

PROJECT: 17BP.12.R.42 REFERENCE: N/A

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY CLEVELAND
 SITE DESCRIPTION BRIDGE NO. 329 ON SR 2212 OVER
TRIBUTARY TO BUFFALO CREEK

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.12.R.42	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 RELED 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

J.K. STICKNEY
C.L. SMITH
M.R. MOORE

INVESTIGATED BY J.K. STICKNEY
 DRAWN BY T.T. WALKER
 CHECKED BY J.E. BEVERLY *JEB*
 SUBMITTED BY E.N. WILLIAMS
 DATE JUNE 2016



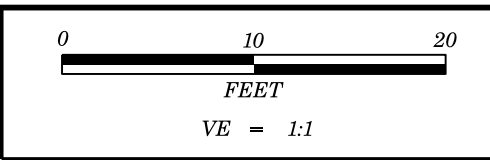
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Eric N. Williams 7/13/2016

AGB874FT1078828 SIGNATURE DATE

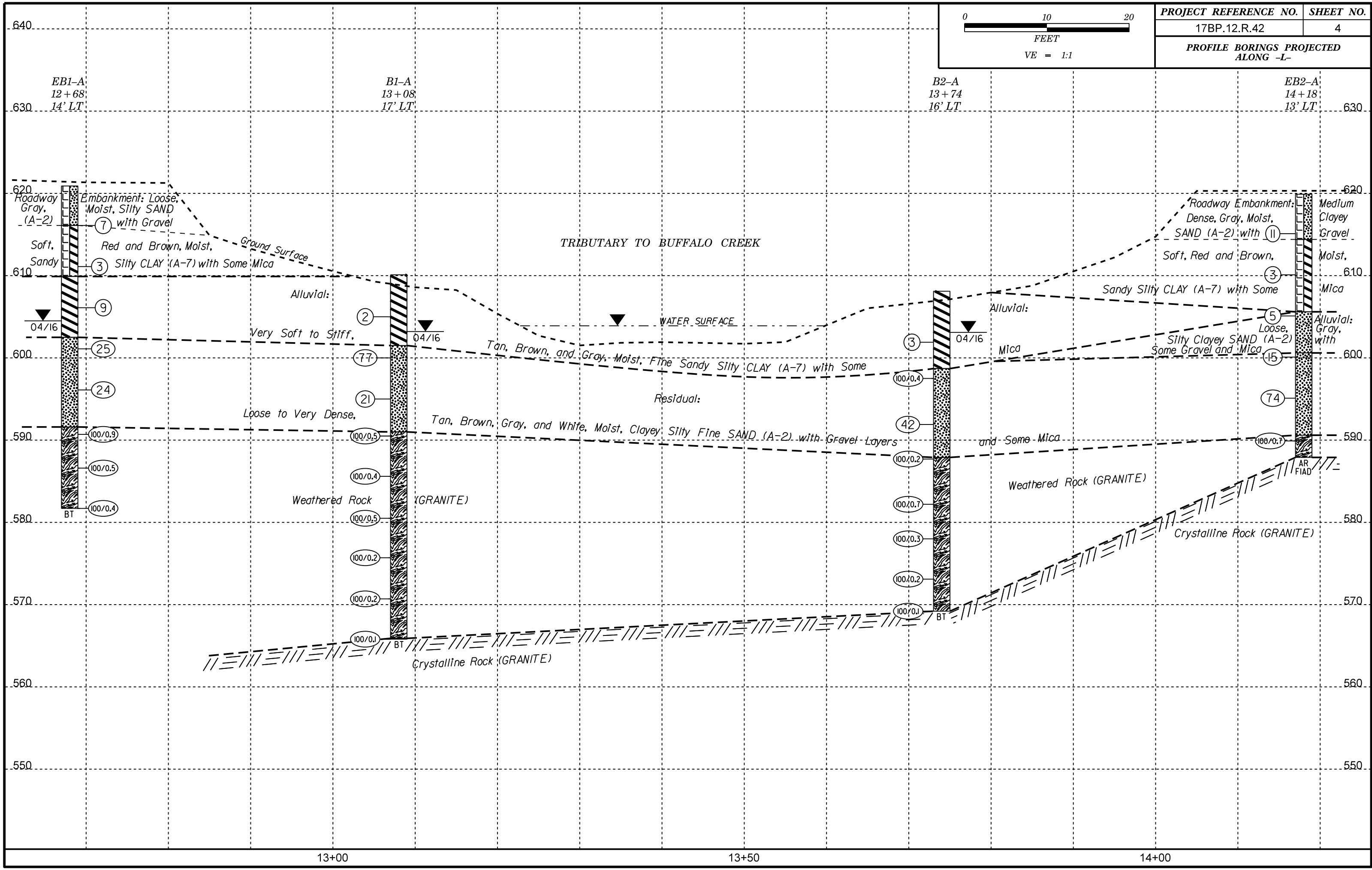
DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.42	3
SITE PLAN	
 0 60 120 FEET	
SKEW = 90 DEGREES	





