

REFERENCE: B-3186/B-5898

PROJECT: 38332/48030

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY HAYWOOD
 PROJECT DESCRIPTION US 23/US 74/US 19 (GREAT SMOKY MOUNTAIN HWY) FROM WEST OF NC 209 (BRABTREE RD.) TO EAST OF RUSS AVE.
 SITE DESCRIPTION RETAINING WALL #5 FROM -YIRT- STA. 15+25.00 TO 26+12.97

STATE N.C.	STATE PROJECT REFERENCE NO. B-3186/B-5898	SHEET NO. 1	TOTAL SHEETS 18
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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
R. DUGGER
N. YACOBI
C. SWAFFORD
GEOTECHNOLOGY, INC.

INVESTIGATED BY C. SWAFFORD
 DRAWN BY T. LYNN
 CHECKED BY K. BUSSEY
 SUBMITTED BY HDR
 DATE NOVEMBER 2021

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 N.C.B.E.L.S. License Number: F-0116



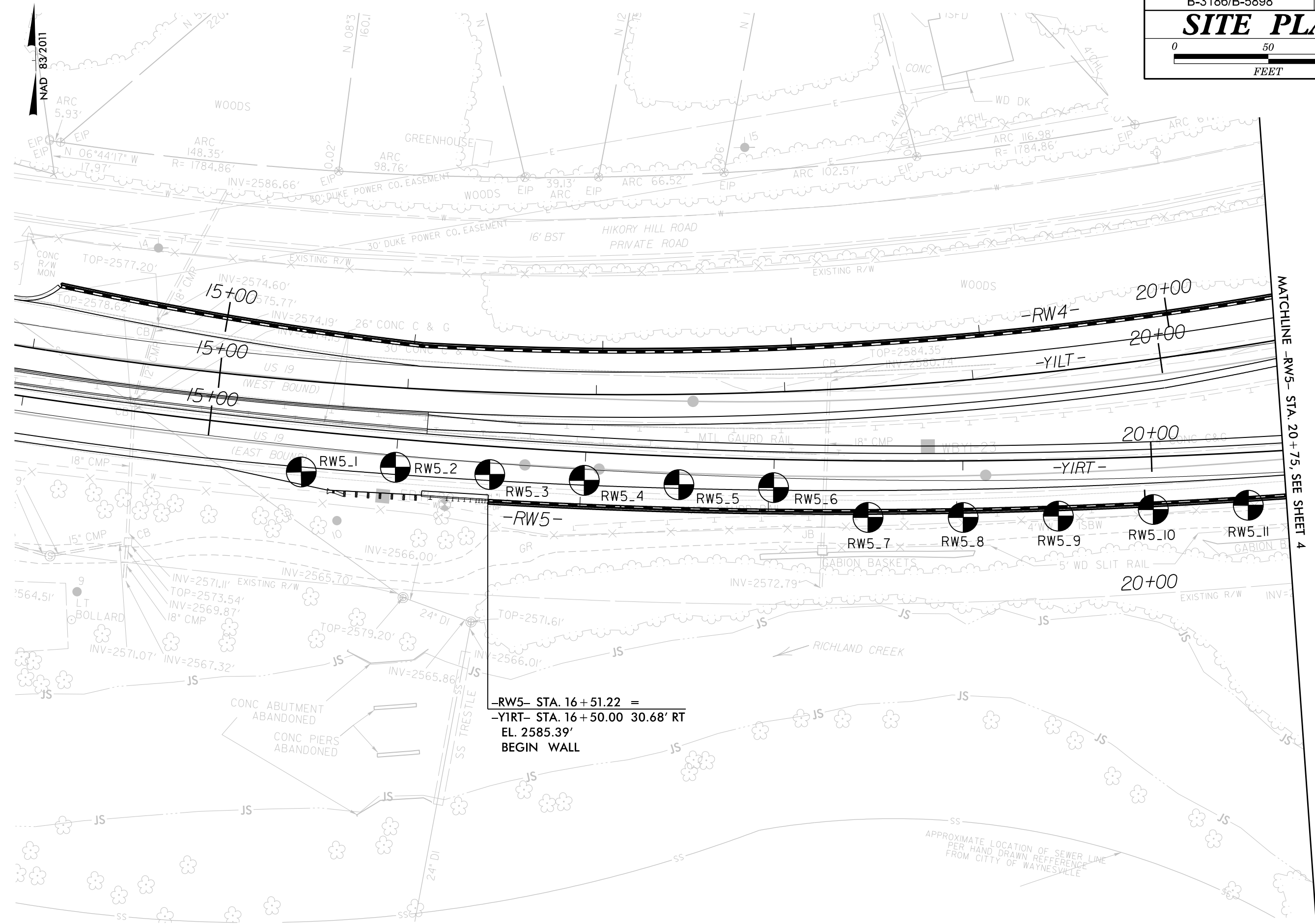
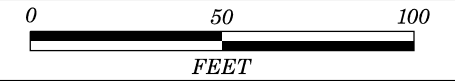
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 UNLESS ALL SIGNATURES COMPLETED**

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	
<p>SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 208, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</p>		<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.</p>		<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>		<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOADED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDES - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>	
<p>SOIL LEGEND AND AASHTO CLASSIFICATION</p>		<p>ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>		<p>WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)</p>			
<p>MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>		<p>COMPRESSIONSIBILITY SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50</p>		<p>PERCENTAGE OF MATERIAL</p>			
<p>COMPRESSIBILITY</p>		<p>PERCENTAGE OF MATERIAL</p>		<p>WEATHERING</p>			
<p>TEXTURE OR GRAIN SIZE</p>		<p>GROUND WATER</p>		<p>WEATHERING</p>			
<p>CONSISTENCY OR DENSENESS</p>		<p>MISCELLANEOUS SYMBOLS</p>		<p>WEATHERING</p>			
<p>RECOMMENDATION SYMBOLS</p>		<p>ABBREVIATIONS</p>		<p>WEATHERING</p>			
<p>SOIL MOISTURE - CORRELATION OF TERMS</p>		<p>EQUIPMENT USED ON SUBJECT PROJECT</p>		<p>ROCK HARDNESS</p>			
<p>PLASTICITY</p>		<p>FRACURE SPACING</p>		<p>ROCK HARDNESS</p>			
<p>COLOR</p>		<p>FRACURE SPACING</p>		<p>ROCK HARDNESS</p>			

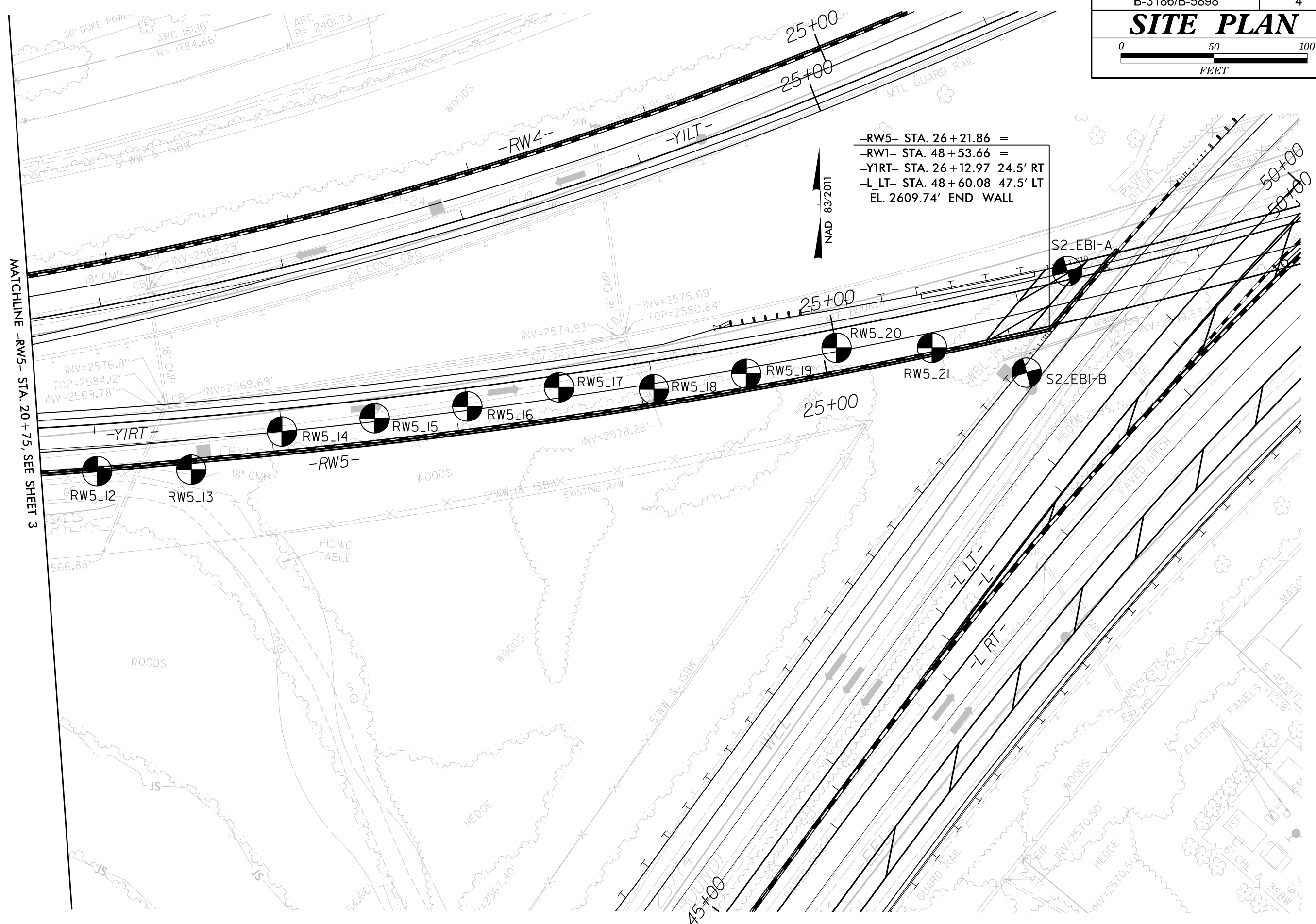
SITE PLAN



MATCHLINE -RW5- STA. 20+75, SEE SHEET 4

-RW5- STA. 16+51.22 =
 -YIRT- STA. 16+50.00 30.68' RT
 EL. 2585.39'
 BEGIN WALL

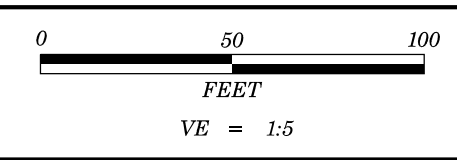
APPROXIMATE LOCATION OF SEWER LINE
 PER HAND DRAWN REFERENCE
 FROM CITY OF WAYNESVILLE



