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REFERENCE: B-4746

PROJECT: 38518

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY FORSYTH
PROJECT DESCRIPTION REPLACE BRIDGE NO. 229 OVER
NORFOLK AND WESTERN RAILROAD ON SR 2264

CONTENTS

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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4746	1	12

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

- T. WELLS
- W. WHICHARD
- D. GOODNIGHT
- B. JOHNSON
- R. BLINSON
- W. ALLEN
- R. TOOTHMAN

INVESTIGATED BY T. WELLS
 DRAWN BY T. WELLS
 CHECKED BY X. BARRETT
 SUBMITTED BY KLEINFELDER SE
 DATE DECEMBER 2015

NORTH CAROLINA FIRM LICENSE NO. F-II43



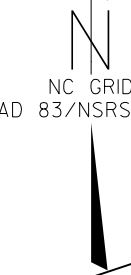
DocuSigned by
Xavier C. Barrett
2D00374FA68B407...

12/19/2015

SIGNATURE DATE

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

NC GRID
NAD 83/NSRS 2007



-Y4- POT Sta. 13+14.08

-Y3-
POT Sta. 13+14.08

PROPOSED
RETAINING
WALL

RW2-1

EB1-A

EB1-C

EB2-A

EB2-B

EB1-B

SR 2264 AKRON DR 27' BST

CONC DECK
BRIDGE #229

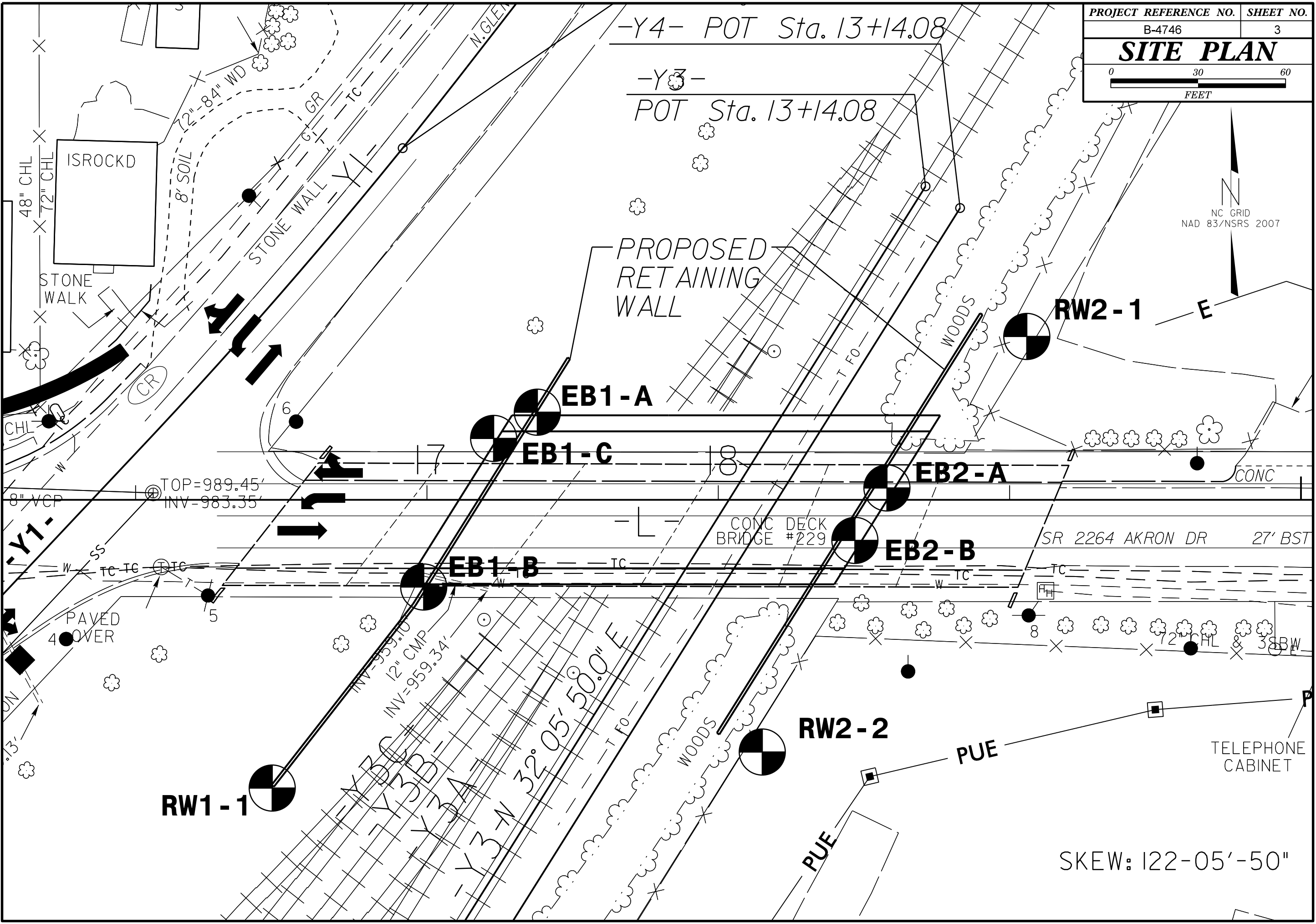
RW2-2

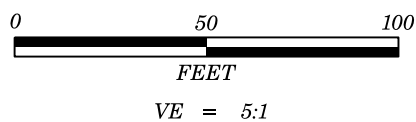
RW1-1

PUE

TELEPHONE
CABINET

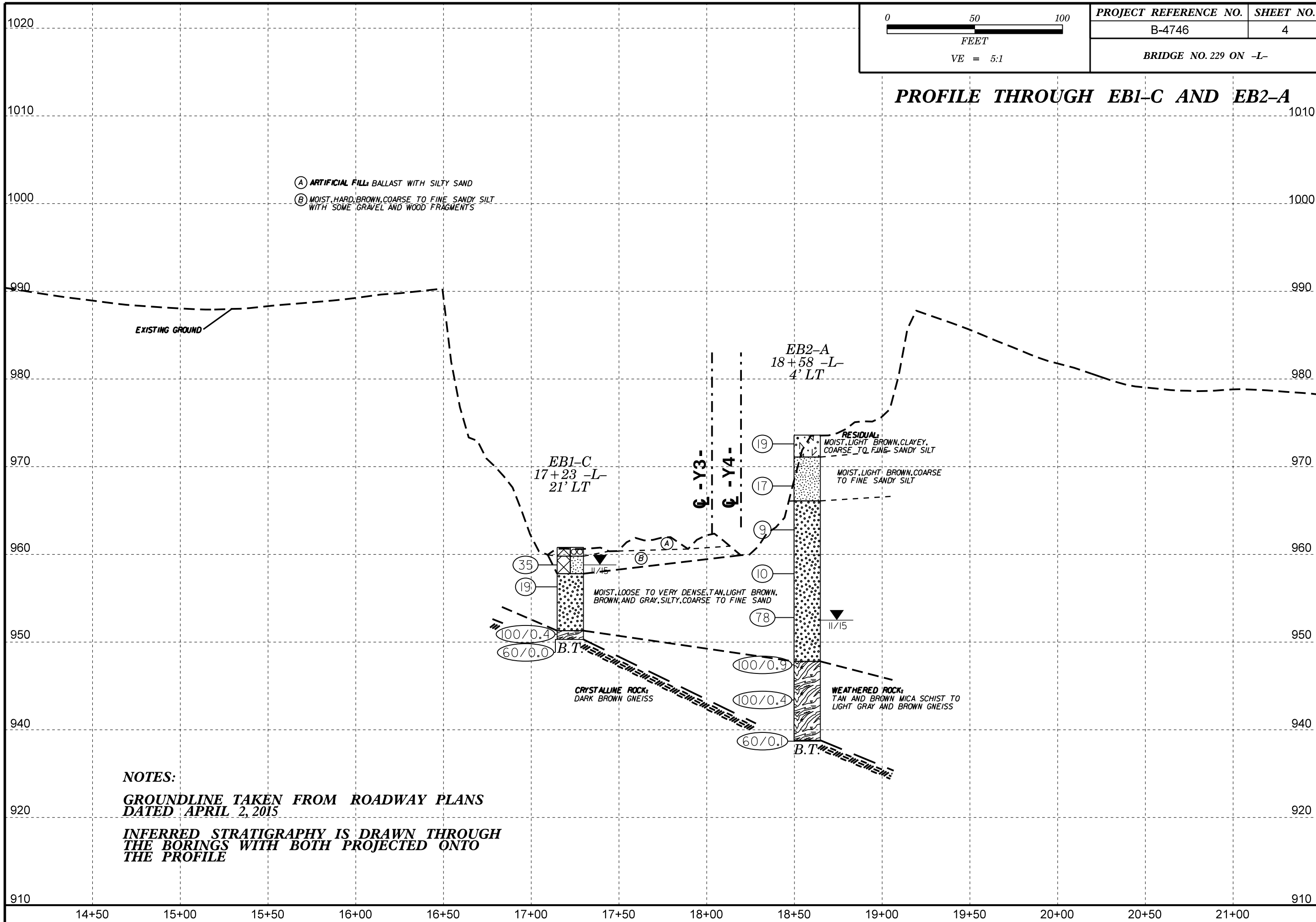
SKEW: 122-05'-50"