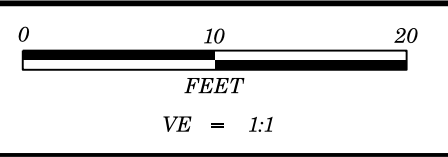
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17BP.12.R.42	4
PROFILE BORINGS PROJECTED ALONG -L-	



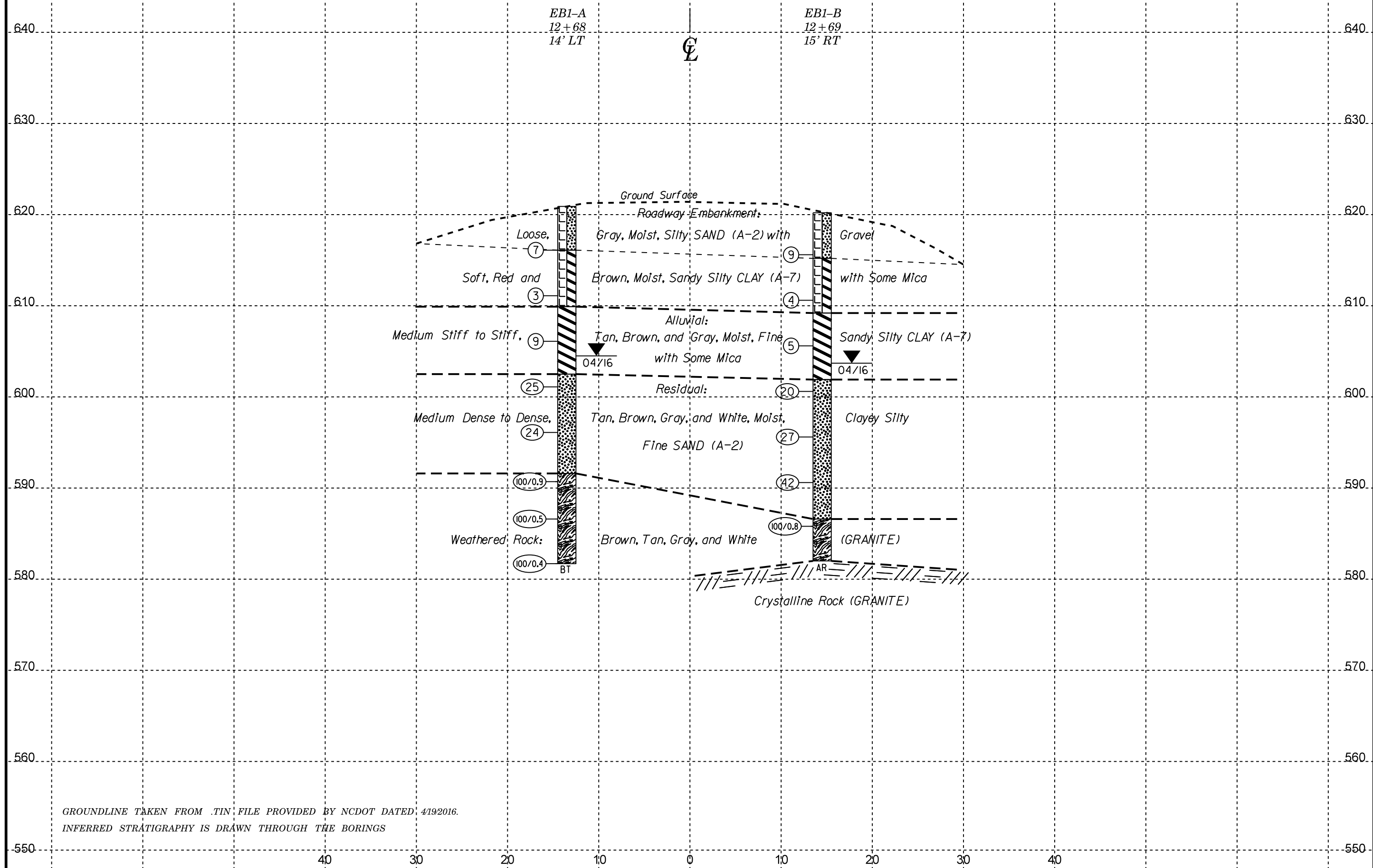
13+00

13+50

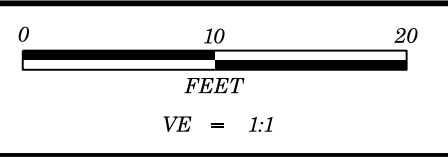
