

REFERENCE: B-5343

PROJECT: 46057

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY ROCKINGHAM  
PROJECT DESCRIPTION BRIDGE NO. 169 OVER  
CASCADE CREEK ON NC 770 (BERRY HILL RD.)

**CONTENTS**

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
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2	LEGEND
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6	CROSS SECTIONS
7-9	BORING LOGS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5343	1	7

**CAUTION NOTICE**

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:
- THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
  - BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

M. BAHIRADHAN

C. BUTLER

J. WHITT

TRIGON EXP.

INVESTIGATED BY M. BAHIRADHAN

DRAWN BY C. BUTLER

CHECKED BY M. BAHIRADHAN

SUBMITTED BY SCHNABEL ENG.

DATE DECEMBER 2015



DocuSigned by:  
Mahalingam Bahiradhan 2016

4DEAD345C826472 SIGNATURE DATE

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

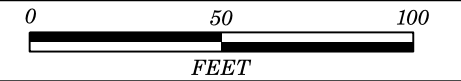
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

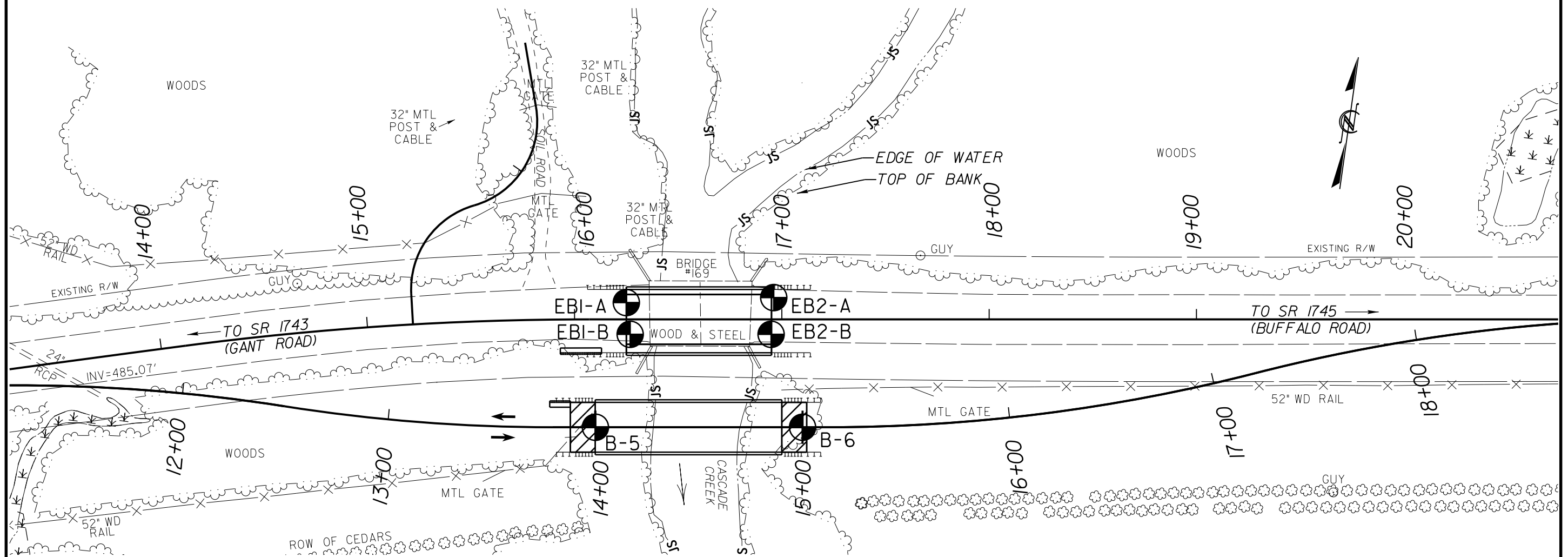
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

