

PROJECT: 17BP.8.R.102 REFERENCE: SF-610224

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-610224	1	9

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STRUCTURE SUBSURFACE INVESTIGATION

COUNTY Montgomery
PROJECT DESCRIPTION Bridge #224 on SR 1562
(McCallum Pond Rd.) over Big Creek

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

Chris Taylor
Mike Morgan
Kendall Bane

INVESTIGATED BY D. Michael Gragg
DRAWN BY Wesley Shuecraft
CHECKED BY Kenneth Bussey
SUBMITTED BY ICA Engineering
DATE August, 2016



DocuSigned by:
Kenneth Bussey 9/9/2016
6EB2C05E818184FC 610184FC 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

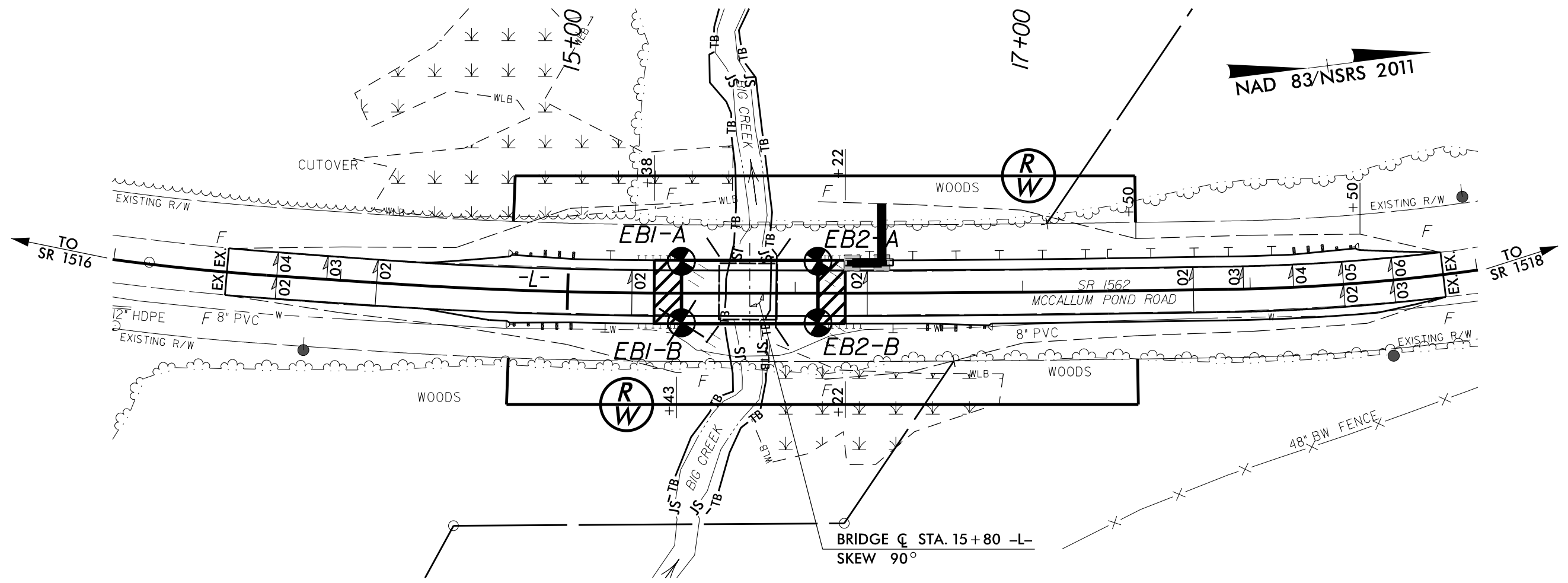
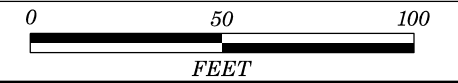
SOIL DESCRIPTION, SOIL LEGEND AND AASHTO CLASSIFICATION, CONSISTENCY OR DENSENESS, TEXTURE OR GRAIN SIZE, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, COLOR