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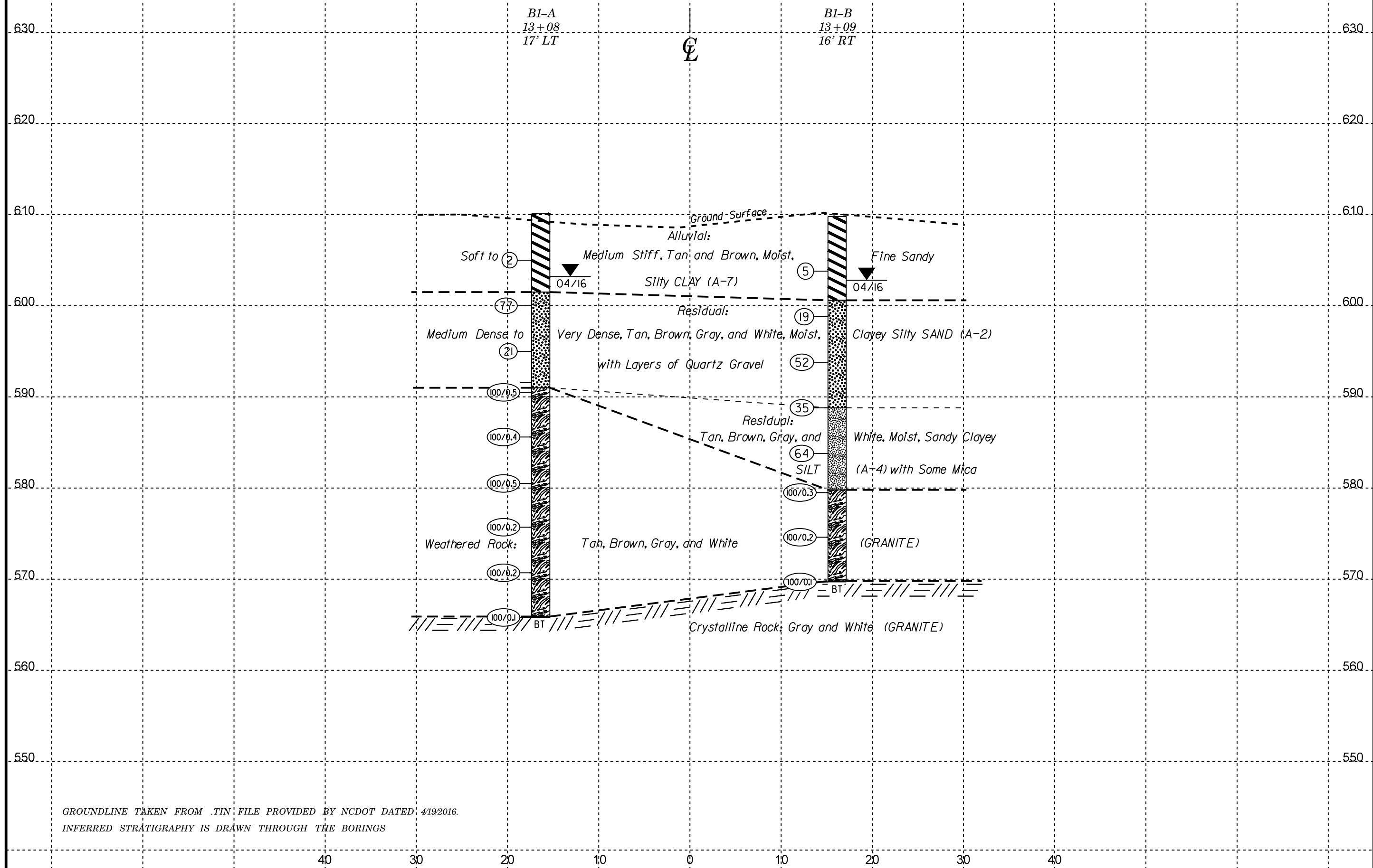
PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.42	5
SECTION THROUGH END BENT 1	
STA. 12+68	
SKEW=90 DEGREES	