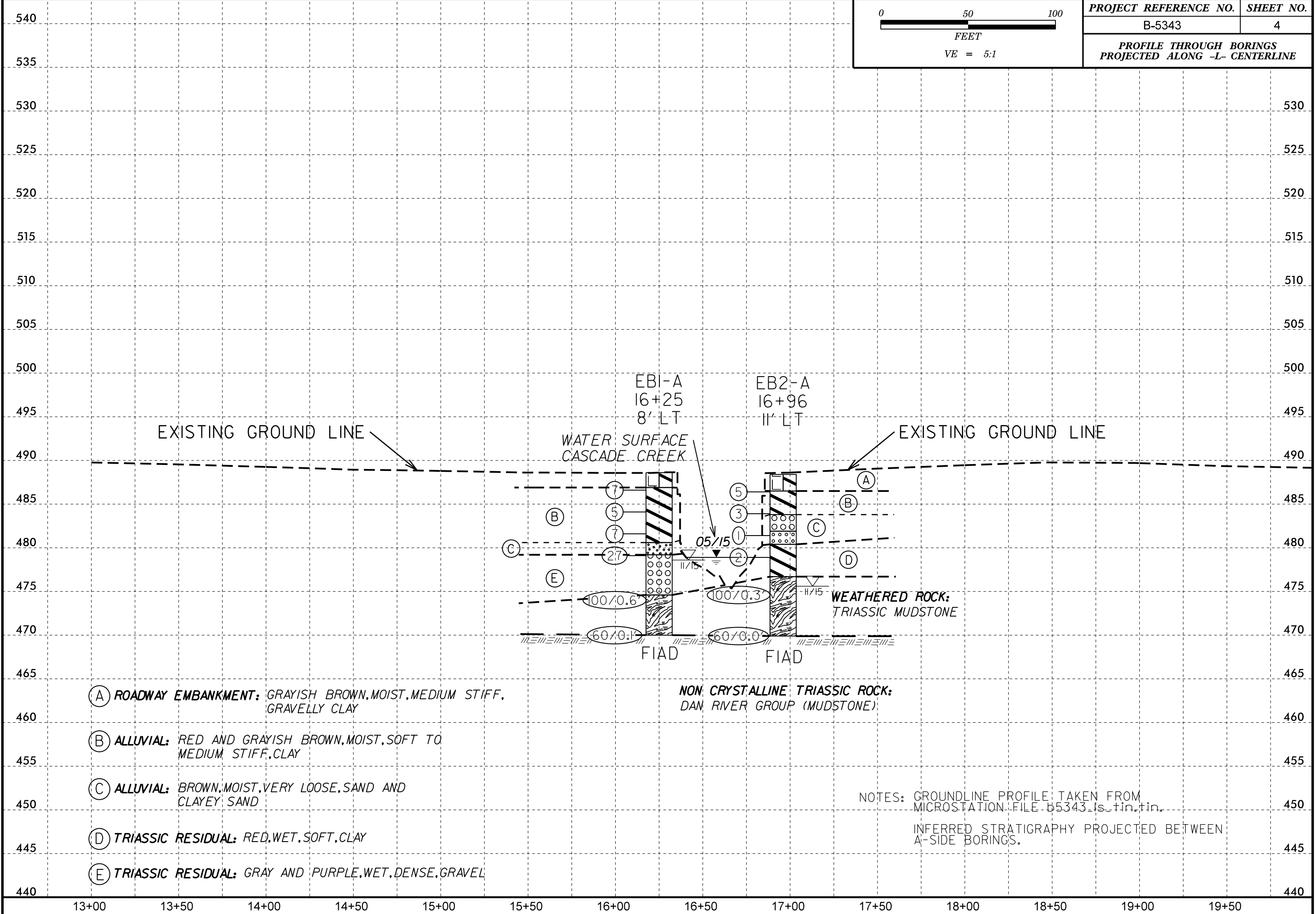
SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, SOIL LEGEND AND AASHTO CLASSIFICATION, MINERALOGICAL COMPOSITION, COMPRESSIBILITY, PERCENTAGE OF MATERIAL, GROUND WATER, MISCELLANEOUS SYMBOLS, RECOMMENDATION SYMBOLS, ABBREVIATIONS, EQUIPMENT USED ON SUBJECT PROJECT, FRACTURE SPACING, BEDDING, INDURATION, PLASTICITY, COLOR