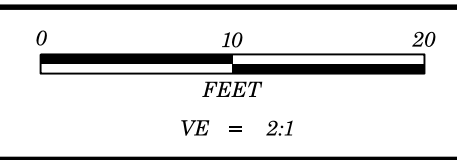


PROJECT REFERENCE NO.	SHEET NO.
B-4746	4
BRIDGE NO. 229 ON -L-	

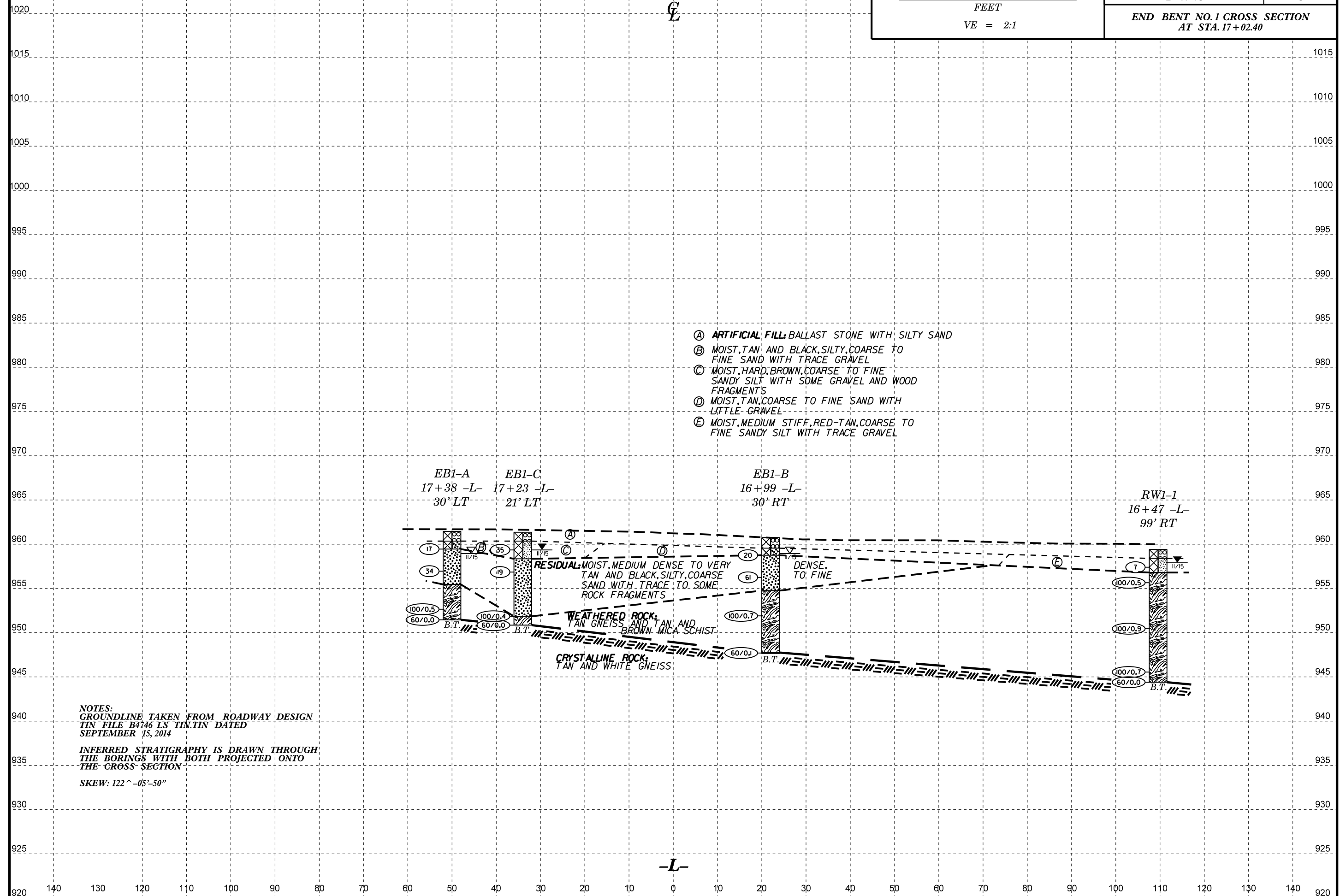
PROFILE THROUGH EB1-C AND EB2-A



NOTES:
 GROUNDLINE TAKEN FROM ROADWAY PLANS
 DATED APRIL 2, 2015
 INFERRED STRATIGRAPHY IS DRAWN THROUGH
 THE BORINGS WITH BOTH PROJECTED ONTO
 THE PROFILE



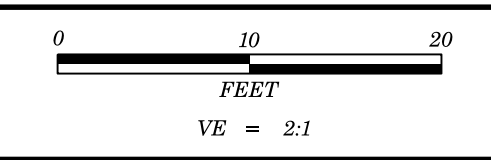
PROJECT REFERENCE NO.	SHEET NO.
B-4746	5