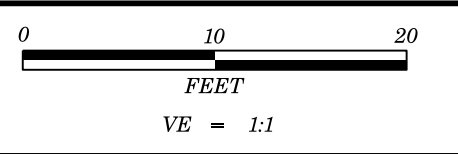
GROUNDLINE TAKEN FROM .TIN FILE PROVIDED BY NCDOT DATED 4/19/2016.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS



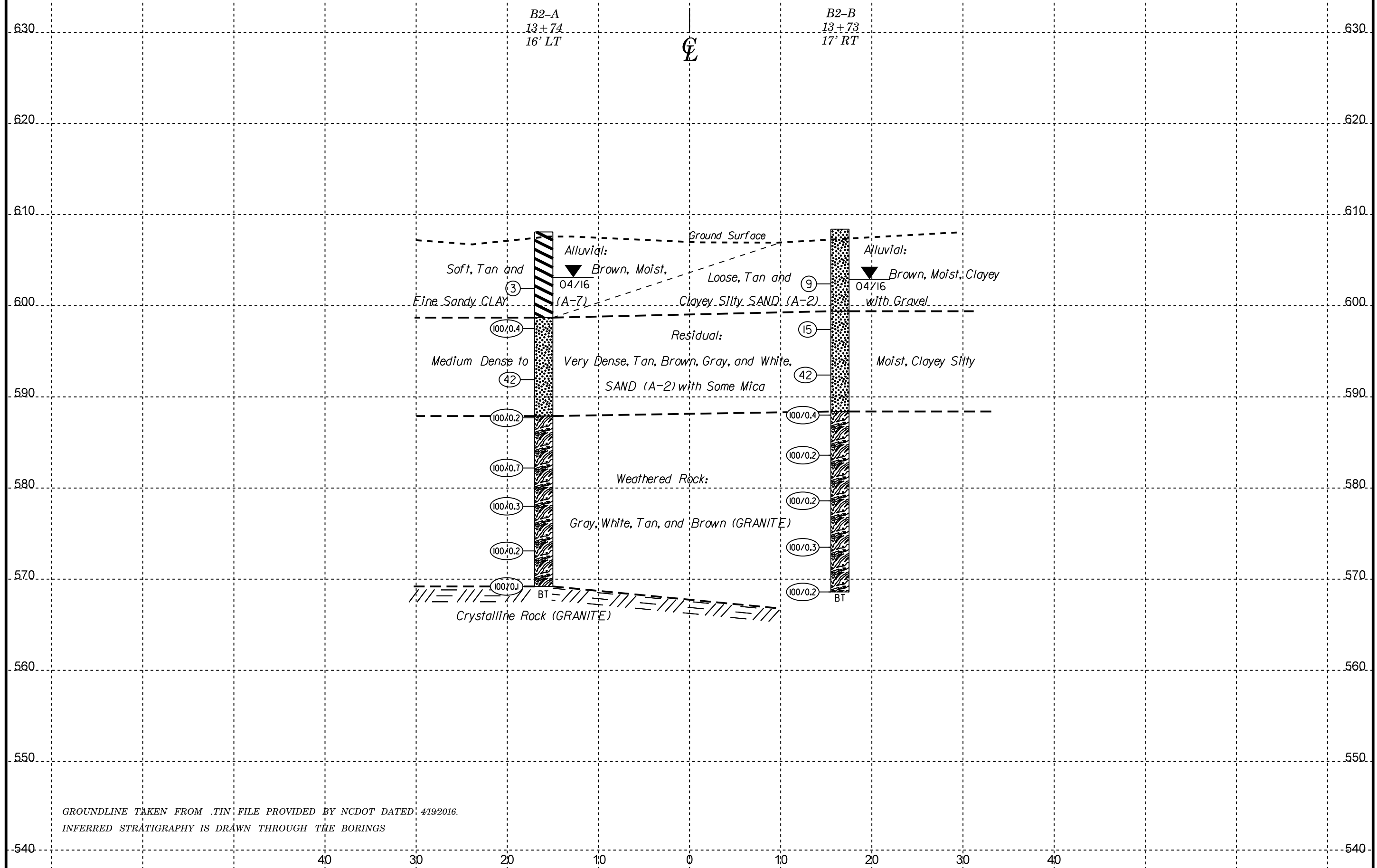
PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.42	6
SECTION THROUGH BENT 1	
STA. 13+08	
SKEW=90 DEGREES	