# SITE PLAN



SKEW 90°

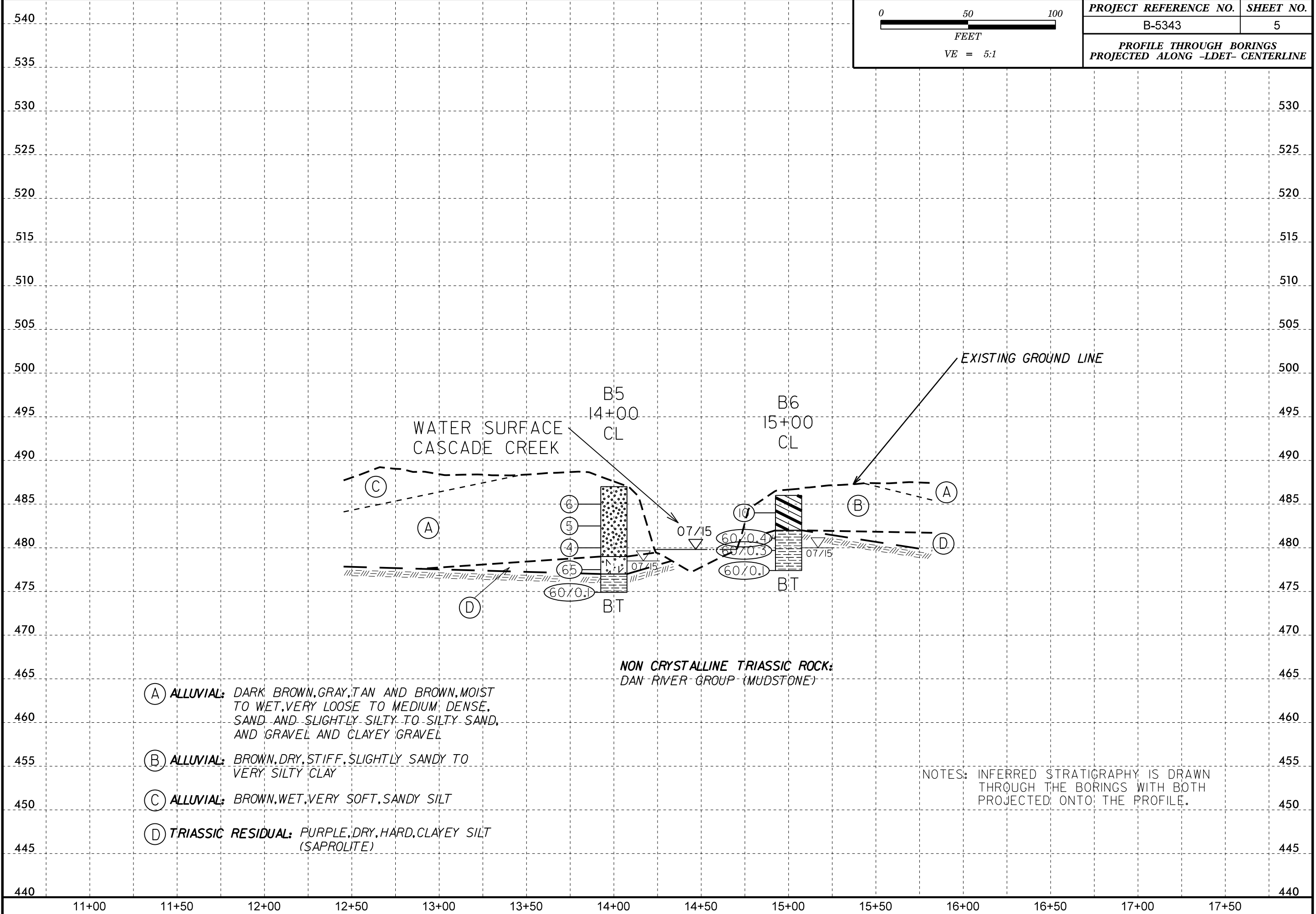




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