END BENT NO. 1 CROSS SECTION AT STA. 17+02.40	



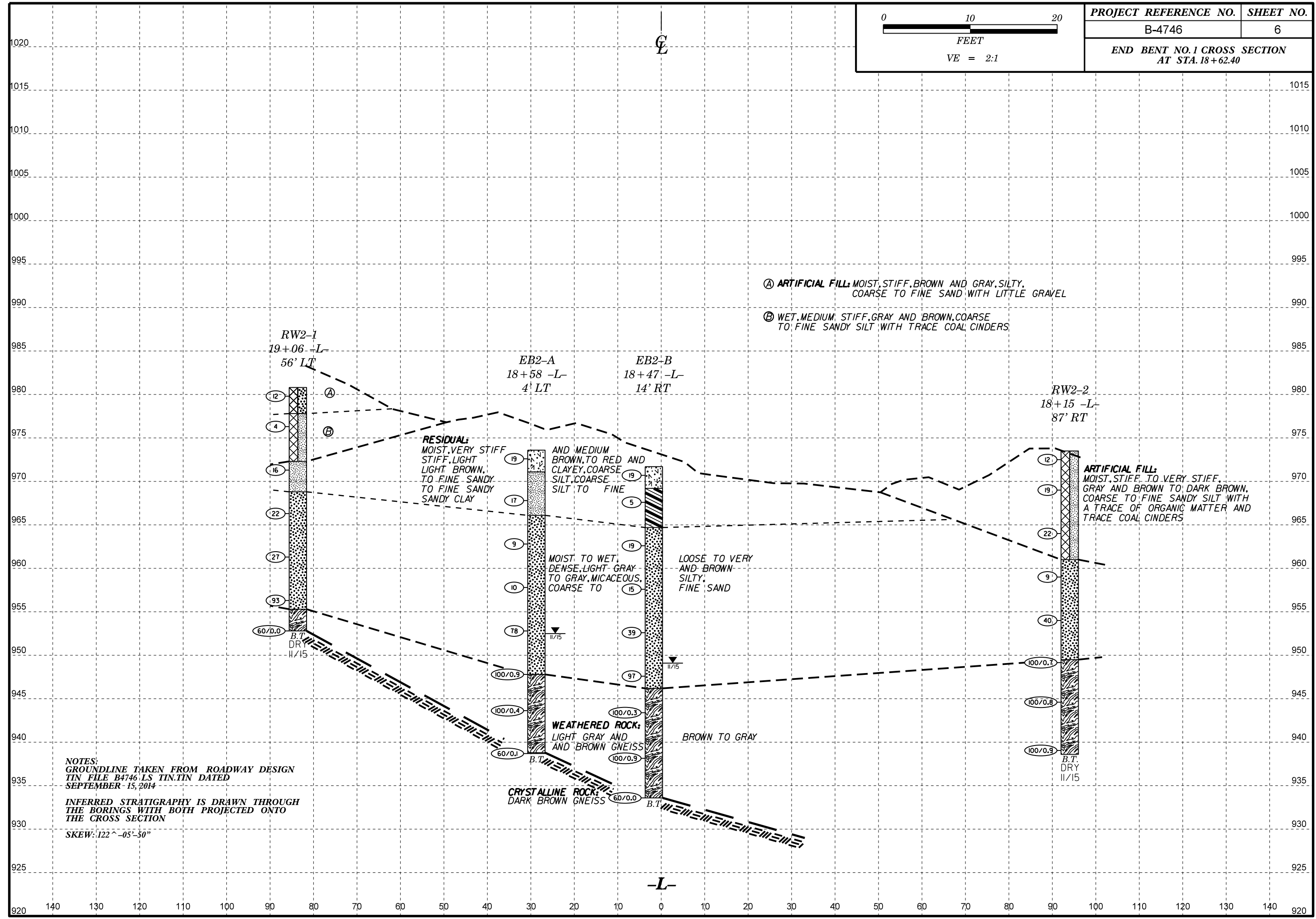
- Ⓐ **ARTIFICIAL FILL:** BALLAST STONE WITH SILTY SAND
- Ⓑ **MOIST, TAN AND BLACK, SILTY, COARSE TO FINE SAND WITH TRACE GRAVEL**
- Ⓒ **MOIST, HARD, BROWN, COARSE TO FINE SANDY SILT WITH SOME GRAVEL AND WOOD FRAGMENTS**
- Ⓓ **MOIST, TAN, COARSE TO FINE SAND WITH LITTLE GRAVEL**
- Ⓔ **MOIST, MEDIUM STIFF, RED-TAN, COARSE TO FINE SANDY SILT WITH TRACE GRAVEL**

