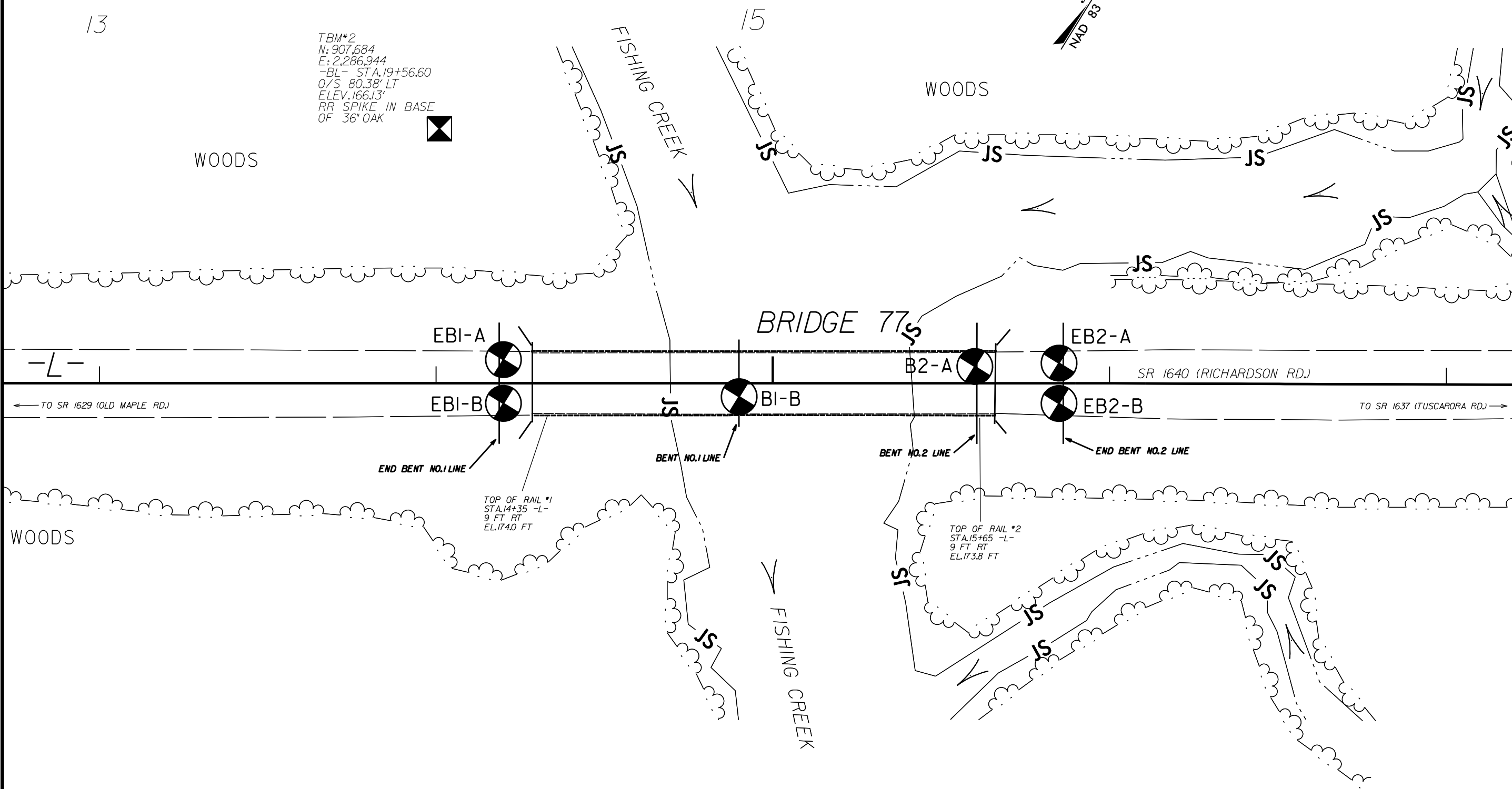
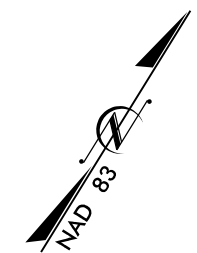
DocuSigned by:  
  