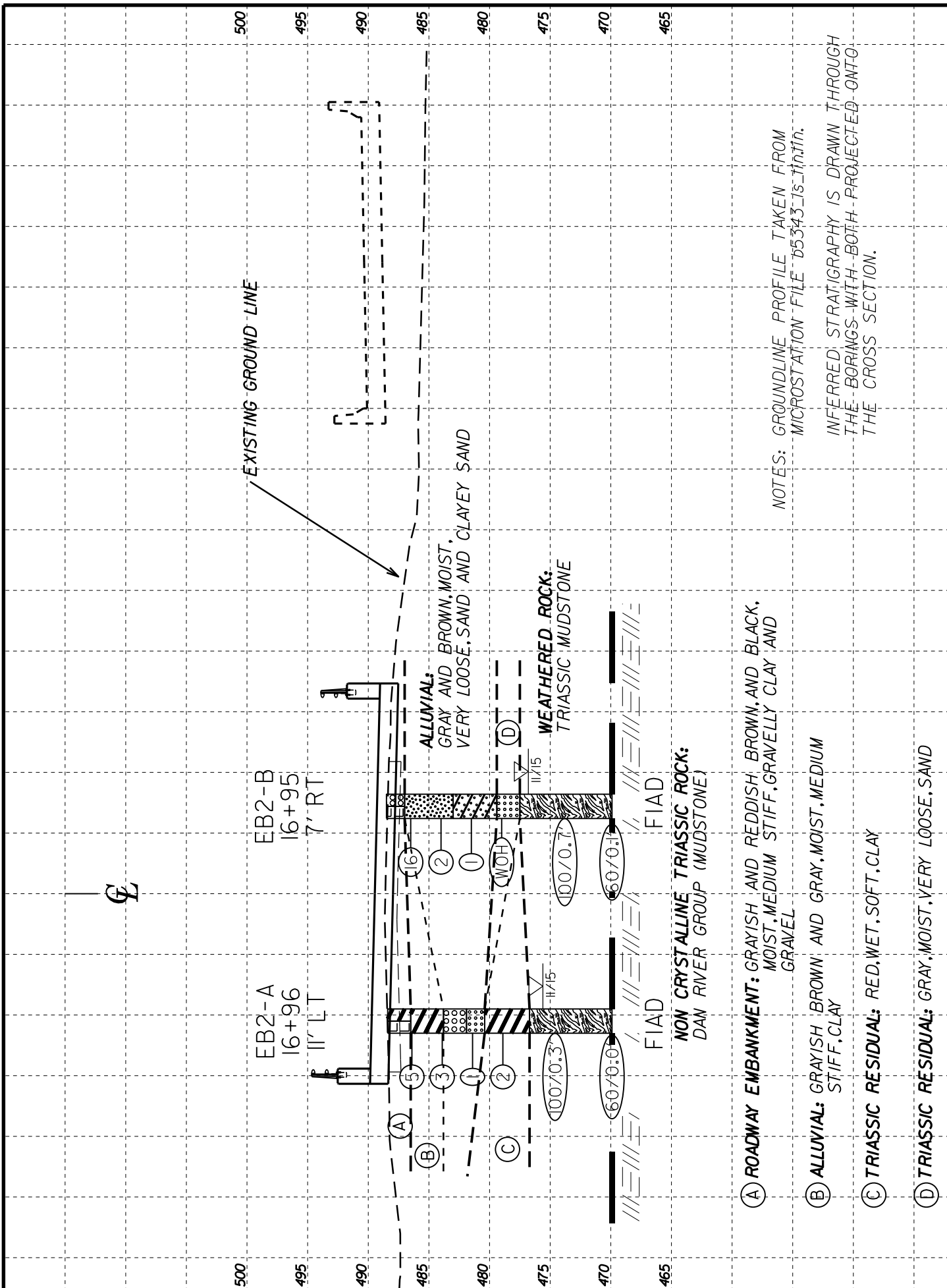
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