NOTES:
 GROUNDLINE TAKEN FROM ROADWAY DESIGN
 TIN FILE B4746 LS TINTIN DATED
 SEPTEMBER 15, 2014
 INFERRED STRATIGRAPHY IS DRAWN THROUGH
 THE BORINGS WITH BOTH PROJECTED ONTO
 THE CROSS SECTION
 SKEW: 122 ^ -05'-50"

-L-



PROJECT REFERENCE NO.	SHEET NO.
B-4746	6
END BENT NO. 1 CROSS SECTION AT STA. 18+62.40	



- Ⓐ **ARTIFICIAL FILL:** MOIST, STIFF, BROWN AND GRAY, SILTY, COARSE TO FINE SAND WITH LITTLE GRAVEL
- Ⓑ **WET, MEDIUM, STIFF, GRAY AND BROWN, COARSE TO FINE SANDY SILT WITH TRACE COAL CINDERS**

RW2-1
19+06 -L-
56' LT

EB2-A
18+58 -L-
4' LT

EB2-B
18+47 -L-
14' RT

RW2-2
18+15 -L-
87' RT

RESIDUAL:
MOIST, VERY STIFF
STIFF, LIGHT
LIGHT BROWN,
TO FINE SANDY
TO FINE SANDY
SANDY CLAY

AND MEDIUM
BROWN, TO RED AND
CLAYEY, COARSE
SILT, COARSE
SILT TO FINE

ARTIFICIAL FILL:
MOIST, STIFF, TO VERY STIFF,
GRAY AND BROWN TO DARK BROWN,
COARSE TO FINE SANDY SILT WITH
A TRACE OF ORGANIC MATTER AND
TRACE COAL CINDERS

MOIST TO WET,
DENSE, LIGHT GRAY
TO GRAY, MICACEOUS,
COARSE TO

LOOSE TO VERY
AND BROWN
SILTY,
FINE SAND

WEATHERED ROCK:
LIGHT GRAY AND
AND BROWN GNEISS

BROWN TO GRAY

CRYSTALLINE ROCK:
DARK BROWN GNEISS

NOTES:
GROUNDLINE TAKEN FROM ROADWAY DESIGN
TIN FILE B4746 LS TIN TIN DATED
SEPTEMBER 15, 2014

INFERRED STRATIGRAPHY IS DRAWN THROUGH
THE BORINGS WITH BOTH PROJECTED ONTO
THE CROSS SECTION

SKIEW: 122° -05'-50"