 C06817E5E770411...  
 SIGNATURE DATE  
 1/11/2018

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



13

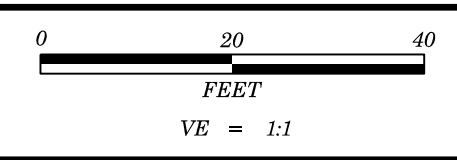
TBM#2  
 N: 907.684  
 E: 2,286.944  
 -BL- STA. 19+56.60  
 O/S 80.38' LT  
 ELEV. 166.13'  
 RR SPIKE IN BASE  
 OF 36" OAK



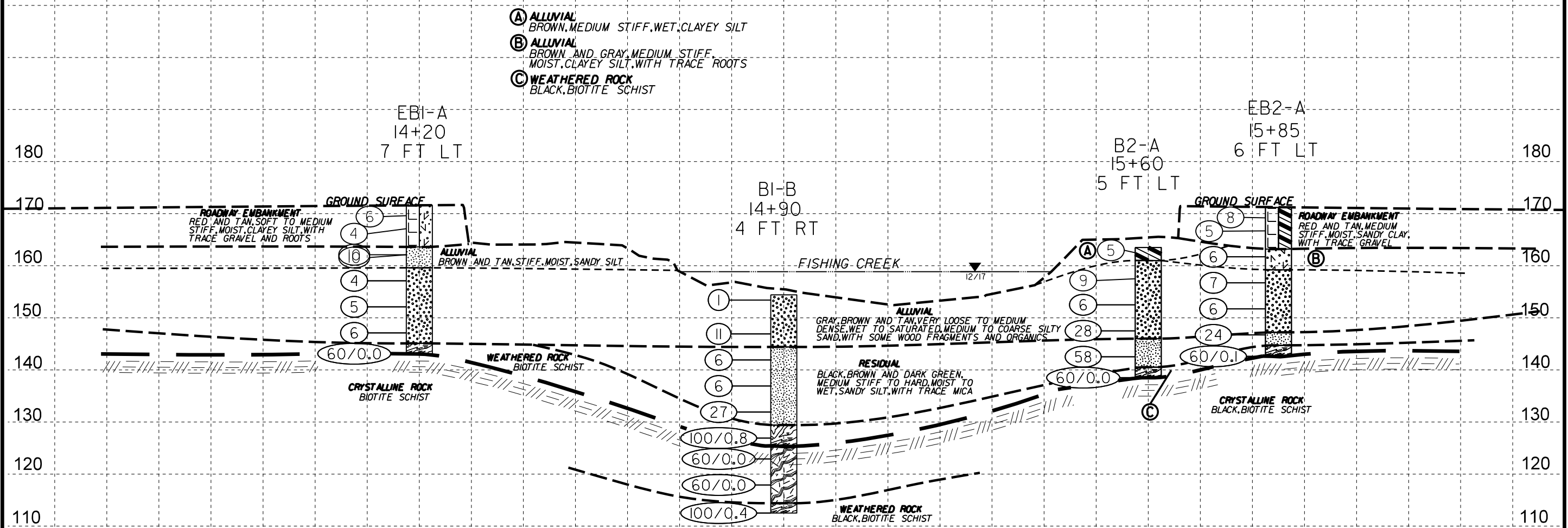
TOP OF RAIL #1  
 STA. 14+35 -L-  
 9 FT RT  
 EL. 174.0 FT

TOP OF RAIL #2  
 STA. 15+65 -L-  
 9 FT RT  
 EL. 173.8 FT

SKEW = 90 DEG.