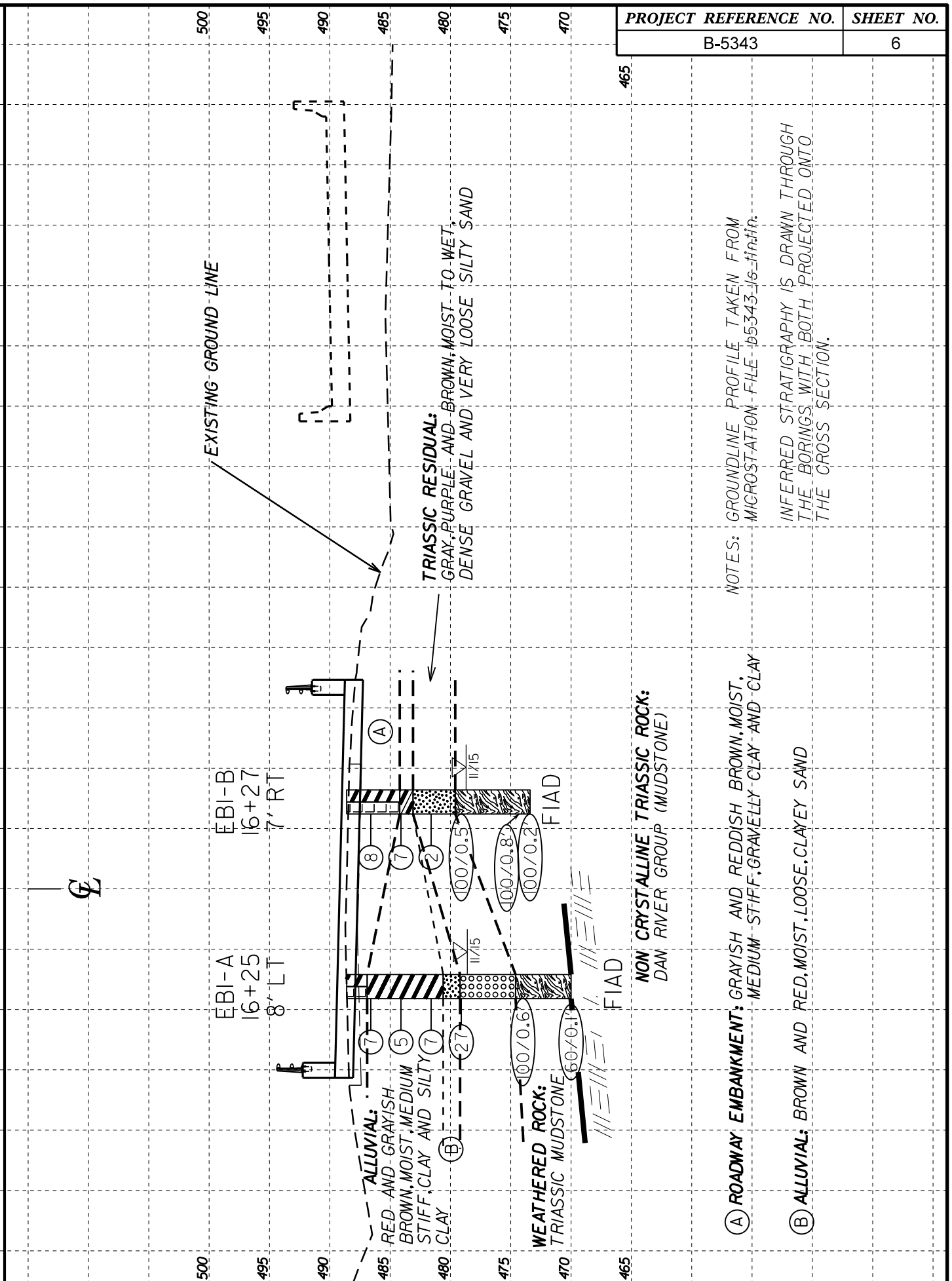
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HORIZ. SCALE 0 10 20 (FEET)  
 VE = 1:1