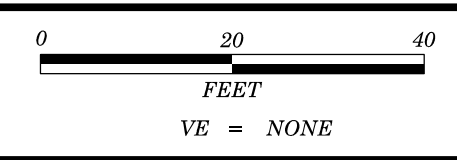
GRADATION, ANGULARITY OF GRAINS, MINERALOGICAL COMPOSITION, COMPRESSIBILITY, PERCENTAGE OF MATERIAL, GROUND WATER, MISCELLANEOUS SYMBOLS, RECOMMENDATION SYMBOLS, ABBREVIATIONS, EQUIPMENT USED ON SUBJECT PROJECT

ROCK DESCRIPTION, WEATHERING, ROCK HARDNESS, FRACTURE SPACING, BEDDING, INDURATION

TERMS AND DEFINITIONS, ALLUVIUM (ALLUV.), AQUIFER, ARENACEOUS, ARGILLACEOUS, ARTESIAN, CALCAREOUS (CALC.), COLLUVIUM, CORE RECOVERY (REC.), DIKE, DIP, DIP DIRECTION (DIP AZIMUTH), FAULT, FISSILE, FLOAT, FLOOD PLAIN (FP), FORMATION (FM), JOINT, LEDGE, LENS, MOTTLED (MOT.), PERCHED WATER, RESIDUAL (RES.) SOIL, ROCK QUALITY DESIGNATION (ROD), SAPROLITE (SAP.), SILL, SLICKENSIDE, STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT), STRATA CORE RECOVERY (SREC.), STRATA ROCK QUALITY DESIGNATION (SROD), TOPSOIL (TS.)

