

REFERENCE: B-5171

PROJECT: 42329

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY GRANVILLE
PROJECT DESCRIPTION BRIDGE NO. 125 OVER
AARON'S CREEK ON SR 1400 (GRASSY CREEK-
VIRGILINA ROAD)

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	PROFILE
5-7	CROSS SECTIONS
8-II	BORE LOGS, CORE REPORT, & CORE PHOTOGRAPHS
12	ROCK CORE TEST RESULTS
13	SITE PHOTOGRAPHS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5171	1	13

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

E. MAYR, PE

TRIGON

E. ESTEP

T. PRESTON

INVESTIGATED BY D. BROWN, PE

DRAWN BY D. BROWN, PE

CHECKED BY E. MAYR, PE

SUBMITTED BY D. BROWN, PE

DATE JULY 2015



DocuSigned by:

Donald W. Brown Jr. 7/22/2015

056948D03967464...

SIGNATURE

DATE

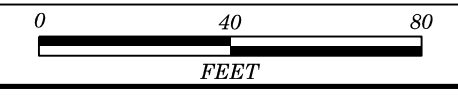
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

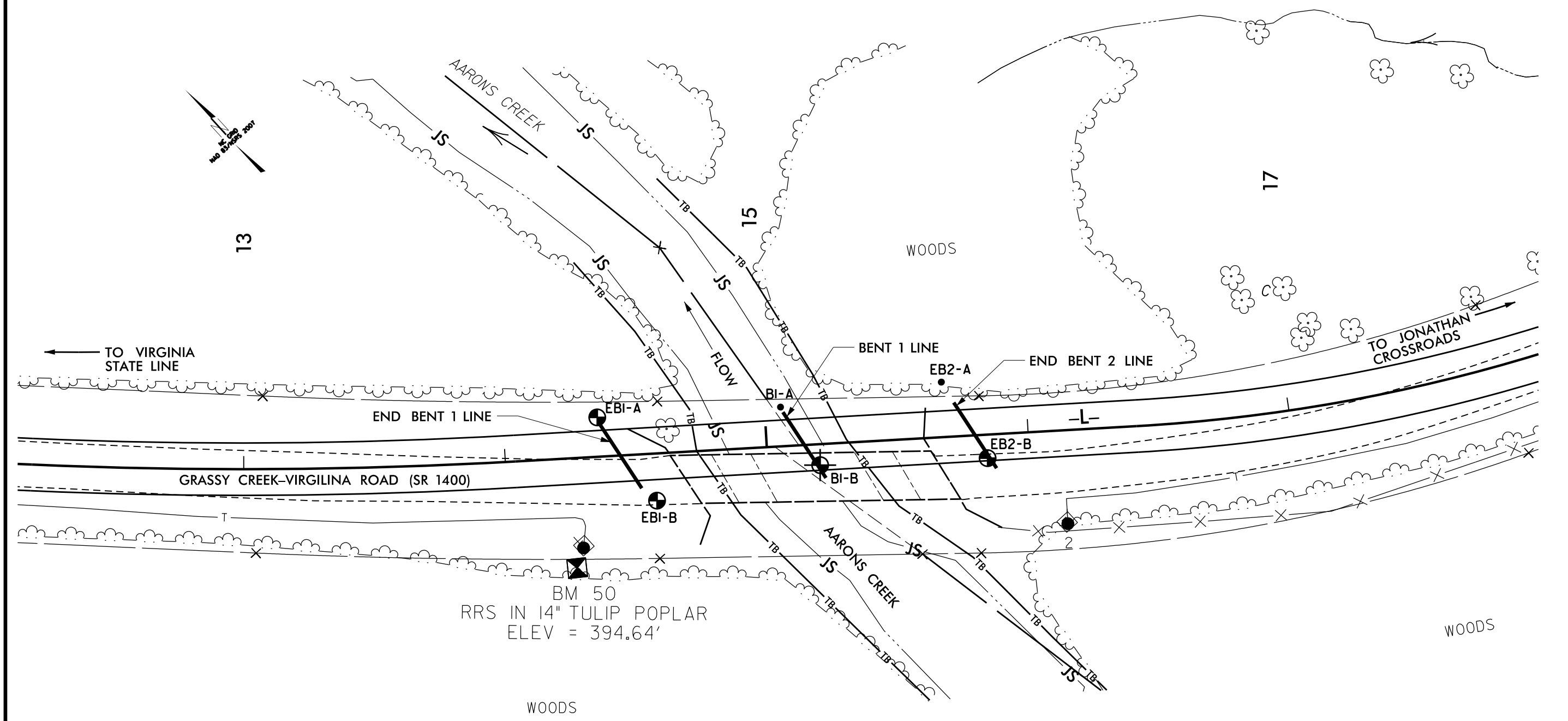
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