PROJECT REFERENCE NO.	SHEET NO.
SF-920077	4
PROFILE ALONG -L- CENTERLINE	



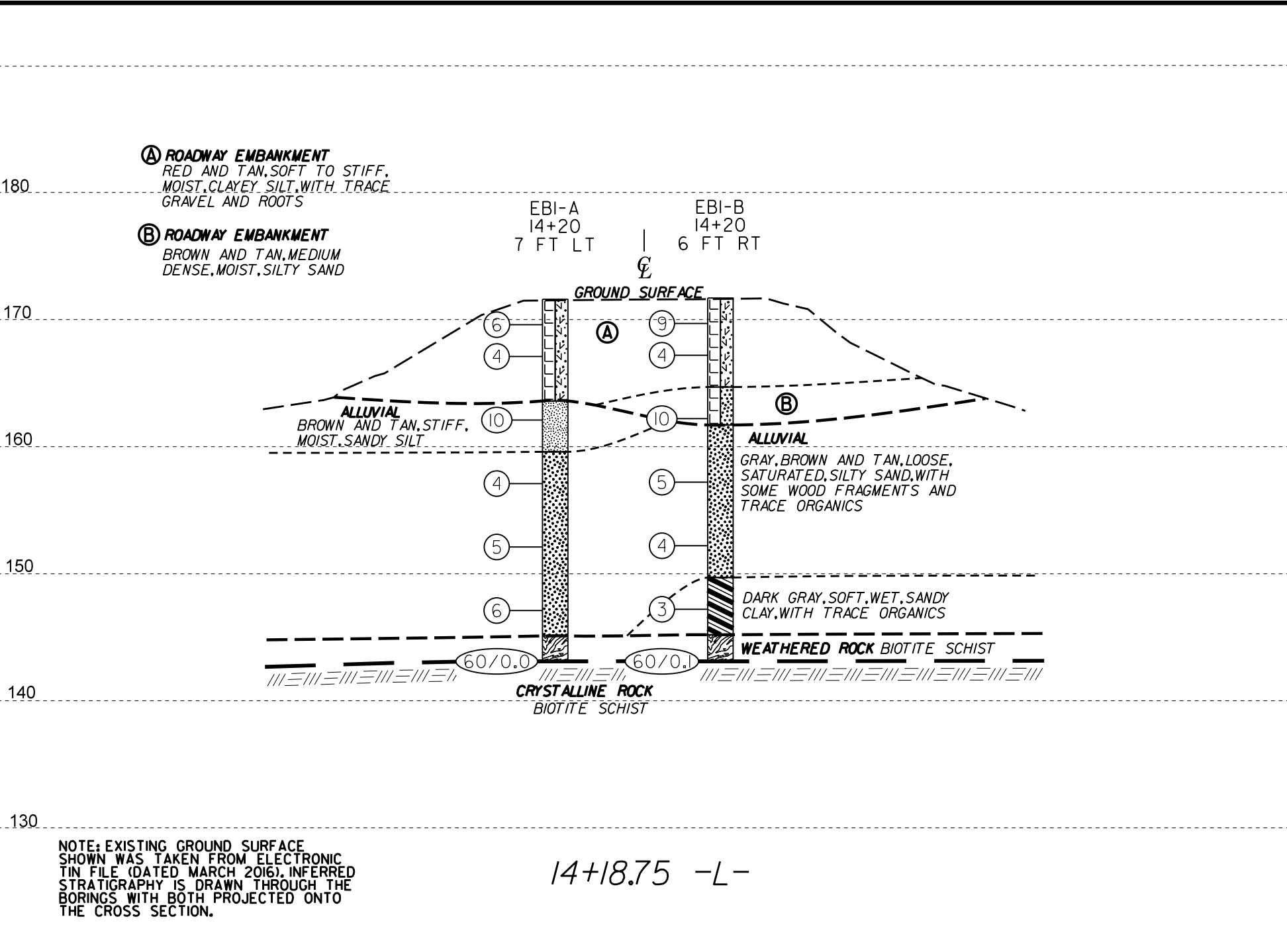
NOTE: EXISTING GROUND SURFACE SHOWN WAS TAKEN FROM ELECTRONIC TIN FILE (DATED MARCH 2016). INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE -L- PROFILE.