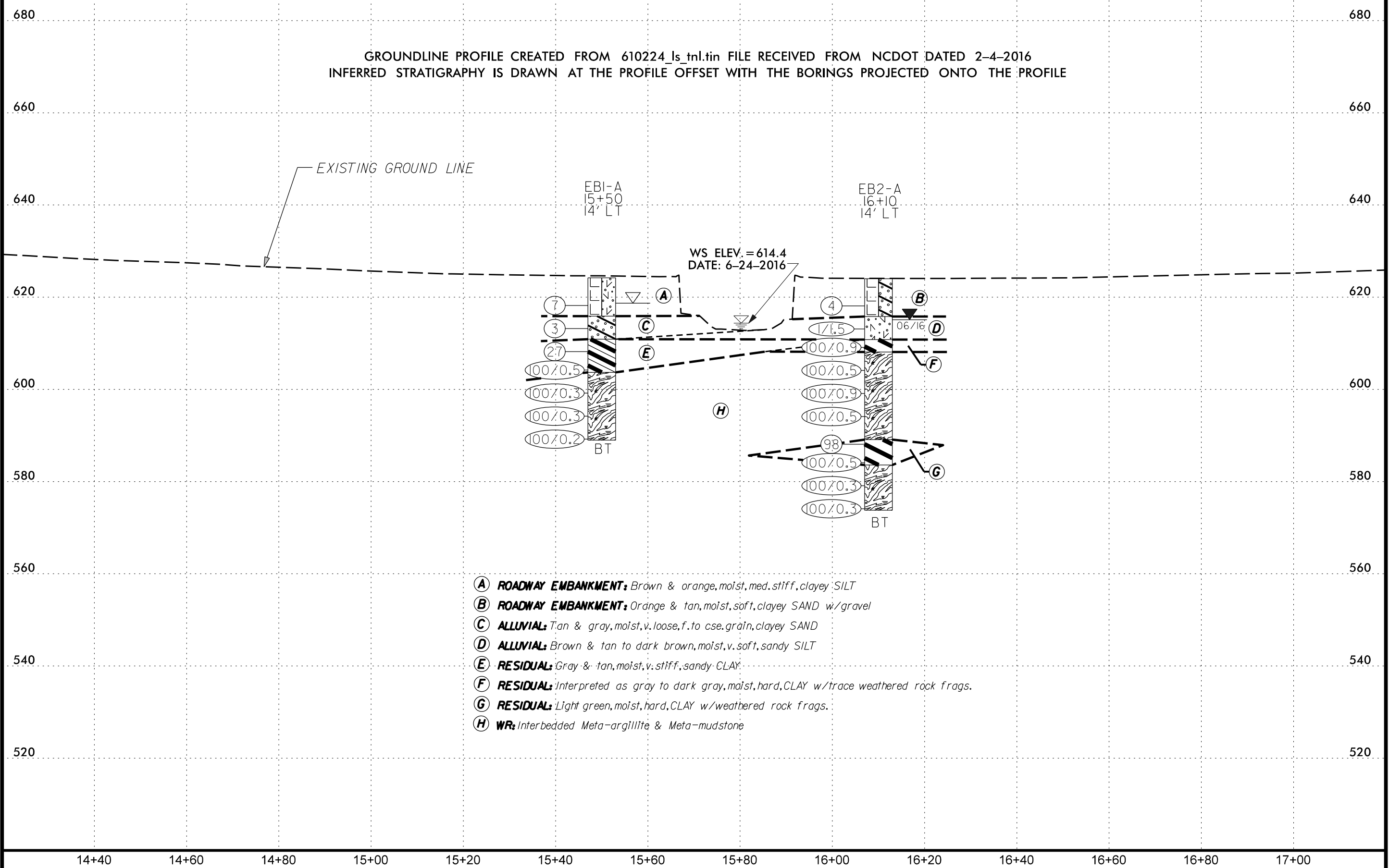
SITE PLAN



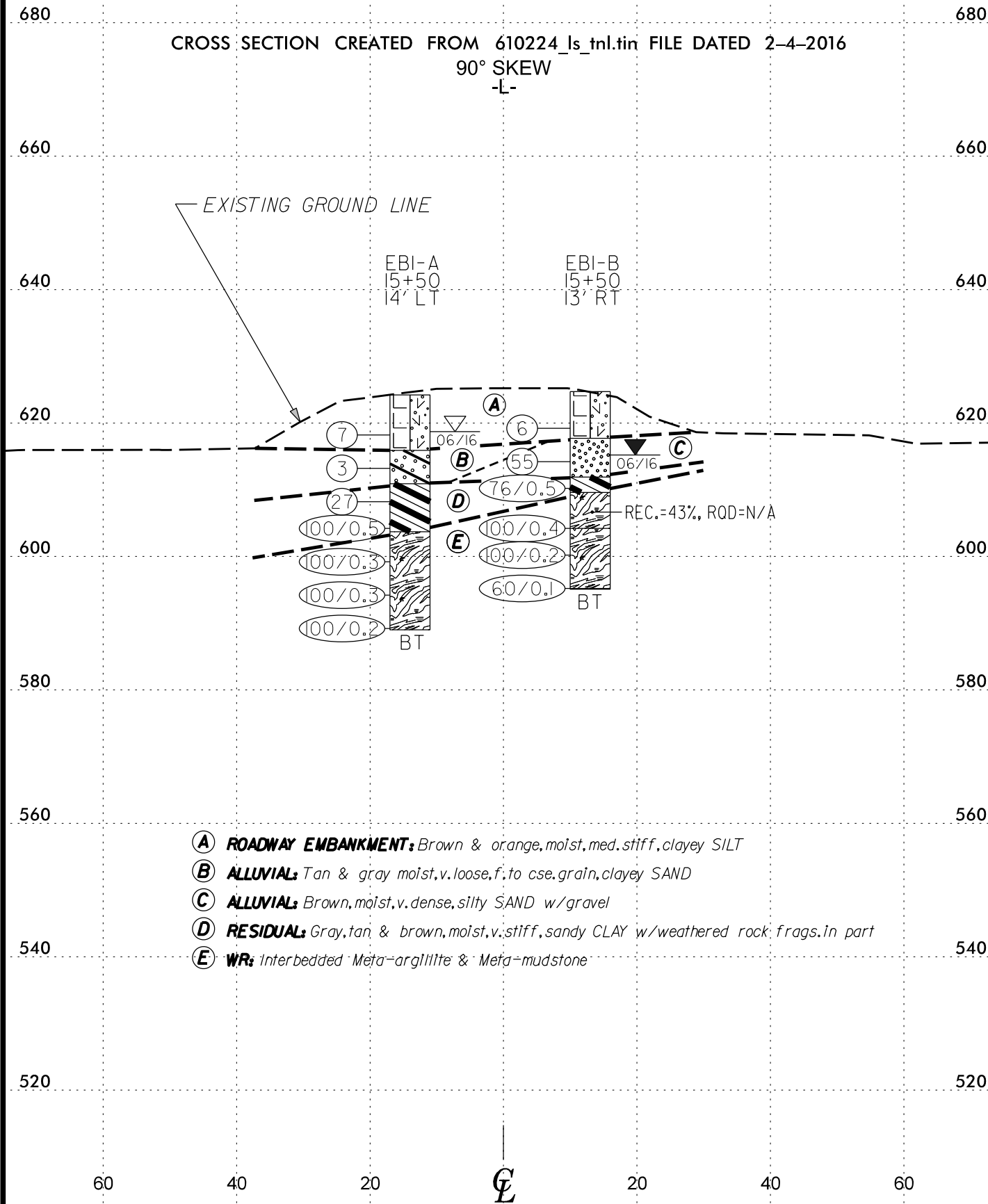


PROJECT REFERENCE NO.	SHEET NO.
SF-610224	4
PROFILE 14' LT. OF -L-	

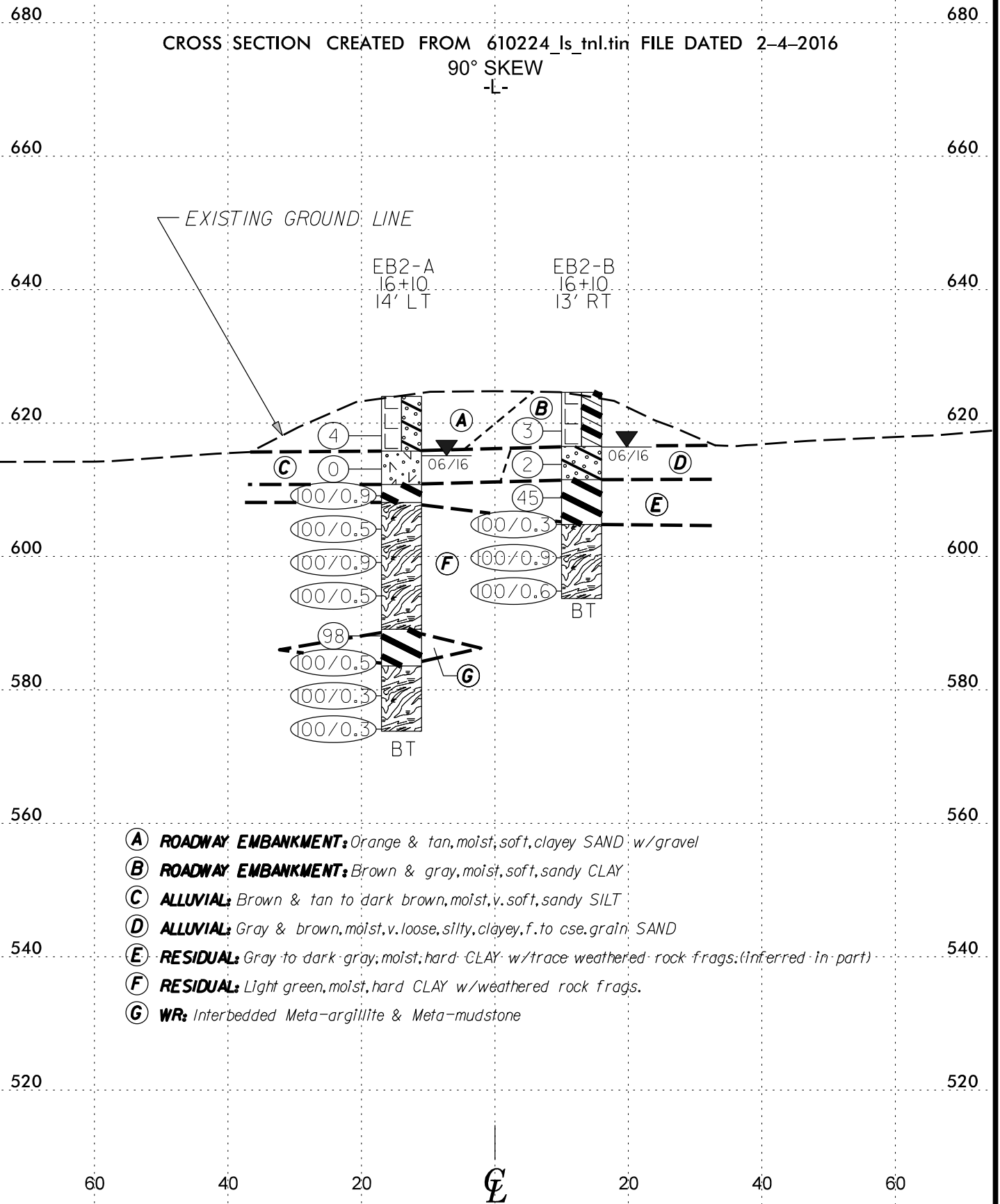
GROUNDLINE PROFILE CREATED FROM 610224_Is_tnl.tin FILE RECEIVED FROM NCDOT DATED 2-4-2016
 INFERRED STRATIGRAPHY IS DRAWN AT THE PROFILE OFFSET WITH THE BORINGS PROJECTED ONTO THE PROFILE