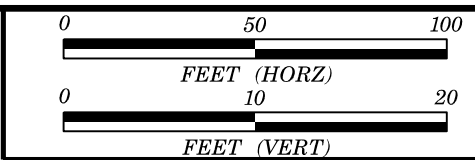
SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, SOIL LEGEND AND AASHTO CLASSIFICATION, CONSISTENCY OR DENSENESS, TEXTURE OR GRAIN SIZE, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, COLOR, MISCELLANEOUS SYMBOLS, RECOMMENDATION SYMBOLS, ABBREVIATIONS, EQUIPMENT USED ON SUBJECT PROJECT, FRACTURE SPACING, BEDDING, INDURATION.

SITE PLAN

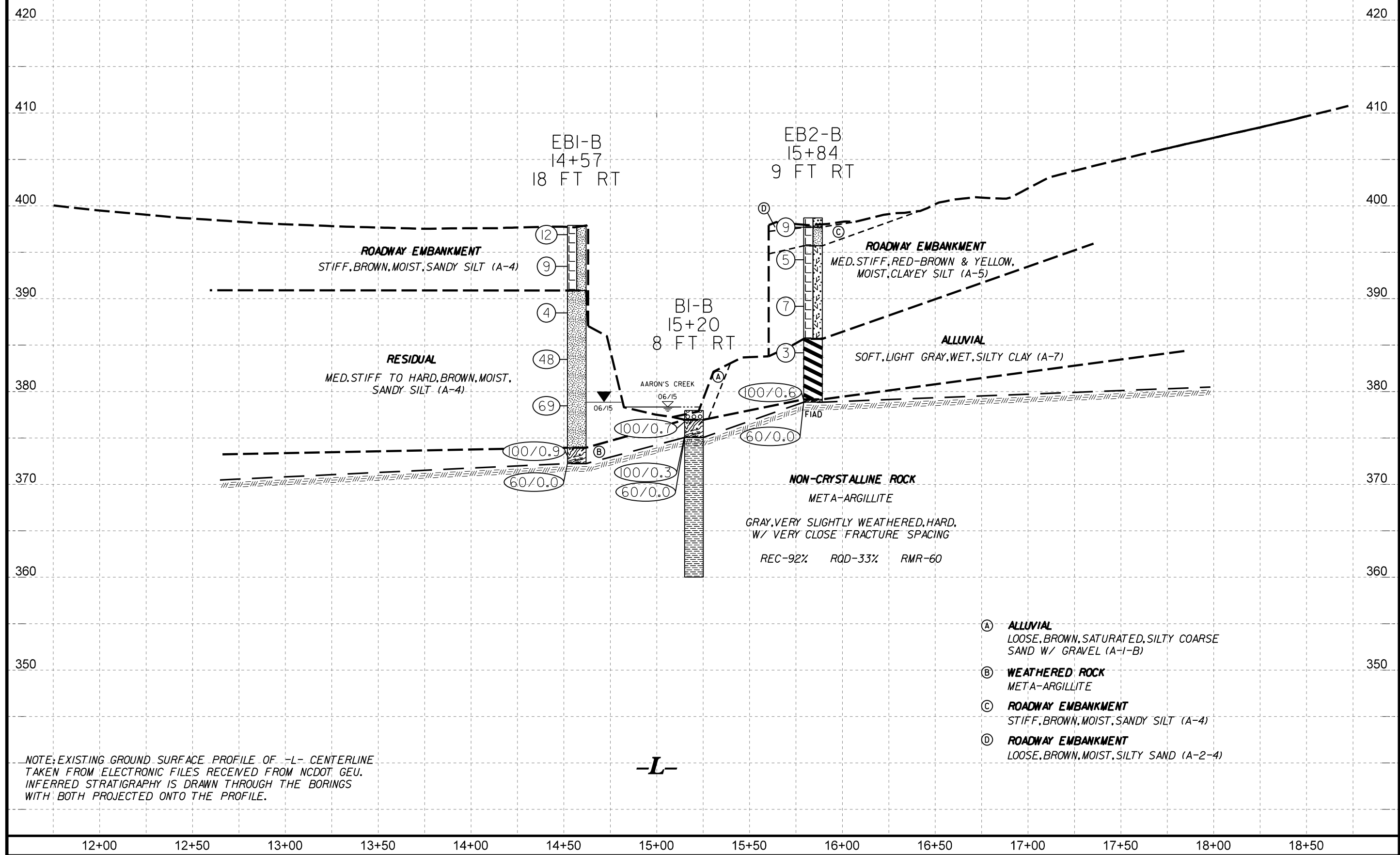


SKEW = 60 DEG.