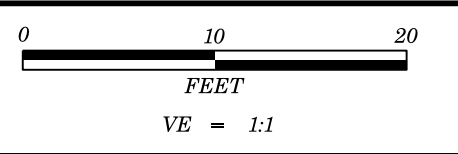
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 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS



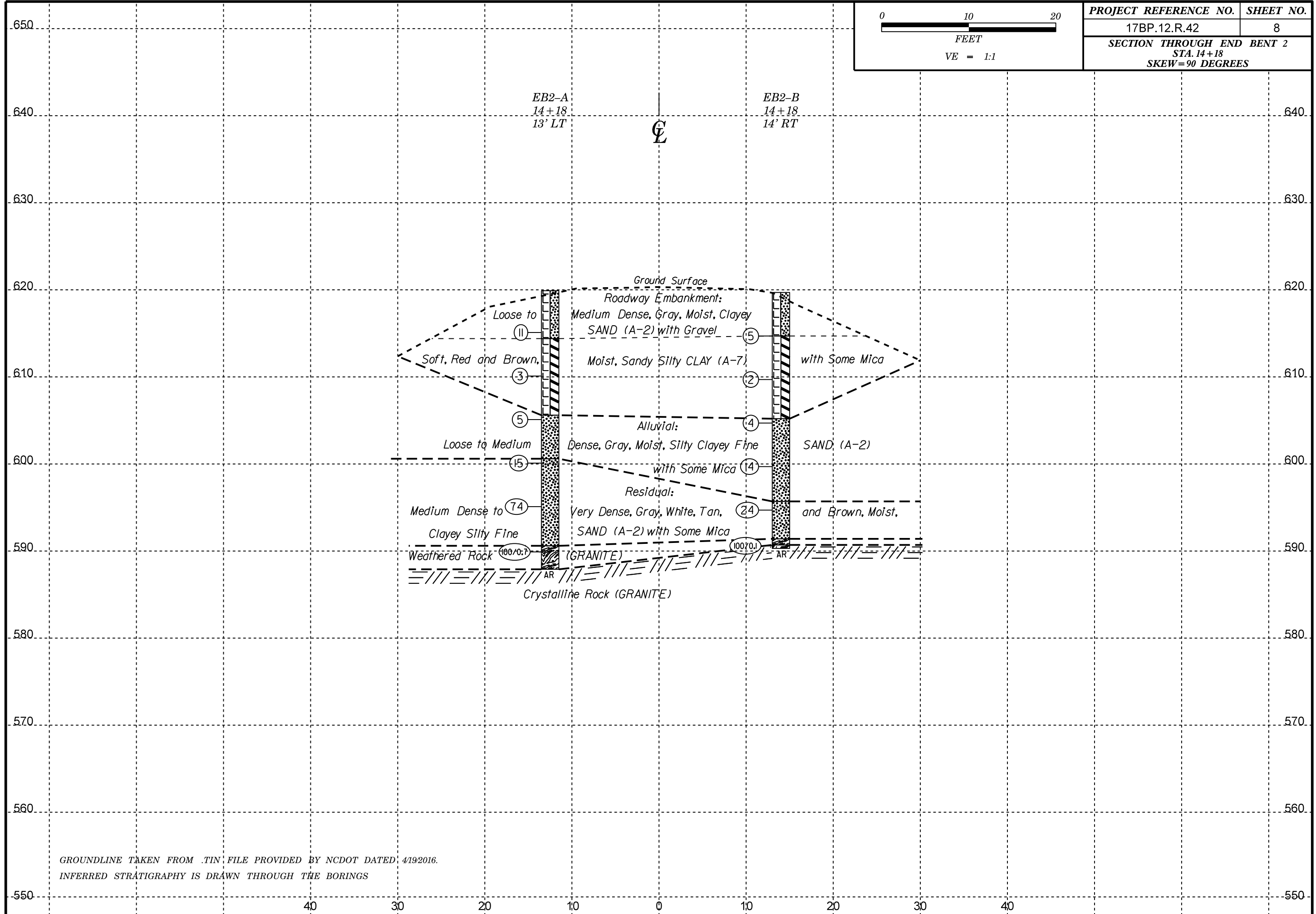
PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.42	7
SECTION THROUGH BENT 2	
STA. 13+74	
SKEW=90 DEGREES	