- (A) **ROADWAY EMBANKMENT:** Brown & orange, moist, med. stiff, clayey SILT
- (B) **ROADWAY EMBANKMENT:** Orange & tan, moist, soft, clayey SAND w/gravel
- (C) **ALLUVIAL:** Tan & gray, moist, v. loose, f. to cse. grain, clayey SAND
- (D) **ALLUVIAL:** Brown & tan to dark brown, moist, v. soft, sandy SILT
- (E) **RESIDUAL:** Gray & tan, moist, v. stiff, sandy CLAY
- (F) **RESIDUAL:** Interpreted as gray to dark gray, moist, hard, CLAY w/trace weathered rock frags.
- (G) **RESIDUAL:** Light green, moist, hard, CLAY w/weathered rock frags.
- (H) **WR:** Interbedded Meta-argillite & Meta-mudstone



- (A) **ROADWAY EMBANKMENT:** Brown & orange, moist, med. stiff, clayey SILT
- (B) **ALLUVIAL:** Tan & gray moist, v. loose, f. to cse. grain, clayey SAND
- (C) **ALLUVIAL:** Brown, moist, v. dense, silty SAND w/ gravel
- (D) **RESIDUAL:** Gray, tan & brown, moist, v. stiff, sandy CLAY w/ weathered rock frags. in part
- (E) **WR:** Interbedded Meta-argillite & Meta-mudstone



- (A) **ROADWAY EMBANKMENT:** Orange & tan, moist, soft, clayey SAND w/ gravel
- (B) **ROADWAY EMBANKMENT:** Brown & gray, moist, soft, sandy CLAY
- (C) **ALLUVIAL:** Brown & tan to dark brown, moist, v. soft, sandy SILT
- (D) **ALLUVIAL:** Gray & brown, moist, v. loose, silty, clayey, f. to cse. grain SAND
- (E) **RESIDUAL:** Gray to dark gray, moist, hard CLAY w/ trace weathered rock frags. (inferred in part)
- (F) **RESIDUAL:** Light green, moist, hard CLAY w/ weathered rock frags.
- (G) **WR:** Interbedded Meta-argillite & Meta-mudstone