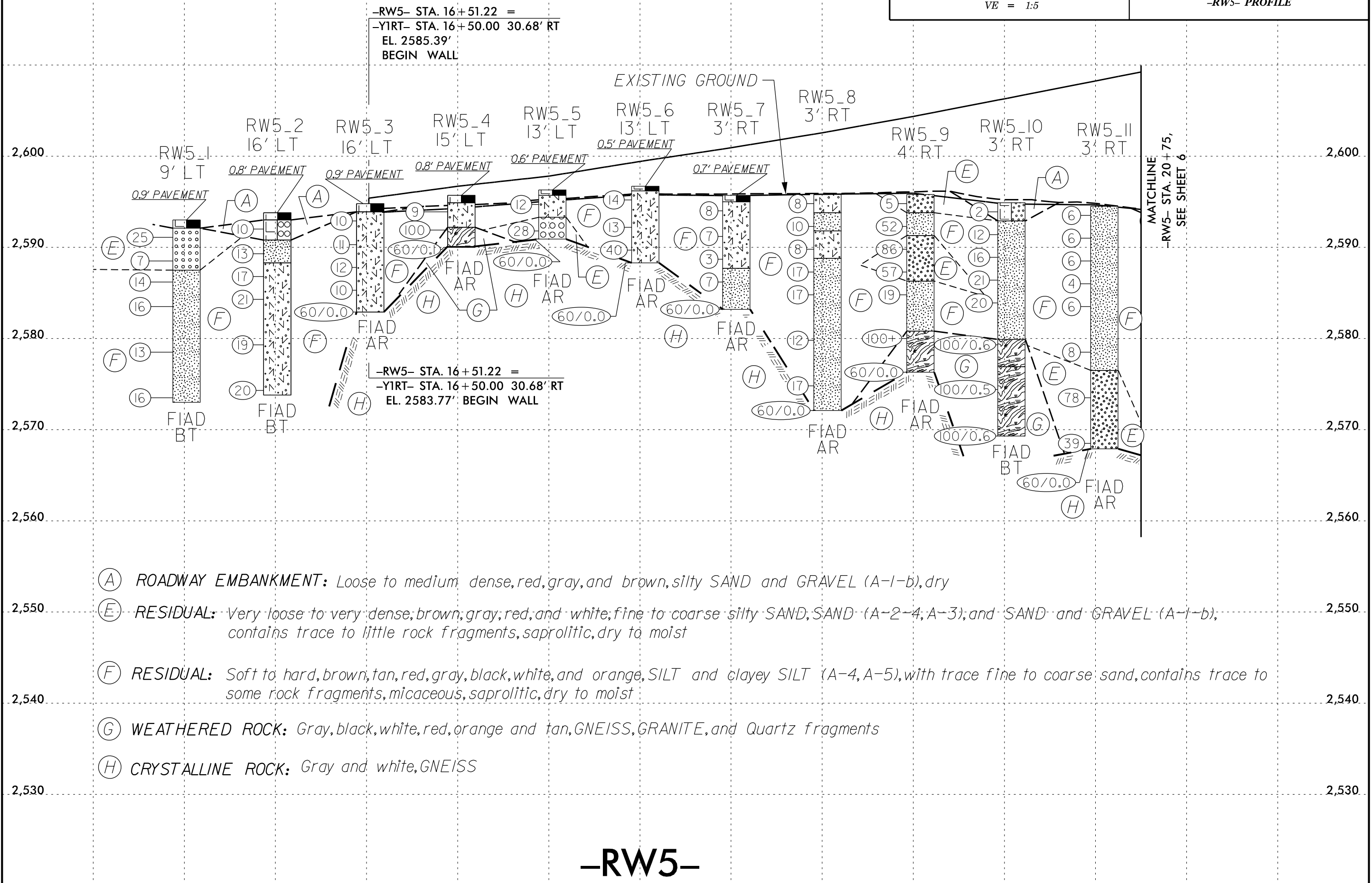
-RW5- STA. 26+21.86 =
 -RW1- STA. 48+53.66 =
 -YIRT- STA. 26+12.97 24.5' RT
 -L LT- STA. 48+60.08 47.5' LT
 EL. 2609.74' END WALL



MATCHLINE -RW5- STA. 20+75, SEE SHEET 3



PROJECT REFERENCE NO.	SHEET NO.
B-3186/B-5898	5
-RW5- PROFILE	



-RW5- STA. 16+51.22 =
 -YIRT- STA. 16+50.00 30.68' RT
 EL. 2585.39'
 BEGIN WALL

-RW5- STA. 16+51.22 =
 -YIRT- STA. 16+50.00 30.68' RT
 EL. 2583.77'
 BEGIN WALL

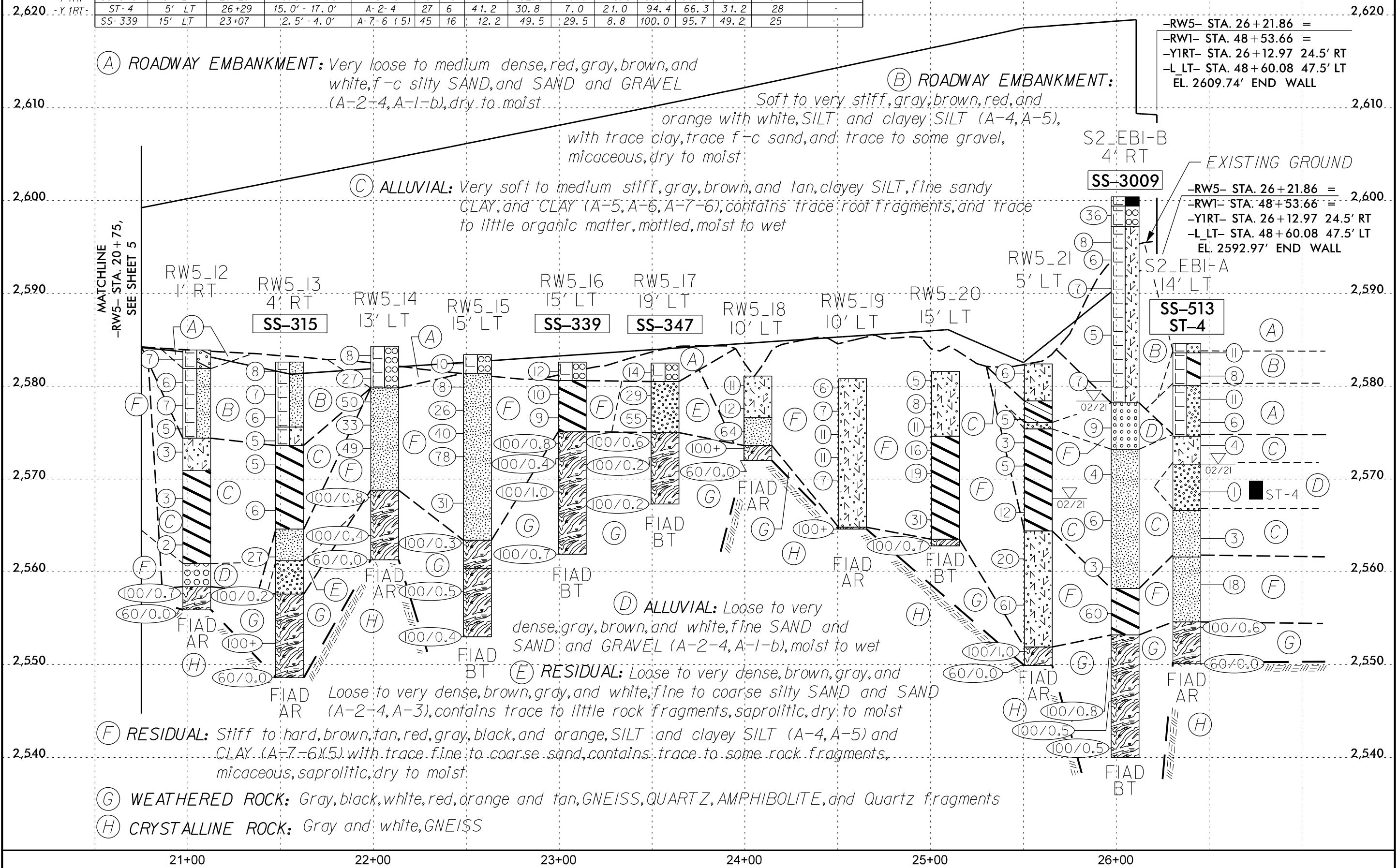
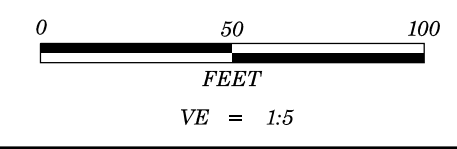
- (A) ROADWAY EMBANKMENT: Loose to medium dense, red, gray, and brown, silty SAND and GRAVEL (A-1-b), dry
- (E) RESIDUAL: Very loose to very dense, brown, gray, red, and white, fine to coarse silty SAND, SAND (A-2-4, A-3), and SAND and GRAVEL (A-1-b); contains trace to little rock fragments, saprolitic, dry to moist
- (F) RESIDUAL: Soft to hard, brown, tan, red, gray, black, white, and orange, SILT and clayey SILT (A-4, A-5), with trace fine to coarse sand, contains trace to some rock fragments, micaceous, saprolitic, dry to moist
- (G) WEATHERED ROCK: Gray, black, white, red, orange and tan, GNEISS, GRANITE, and Quartz fragments
- (H) CRYSTALLINE ROCK: Gray and white, GNEISS

-RW5-

17+00 18+00 19+00 20+00

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-315	3' RT	21+55	2.5' - 4.0'	A-4 (1)	38	8	28.5	29.9	34.3	7.3	94.2	75.9	45.9	21	-
SS-339	15' LT	23+07	2.5' - 4.0'	A-7-6 (5)	45	16	12.2	49.5	29.5	8.8	100.0	95.7	49.2	25	-
SS-347	19' LT	23+57	5.0' - 6.5'	A-2-4	34	8	39.8	31.4	18.9	9.9	96.5	70.5	33.6	11	-
SS-3009	44' RT	25+96	38.9' - 40.4'	A-4	37	8	26.8	36.0	25.4	11.8	86.6	72.3	36.7	43	-
SS-513	5' LT	26+29	10.0' - 11.5'	A-5 (9)	48	10	4.1	32.5	49.9	13.5	100.0	98.0	74.1	51	-
ST-4	5' LT	26+29	15.0' - 17.0'	A-2-4	27	6	41.2	30.8	7.0	21.0	94.4	66.3	31.2	28	-
SS-339	15' LT	23+07	2.5' - 4.0'	A-7-6 (5)	45	16	12.2	49.5	29.5	8.8	100.0	95.7	49.2	25	-