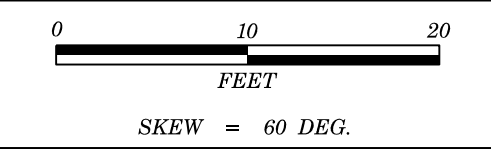


PROJECT REFERENCE NO.	SHEET NO.
B-5171	4
PROFILE THROUGH B-SIDE BORINGS PROJECTED ALONG -L- CENTERLINE	

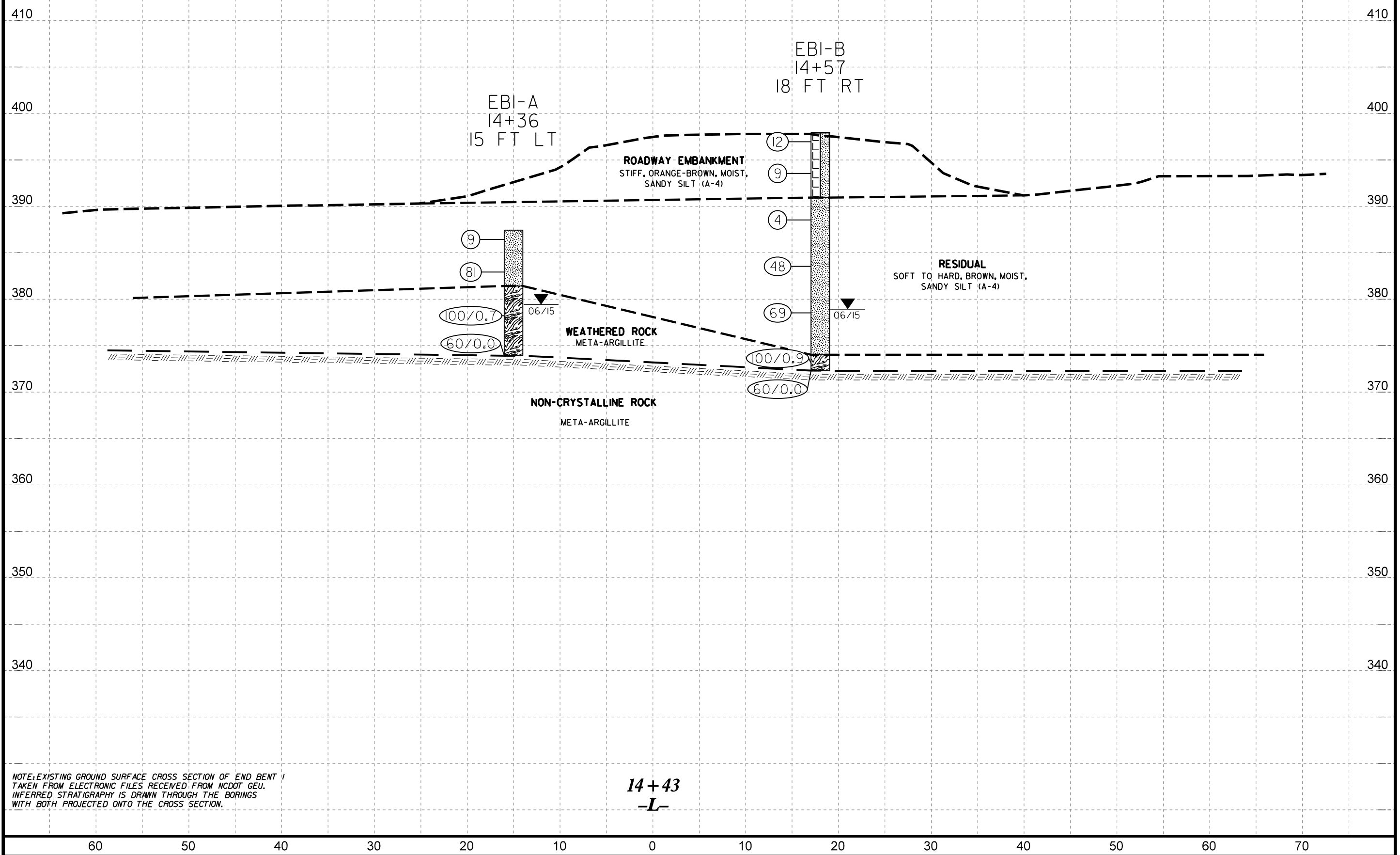


- (A) **ALLUVIAL**
LOOSE, BROWN, SATURATED, SILTY COARSE SAND W/ GRAVEL (A-1-B)
- (B) **WEATHERED ROCK**
META-ARGILLITE
- (C) **ROADWAY EMBANKMENT**
STIFF, BROWN, MOIST, SANDY SILT (A-4)
- (D) **ROADWAY EMBANKMENT**
LOOSE, BROWN, MOIST, SILTY SAND (A-2-4)

NOTE: EXISTING GROUND SURFACE PROFILE OF -L- CENTERLINE TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.