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.8.R.102		TIP SF-610224		COUNTY MONTGOMERY		GEOLOGIST Taylor, Chris										
SITE DESCRIPTION Bridge No. 224 on SR 1562 (McCallum Pond Rd.) over Big Creek							GROUND WTR (ft)									
BORING NO. EB1-A		STATION 15+50		OFFSET 14 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 624.2 ft		TOTAL DEPTH 35.2 ft		NORTHING 558,249		EASTING 1,770,017										
DRILL RIG/HAMMER EFF./DATE HDR0404 CME-45C 91.5% 11/10/2015			DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic											
DRILLER Morgan, M.		START DATE 06/26/16		COMP. DATE 06/26/16		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														624.2	0.0	GROUND SURFACE
																ROADWAY EMBANKMENT
																Brown & orange, moist, med. stiff, clayey SILT (A-5).
620	619.2	5.0														
615	614.2	10.0														
610	609.2	15.0														
605	604.2	20.0														
600	599.2	25.0														
595	594.2	30.0														
590	589.2	35.0														

WBS 17BP.8.R.102		TIP SF-610224		COUNTY MONTGOMERY		GEOLOGIST Taylor, Chris										
SITE DESCRIPTION Bridge No. 224 on SR 1562 (McCallum Pond Rd.) over Big Creek							GROUND WTR (ft)									
BORING NO. EB1-B		STATION 15+50		OFFSET 13 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 624.7 ft		TOTAL DEPTH 29.6 ft		NORTHING 558,252		EASTING 1,770,044										
DRILL RIG/HAMMER EFF./DATE HDR0404 CME-45C 91.5% 11/10/2015			DRILL METHOD NW Casing w/ Core		HAMMER TYPE Automatic											
DRILLER Morgan, M.		START DATE 06/24/16		COMP. DATE 06/24/16		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														624.7	0.0	GROUND SURFACE
																ROADWAY EMBANKMENT
																Brown, moist, med. stiff, clayey SILT (A-5).
620	620.2	4.5														
615	615.2	9.5														
610	610.2	14.5														
605	604.2	20.5														
600	600.2	24.5														
595	595.2	29.5														