GEOTECHNICAL BORING REPORT BORE LOG

WBS 38332.1.FS1			TIP B-3186 / B-5898			COUNTY HAYWOOD			GEOLOGIST C. Swafford							
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13								GROUND WTR (ft)								
BORING NO. RW5_1		STATION 15+52		OFFSET 9 ft LT		ALIGNMENT -RW5-		0 HR. Dry								
COLLAR ELEV. 2,583.0 ft		TOTAL DEPTH 20.0 ft		NORTHING 666,845		EASTING 818,199		24 HR. FIAD								
DRILL RIG/HAMMER EFF./DATE GTC CME 75 183277				DRILL METHOD H.S. Augers				HAMMER TYPE Automatic								
DRILLER K. Boone		START DATE 02/25/21		COMP. DATE 02/25/21		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)		
2585															2,583.0 GROUND SURFACE 0.0	
	2,582.1	0.9	8	16	9										2,582.1 0.9' PAVEMENT 0.9	
2580	2,579.5	3.5	6	4	3										RESIDUAL Loose to medium dense, brown, f-c SAND (A-3), contains trace rock fragments	
	2,577.2	5.8	6	7	7										2,577.5 5.5	
2575	2,574.5	8.5	6	8	8										Stiff to very stiff, brown, tan, and orange, SILT (A-4), micaceous	
	2,569.5	13.5	3	5	8											
2570																
	2,564.5	18.5	4	7	9											
2565																
															2,563.0 Boring Terminated at Elevation 2,563.0 ft in SILT 20.0	

WBS 38332.1.FS1			TIP B-3186 / B-5898			COUNTY HAYWOOD			GEOLOGIST N. Yacobi							
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13								GROUND WTR (ft)								
BORING NO. RW5_2		STATION 16+54		OFFSET 16 ft LT		ALIGNMENT -RW5-		0 HR. Dry								
COLLAR ELEV. 2,583.8 ft		TOTAL DEPTH 20.0 ft		NORTHING 666,847		EASTING 818,249		24 HR. FIAD								
DRILL RIG/HAMMER EFF./DATE GTC CME 75 183277				DRILL METHOD H.S. Augers				HAMMER TYPE Automatic								
DRILLER K. Boone		START DATE 02/13/21		COMP. DATE 02/13/21		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)		
2585															2,583.8 GROUND SURFACE 0.0	
	2,583.0	0.8	2	4	6										2,583.0 0.8' Pavement 0.8	
2580	2,580.3	3.5	5	6	7										ROADWAY EMBANKMENT Loose to medium dense, red and brown, silty GRAVEL (A-1-b) 3.0	
	2,577.8	6.0	4	7	10										RESIDUAL Stiff, red and brown, SILT (A-4), micaceous 5.5	
2575	2,575.3	8.5	3	8	13										Very stiff, gray, clayey SILT (A-5), micaceous, saprolitic	
	2,570.3	13.5	3	8	11											
2570																
	2,565.3	18.5	4	8	12											
2565																
															2,563.8 Boring Terminated at Elevation 2,563.8 ft in SILT 20.0	

NCDOT BORE DOUBLE_B3186_GEO_SPT.GPJ_NC_DOT.GDT_7/8/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)								
BORING NO. RW5_3		STATION 16+52		OFFSET 16 ft LT		ALIGNMENT -RW5-									
COLLAR ELEV. 2,584.8 ft		TOTAL DEPTH 11.9 ft		NORTHING 666,842		EASTING 818,299									
DRILL RIG/HAMMER EFF./DATE GTC CME 75 183277			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER K. Boone		START DATE 02/13/21		COMP. DATE 02/13/21		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					
2585	2,583.9	0.9	2	4	6									2,584.8 GROUND SURFACE 0.0	
	2,583.9													2,583.9 0.9' PAVEMENT 0.9	
2580	2,581.3	3.5	3	4	7									RESIDUAL Stiff, red and brown, clayey SILT (A-5), contains trace rock fragments, micaceous, saprolitic	
	2,578.8	6.0	5	6	6										
	2,576.3	8.5	3	4	6										
2575	2,572.9	11.9													
			60/0.0											2,572.9 11.9	
Boring Terminated with Standard Penetration Test Refusal at Elevation 2,572.9 ft on Crystalline Rock (GNEISS). A.R. at a depth of 11.9'.															

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)								
BORING NO. RW5_4		STATION 17+02		OFFSET 15 ft LT		ALIGNMENT -RW5-									
COLLAR ELEV. 2,585.7 ft		TOTAL DEPTH 5.7 ft		NORTHING 666,837		EASTING 818,349									
DRILL RIG/HAMMER EFF./DATE GTC CME 75 183277			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER K. Boone		START DATE 02/13/21		COMP. DATE 02/13/21		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					
2590														2,585.7 GROUND SURFACE 0.0	
														2,584.9 0.8' Pavement 0.8	
2585	2,584.9	0.8	3	4	5									RESIDUAL Stiff, red and gray, clayey SILT (A-5), contains trace rock fragments, micaceous	
	2,582.2	3.5													2,582.2 3.5
2580	2,580.1	5.6												WEATHERED ROCK Gray and white, GNEISS	
															2,580.1 5.6
														CRYSTALLINE ROCK Gray and white, GNEISS	
															2,580.0 5.7
Boring Terminated with Standard Penetration Test Refusal at Elevation 2,580.0 ft in Crystalline Rock (GNEISS). A.R. at a depth of 5.6'.															

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC_DOT.GDT 7/8/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)								
BORING NO. RW5_5		STATION 17+52		OFFSET 14 ft LT		ALIGNMENT -RW5-									
COLLAR ELEV. 2,586.3 ft		TOTAL DEPTH 5.4 ft		NORTHING 666,834		EASTING 818,399									
DRILL RIGHAMMER EFF./DATE GTC3277 CME-75 83%(09/15/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER K. Boone		START DATE 02/13/21		COMP. DATE 02/14/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2590															
2585	2,585.7	0.6	7	5	7								D	2,586.3 GROUND SURFACE 0.0 2,585.7 0.6' PAVEMENT 0.6	
	2,582.8	3.5	5	11	17								D	2,583.3 RESIDUAL 3.0 Stiff, red and brown, clayey SILT (A-5), with trace gravel (quartz)	
	2,580.9	5.4											D	2,580.9 Medium dense, red, gray, and white, f-c SAND and GRAVEL (A-1-b), with some silt 5.4 Boring Terminated with Standard Penetration Test Refusal at Elevation 2,580.9 ft on Crystalline Rock (GNEISS). A.R. at a depth of 5.4'.	

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)								
BORING NO. RW5_6		STATION 18+03		OFFSET 14 ft LT		ALIGNMENT -RW5-									
COLLAR ELEV. 2,586.7 ft		TOTAL DEPTH 8.4 ft		NORTHING 666,831		EASTING 818,450									
DRILL RIGHAMMER EFF./DATE GTC3277 CME-75 83%(09/15/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER K. Boone		START DATE 02/14/21		COMP. DATE 02/14/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2590															
2585	2,586.2	0.5	5	4	10								D	2,586.7 GROUND SURFACE 0.0 2,586.2 0.5' PAVEMENT 0.5	
	2,583.2	3.5	5	4	9								D	2,583.2 RESIDUAL 3.0 Stiff to hard, red, brown, and gray, clayey SILT (A-5), with trace f-c sand and rock fragments (quartz), micaceous, saprolitic	
2580	2,580.7	6.0	4	11	29								D	2,580.7 6.0	
	2,578.3	8.4											D	2,578.3 8.4 Boring Terminated with Standard Penetration Test Refusal at Elevation 2,578.3 ft on Crystalline Rock (GNEISS). A.R. at a depth of 8.4'.	

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)								
BORING NO. RW5_7		STATION 18+53		OFFSET 2 ft RT		ALIGNMENT -RW5-									
COLLAR ELEV. 2,585.7 ft		TOTAL DEPTH 12.5 ft		NORTHING 666,814		EASTING 818,499									
DRILL RIGHAMMER EFF./DATE GTC3277 CME-75 83%(09/15/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER K. Boone		START DATE 02/14/21		COMP. DATE 02/14/21		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					
2590															
2585	2,585.0	0.7	2	4	4									2,585.7 GROUND SURFACE 0.0 2,585.0 0.7' PAVEMENT 0.7	
2580	2,582.2	3.5	3	4	3								D	RESIDUAL Soft to stiff, red and brown, clayey SILT (A-5), with trace gravel (quartz)	
	2,579.7	6.0	2	1	2								D	No recovery	
2575	2,577.2	8.5	4	4	3								D	Medium stiff, red and brown with white, SILT (A-4), with few gravel (well-rounded quartz)	
	2,573.2	12.5	60/0.0											Boring Terminated with Standard Penetration Test Refusal at Elevation 2,573.2 ft on Crystalline Rock (GNEISS). A.R. at a depth of 12.5'.	

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)								
BORING NO. RW5_8		STATION 19+03		OFFSET 2 ft RT		ALIGNMENT -RW5-									
COLLAR ELEV. 2,585.8 ft		TOTAL DEPTH 23.7 ft		NORTHING 666,813		EASTING 818,550									
DRILL RIGHAMMER EFF./DATE GTC3277 CME-75 83%(09/15/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER K. Boone		START DATE 02/15/21		COMP. DATE 02/15/21		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					
2590															
2585	2,585.8	0.0	7	5	3									2,585.8 GROUND SURFACE 0.0	
2580	2,583.3	2.5	6	4	6								M	RESIDUAL Stiff, brown, clayey SILT (A-5), micaceous	
	2,580.8	5.0	5	3	5								D	Medium stiff to stiff, brown and black, SILT (A-4)	
2575	2,578.3	7.5	7	7	10								M	Stiff, red and brown, clayey SILT (A-5)	
	2,575.8	10.0	5	8	9								D	Stiff, red, brown, and tan, SILT (A-4), micaceous, saprolitic	
2570	2,570.8	15.0	3	5	7								D		
2565	2,565.8	20.0	5	7	10								D		
	2,562.1	23.7	60/0.0											Boring Terminated with Standard Penetration Test Refusal at Elevation 2,562.1 ft on Crystalline Rock (GNEISS). A.R. at a depth of 23.7'.	

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC_DOT.GDT 11/5/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)									
BORING NO. RW5_9		STATION 19+54		OFFSET 3 ft RT		ALIGNMENT -RW5-										
COLLAR ELEV. 2,585.8 ft		TOTAL DEPTH 19.5 ft		NORTHING 666,813		EASTING 818,600										
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wansrath		START DATE 03/14/21		COMP. DATE 03/14/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2590																
2585	2,585.8	0.0	5	2	3								D		2,585.8	GROUND SURFACE
	2,583.3	2.5	4	23	29								D		2,583.8	RESIDUAL Loose, brown, silty SAND (A-2-4), with some gravel
2580	2,580.8	5.0	33	44	42								D		2,581.3	Very stiff, brown and red, SILT (A-4), contains some rock fragments
	2,578.3	7.5	28	28	29								D		2,576.3	Very dense, brown and black, f-c silty SAND (A-2-4), contains trace rock fragments, saprolitic
2575	2,575.8	10.0	16	10	9								D		2,576.3	Very stiff, brown, SILT (A-4), with trace f sand
2570	2,570.8	15.0	62	90	47								D		2,570.8	WEATHERED ROCK White and tan, GRANITE and quartz fragments
	2,566.3	19.5	60/0.0												2,566.3	Boring Terminated with Standard Penetration Test Refusal at Elevation 2,566.3 ft on Crystalline Rock (GNEISS). A.R. at a depth of 19.5'.