14+00

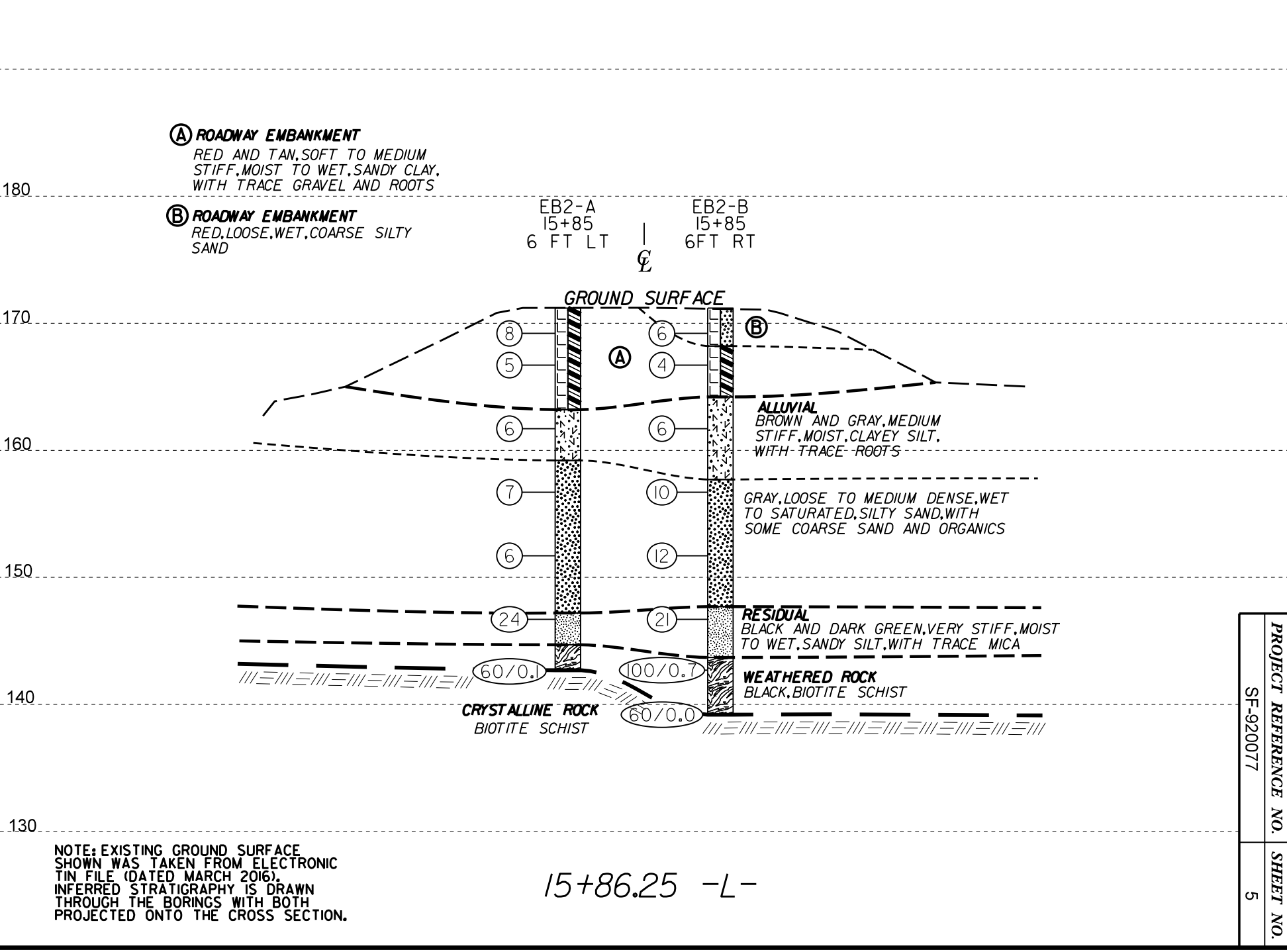
15+00

16+00

HORIZ. SCALE 0 (FEET) 10 20  
 VE = 1:1  
 CROSS SECTION AT END BENT NO. 1



HORIZ. SCALE 0 (FEET) 10 20  
 VE = 1:1  
 CROSS SECTION AT END BENT NO. 2



PROJECT REFERENCE NO. SF-920077  
 SHEET NO. 5

# GEOTECHNICAL BORING REPORT

## BORE LOG

<b>WBS</b> 17BP.5.R.77		<b>TIP</b> SF-920077		<b>COUNTY</b> WARREN		<b>GEOLOGIST</b> C.T. Tang	
<b>SITE DESCRIPTION</b> Bridge No. 77 on SR 1640 (Richardson Rd.) over Fishing Creek							<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> EB1-A		<b>STATION</b> 14+20		<b>OFFSET</b> 7 ft LT		<b>ALIGNMENT</b> -L-	
<b>COLLAR ELEV.</b> 171.6 ft		<b>TOTAL DEPTH</b> 28.5 ft		<b>NORTHING</b> 907,636		<b>EASTING</b> 2,286,996	
<b>DRILL RIG/HAMMER EFF./DATE</b> BRI0674 CME-45C 91% 02/22/2017		<b>DRILL METHOD</b> Mud Rotary			<b>HAMMER TYPE</b> Automatic		
<b>DRILLER</b> G. Eister		<b>START DATE</b> 12/13/17		<b>COMP. DATE</b> 12/13/17		<b>SURFACE WATER DEPTH</b> N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
175															
170	170.6	1.0	2	3	3									171.6	GROUND SURFACE
	168.1	3.5	1	2	2										<b>ROADWAY EMBANKMENT</b> Red and Tan, Clayey Silt, with Trace Gravel and Roots
165															
	163.1	8.5	3	4	6									163.6	<b>ALLUVIAL</b> Brown and Tan, Silty Silt
160															
	158.1	13.5	2	2	2									159.6	<b>ALLUVIAL</b> Brown, Tan and Gray, Silty Sand, with Some Wood Fragments
155															
	153.1	18.5	2	2	3										Sat.
150															
	148.1	23.5	3	3	3										Sat.
145															