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38518.1.1		TIP B-4746		COUNTY FORSYTH		GEOLOGIST Wells, T. R.									
SITE DESCRIPTION Replace Bridge No. 229 Over Norfolk and Western Railroad on SR 2264 (Akron Drive)							GROUND WTR (ft)								
BORING NO. EB1-A		STATION 17+38		OFFSET 30 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 960.9 ft		TOTAL DEPTH 10.0 ft		NORTHING 872,598		EASTING 1,636,792									
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 68% 02/20/2015			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Whichard, S. W.		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					
965															
960	959.9	1.0	3	5	12									960.9 GROUND SURFACE 0.0	
														959.8 ARTIFICIAL FILL 1.1	
														958.9 Ballast Stone with Silty Sand 2.0	
	957.4	3.5	15	17	17									954.9 ARTIFICIAL FILL 6.0	
														Tan and Black, Silty, Coarse to Fine SAND with Trace Gravel	
955														954.9 RESIDUAL 6.0	
														Tan, Silty, Coarse to Fine SAND	
	952.4	8.5	100/0.5											950.9 WEATHERED ROCK 10.0	
														Tan GNEISS	
	950.9	10.0	60/0.0												

WBS 38518.1.1		TIP B-4746		COUNTY FORSYTH		GEOLOGIST Wells, T. R.									
SITE DESCRIPTION Replace Bridge No. 229 Over Norfolk and Western Railroad on SR 2264 (Akron Drive)							GROUND WTR (ft)								
BORING NO. EB1-C		STATION 17+23		OFFSET 21 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 960.8 ft		TOTAL DEPTH 10.5 ft		NORTHING 872,589		EASTING 1,636,777									
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 68% 02/20/2015			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Whichard, S. W.		START DATE 11/05/15		COMP. DATE 11/05/15		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					
965															
960	959.8	1.0	3	24	11									960.8 GROUND SURFACE 0.0	
														959.8 ARTIFICIAL FILL 1.0	
														957.8 Ballast Stone with Silty Sand 3.0	
	957.3	3.5	12	10	9									957.8 Brown, Coarse to Fine Sandy SILT with Some Gravel and Wood Fragments 3.0	
955														RESIDUAL 6.0	
														Tan, Silty, Coarse to Fine SAND	
	952.3	8.5	2	6	100/0.4									951.3 WEATHERED ROCK 9.5	
														Tan and Brown MICA SCHIST	
	950.3	10.5	60/0.0											950.3 WEATHERED ROCK 10.5	

NCDOT BORE DOUBLE B4746_GEO_BRDG0229_GINT.GPJ NC_DOT.GDT 12/15/15

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38518.1.1		TIP B-4746		COUNTY FORSYTH		GEOLOGIST Wells, T. R.										
SITE DESCRIPTION Replace Bridge No. 229 Over Norfolk and Western Railroad on SR 2264 (Akron Drive)							GROUND WTR (ft)									
BORING NO. EB1-B		STATION 16+99		OFFSET 30 ft RT		ALIGNMENT -L-	0 HR. 5.5									
COLLAR ELEV. 960.2 ft		TOTAL DEPTH 13.1 ft		NORTHING 872,538		EASTING 1,636,753	24 HR. 1.8									
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 68% 02/20/2015				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Whichard, S. W.		START DATE 11/05/15		COMP. DATE 11/05/15		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
965																
960	959.2	1.0	8	6	14									960.2	0.0	GROUND SURFACE
	958.2													959.0	1.2	ARTIFICIAL FILL
	956.7	3.5	24	34	27									958.2	2.0	Ballast Stone with Silty Sand
955																Tan, Silty, Coarse to Fine Sand with a Little Gravel
	954.2													954.2	6.0	RESIDUAL
	951.7	8.5	70	30/0.2												Tan, Silty, Coarse to Fine SAND with Some Rock Fragments
950																WEATHERED ROCK
	947.2	13.0	60/0.1											947.2	13.0	Tan GNEISS
														947.1	13.1	CRYSTALLINE ROCK
																Tan and White Gneiss
																Boring Terminated with Standard Penetration Test Refusal at Elevation 947.1 ft in CRYSTALLINE ROCK: GNEISS