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)									
BORING NO. RW5_10		STATION 20+04		OFFSET 2 ft RT		ALIGNMENT -RW5-										
COLLAR ELEV. 2,584.9 ft		TOTAL DEPTH 25.6 ft		NORTHING 666,815		EASTING 818,651										
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wansrath		START DATE 03/16/21		COMP. DATE 03/16/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2585	2,584.9	0.0	3	1	1										2,584.9	GROUND SURFACE
	2,582.4	2.5	4	5	7								D		2,582.9	ROADWAY EMBANKMENT Very loose, brown, silty SAND (A-2-4)
2580	2,579.9	5.0	8	8	8								D			RESIDUAL Stiff to very stiff, brown, black and red, SILT (A-4), with trace f-c sand, micaceous, saprolitic
	2,577.4	7.5	8	9	12								D			
2575	2,574.9	10.0	11	8	12								D			
2570	2,569.9	15.0	71	39/0.1									D		2,569.9	WEATHERED ROCK Light tan and white, GRANITE and quartz fragments
2565	2,564.9	20.0	100/0.5										D		2,566.9	Dark brown, black, and red, GNEISS
2560	2,559.9	25.0	69	31/0.1									D		2,559.3	Boring Terminated at Elevation 2,559.3 ft in Weathered Rock (GNEISS)

GEOTECHNICAL BORING REPORT BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi											
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)										
BORING NO. RW5_11		STATION 20+55		OFFSET 2 ft RT		ALIGNMENT -RW5-											
COLLAR ELEV. 2,584.5 ft		TOTAL DEPTH 26.6 ft		NORTHING 666,816		EASTING 818,701											
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER L. Wansrath		START DATE 03/16/21		COMP. DATE 03/16/21		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
2585	2,584.5	0.0	4	2	4										2,584.5	GROUND SURFACE	0.0
2580	2,582.0	2.5	5	3	3								D	RESIDUAL Medium stiff to stiff, red, brown, and gray, SILT (A-4), with trace f-c sand and clay, micaceous			
	2,579.5	5.0	3	3	3								D				
2575	2,577.0	7.5	2	2	2								M				
	2,574.5	10.0	3	3	3								D				
2570	2,569.5	15.0	3	4	4								D				
	2,566.5	20.0	30	35	43								D				Very dense, gray and brown, f silty SAND (A-2-4)
2560	2,559.5	25.0	10	14	25								D				
	2,557.9	26.6	60/0.0										D				Boring Terminated with Standard Penetration Test Refusal at Elevation 2,557.9 ft on Crystalline Rock (GNEISS). A.R. at a depth of 26.6'.

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi											
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)										
BORING NO. RW5_12		STATION 21+05		OFFSET CL		ALIGNMENT -RW5-											
COLLAR ELEV. 2,583.9 ft		TOTAL DEPTH 28.0 ft		NORTHING 666,821		EASTING 818,751											
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER L. Wansrath		START DATE 03/15/21		COMP. DATE 03/16/21		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
2585	2,583.9	0.0	4	3	4										2,583.9	GROUND SURFACE	0.0
2580	2,581.4	2.5	3	2	4								D	ROADWAY EMBANKMENT Loose, gray and brown, clayey SAND (A-2-6), with trace gravel Medium stiff, brown, SILT (A-4), with trace clay, micaceous			
	2,578.9	5.0	6	4	3								M				
2575	2,576.4	7.5	2	3	2								M				
	2,573.9	10.0	2	1	2								M				
2570	2,568.9	15.0	1	1	2								M	ALLUVIAL Soft, tan and light grayish brown, clayey SILT (A-5), contains trace root fragments, mottled Very soft, dark gray and brown, silty CLAY (A-7-6), contains trace root fragments, mottled			
	2,563.9	20.0	1	1	1								M				
2560	2,558.9	25.0	11	50	50/0.2								W	Very dense, brown and white, SAND and GRAVEL (A-1-b)			
	2,555.9	28.0	60/0.0										W				WEATHERED ROCK Red and brown, GNEISS
																Boring Terminated with Standard Penetration Test Refusal at Elevation 2,555.9 ft on Crystalline Rock (GNEISS). A.R. at a depth of 28.0'.	

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger								
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)							
BORING NO. RW5_15		STATION 22+56		OFFSET 15 ft LT		ALIGNMENT -RW5-								
COLLAR ELEV. 2,583.4 ft		TOTAL DEPTH 30.4 ft		NORTHING 666,846		EASTING 818,901								
DRILL RIGHAMMER EFF./DATE GTC9083 CME-550X 80%(11/24/2020)			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 02/13/21		COMP. DATE 02/13/21		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				
2585	2,583.4	0.0	4	6	4								2,583.4 GROUND SURFACE 0.0	
2580	2,580.9	2.5	2	2	6							D	2,581.4 ROADWAY EMBANKMENT 2.0	
	2,578.4	5.0	12	12	14							D	RESIDUAL Loose to medium dense, brown, black, and orange, SAND and GRAVEL (A-1-b)	
2575	2,575.9	7.5	6	15	25							D	RESIDUAL Medium dense to very dense, gray and white, f-c silty SAND (A-2-4), saprolitic	
	2,573.4	10.0	29	33	45							D		
2570	2,568.4	15.0	8	14	17							D		
	2,563.4	20.0	100/0.3									D	2,563.4 WEATHERED ROCK 20.0	
2560	2,558.4	25.0	100/0.5									D	2,560.4 WEATHERED ROCK 23.0	
	2,553.4	30.0	100/0.4									D	2,553.0 WEATHERED ROCK 30.4	
Boring Terminated at Elevation 2,553.0 ft in Weathered Rock (AMPHIBOLITE)														

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger								
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)							
BORING NO. RW5_16		STATION 23+07		OFFSET 15 ft LT		ALIGNMENT -RW5-								
COLLAR ELEV. 2,582.6 ft		TOTAL DEPTH 20.7 ft		NORTHING 666,852		EASTING 818,951								
DRILL RIGHAMMER EFF./DATE GTC9083 CME-550X 80%(11/24/2020)			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 02/13/21		COMP. DATE 02/13/21		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				
2585	2,582.6	0.0	4	6	6								2,582.6 GROUND SURFACE 0.0	
2580	2,580.1	2.5	5	5	5							D	2,580.6 ROADWAY EMBANKMENT 2.0	
	2,577.6	5.0	3	4	5							D	RESIDUAL Medium dense, brown, black, and orange, SAND and GRAVEL (A-1-b)	
2575	2,575.1	7.5	11	48	52/0.3							D	RESIDUAL Stiff, brown and orange, f sandy, silty CLAY (A-7-6)(5), highly micaceous, saprolitic (gneiss)	
	2,572.6	10.0	100/0.4									D	WEATHERED ROCK Brown and orange, GNEISS with some quartz fragments	
2570	2,569.6	13.0	11	37	63/0.5							D		
	2,562.6	20.0	53	47/0.2								D	2,561.9 WEATHERED ROCK 20.7	
Boring Terminated at Elevation 2,561.9 ft in Weathered Rock (GNEISS)														

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC_DOT.GDT 8/12/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger									
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)								
BORING NO. RW5_17		STATION 23+57		OFFSET 19 ft LT		ALIGNMENT -RW5-									
COLLAR ELEV. 2,582.5 ft		TOTAL DEPTH 15.2 ft		NORTHING 666,861		EASTING 819,000									
DRILL RIG/HAMMER EFF./DATE GTC CME550X 9083			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 02/13/21		COMP. DATE 02/13/21		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					
2585	2,582.5	0.0	4	6	8								2,582.5 GROUND SURFACE 0.0		
2580	2,580.0	2.5	11	13	16							D	2,580.5 ROADWAY EMBANKMENT Medium dense, brown and orange, SAND and GRAVEL (A-1-b) 2.0		
	2,577.5	5.0	27	27	28							D	RESIDUAL Medium dense to very dense, brown, tan and white, f-c silty SAND (A-2-4), with trace clay, micaceous 7.5		
2575	2,575.0	7.5	36	64/0.1								SS-347 11%	WEATHERED ROCK Brown, tan, and white, GNEISS 7.5		
	2,572.5	10.0	100/0.2										100/0.6 100/0.2		
2570	2,567.5	15.0	100/0.2										100/0.2	2,567.3 Boring Terminated at Elevation 2,567.3 ft in Weathered Rock (GNEISS) 15.2	

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi								
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)							
BORING NO. RW5_18		STATION 24+07		OFFSET 10 ft LT		ALIGNMENT -RW5-								
COLLAR ELEV. 2,581.1 ft		TOTAL DEPTH 9.1 ft		NORTHING 666,859		EASTING 819,051								
DRILL RIG/HAMMER EFF./DATE GTC CME 550X 9083			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic								
DRILLER K. Boone		START DATE 02/15/21		COMP. DATE 02/15/21		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				
2585	2,581.1	0.0	2	5	6								2,581.1 GROUND SURFACE 0.0	
2580	2,578.6	2.5	4	5	7							M	RESIDUAL Stiff, brown, clayey SILT (A-5), micaceous, contains trace rock fragments 4.5	
	2,576.1	5.0	26	27	37							M	2,576.6 Hard, brown, SILT (A-4), saprolitic 4.5	
2575	2,573.6	7.5	4/0.3		60/0.0							D	2,573.6 WEATHERED ROCK Brown, GNEISS 7.5	
	2,572.0	9.1	60/0.0		60/0.0								2,572.0 Boring Terminated with Standard Penetration Test Refusal at Elevation 2,572.0 ft in Crystalline Rock (GNEISS). A.R. at a depth of 9.1'. 9.1	

NCDOT BORE DOUBLE_B3186_GEO_SPT.GPJ NC_DOT.GDT 7/8/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)								
BORING NO. RW5_19		STATION 24+58		OFFSET 10 ft LT		ALIGNMENT -RW5-									
COLLAR ELEV. 2,580.8 ft		TOTAL DEPTH 16.2 ft		NORTHING 666,866		EASTING 819,101									
DRILL RIG/HAMMER EFF./DATE GTC CME 550X 9083				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER K. Boone		START DATE 02/15/21		COMP. DATE 02/15/21		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					
2585															
2580	2,580.8	0.0												2,580.8	0.0
	2,578.3	2.5	2	3	3										
	2,575.8	5.0	1	2	5										
2575	2,575.8	5.0	3	4	7										
	2,573.3	7.5	2	5	6										
2570	2,570.8	10.0	1	3	4										
	2,565.8	15.0	1	9	60/0.2										
														2,564.8	16.0
														2,564.6	16.2
WEATHERED ROCK Brown, white, and tan, GNEISS Boring Terminated with Standard Penetration Test Refusal at Elevation 2,564.6 ft in Weathered Rock (GNEISS)															

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)								
BORING NO. RW5_20		STATION 25+08		OFFSET 15 ft LT		ALIGNMENT -RW5-									
COLLAR ELEV. 2,581.6 ft		TOTAL DEPTH 18.8 ft		NORTHING 666,879		EASTING 819,149									
DRILL RIG/HAMMER EFF./DATE GTC CME 550X 9083				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER K. Boone		START DATE 02/14/21		COMP. DATE 02/14/21		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					
2585															
	2,581.6	0.0												2,581.6	0.0
2580	2,579.1	2.5	1	2	3										
	2,576.6	5.0	4	3	5										
2575	2,576.6	5.0	3	4	7										
	2,574.1	7.5	4	6	10										
2570	2,571.6	10.0	5	7	12										
	2,566.6	15.0	7	13	18										
2565	2,563.5	18.1	35	65/0.2										2,563.5	18.1
	2,562.8	18.8												2,562.8	18.8
WEATHERED ROCK Brown, white, and tan, GNEISS Boring Terminated with Standard Penetration Test Refusal at Elevation 2,562.8 ft on Crystalline Rock (GNEISS). A.R. at a depth of 18.8'.															