HORIZ. SCALE 0 10 20 (FEET)  
 VE = 1:1

**CROSS SECTION THROUGH END BENT 1**

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 42263		TIP B-5343		COUNTY ROCKINGHAM		GEOLOGIST R. Rivenbark									
SITE DESCRIPTION Bridge No. 169 on NC 770 over Cascade Creek							GROUND WTR (ft)								
BORING NO. B5		STATION 14+00		OFFSET CL		ALIGNMENT -LDET-									
COLLAR ELEV. 487.0 ft		TOTAL DEPTH 12.1 ft		NORTHING 1,013,044		EASTING 1,808,938									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 90% 02/20/2015		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER R. Toothman		START DATE 07/06/15		COMP. DATE 07/06/15		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					
490															
	486.0	1.0	1	3	3									487.0	0.0
485	483.5	3.5	1	2	3										
	481.0	6.0	2	2	2										
480	478.5	8.5	14	17	48									479.0	8.0
	477.0													477.0	10.0
	475.0	12.0												474.9	12.1
			60/0.1												

WBS 42263		TIP B-5343		COUNTY ROCKINGHAM		GEOLOGIST R. Rivenbark									
SITE DESCRIPTION Bridge No. 169 on NC 770 over Cascade Creek							GROUND WTR (ft)								
BORING NO. B6		STATION 15+00		OFFSET CL		ALIGNMENT -LDET-									
COLLAR ELEV. 486.0 ft		TOTAL DEPTH 8.6 ft		NORTHING 1,013,057		EASTING 1,809,037									
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 90% 02/20/2015		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER R. Toothman		START DATE 07/06/15		COMP. DATE 07/06/15		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					
490															
	486.0	1.0	2	3	7									486.0	0.0
485	482.5	3.5	4	19	60/0.4									482.0	4.0
	480.0	6.0													
480	477.5	8.5												477.4	8.6

NCDOT BORE DOUBLE B5343\_GEO\_BRDG0169.GPJ NC\_DOT.GDT 7/27/15

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 46057.1.1		TIP B-5343		COUNTY ROCKINGHAM		GEOLOGIST Whitt, J.											
SITE DESCRIPTION Bridge 169 over Cascade Creek on NC 770 (Berry Hill Rd.)							GROUND WTR (ft)										
BORING NO. EB1-A		STATION 16+25		OFFSET 8 ft LT		ALIGNMENT -L-											
COLLAR ELEV. 488.6 ft		TOTAL DEPTH 18.6 ft		NORTHING 1,013,105		EASTING 1,808,945											
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 68% 02/20/2015			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic											
DRILLER Toothman, R.		START DATE 11/06/15		COMP. DATE 11/06/15		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							
490															488.6	GROUND SURFACE	0.0
	487.6	1.0													488.9	ROADWAY EMBANKMENT GRAYISH BROWN, GRAVELLY CLAY WITH LITTLE SAND AND SILT	1.7
485	485.1	3.5	2	3	4											ALLUVIAL RED, CLAY	
	482.6	6.0	2	3	4												
480	480.1	8.5	3	10	17										480.6	ORANGISH BROWN AND RED, CLAYEY FINE SAND	8.0
															479.2	TRIASSIC RESIDUAL GRAY AND PURPLE, FINE TO COARSE GRAVEL WITH SOME SAND	9.4
475	475.1	13.5	27	58	42/0.1'										474.6	WEATHERED ROCK TRIASSIC MUDSTONE	14.0
470	470.1	18.5													470.0	Boring Terminated at Elevation 470.0 ft In Non-crystalline Rock (Triassic mudstone)	18.6

WBS 46057.1.1		TIP B-5343		COUNTY ROCKINGHAM		GEOLOGIST Whitt, J.											
SITE DESCRIPTION Bridge 169 over Cascade Creek on NC 770 (Berry Hill Rd.)							GROUND WTR (ft)										
BORING NO. EB1-B		STATION 16+27		OFFSET 7 ft RT		ALIGNMENT -L-											
COLLAR ELEV. 488.6 ft		TOTAL DEPTH 15.2 ft		NORTHING 1,013,090		EASTING 1,808,949											
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 68% 02/20/2015			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic											
DRILLER Toothman, R.		START DATE 11/06/15		COMP. DATE 11/06/15		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							
490															488.6	GROUND SURFACE	0.0
	487.6	1.0													488.9	ROADWAY EMBANKMENT REDDISH BROWN, CLAY	1.7
485	485.1	3.5	3	3	5										484.2	ALLUVIAL LIGHT GRAYISH BROWN, SILTY CLAY WITH TRACE SAND AND GRAVEL	4.4
	482.6	6.0	2	3	4										483.1	TRIASSIC RESIDUAL BROWN, SILTY SAND WITH LITTLE CLAY	5.5
480	480.1	8.5	1	1	1										479.6	WEATHERED ROCK TRIASSIC MUDSTONE	9.0
475	475.1	13.5	10	84	16/0.0'										473.6	Boring Terminated at Elevation 473.4 ft In Weathered Rock (Triassic mudstone)	15.2