	143.1	28.5												145.1	<b>WEATHERED ROCK</b> Biotite Schist
														143.1	<b>WEATHERED ROCK</b> Biotite Schist

Boring Terminated with Standard Penetration Test Refusal at Elevation 143.1 ft on Crystalline Rock

<b>WBS</b> 17BP.5.R.77		<b>TIP</b> SF-920077		<b>COUNTY</b> WARREN		<b>GEOLOGIST</b> C.T. Tang	
<b>SITE DESCRIPTION</b> Bridge No. 77 on SR 1640 (Richardson Rd.) over Fishing Creek							<b>GROUND WTR (ft)</b>
<b>BORING NO.</b> EB1-B		<b>STATION</b> 14+20		<b>OFFSET</b> 6 ft RT		<b>ALIGNMENT</b> -L-	
<b>COLLAR ELEV.</b> 171.7 ft		<b>TOTAL DEPTH</b> 28.6 ft		<b>NORTHING</b> 907,625		<b>EASTING</b> 2,287,003	
<b>DRILL RIG/HAMMER EFF./DATE</b> BRI0674 CME-45C 91% 02/22/2017		<b>DRILL METHOD</b> Mud Rotary			<b>HAMMER TYPE</b> Automatic		
<b>DRILLER</b> G. Eister		<b>START DATE</b> 12/12/17		<b>COMP. DATE</b> 12/12/17		<b>SURFACE WATER DEPTH</b> N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
175															
170	170.7	1.0	3	5	4									171.7	GROUND SURFACE
	168.2	3.5	2	2	2										<b>ROADWAY EMBANKMENT</b> Red and Tan, Clayey Silt, with Trace Gravel and Roots
165															
	163.2	8.5	5	6	4									164.7	Brown and Tan, Silty Sand
160															
	158.2	13.5	2	2	3									161.7	<b>ALLUVIAL</b> Brown and Gray, Silty Sand, with Trace Organics and Wood Fragments
155															
	153.2	18.5	1	2	2										Sat.
150															
	148.2	23.5	2	2	1									149.7	Dark Gray, Sandy Clay, with Trace Organics
145															
	143.2	28.5												145.2	<b>WEATHERED ROCK</b> Biotite Schist
														143.1	<b>WEATHERED ROCK</b> Biotite Schist