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC_DOT.GDT 7/8/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)									
BORING NO. RW5_21		STATION 25+58		OFFSET 5 ft LT		ALIGNMENT -RW5-										
COLLAR ELEV. 2,582.4 ft		TOTAL DEPTH 32.5 ft		NORTHING 666,877		EASTING 819,201										
DRILL RIG/HAMMER EFF./DATE GTC CME 550X 9083				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER K. Boone		START DATE 02/14/21		COMP. DATE 02/14/21		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)		
2585														2,582.4	0.0	GROUND SURFACE
2580	2,582.4	0.0	3	2	4	6						M		2,578.4	4.0	ALLUVIAL Medium stiff, brown, clayey SILT (A-5), with trace sand, micaceous
	2,577.4	5.0	3	2	3	5						M		2,576.1	6.3	Medium stiff, gray, sandy CLAY (A-6)
2575	2,574.9	7.5	2	1	2	3						M		2,575.4	7.0	Loose, gray, fine SAND (A-2-4)
	2,572.4	10.0	2	3	2	5						M				Soft to stiff, gray, CLAY (A-7-6), with few F-c sand lenses, contains little organic matter
2570																
	2,567.4	15.0	7	6	6	12							Sat.			
2565														2,564.4	18.0	RESIDUAL
	2,562.4	20.0	3	5	15	20							Sat.			Very stiff to hard, gray, brown, white, and red, clayey SILT (A-5), saprolitic
2560																
	2,557.4	25.0	14	18	43	31										
2555																
	2,552.4	30.0	18	35	65/0.5									2,551.9	30.5	WEATHERED ROCK
2550	2,549.9	32.5	60/0.0											2,549.9	32.5	Brown, tan, orange, and white, GNEISS
																Boring Terminated with Standard Penetration Test Refusal at Elevation 2,549.9 ft on Crystalline Rock (GNEISS). A.R. at a depth of 32.5'.

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC_DOT.GDT 7/8/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST C. Swafford										
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)									
BORING NO. S2_EB1-B		STATION 25+96		OFFSET 44 ft RT		ALIGNMENT -Y1RT-										
COLLAR ELEV. 2,600.4 ft		TOTAL DEPTH 60.4 ft		NORTHING 666,863		EASTING 819,251										
DRILL RIGHAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)			DRILL METHOD Mud Rotary			HAMMER TYPE Automatic										
DRILLER K. Boone		START DATE 02/27/21		COMP. DATE 02/27/21		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						
2605																
2600	2,599.4	1.0	11	20	16											
	2,596.5	3.9	6	4	4											
2595	2,594.6	5.8	6	3	3											
	2,591.5	8.9	4	3	4											
2590																
	2,586.5	13.9	3	2	3											
2585																
	2,581.5	18.9	3	3	4											
2580																
	2,576.5	23.9	4	4	5											
2575																
	2,571.5	28.9	3	3	1											
2570																
	2,566.5	33.9	1	3	3											
2565																
	2,561.5	38.9	WOH	1	2											
2560																
	2,556.5	43.9	18	27	33											
2555																
	2,551.5	48.9	32	68/0.3												
2550																
	2,546.5	53.9	86	14/0.0												
2545																
	2,541.5	58.9	79	21/0.0												
2540																
Boring Terminated at Elevation 2,540.0 ft in Weathered Rock (GNEISS)																

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST C. Swafford										
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)									
BORING NO. S2_EB1-A		STATION 26+29		OFFSET 5 ft LT		ALIGNMENT -Y1RT-										
COLLAR ELEV. 2,584.6 ft		TOTAL DEPTH 34.5 ft		NORTHING 666,917		EASTING 819,274										
DRILL RIGHAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 02/25/21		COMP. DATE 02/25/21		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						
2585	2,584.6	0.0	5	7	4											
	2,582.1	2.5	3	4	4											
2580	2,579.6	5.0	6	5	6											
	2,577.1	7.5	3	3	3											
2575	2,574.6	10.0	3	2	2											
	2,569.6	15.0	1	WOH	1											
2570																
	2,564.6	20.0	1	1	2											
2565																
	2,559.6	25.0	4	7	11											
2560																
	2,554.6	30.0	90	10/0.1												
2555																
	2,550.1	34.5	60/0.0													
Boring Terminated with Standard Penetration Test Refusal at Elevation 2,550.1 ft on Crystalline Rock (GNEISS)																
Other Samples: ST-4 (15.0 - 17.0)																

NCDOT BORE DOUBLE B3186_GEO_SITE 2.GPJ NC DOT.GDT 8/12/21

REFERENCE: B-3186/B-5898

PROJECT: 38332/48030

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5-II	BORE LOGS, CORE LOGS & CORE PHOTOGRAPHIC RECORDS

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY HAYWOOD
PROJECT DESCRIPTION US 23/US 74/US 19 (GREAT SMOKY MOUNTAIN HWY) FROM WEST OF NC 209 (CRABTREE RD.) TO EAST OF RUSS AVE.
SITE DESCRIPTION RETAINING WALL #6 FROM -L LT- STA. 70+03.33 TO 73+97.95

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3186/B-5898	1	11

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

J. CRENSHAW
N. YACOBI
R. DUGGER
GEOTECHNOLOGY, INC.

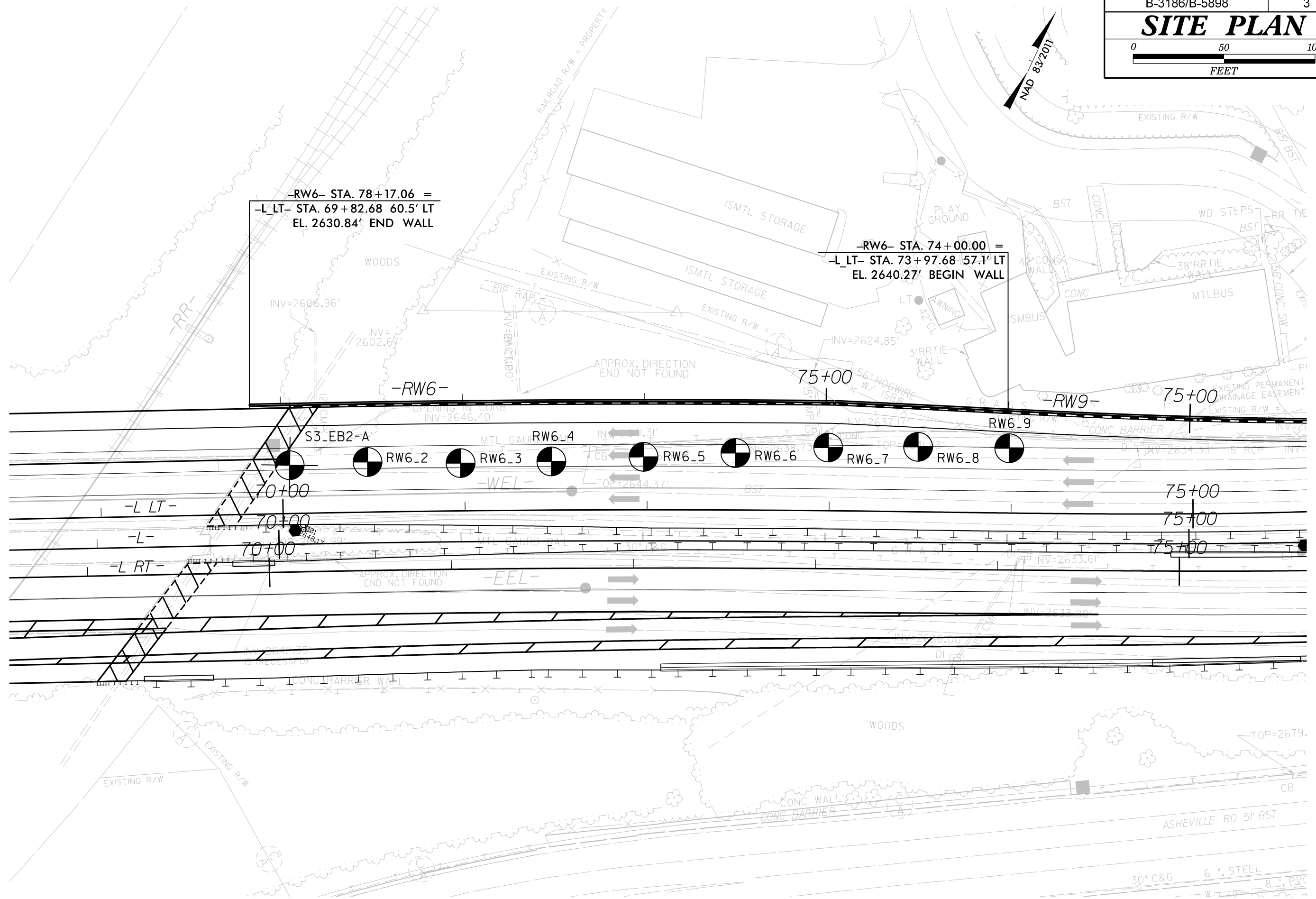
INVESTIGATED BY C. SWAFFORD
DRAWN BY T. LYNN
CHECKED BY K. BUSSEY
SUBMITTED BY HDR
DATE NOVEMBER 2021