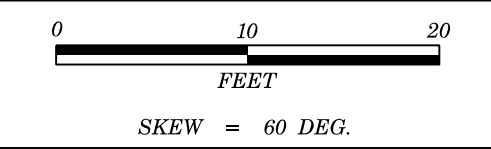


PROJECT REFERENCE NO.	SHEET NO.
B-5171	5
CROSS SECTION ACROSS END BENT 1	

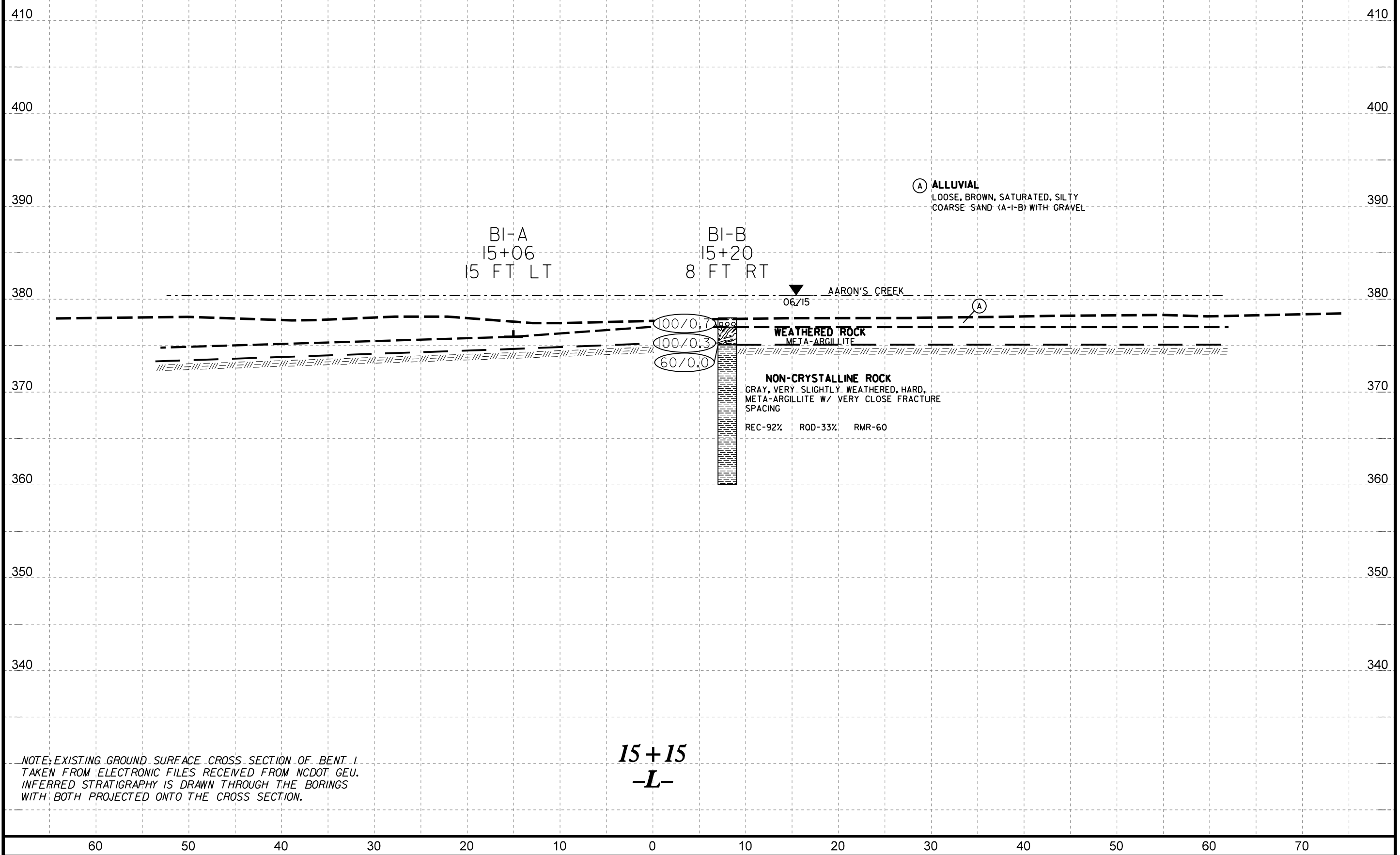


NOTE: EXISTING GROUND SURFACE CROSS SECTION OF END BENT 1
TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS
WITH BOTH PROJECTED ONTO THE CROSS SECTION.

14+43
-L-



PROJECT REFERENCE NO.	SHEET NO.
B-5171	6
CROSS SECTION ACROSS BENT 1	



BI-A
15+06
15 FT LT

BI-B
15+20
8 FT RT

(A) ALLUVIAL
LOOSE, BROWN, SATURATED, SILTY
COARSE SAND (A-1-B) WITH GRAVEL

▲ 06/15
AARON'S CREEK

100/0.7
100/0.3
60/0.0

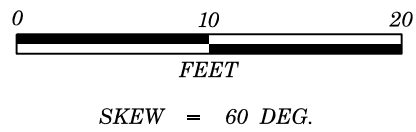
WEATHERED ROCK
META-ARGILLITE

NON-CRYSTALLINE ROCK
GRAY, VERY SLIGHTLY WEATHERED, HARD,
META-ARGILLITE W/ VERY CLOSE FRACTURE
SPACING
REC-92% ROD-33% RMR-60