NCDOT BORE DOUBLE B4746_GEO_BRDG0229_GINT.GPJ NC_DOT.GDT 12/15/15

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38518.1.1		TIP B-4746		COUNTY FORSYTH		GEOLOGIST Wells, T. R.										
SITE DESCRIPTION Replace Bridge No. 229 Over Norfolk and Western Railroad on SR 2264 (Akron Drive)							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 18+58		OFFSET 4 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 973.6 ft		TOTAL DEPTH 34.9 ft		NORTHING 872,572		EASTING 1,636,912										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 68% 02/20/2015			DRILL METHOD NQ Casing w/ SPT			HAMMER TYPE Automatic										
DRILLER Whichard, S. W.		START DATE 10/30/15		COMP. DATE 10/30/15		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						
975	973.6	0.0	9	10	9									973.6	0.0	GROUND SURFACE
970	968.8	4.8	11	9	8									971.1	2.5	RESIDUAL Light Brown, Clayey, Coarse to Fine Sandy SILT
	966.1	7.5												966.1	7.5	Light Brown, Coarse to Fine Sandy SILT
965	963.8	9.8	5	5	4											Brown to Light Gray and Brown, Silty, Coarse to Fine SAND
	958.8	14.8	4	5	5											
955	953.8	19.8	22	31	47											WEATHERED ROCK Light Gray and Brown
	948.8	24.8	19	25	75/0.4									947.8	25.8	
945	943.8	29.8	100/0.4													CRYSTALLINE ROCK Dark Brown
	938.8	34.8	60/0.1											938.8	34.8	
														938.7	34.9	Boring Terminated with Standard Penetration Test Refusal at Elevation 938.7 ft in CRYSTALLINE ROCK: GNEISS

WBS 38518.1.1		TIP B-4746		COUNTY FORSYTH		GEOLOGIST Wells, T. R.										
SITE DESCRIPTION Replace Bridge No. 229 Over Norfolk and Western Railroad on SR 2264 (Akron Drive)							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 18+47		OFFSET 14 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 971.7 ft		TOTAL DEPTH 38.1 ft		NORTHING 872,554		EASTING 1,636,901										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 68% 02/20/2015			DRILL METHOD NQ Casing w/ SPT			HAMMER TYPE Automatic										
DRILLER Whichard, S. W.		START DATE 10/29/15		COMP. DATE 10/29/15		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						
975	971.7	0.0	6	9	10									971.7	0.0	GROUND SURFACE
970	968.6	3.1	8	2	3									969.2	2.5	RESIDUAL Light Brown, Clayey, Fine Sandy SILT
	964.7	7.0												964.7	7.0	Red and Light Brown, Fine Sandy CLAY
965	963.6	8.1	7	8	11											Light Gray and Brown to Gray and Brown, Micaceous, Silty, Coarse to Fine SAND
	958.6	13.1	4	6	9											
955	953.6	18.1	10	17	22											WEATHERED ROCK Gray and Brown
	948.6	23.1	37	34	63									946.2	25.5	
945	943.6	28.1	100/0.3													CRYSTALLINE ROCK Dark Brown
	938.6	33.1	40	60/0.4										938.6	33.1	
940	933.6	38.1	60/0.0											933.6	38.1	Boring Terminated with Standard Penetration Test Refusal at Elevation 933.6 ft on CRYSTALLINE ROCK: GNEISS

NCDOT BORE DOUBLE B4746_GEO_BRDG0229_GINT.GPJ NC_DOT.GDT 12/15/15

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38518.1.1	TIP B-4746	COUNTY FORSYTH	GEOLOGIST Wells, T. R.
SITE DESCRIPTION Replace Bridge No. 229 Over Norfolk and Western Railroad on SR 2264 (Akron Drive)			GROUND WTR (ft)
BORING NO. RW2-2	STATION 18+15	OFFSET 87 ft RT	ALIGNMENT -L-
COLLAR ELEV. 973.5 ft	TOTAL DEPTH 34.9 ft	NORTHING 872,481	EASTING 1,636,869
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 68% 02/20/2015		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Whichard, S. W.	START DATE 10/26/15	COMP. DATE 10/26/15	SURFACE WATER DEPTH N/A