NCDOT BORE DOUBLE_SF610224_GEO_BRDG_BIG CREEK.GPJ_NC_DOT.GDT 8/31/16

GEOTECHNICAL BORING REPORT

CORE LOG

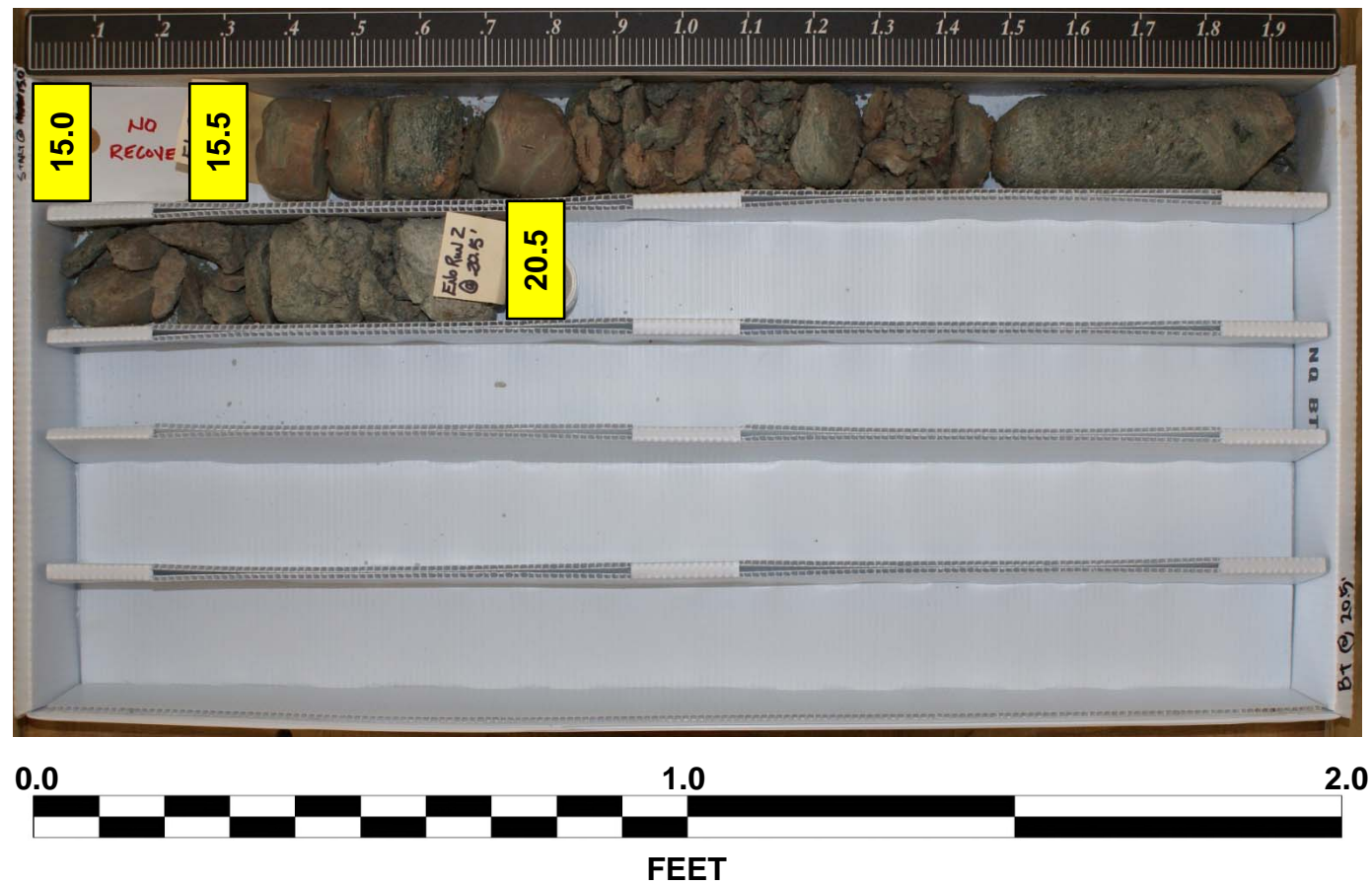
WBS 17BP.8.R.102		TIP SF-610224		COUNTY MONTGOMERY		GEOLOGIST Taylor, Chris						
SITE DESCRIPTION Bridge No. 224 on SR 1562 (McCallum Pond Rd.) over Big Creek							GROUND WTR (ft)					
BORING NO. EB1-B		STATION 15+50		OFFSET 13 ft RT		ALIGNMENT -L-						
COLLAR ELEV. 624.7 ft		TOTAL DEPTH 29.6 ft		NORTHING 558,252		EASTING 1,770,044						
DRILL RIG/HAMMER EFF./DATE HDR0404 CME-45C 91.5% 11/10/2015				DRILL METHOD NW Casing w/ Core		HAMMER TYPE Automatic						
DRILLER Morgan, M.		START DATE 06/24/16		COMP. DATE 06/24/16		SURFACE WATER DEPTH N/A						
CORE SIZE NQ2		TOTAL RUN 5.5 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)	
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %				
609.7	609.7	15.0	0.5	1:05/0.5	(0.0)	N/A	(2.3)	N/A		Begin Coring @ 15.0 ft		
	609.2	15.5	5.0	1:58 2:11 1:30 1:21 1:49	0% (2.3) 46%	N/A	42%			609.7	WEATHERED ROCK Green-gray, pink-purple, sev. weathered w/seams completely weathered, soft to med. hard, close to v. close frac. spacing, thinly bedded, friable in parts, foliated in parts, interbedded Meta-argillite & Meta-mudstone.	15.0
605	604.2	20.5		N=100/0.4						604.2	WEATHERED ROCK See bore log for details.	20.5
600				N=100/0.2								
				N=60/0.1						595.2 595.1	CRYSTALLINE ROCK Boring Terminated with Standard Penetration Test Refusal at Elevation 595.1 ft in Crystalline Rock (Interbedded Meta-argillite & Meta-mudstone). Coring was terminated at 20.5' and investigation returned to tri-cone/SPT drilling to 29.6' (termination of boring).	29.5 29.6