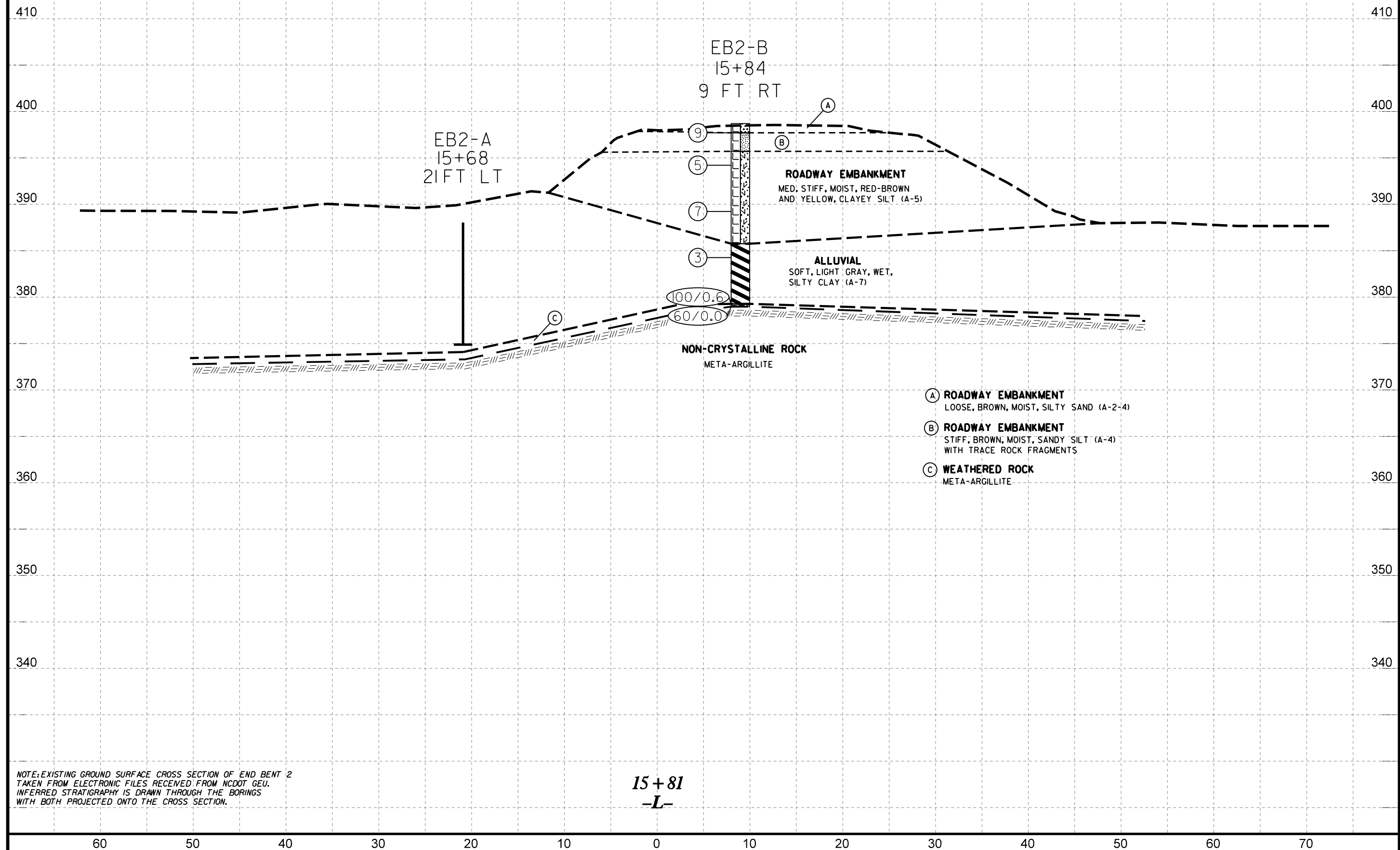
NOTE: EXISTING GROUND SURFACE CROSS SECTION OF BENT 1
TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS
WITH BOTH PROJECTED ONTO THE CROSS SECTION.