HDR HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-01116



SIGNATURE _____ DATE _____

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



-RW6- STA. 78+17.06 =
 -L LT- STA. 69+82.68 60.5' LT
 EL. 2630.84' END WALL

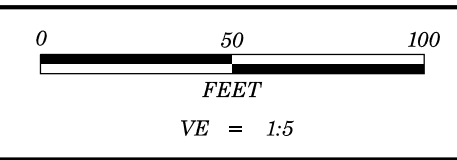
-RW6- STA. 74+00.00 =
 -L LT- STA. 73+97.68 57.1' LT
 EL. 2640.27' BEGIN WALL

S3_EB2-A
 70+00

RW6_2 RW6_3 RW6_4 RW6_5 RW6_6 RW6_7 RW6_8 RW6_9

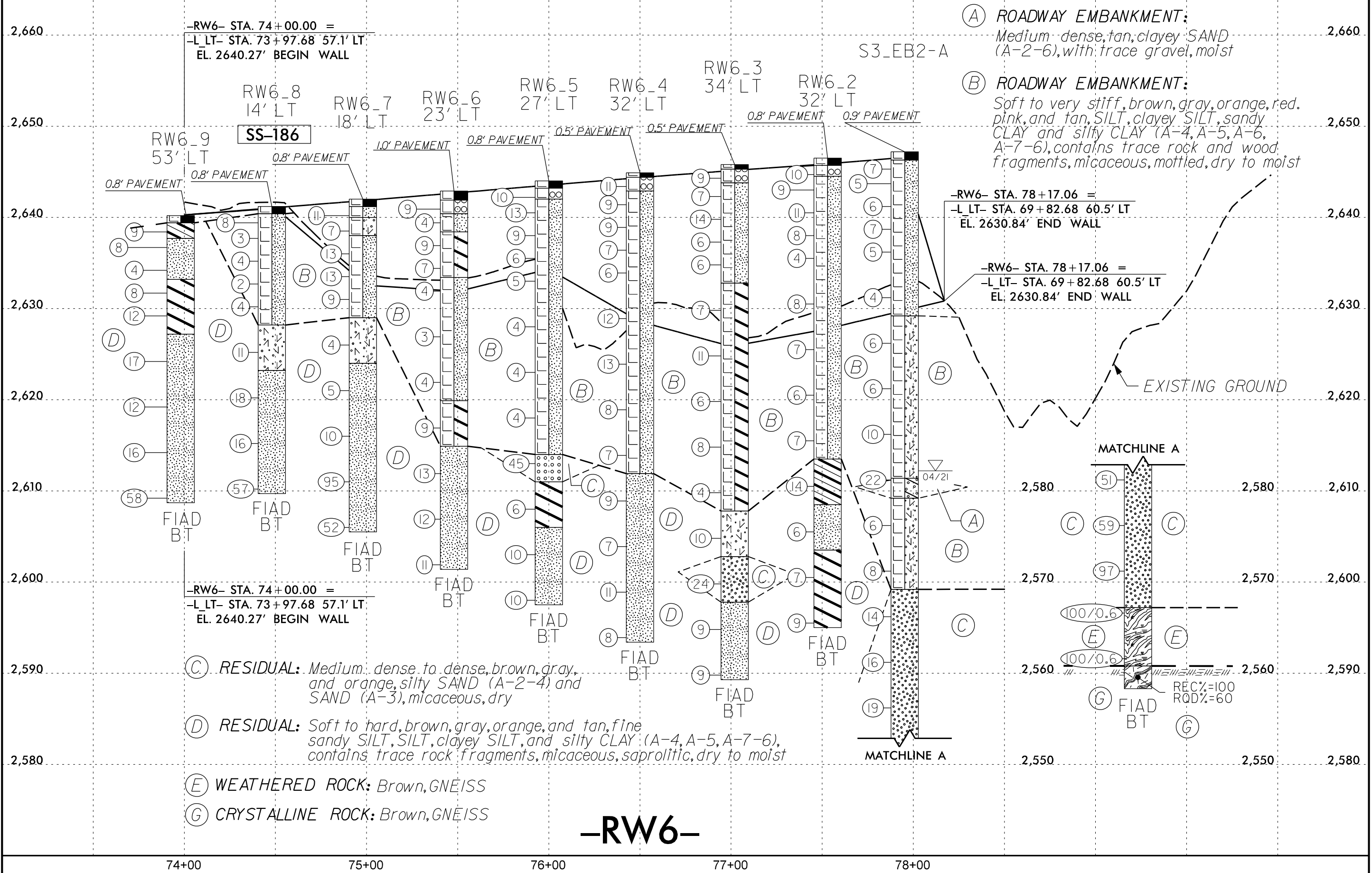
75+00
 75+00
 75+00

30" C&G 6" STEEL 8" PVC



PROJECT REFERENCE NO.	SHEET NO.
B-3186/B-5898	4
-RW6- PROFILE	

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-186	15' LT	74+48	7.5' - 9.0'	A-4	32	4	22.9	33.3	30.7	13.1	97.7	84.3	50.7	21	-



-RW6-

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST J. Crenshaw	
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)
BORING NO. S3_EB2-A		STATION 70+07		OFFSET 43 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 2,647.2 ft		TOTAL DEPTH 88.9 ft		NORTHING 667,892		EASTING 821,164	
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic		
DRILLER L. Wanstrath		START DATE 04/12/21		COMP. DATE 04/13/21		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2650																
	2,646.3	0.9													2,647.2	0.0
	2,644.7	2.5	3	4	3									2,646.3	0.9	
2645	2,644.7	2.5	3	2	3											
	2,642.2	5.0	3	3	3											
2640	2,639.7	7.5	2	3	4											
	2,637.2	10.0	2	3	2											
2635	2,632.2	15.0	2	2	2											
2630	2,627.2	20.0	2	2	4											
2625	2,622.2	25.0	2	2	4											
2620	2,617.2	30.0	4	4	6											
2615	2,612.2	35.0	10	14	8											
2610	2,607.2	40.0	2	2	4											
2605	2,602.2	45.0	3	3	5											
2600	2,597.2	50.0	3	6	8											
2595	2,592.2	55.0	4	7	9											
2590	2,587.2	60.0	6	7	12											
2585	2,582.2	65.0	22	22	29											
2580	2,577.2	70.0	25	29	30											
2575	2,572.2	75.0	44	44	53											
2570																

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST J. Crenshaw	
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)
BORING NO. S3_EB2-A		STATION 70+07		OFFSET 43 ft LT		ALIGNMENT -L-	
COLLAR ELEV. 2,647.2 ft		TOTAL DEPTH 88.9 ft		NORTHING 667,892		EASTING 821,164	
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic		
DRILLER L. Wanstrath		START DATE 04/12/21		COMP. DATE 04/13/21		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2570																
	2,567.2	80.0	90	10/0.1											2,567.2	80.0
2565	2,562.2	85.0	85	15/0.1												
2560																

Match Line

WEATHERED ROCK
Brown, GNEISS

CRYSTALLINE ROCK
Brown, Migmatitic Biotite GNEISS


Boring Terminated at Elevation 2,558.3 ft in Crystalline Rock (GNEISS)

NOTES
Core barrel blocked off and wireline cable malfunction - Rock fell into hole when core barrel removed to retrieve core barrel. Abandoned boring to allow for time to get off road before traffic closure stop time.

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC DOT.GDT 8/10/21

GEOTECHNICAL BORING REPORT

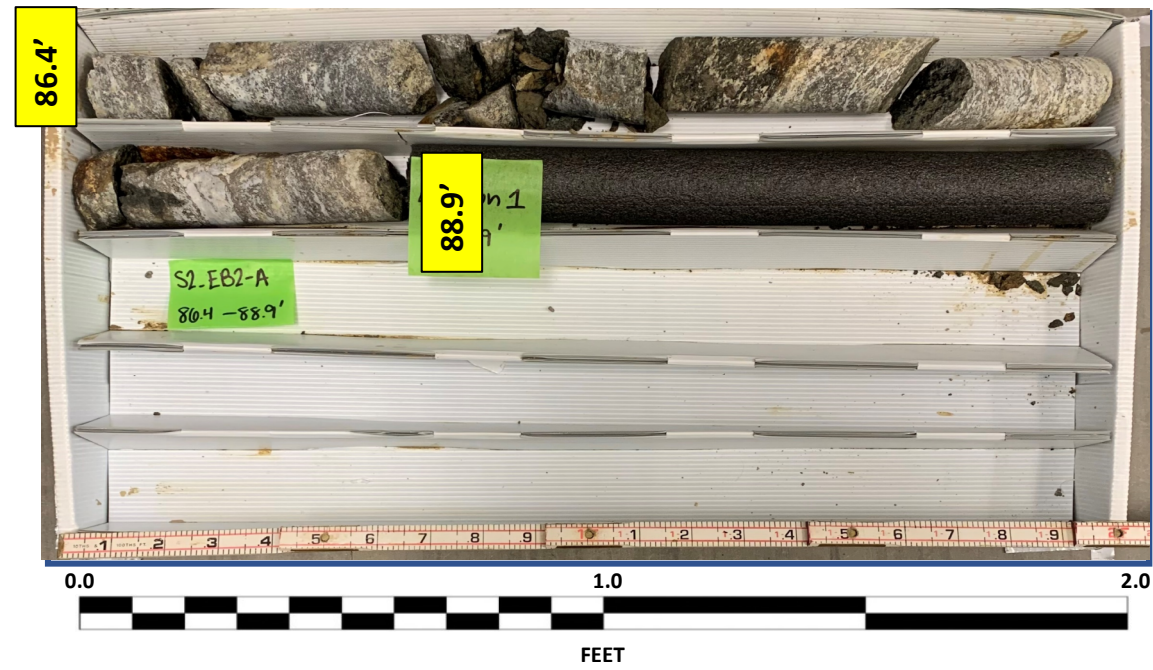
CORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST J. Crenshaw						
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)					
BORING NO. S3_EB2-A		STATION 70+07		OFFSET 43 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 2,647.2 ft		TOTAL DEPTH 88.9 ft		NORTHING 667,892		EASTING 821,164						
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic						
DRILLER L. Wanstrath		START DATE 04/12/21		COMP. DATE 04/13/21		SURFACE WATER DEPTH N/A						
CORE SIZE NQ2		TOTAL RUN 2.5 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) %				
2560.8	2560.8	86.4	2.5	1:11	(2.5)	(1.5)	(2.5)	(1.5)		Begin Coring @ 86.4 ft	86.4	
	2,558.3	88.9		1:56 2:35/0.5	100%	60%	100%	60%		2,560.8	CRYSTALLINE ROCK	86.4
										2,558.3	Brown, Migmatitic Biotite GNEISS, moderate to severe weathering, hard, close fracture spacing	88.9
<p>NOTES</p> <p>Core barrel blocked off and wireline cable malfunction - Rock fell into hole when core barrel removed to retrieve core barrel</p> <p>Abandoned boring to allow for time to get off road before traffic closure stop time</p>												