Boring Terminated with Standard Penetration Test Refusal at Elevation 143.1 ft in Crystalline Rock

NCDOT BORE DOUBLE 920077\_GEO\_BRD06077\_BH.GPJ NC\_DOT.GDT 12/19/17

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 17BP.5.R.77		TIP SF-920077		COUNTY WARREN		GEOLOGIST C.T. Tang									
SITE DESCRIPTION Bridge No. 77 on SR 1640 (Richardson Rd.) over Fishing Creek							GROUND WTR (ft)								
BORING NO. B1-B		STATION 14+90		OFFSET 4 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 154.4 ft		TOTAL DEPTH 41.9 ft		NORTHING 907,664		EASTING 2,287,062									
DRILL RIG/HAMMER EFF./DATE BRI0674 CME-45C 91% 02/22/2017			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic									
DRILLER G. Eister		START DATE 12/12/17		COMP. DATE 12/12/17		SURFACE WATER DEPTH 3.8ft									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
155	154.4	0.0												154.4	MUD LINE
			WOH	WOH	1								Sat.		<b>ALLUVIAL</b> Gray, Medium to Coarse Silty Sand, with Wood Fragments and Organics
150	147.9	6.5	5	6	5								Sat.		
145	142.9	11.5	2	3	3								W	144.4	<b>RESIDUAL</b> Brown and Black, Sandy Silt
140	137.9	16.5	3	3	3								W		
135	132.9	21.5	6	9	18								W		
130	127.9	26.5	64	36/0.3									W	129.4	<b>WEATHERED ROCK</b> Brown and Black, Biotite Schist
125	122.9	31.5	60/0.0											125.4	<b>CRYSTALLINE ROCK</b> Biotite Schist
120	117.9	36.5	60/0.0												
115	112.9	41.5	100/0.4											114.4	<b>WEATHERED ROCK</b> Brown and Black, Biotite Schist
														112.5	Boring Terminated at Elevation 112.5 ft in Weathered Rock

WBS 17BP.5.R.77		TIP SF-920077		COUNTY WARREN		GEOLOGIST C.T. Tang									
SITE DESCRIPTION Bridge No. 77 on SR 1640 (Richardson Rd.) over Fishing Creek							GROUND WTR (ft)								
BORING NO. B2-A		STATION 15+60		OFFSET 5 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 163.5 ft		TOTAL DEPTH 25.0 ft		NORTHING 907,708		EASTING 2,287,116									
DRILL RIG/HAMMER EFF./DATE BRI0674 CME-45C 91% 02/22/2017			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic									
DRILLER G. Eister		START DATE 12/11/17		COMP. DATE 12/11/17		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
165	163.5	0.0												163.5	GROUND SURFACE
			1	2	3								W	161.0	<b>ALLUVIAL</b> Brown, Clayey Silt
160	158.5	5.0	3	5	4								W		Gray, White and Brown, Medium to Coarse Silty Sand
155	153.5	10.0	2	4	2								W		
150	148.5	15.0	9	15	13								Sat.		
145	143.5	20.0	14	22	36								W	146.0	<b>RESIDUAL</b> Black and Dark Green, Sandy Silt, with Trace Mica
140	138.5	25.0	60/0.0											140.5	<b>WEATHERED ROCK</b> Biotite Schist
														138.5	Boring Terminated with Standard Penetration Test Refusal at Elevation 138.5 ft on Crystalline Rock