GROUNDLINE TAKEN FROM .TIN FILE PROVIDED BY NCDOT DATED 4/19/2016.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS



PROJECT REFERENCE NO.	SHEET NO.
17BP.12.R.42	8
SECTION THROUGH END BENT 2	
STA. 14+18	
SKEW=90 DEGREES	



GROUNDLINE TAKEN FROM .TIN FILE PROVIDED BY NCDOT DATED 4/19/2016.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.12.R.42		TIP N/A		COUNTY CLEVELAND		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Bridge No. 329 on SR 2212 over Tributary to Buffalo Creek							GROUND WTR (ft)								
BORING NO. EB1-A		STATION 12+68		OFFSET 14 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 620.9 ft		TOTAL DEPTH 39.2 ft		NORTHING 534,508		EASTING 1,250,968									
DRILL RIG/HAMMER EFF./DATE HFC0070 CME-45C 84% 05/15/2015				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Moore, M.R.		START DATE 04/18/16		COMP. DATE 04/18/16		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					
625															
620															620.9 GROUND SURFACE 0.0
615	617.1	3.8	7	5	2							M	616.1 ROADWAY EMBANKMENT 4.8	616.1 Gray, Silty SAND (A-2) with Gravel	
610	612.1	8.8	2	1	2							M	609.9 Red and Brown, Sandy Silty CLAY (A-7), Some Mica 11.0	609.9	
605	607.1	13.8	3	4	5							M	602.5 ALLUVIAL 18.4	602.5 Tan, Brown, and Gray, Fine Sandy Silty CLAY (A-7), Some Mica	
600	602.1	18.8	5	10	15							M	601.6 RESIDUAL 18.6	601.6 Tan, Brown, Gray, and White, Clayey Silty Fine SAND (A-2), Some Mica	
595	597.1	23.8	7	10	14							M	591.6 WEATHERED ROCK 29.3	591.6 Brown, Tan, Gray, and White (GRANITE)	
590	592.1	28.8	19	48	52/0.4							M	586.6 WEATHERED ROCK 33.6	586.6 Brown, White, and Gray-White (GRANITE)	
585	587.1	33.8	100/0.5									M	582.0 Boring Terminated by Auger Refusal at Elevation 582.0 ft on Crystalline Rock (GRANITE) 38.2	582.0	
	582.1	38.8	100/0.4									M			

WBS 17BP.12.R.42		TIP N/A		COUNTY CLEVELAND		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Bridge No. 329 on SR 2212 over Tributary to Buffalo Creek							GROUND WTR (ft)								
BORING NO. EB1-B		STATION 12+69		OFFSET 15 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 620.2 ft		TOTAL DEPTH 38.2 ft		NORTHING 534,483		EASTING 1,250,979									
DRILL RIG/HAMMER EFF./DATE HFC0070 CME-45C 84% 05/15/2015				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Moore, M.R.		START DATE 04/14/16		COMP. DATE 04/14/16		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					
625															
620															620.2 GROUND SURFACE 0.0
615	616.6	3.6	6	5	4							M	615.2 ROADWAY EMBANKMENT 5.0	615.2 Gray, Silty SAND (A-2) with Gravel	
610	611.6	8.6	1	2	2							M	609.2 Red and Brown, Fine Sandy Silty CLAY (A-7), Some Mica 11.0	609.2	
605	606.6	13.6	1	2	3							M	601.9 ALLUVIAL 18.3	601.9 Tan and Brown, Fine Sandy Silty CLAY (A-7), Some Mica	
600	601.6	18.6	3	9	11							M	586.6 RESIDUAL 33.6	586.6 Tan, Brown, Gray, and White, Clayey Silty Fine SAND (A-2)	
595	596.6	23.6	2	9	18							M	582.0 Boring Terminated by Auger Refusal at Elevation 582.0 ft on Crystalline Rock (GRANITE) 38.2	582.0	
590	591.6	28.6	18	19	23							M			
585	586.6	33.6	64	36/0.3								M			