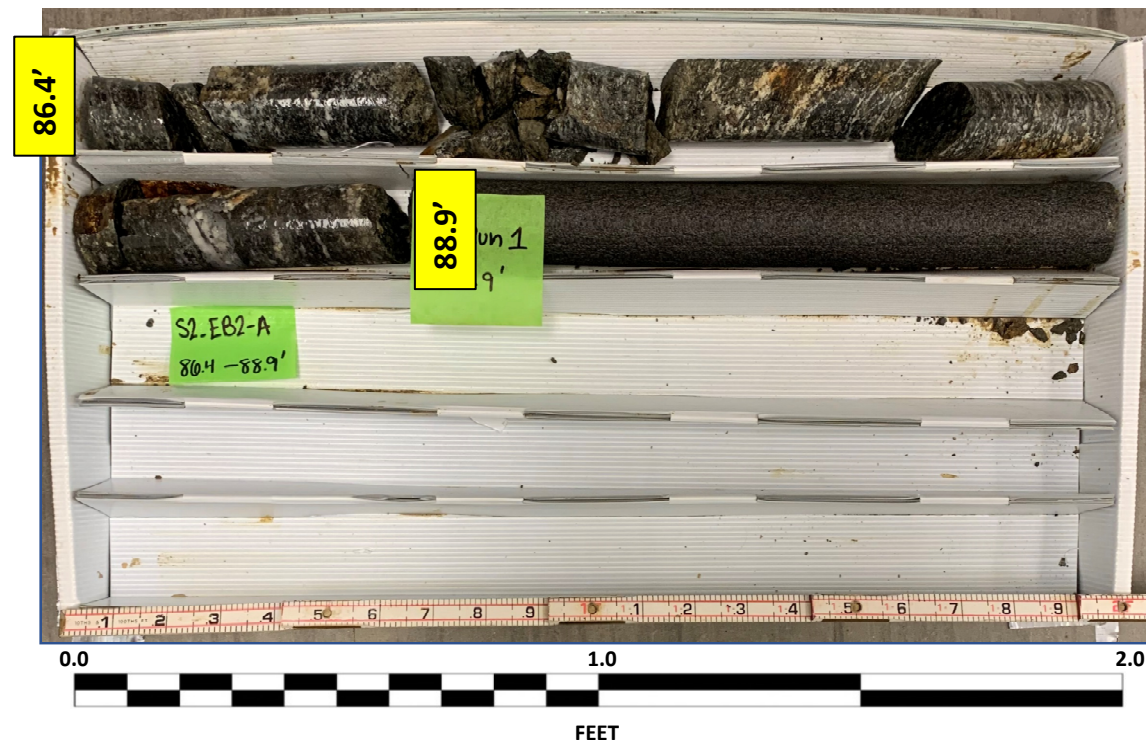
NCDOT CORE DOUBLE B3186_GEO_SPT.GPJ NC_DOT.GDT 8/10/21

CORE PHOTOGRAPHIC RECORD
38330.1.FS1 (B-3186/B-5898)
US 23/ US 74 Great Smokey Mountain Highway

S3_EB2-A
Box 1 of 1: 86.4 – 88.9 FEET
DRY



S3_EB2-A
Box 1 of 1: 86.4 – 88.9 FEET
WET



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger									
SITE DESCRIPTION Retaining Wall No. 6 from -L_LT- STA 70+03 to 73+98							GROUND WTR (ft)								
BORING NO. RW6_2		STATION 77+53		OFFSET 33 ft LT		ALIGNMENT -RW6-									
COLLAR ELEV. 2,646.5 ft		TOTAL DEPTH 51.5 ft		NORTHING 667,912		EASTING 821,202									
DRILL RIGHAMMER EFF./DATE GTC9083 CME-550X 80%(11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 02/02/21		COMP. DATE 02/02/21		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)
2650															
2645	2,645.7	0.8	7	5	5									2,646.5	0.0
	2,644.0	2.5	4	4	5									2,645.7	0.8
	2,641.5	5.0												2,644.5	2.0
2640	2,639.0	7.5	5	5	6										
	2,636.5	10.0	3	4	4										
2635	2,631.5	15.0	2	2	2										
	2,626.5	20.0	3	4	4										
2630	2,621.5	25.0	2	3	3										
	2,616.5	30.0	3	3	4										
2625	2,611.5	35.0	15	9	5										
	2,606.5	40.0	2	2	4										
2620	2,601.5	45.0	2	3	4										
	2,596.5	50.0	6	4	5										
2595															

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger									
SITE DESCRIPTION Retaining Wall No. 6 from -L_LT- STA 70+03 to 73+98							GROUND WTR (ft)								
BORING NO. RW6_3		STATION 77+02		OFFSET 34 ft LT		ALIGNMENT -RW6-									
COLLAR ELEV. 2,645.8 ft		TOTAL DEPTH 56.5 ft		NORTHING 667,933		EASTING 821,248									
DRILL RIGHAMMER EFF./DATE GTC9083 CME-550X 80%(11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 02/02/21		COMP. DATE 02/02/21		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)
2650															
2645	2,645.3	0.5	6	4	5									2,645.8	0.0
	2,643.3	2.5	4	4	3									2,645.3	0.5
	2,640.8	5.0	4	7	7									2,643.3	2.5
2640	2,638.3	7.5	2	2	4										
	2,635.8	10.0	2	2	4										
2635	2,630.8	15.0	3	3	4										
	2,625.8	20.0	2	7	4										
2630	2,620.8	25.0	2	3	3										
	2,615.8	30.0	2	4	4										
2625	2,610.8	35.0	2	2	2										
	2,605.8	40.0	2	4	6										
2620	2,600.8	45.0	82	14	10										
	2,595.8	50.0	3	3	6										
2595															
2590															

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ_NC_DOT.GDT 11/5/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38330.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger										
SITE DESCRIPTION Retaining Wall No. 6 from -L_LT- STA 70+03 to 73+98							GROUND WTR (ft)									
BORING NO. RW6_4		STATION 76+50		OFFSET 32 ft LT		ALIGNMENT -RW6-										
COLLAR ELEV. 2,644.9 ft		TOTAL DEPTH 51.5 ft		NORTHING 667,955		EASTING 821,293										
DRILL RIGHAMMER EFF./DATE GTC/CME550X/9083			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 02/02/21		COMP. DATE 02/02/21		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						
2645	2,644.4	0.5												2,644.9	0.0	GROUND SURFACE
	2,644.4	2.5	11	8	3									2,644.4	0.5	0.5' PAVEMENT
	2,642.9	2.5	4	4	5									2,642.9	2.0	ROADWAY EMBANKMENT
2640	2,639.9	5.0	3	4	5											Medium dense, brown and orange, SAND and GRAVEL (A-1-b)
	2,637.4	7.5	2	3	4											Medium stiff to very stiff, brown, tan, and orange, SILT (A-4), with trace clay, micaceous
2635	2,634.9	10.0	2	3	3											
2630	2,629.9	15.0	4	6	6											
2625	2,624.9	20.0	3	7	6											
2620	2,619.9	25.0	2	3	5											
2615	2,614.9	30.0	2	4	3											
2610	2,609.9	35.0	3	4	5									2,611.9	33.0	RESIDUAL
																Medium stiff to stiff, brown and orange SILT (A-4), micaceous, saprolitic
2605	2,604.9	40.0	2	3	4											
2600	2,599.9	45.0	3	4	7											
2595	2,594.9	50.0	3	3	5											
																Boring Terminated at Elevation 2,593.4 ft in SILT

WBS 38330.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger										
SITE DESCRIPTION Retaining Wall No. 6 from -L_LT- STA 70+03 to 73+98							GROUND WTR (ft)									
BORING NO. RW6_5		STATION 76+00		OFFSET 27 ft LT		ALIGNMENT -RW6-										
COLLAR ELEV. 2,644.0 ft		TOTAL DEPTH 46.5 ft		NORTHING 667,979		EASTING 821,338										
DRILL RIGHAMMER EFF./DATE GTC/CME550X/9083			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 02/02/21		COMP. DATE 02/02/21		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						
2645	2,644.0	0.0												2,644.0	0.0	GROUND SURFACE
	2,643.2	0.8	24	6	4									2,643.2	0.8	0.8' PAVEMENT
	2,641.5	2.5	3	4	9									2,642.0	2.0	ROADWAY EMBANKMENT
2640	2,639.0	5.0	3	4	5											Medium dense, brown and orange, SAND and GRAVEL (A-1-b)
	2,636.5	7.5	2	3	3											Medium stiff to stiff, brown and orange, SILT (A-4), with trace clay, micaceous
2635	2,634.0	10.0	2	2	3											
2630	2,629.0	15.0	2	2	2											
2625	2,624.0	20.0	2	2	2											
2620	2,619.0	25.0	2	2	2											
2615	2,614.0	30.0	12	37	8									2,614.0	30.0	RESIDUAL
														2,611.0	33.0	Dense, gray, SAND (A-3) *Suspected Boulder
2610	2,609.0	35.0	4	3	3											Medium stiff, gray, silty CLAY (A-7-6), micaceous, saprolitic
2605	2,604.0	40.0	3	4	6									2,606.0	38.0	Stiff, brown and orange, SILT (A-4), micaceous, saprolitic
2600	2,599.0	45.0	3	4	6											
																Boring Terminated at Elevation 2,597.5 ft in SILT

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ_NC_DOT.GDT 5/26/21

GEOTECHNICAL BORING REPORT BORE LOG

WBS 38330.1.FS1	TIP B-3186 / B-5898	COUNTY HAYWOOD	GEOLOGIST R. Dugger
SITE DESCRIPTION Retaining Wall No. 6 from -L_LT- STA 70+03 to 73+98			GROUND WTR (ft)
BORING NO. RW6_6	STATION 75+48	OFFSET 23 ft LT	ALIGNMENT -RW6- 0 HR. Dry
COLLAR ELEV. 2,642.9 ft	TOTAL DEPTH 41.5 ft	NORTHING 668,003	EASTING 821,382 24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE GTC/CME550X/9083		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER L. Wanstrath	START DATE 02/02/21	COMP. DATE 02/02/21	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							
2645																	
2640	2,641.9	1.0	6	5	4									2,642.9	0.0	GROUND SURFACE	
	2,640.4	2.5	3	2	2									2,641.9	1.0	1.0' PAVEMENT	
	2,637.9	5.0	2	3	6									2,640.4	2.5	ROADWAY EMBANKMENT Loose, brown and orange, SAND and GRAVEL (A-1-b)	
	2,635.4	7.5	4	3	4									2,638.4	4.5	Soft, brown and orange, SILT (A-4), micaceous	
	2,632.9	10.0	3	2	2									2,633.4	9.5	Medium stiff, brown and orange, silty CLAY (A-7-6), micaceous	
	2,627.9	15.0	2	1	2									2,632.0	10.0	Soft, brown and orange, SILT (A-4), micaceous	
	2,622.9	20.0	2	1	3												
	2,617.9	25.0	8	5	4									2,619.9	23.0	Stiff, brown and orange, silty CLAY (A-7-6), with trace rock fragments, micaceous	
	2,612.9	30.0	3	5	8									2,614.9	28.0	RESIDUAL Stiff, brown and orange, SILT (A-4), micaceous, saprolitic	
	2,607.9	35.0	3	5	7												
	2,602.9	40.0	3	4	7												
																	Boring Terminated at Elevation 2,601.4 ft in SILT