NCDOT BORE DOUBLE 920077\_GEO\_BRD06077\_BH.GPJ NC\_DOT.GDT 1/10/18

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 17BP.5.R.77		TIP SF-920077		COUNTY WARREN		GEOLOGIST C.T. Tang									
SITE DESCRIPTION Bridge No. 77 on SR 1640 (Richardson Rd.) over Fishing Creek							GROUND WTR (ft)								
BORING NO. EB2-A		STATION 15+85		OFFSET 6 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 171.2 ft		TOTAL DEPTH 28.6 ft		NORTHING 907,722		EASTING 2,287,137									
DRILL RIG/HAMMER EFF./DATE BRI0674 CME-45C 91% 02/22/2017			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic									
DRILLER G. Eister		START DATE 12/11/17		COMP. DATE 12/11/17		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					
175															
170	170.2	1.0	2	4	4								M	171.2 GROUND SURFACE	0.0
	167.7	3.5	2	2	3								M	ROADWAY EMBANKMENT Red and Tan, Sandy Clay, with Trace Gravel	
165															
	162.7	8.5	3	3	3								M	163.2 ALLUVIAL Brown and Gray, Clayey Silt, with Trace Roots	8.0
160															
	157.7	13.5	3	3	4								W	159.2 Gray and Red, Silty Sand, with Some Organics	12.0
155															
	152.7	18.5	1	3	3								Sat.		
150															
	147.7	23.5	8	15	9								W	147.2 RESIDUAL Black and Dark Green, Sandy Silt	24.0
145															
	142.7	28.5	60/0.1											144.7 WEATHERED ROCK Biotite Schist	26.5
														142.7 WEATHERED ROCK Biotite Schist	28.5
														142.6 CRYSTALLINE ROCK Black, Biotite Schist	28.6
														Boring Terminated with Standard Penetration Test Refusal at Elevation 142.6 ft in Crystalline Rock	

WBS 17BP.5.R.77		TIP SF-920077		COUNTY WARREN		GEOLOGIST C.T. Tang									
SITE DESCRIPTION Bridge No. 77 on SR 1640 (Richardson Rd.) over Fishing Creek							GROUND WTR (ft)								
BORING NO. EB2-B		STATION 15+85		OFFSET 6 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 171.2 ft		TOTAL DEPTH 32.0 ft		NORTHING 907,712		EASTING 2,287,143									
DRILL RIG/HAMMER EFF./DATE BRI0674 CME-45C 91% 02/22/2017			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic									
DRILLER G. Eister		START DATE 12/13/17		COMP. DATE 12/13/17		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					
175															
170	170.2	1.0	2	2	4								W	171.2 GROUND SURFACE	0.0
	167.7	3.5	2	2	2								W	168.2 ROADWAY EMBANKMENT Red, Coarse Silty Sand	3.0
165															
	162.7	8.5	3	3	3								M	164.2 ALLUVIAL Brown and Tan, Clayey Silt	7.0
160															
	157.7	13.5	6	6	4								Sat.	157.7 Gray, Silty Sand	13.5
155															
	152.7	18.5	3	4	8								W		
150															
	147.7	23.5	10	10	11								M	147.7 RESIDUAL Black and Dark Green, Sandy Silt, with Trace Mica	23.5
145															
	142.7	28.5	33	67/0.2										143.7 WEATHERED ROCK Black, Biotite Schist	27.5
140															
	139.2	32.0	60/0.0											139.2 Boring Terminated with Standard Penetration Test Refusal at Elevation 139.2 ft on Crystalline Rock	32.0

NCDOT BORE DOUBLE 920077\_GEO\_BRDG0077\_BH.GPJ NC\_DOT.GDT 12/19/17



***SITE PHOTOGRAPH***

**BRIDGE 77**



PHOTOGRAPH NO. 1.: VIEW LOOKING SOUTH