NCDOT BORE DOUBLE_SF220329_GEO_BH_BRDG0329.GPJ_NC_DOT.GDT 6/28/16

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.12.R.42		TIP N/A		COUNTY CLEVELAND		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Bridge No. 329 on SR 2212 over Tributary to Buffalo Creek							GROUND WTR (ft)								
BORING NO. B1-A		STATION 13+08		OFFSET 17 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 610.1 ft		TOTAL DEPTH 44.3 ft		NORTHING 534,526		EASTING 1,251,004									
DRILL RIG/HAMMER EFF./DATE HFC0070 CME-45C 84% 05/15/2015		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic											
DRILLER Moore, M.R.		START DATE 04/08/16		COMP. DATE 04/08/16		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					
615															
610														610.1	0.0
605	606.0	4.1	WOH	WOH	2										
600	601.0	9.1												601.5	8.6
595	596.0	14.1													
590	591.0	19.1												591.0	19.1
585	586.0	24.1													
580	581.0	29.1													
575	575.9	34.2													
570	570.9	39.2													
	565.9	44.2												565.8	44.3

WBS 17BP.12.R.42		TIP N/A		COUNTY CLEVELAND		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION Bridge No. 329 on SR 2212 over Tributary to Buffalo Creek							GROUND WTR (ft)								
BORING NO. B1-B		STATION 13+09		OFFSET 16 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 609.8 ft		TOTAL DEPTH 40.1 ft		NORTHING 534,496		EASTING 1,251,017									
DRILL RIG/HAMMER EFF./DATE HFC0070 CME-45C 84% 05/15/2015		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic											
DRILLER Moore, M.R.		START DATE 04/06/16		COMP. DATE 04/06/16		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					
610															
605	604.8	5.0													
600	599.8	10.0													
595	594.8	15.0													
590	589.8	20.0													
585	584.8	25.0													
580	579.8	30.0													
575	574.8	35.0													
570	569.8	40.0													

NCDOT BORE DOUBLE_SF220329_GEO_BH_BRDG0329.GPJ_NC_DOT.GDT 6/28/16

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.12.R.42		TIP N/A		COUNTY CLEVELAND		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Bridge No. 329 on SR 2212 over Tributary to Buffalo Creek							GROUND WTR (ft)									
BORING NO. B2-A		STATION 13+74		OFFSET 16 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 608.1 ft		TOTAL DEPTH 38.9 ft		NORTHING 534,550		EASTING 1,251,066										
DRILL RIG/HAMMER EFF./DATE HFC0070 CME-45C 84% 05/15/2015		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic												
DRILLER Moore, M.R.		START DATE 04/13/16		COMP. DATE 04/13/16		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						
610														608.1	GROUND SURFACE	0.0
605															ALLUVIAL Tan and Brown, Silty Fine Sandy CLAY (A-7)	
600	602.9	5.2	0	1	2											
595	597.9	10.2	100/0.4											598.7	RESIDUAL Gray and White, Clayey Silty SAND (A-2) with Gravel Layers and Some Mica	9.4
590	592.9	15.2	13	17	25											
585	587.9	20.2	100/0.2											587.9	WEATHERED ROCK Gray and White (GRANITE)	20.2
580	582.9	25.2	26	74/0.2												
575	578.3	29.8	100/0.3													
570	573.3	34.8	100/0.2													
	569.3	38.8	100/0.1											569.3	CRYSTALLINE ROCK (GRANITE)	38.8
														569.2		38.9
Boring Terminated with Standard Penetration Test Refusal at Elevation 569.2 ft on Crystalline Rock (GRANITE)																