NCDOT CORE DOUBLE_SF610224_GEO_BRDG_BIG CREEK.GPJ_NC_DOT.GDT_8/31/16

CORE PHOTOGRAPHIC RECORD

Bridge No. 224 on SR 1562 (McCallum Pond Road) over Big Creek

EB1-B
STA. 15+50 @ 13' RT.
Box 1 of 1: 15.0-20.5 FEET



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.8.R.102		TIP SF-610224		COUNTY MONTGOMERY		GEOLOGIST Taylor, Chris										
SITE DESCRIPTION Bridge No. 224 on SR 1562 (McCallum Pond Rd.) over Big Creek							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 16+10		OFFSET 14 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 624.0 ft		TOTAL DEPTH 50.2 ft		NORTHING 558,308		EASTING 1,770,009										
DRILL RIG/HAMMER EFF./DATE HDR0404 CME-45C 91.5% 11/10/2015			DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic											
DRILLER Morgan, M.		START DATE 06/25/16		COMP. DATE 06/25/16		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						
625														624.0	GROUND SURFACE	0.0
620	619.1	4.9	2	2	2								M	ROADWAY EMBANKMENT Orange & tan, moist, soft, clayey SAND w/gravel (A-2-7).		
615	614.1	9.9	1	WOH	WOH								M	ALLUVIAL Brown & tan to dark brown, moist, v. soft, sandy SILT (A-5).	8.2	
610	609.1	14.9	17	45	55/0.4								M	RESIDUAL Interpreted as gray to dark gray, moist, hard CLAY w/trace weathered rock frags.	13.2	
605	604.1	19.9	89	11/0.0									M	WEATHERED ROCK Interbedded Meta-argillite & Meta-mudstone	15.9	
600	599.1	24.9	25	75/0.4									M		100/0.9	
595	594.1	29.9	100/0.5										M		100/0.5	
590	589.1	34.9	20	29	69								M	RESIDUAL Light green, moist, hard CLAY w/weathered rock frags. (A-7-5).	34.9	
585	584.1	39.9	100/0.5										M	WEATHERED ROCK Interbedded Meta-argillite & Meta-mudstone	40.4	
580	579.1	44.9	100/0.3										M		100/0.3	
575	574.1	49.9	100/0.3										M		100/0.3	
														573.8	Boring Terminated at Elevation 573.8 ft in Weathered Rock (Interbedded Meta-argillite & Meta-mudstone).	50.2

WBS 17BP.8.R.102		TIP SF-610224		COUNTY MONTGOMERY		GEOLOGIST Taylor, Chris										
SITE DESCRIPTION Bridge No. 224 on SR 1562 (McCallum Pond Rd.) over Big Creek							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 16+10		OFFSET 13 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 624.6 ft		TOTAL DEPTH 30.9 ft		NORTHING 558,312		EASTING 1,770,036										
DRILL RIG/HAMMER EFF./DATE HDR0404 CME-45C 91.5% 11/10/2015			DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic											
DRILLER Morgan, M.		START DATE 06/24/16		COMP. DATE 06/24/16		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						
625														624.6	GROUND SURFACE	0.0
620	619.8	4.8	1	1	2								M	ROADWAY EMBANKMENT Brown & gray, moist, soft, sandy CLAY (A-6).		
615	614.8	9.8	WOH	1	1								M	ALLUVIAL Gray & brown, moist, v. loose, silty, clayey, f. to cse. grain SAND (A-2-7).	8.1	
610	609.8	14.8	10	16	29								M	RESIDUAL Gray to dk. gray, moist, hard CLAY w/trc. weathered rock frags. (A-7-5).	13.1	
605	604.8	19.8	100/0.3										M	WEATHERED ROCK Interbedded Meta-argillite & Meta-mudstone	19.8	
600	599.8	24.8	21	46	54/0.4								M		100/0.9	
595	594.8	29.8	27	73	27/0.1								M		100/0.6	
														593.7	Boring Terminated at Elevation 593.7 ft in Weathered Rock (Interbedded Meta-argillite & Meta-mudstone).	30.9

NCDOT BORE DOUBLE_SF610224_GEO_BRDG_BIG CREEK.GPJ_NC_DOT.GDT 8/31/16