NCDOT BORE DOUBLE B5343\_GEO\_BRDG0169.GPJ NC\_DOT.GDT 12/18/15



# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 46057.1.1		TIP B-5343		COUNTY ROCKINGHAM		GEOLOGIST Whitt, J.									
SITE DESCRIPTION Bridge 169 over Cascade Creek on NC 770 (Berry Hill Rd.)							GROUND WTR (ft)								
BORING NO. EB2-A		STATION 16+96		OFFSET 11 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 488.4 ft		TOTAL DEPTH 18.5 ft		NORTHING 1,013,117		EASTING 1,809,015									
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 68% 02/20/2015		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Toothman, R.		START DATE 11/06/15		COMP. DATE 11/06/15		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					
490														488.4	0.0
	487.4	1.0	3	2	3								M	ROADWAY EMBANKMENT	
485	484.9	3.5	WOH	2	1								M	GRAYISH BROWN, GRAVELLY CLAY WITH LITTLE SAND AND SILT	1.9
	482.4	6.0	WOH	WOH	1								M	ALLUVIAL LIGHT GRAYISH BROWN, CLAY	4.6
480	479.9	8.5	WOH	WOH	2								M	ORANGISH BROWN, FINE TO COARSE SAND WITH LITTLE SILT	6.5
	477.9	10.5	WOH	WOH	2								W	ORANGISH BROWN, FINE SAND WITH LITTLE SILT	8.0
	476.7	11.7											W	TRIASSIC RESIDUAL GRAY, CLAY	11.7
475	474.9	13.5	100/0.3											WEATHERED ROCK TRIASSIC MUDSTONE	
470	469.9	18.5	60/0.0												18.5
Boring Terminated at Elevation 469.9 ft On Non-crystalline Rock (Triassic mudstone)															

WBS 46057.1.1		TIP B-5343		COUNTY ROCKINGHAM		GEOLOGIST Whitt, J.									
SITE DESCRIPTION Bridge 169 over Cascade Creek on NC 770 (Berry Hill Rd.)							GROUND WTR (ft)								
BORING NO. EB2-B		STATION 16+95		OFFSET 7 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 488.5 ft		TOTAL DEPTH 18.6 ft		NORTHING 1,013,100		EASTING 1,809,016									
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 68% 02/20/2015		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Toothman, R.		START DATE 11/06/15		COMP. DATE 11/06/15		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					
490														488.5	0.0
	487.5	1.0	16	10	6								M	ROADWAY EMBANKMENT	
485	485.0	3.5	1	1	1								M	BLACK AND REDDISH BROWN, GRAVEL WITH LITTLE SAND AND SILT AND CLAY	1.5
	482.5	6.0	WOH	WOH	1								M	ALLUVIAL BROWN, SILTY FINE SAND	5.5
480	480.0	8.5	WOH	WOH	WOH								M	LIGHT BROWN, CLAYEY FINE SAND WITH TRACE GRAVEL	9.1
	477.5	11.0											M	TRIASSIC RESIDUAL LIGHT GRAY AND GRAY, FINE TO MEDIUM SAND WITH LITTLE SILT	11.0
475	475.0	13.5	55	35	65/0.2									WEATHERED ROCK TRIASSIC MUDSTONE	
470	470.0	18.5	60/0.1												18.6
Boring Terminated at Elevation 469.9 ft In Non-crystalline Rock (Triassic mudstone)															

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