WBS 17BP.12.R.42		TIP N/A		COUNTY CLEVELAND		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Bridge No. 329 on SR 2212 over Tributary to Buffalo Creek							GROUND WTR (ft)									
BORING NO. B2-B		STATION 13+73		OFFSET 17 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 608.4 ft		TOTAL DEPTH 39.8 ft		NORTHING 534,519		EASTING 1,251,077										
DRILL RIG/HAMMER EFF./DATE HFC0070 CME-45C 84% 05/15/2015		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic												
DRILLER Moore, M.R.		START DATE 04/14/16		COMP. DATE 04/14/16		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						
610														608.4	GROUND SURFACE	0.0
605															ALLUVIAL Tan and Brown, Clayey Silty SAND (A-2) with Gravel	
600	603.4	5.0	1	2	7											
595	598.4	10.0	9	7	8									599.4	RESIDUAL Tan, Brown, Gray, and White, Clayey Silty SAND (A-2) with Some Mica	9.0
590	593.4	15.0	15	21	21											
585	588.4	20.0	100/0.4											588.4	WEATHERED ROCK Gray, White, Tan, and Brown (GRANITE)	20.0
580	583.8	24.6	100/0.2													
575	578.8	29.6	100/0.2													
570	573.8	34.6	100/0.3													
	568.8	39.6	100/0.2											568.6		39.8
Boring Terminated at Elevation 568.6 ft in Weathered Rock (GRANITE)																

NCDOT BORE DOUBLE_SF220329_GEO_BH_BRDG0329.GPJ_NC_DOT.GDT 6/28/16

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.12.R.42		TIP N/A		COUNTY CLEVELAND		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Bridge No. 329 on SR 2212 over Tributary to Buffalo Creek							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 14+18		OFFSET 13 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 619.9 ft		TOTAL DEPTH 32.0 ft		NORTHING 534,563		EASTING 1,251,108										
DRILL RIG/HAMMER EFF./DATE HFC0070 CME-45C 84% 05/15/2015			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Moore, M.R.		START DATE 04/18/16		COMP. DATE 04/18/16		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														619.9	GROUND SURFACE	0.0
															ROADWAY EMBANKMENT Gray, Clayey Silty SAND (A-2) with Gravel	
615	616.1	3.8	7	6	5								M	614.4	Red and Brown, Sandy Silty CLAY (A-7), Some Mica	5.5
610	611.1	8.8	1	2	1								M			
605	606.1	13.8	3	2	3								M	605.6	ALLUVIAL Gray, Silty Clayey Fine SAND (A-2), Some Mica	14.3
600	601.1	18.8	3	5	10								M	600.6	RESIDUAL Gray, White, Tan, and Brown, Clayey Silty Fine SAND (A-2), Some Mica	19.3
595	596.1	23.8	30	32	42								M			
590	591.1	28.8	26	59	41/0.2								M	590.6	WEATHERED ROCK Tan, Brown, Gray, and White (GRANITE)	29.3
														587.9	Boring Terminated by Auger Refusal at Elevation 587.9 ft on Crystalline Rock (GRANITE)	32.0

WBS 17BP.12.R.42		TIP N/A		COUNTY CLEVELAND		GEOLOGIST Stickney, J. K.										
SITE DESCRIPTION Bridge No. 329 on SR 2212 over Tributary to Buffalo Creek							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 14+18		OFFSET 14 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 619.7 ft		TOTAL DEPTH 29.4 ft		NORTHING 534,538		EASTING 1,251,118										
DRILL RIG/HAMMER EFF./DATE HFC0070 CME-45C 84% 05/15/2015			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Moore, M.R.		START DATE 04/18/16		COMP. DATE 04/18/16		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														619.7	GROUND SURFACE	0.0
															ROADWAY EMBANKMENT Gray, Clayey Silty SAND (A-2) with Gravel	
615	615.7	4.0	5	2	3								M	614.7	Red and Brown, Sandy Silty CLAY (A-7), Some Mica	5.0
610	610.7	9.0	1	1	1								M			
605	605.7	14.0	1	2	2								M	605.2	ALLUVIAL Gray, Clayey Silty Fine SAND (A-2), Some Mica	14.5
600	600.7	19.0	6	7	7								M			
595	595.7	24.0	10	13	11								M	595.7	RESIDUAL Tan, Brown, Gray, and White, Clayey Silty Fine SAND (A-2)	24.0
														591.4		
														590.7	WEATHERED ROCK Gray, White, Tan, and Brown (GRANITE)	29.0
														590.3	CRYSTALLINE ROCK (GRANITE)	29.4
															Boring Terminated by Auger Refusal at Elevation 590.3 ft on Crystalline Rock (GRANITE)	