15+15
-L-

60 50 40 30 20 10 0 10 20 30 40 50 60 70



PROJECT REFERENCE NO.	SHEET NO.
B-5171	7
CROSS SECTION ACROSS END BENT 2	



EB2-A
15+68
21 FT LT

EB2-B
15+84
9 FT RT

ROADWAY EMBANKMENT
MED. STIFF, MOIST, RED-BROWN
AND YELLOW, CLAYEY SILT (A-5)

ALLUVIAL
SOFT, LIGHT GRAY, WET,
SILTY CLAY (A-7)

NON-CRYSTALLINE ROCK
META-ARGILLITE

- (A) **ROADWAY EMBANKMENT**
LOOSE, BROWN, MOIST, SILTY SAND (A-2-4)
- (B) **ROADWAY EMBANKMENT**
STIFF, BROWN, MOIST, SANDY SILT (A-4)
WITH TRACE ROCK FRAGMENTS
- (C) **WEATHERED ROCK**
META-ARGILLITE

NOTE: EXISTING GROUND SURFACE CROSS SECTION OF END BENT 2
TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS
WITH BOTH PROJECTED ONTO THE CROSS SECTION.

15+81
-L-

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 42329.1.1		TIP B-5171		COUNTY GRANVILLE		GEOLOGIST E. MAYR										
SITE DESCRIPTION Bridge No. 125 over Aaron's Creek on SR1400 (Grassy Creek-Virgilina Rd)							GROUND WTR (ft)									
BORING NO. EB1-A		STATION 14+36		OFFSET 15 ft LT		ALIGNMENT L										
COLLAR ELEV. 387.4 ft		TOTAL DEPTH 13.5 ft		NORTHING 1,012,629		EASTING 2,076,574										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 68% 02/20/2015				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Estep		START DATE 06/17/15		COMP. DATE 06/17/15		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						
390	387.4	0.0	4	5	4									387.4	GROUND SURFACE	0.0
385	383.9	3.5	11	25	56									381.4	RESIDUAL BROWN, SANDY SILT	6.0
380	378.9	8.5	51	49/0.2										373.9	WEATHERED ROCK META-ARGILLITE	13.5
375	373.9	13.5	60/0.0											373.9	Boring Terminated with Standard Penetration Test Refusal at Elevation 373.9 ft on Non-crystalline Rock (meta-argillite)	

WBS 42329.1.1		TIP B-5171		COUNTY GRANVILLE		GEOLOGIST E. MAYR										
SITE DESCRIPTION Bridge No. 125 over Aaron's Creek on SR1400 (Grassy Creek-Virgilina Rd)							GROUND WTR (ft)									
BORING NO. EB1-B		STATION 14+57		OFFSET 18 ft RT		ALIGNMENT L										
COLLAR ELEV. 397.9 ft		TOTAL DEPTH 25.6 ft		NORTHING 1,012,591		EASTING 2,076,569										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 68% 02/20/2015				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Estep		START DATE 06/17/15		COMP. DATE 06/17/15		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						
400	397.9	0.0	6	6	6									397.9	GROUND SURFACE	0.0
395	394.5	3.4	5	4	5									390.9	ROADWAY EMBANKMENT ORANGE-BROWN, SANDY SILT	7.0
390	389.5	8.4	5	2	2									374.0	RESIDUAL BROWN, SANDY SILT	23.9
385	384.5	13.4	9	17	31									372.3	WEATHERED ROCK META-ARGILLITE	25.6
380	379.5	18.4	16	26	43									372.3	Boring Terminated with Standard Penetration Test Refusal at Elevation 372.3 ft on Non-crystalline Rock (meta-argillite)	
375	374.5	23.4	23	48	52/0.4									372.3	Boring Terminated with Standard Penetration Test Refusal at Elevation 372.3 ft on Non-crystalline Rock (meta-argillite)	
	372.3	25.6	60/0.0											372.3	Boring Terminated with Standard Penetration Test Refusal at Elevation 372.3 ft on Non-crystalline Rock (meta-argillite)	

NCDOT BORE DOUBLE B5171_GEO_BRDG0125_BH.GPJ NC_DOT.GDT 07/15/15

CORE PHOTOGRAPHS

BORING BI-B
15+20 -L-, 8 FT RT



CORE BOX 1: RUNS 1, 2, AND 3.