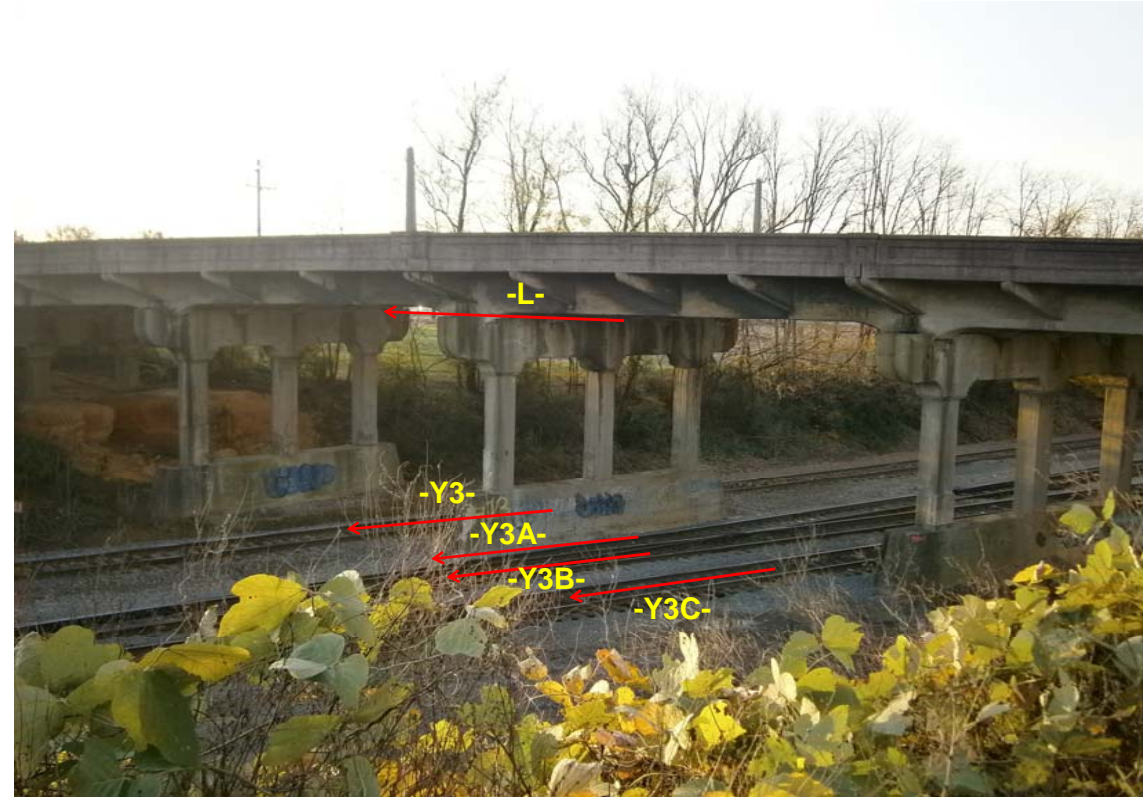
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
975													GROUND SURFACE	0.0
	973.5	0.0	5	5	7							M	ARTIFICIAL FILL Gray and Brown. Coarse to Fine Sandy SILT	
970	970.0	3.5	11	9	10							M		
965	965.0	8.5	12	11	11							M	Dark Brown, Coarse to Fine Sandy SILT with a Trace of Organic Matter and Trace Coal Cinders	7.5
960	960.0	13.5	7	5	4							M	RESIDUAL Gray and Brown, Micaceous, Silty, Coarse to Fine SAND	12.5
955	955.0	18.5	19	19	21							M		
950	950.0	23.5	22	67	23/0.2					100/0.7			WEATHERED ROCK Gray and Brown	24.0
945	945.0	28.5	54	46/0.3						100/0.8				
940	940.0	33.5	24	27	73/0.4					100/0.9			Boring Terminated at Elevation 938.6 ft in WEATHERED ROCK: GNEISS	34.9

NCDOT BORE DOUBLE B4746_GEO_BRDG0229_GINT.GPJ NC_DOT.GDT 12/15/15

SITE PHOTOGRAPHS



View Looking West along -L- from End Bent 2



Profile of Bridge From Northwest of End Bent 1