CORE BOX 2: RUNS 4, 5, AND 6.

GEOTECHNICAL BORING REPORT BORE LOG

WBS 42329.1.1		TIP B-5171		COUNTY GRANVILLE		GEOLOGIST E. MAYR	
SITE DESCRIPTION Bridge No. 125 over Aaron's Creek on SR1400 (Grassy Creek-Virgilina Rd)							GROUND WTR (ft)
BORING NO. EB2-B		STATION 15+84		OFFSET 9 ft RT		ALIGNMENT L	
COLLAR ELEV. 398.7 ft		TOTAL DEPTH 19.8 ft		NORTHING 1,012,518		EASTING 2,076,674	
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 84% 02/20/2015				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Estep		START DATE 06/19/15		COMP. DATE 06/19/15		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)		
400															398.7	GROUND SURFACE	0.0
	398.7	0.0	3	4	5	9							M		397.7	ROADWAY EMBANKMENT BROWN, SILTY SAND	1.0
395	395.2	3.5	2	2	3	5							M		395.7	BROWN, SANDY SILT WITH TRACE ROCK FRAGMENTS	3.0
													M			RED-BROWN AND YELLOW, CLAYEY SILT	
390	390.2	8.5	3	3	4	7							M				
385	385.2	13.5	3	1	2	3							W		385.7	ALLUVIAL LIGHT GRAY, SILTY CLAY	13.0
380	380.2	18.5	2	3	97/0.1	3									379.2	WEATHERED ROCK META-ARGILLITE	19.5
	378.9	19.8	60/0.0			100/0.6									378.9	Boring Terminated with Standard Penetration Test Refusal at Elevation 378.9 ft on Non-crystalline Rock (meta-argillite)	19.8

NCDOT BORE DOUBLE B5171_GEO_BRDG0125_BH.GPJ NC_DOT.GDT 07/21/15

ROCK CORE TEST RESULTS



**UNCONFINED COMPRESSIVE STRENGTH
OF INTACT ROCK CORE SPECIMEN**
ASTM D7012

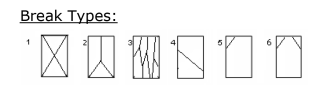
WBS No.: 42329.1.1
TIP No.: B-5171
County: Granville

Test Date: 7/3/2015
Tested By: E. Mayr

Description: Bridge 125 Over Aaron's Creek on SR 1400

Test No.	1			
Boring ID	B1-B			
Station	15+20			
Sample ID	RS-1			
Sample Depth, ft	4.2			
Core Length #1, in.	3.690			
Core Length #2, in.	3.670			
Avg. Core Length, in.	3.680			
Core Dia. #1, in.	1.990			
Core Dia. #2, in.	1.970			
Avg. Core Dia., in.	1.980			
Length/Dia. Ratio	1.86			
X-Sectional Area, in ²	3.08			
Weight, lb	0.72			
Unit Weight, pcf	109.80			
Break Type	3			
Load at Failure, lb	72,970			
Correction Factor	1.00			
Comp. Strength, psi	23,699			
Comp. Strength, ksf	3,413			

Rock Descriptions:
Test 1: Gray, very slightly weathered meta-argillite with very close fracture spacing



SITE PHOTOGRAPHS



PHOTOGRAPH 1: VIEW OF AARON'S CREEK BELOW BRIDGE I25 LOOKING UPSTREAM.



PHOTOGRAPH 2: VIEW ALONG SOUTH SIDE OF BRIDGE I25 LOOKING SOUTHEAST.