WBS 38330.1.FS1	TIP B-3186 / B-5898	COUNTY HAYWOOD	GEOLOGIST N. Yacobi
SITE DESCRIPTION Retaining Wall No. 6 from -L_LT- STA 70+03 to 73+98			GROUND WTR (ft)
BORING NO. RW6_7	STATION 74+98	OFFSET 18 ft LT	ALIGNMENT -RW6- 0 HR. Dry
COLLAR ELEV. 2,642.0 ft	TOTAL DEPTH 36.5 ft	NORTHING 668,028	EASTING 821,427 24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE GTC/CME550X/9083		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER L. Wanstrath	START DATE 02/04/21	COMP. DATE 02/04/21	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							
2645																	
2640	2,641.2	0.8	7	5	6									2,642.0	0.0	GROUND SURFACE	
	2,639.5	2.5	3	3	4									2,641.2	0.8	0.8' PAVEMENT	
	2,637.0	5.0	5	6	7									2,640.0	2.0	ROADWAY EMBANKMENT Stiff, gray, brown and red, SILT (A-4), with trace clay, micaceous	
	2,634.5	7.5	6	6	7									2,638.0	4.0	Medium stiff, gray and red, clayey SILT (A-5), micaceous	
	2,632.0	10.0	6	4	5											Stiff, brown, SILT (A-4), micaceous	
	2,627.0	15.0	2	2	2									2,629.0	13.0	RESIDUAL Soft to medium stiff, red, clayey SILT (A-5), micaceous	
	2,622.0	20.0	1	2	3									2,624.0	18.0	Stiff to hard, brown, orange and gray, SILT (A-4), micaceous, saprolitic	
	2,617.0	25.0	4	4	6												
	2,612.0	30.0	13	34	61												
	2,607.0	35.0	14	27	25												
																	Boring Terminated at Elevation 2,605.5 ft in SILT

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC_DOT.GDT 5/26/21

GEOTECHNICAL BORING REPORT BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Retaining Wall No. 6 from -L_LT- STA 70+03 to 73+98							GROUND WTR (ft)									
BORING NO. RW6_8		STATION 74+48		OFFSET 15 ft LT		ALIGNMENT -RW6-										
COLLAR ELEV. 2,641.2 ft		TOTAL DEPTH 31.5 ft		NORTHING 668,049		EASTING 821,472										
DRILL RIGHAMMER EFF./DATE GTC9083 CME-550X 80%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 02/03/21		COMP. DATE 02/03/21		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						
2645																
2640	2,640.4	0.8	5	4	4								M	2,641.2 GROUND SURFACE 0.0		
	2,638.7	2.5	1	2	1								M	2,640.4 0.8' PAVEMENT 0.8		
	2,636.2	5.0											M	ROADWAY EMBANKMENT		
	2,633.7	7.5											M	Soft to medium stiff, red, brown and pink, SILT (A-4)		
2635	2,631.2	10.0	1	1	1								D	SS-186 21%		
2630	2,626.2	15.0	3	4	7								D	RESIDUAL		
	2,623.2	18.0											D	Stiff, brown and red, clayey SILT (A-5), micaceous	13.0	
2625	2,621.2	20.0	5	7	11								D	Very stiff to hard, brown, red and gray, SILT (A-4), with trace rock fragments, micaceous	18.0	
2620	2,616.2	25.0	4	7	9								D			
2615	2,611.2	30.0	13	24	33								D			
2610													D	Boring Terminated at Elevation 2,609.7 ft in SILT	31.5	

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Retaining Wall No. 6 from -L_LT- STA 70+03 to 73+98							GROUND WTR (ft)									
BORING NO. RW6_9		STATION 74+02		OFFSET 20 ft RT		ALIGNMENT -RW9-										
COLLAR ELEV. 2,640.2 ft		TOTAL DEPTH 31.5 ft		NORTHING 668,070		EASTING 821,517										
DRILL RIGHAMMER EFF./DATE GTC9083 CME-550X 80%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 02/03/21		COMP. DATE 02/03/21		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						
2645																
2640	2,639.4	0.8	7	4	5								D	2,640.2 GROUND SURFACE 0.0		
	2,637.7	2.5	3	4	4								M	2,639.4 0.8' PAVEMENT 0.8		
	2,635.2	5.0	2	2	2								M	RESIDUAL		
2635	2,632.7	7.5	2	3	5								M	Stiff, brown and orange, silty CLAY (A-6)	2.5	
2630	2,630.2	10.0	4	5	7								M	Soft to stiff, brown and orange, SILT (A-4)	7.0	
2625	2,625.2	15.0	8	9	8								M	Stiff, brown, silty CLAY (A-7-6), with trace manganese oxide staining	7.0	
2620	2,620.2	20.0	3	6	6								D	Stiff to hard, brown, gray and black, fine to coarse sandy SILT (A-4), saprolitic (Amphibolite and Gneiss)	13.0	
2615	2,615.2	25.0	5	7	9								D			
2610	2,610.2	30.0	21	18	40								D	Boring Terminated at Elevation 2,608.7 ft in silty SAND	31.5	

REFERENCE: B-3186/B-5898

PROJECT: 38332/48030

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

STATE N.C.	STATE PROJECT REFERENCE NO. B-3186/B-5898	SHEET NO. 1	TOTAL SHEETS 9
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CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5-9	BORE LOGS

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY HAYWOOD
 PROJECT DESCRIPTION US 23/US 74/US 19 (GREAT SMOKY MOUNTAIN HWY) FROM WEST OF NC 209(CRABTREE RD.) TO EAST OF RUSS AVE.
 SITE DESCRIPTION RETAINING WALL #8 FROM -DET01 EB- STA. 34+83.83 TO 29+30.48

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
R. DUGGER
N. YACOBI
GEOTECHNOLOGY, INC.

INVESTIGATED BY C. SWAFFORD
 DRAWN BY T. LYNN
 CHECKED BY K. BUSSEY
 SUBMITTED BY HDR
 DATE NOVEMBER 2021

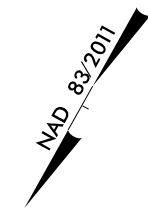
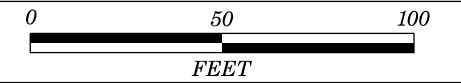
HDR HDR Engineering, Inc. of the Carolinas
 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
 N.C.B.E.L.S. License Number: F-0116



SIGNATURE _____ DATE _____

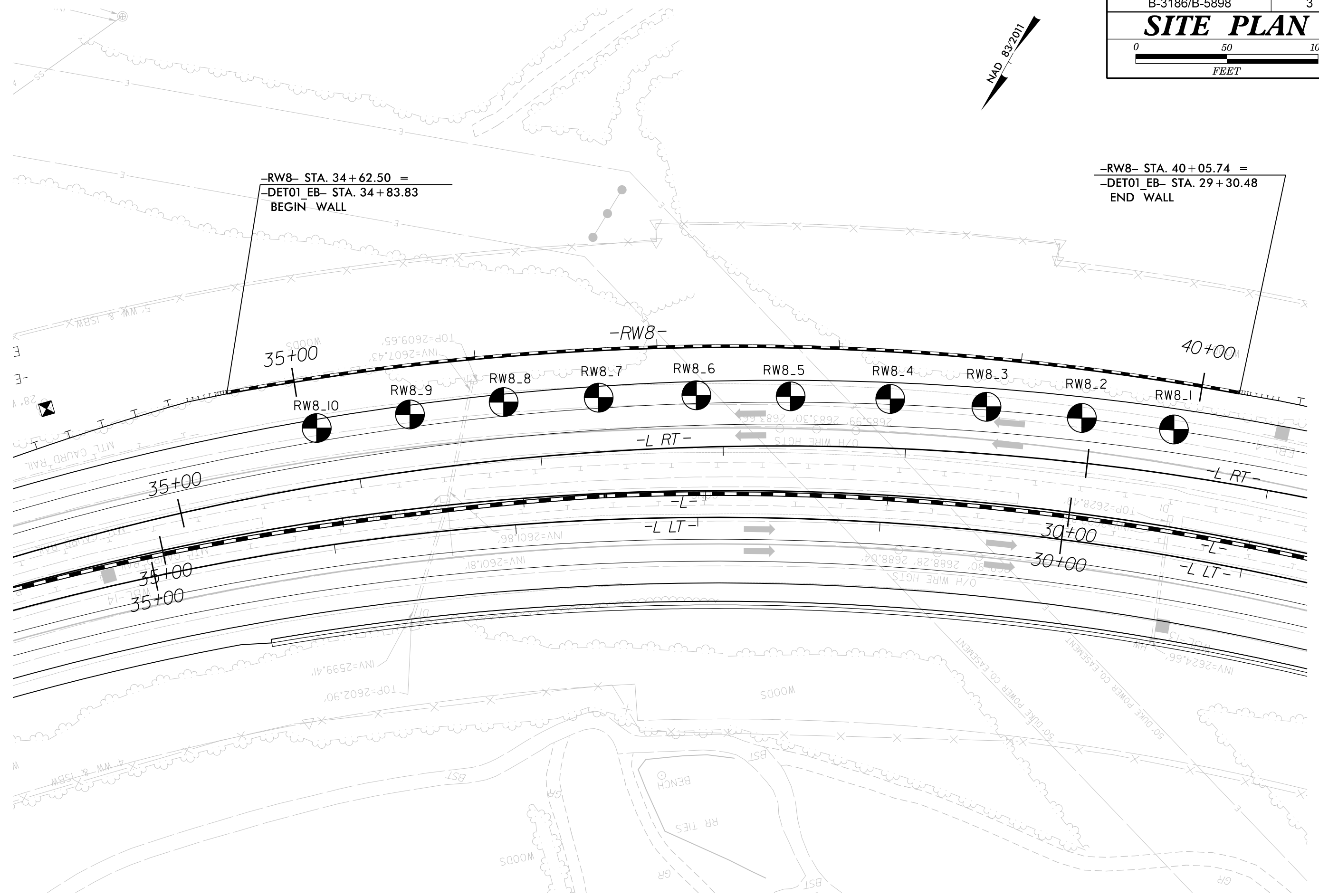
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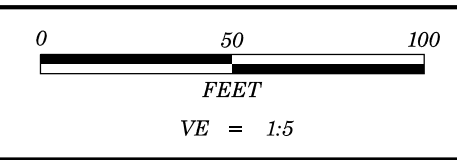
SITE PLAN



-RW8- STA. 34+62.50 =
-DET01_EB- STA. 34+83.83
BEGIN WALL

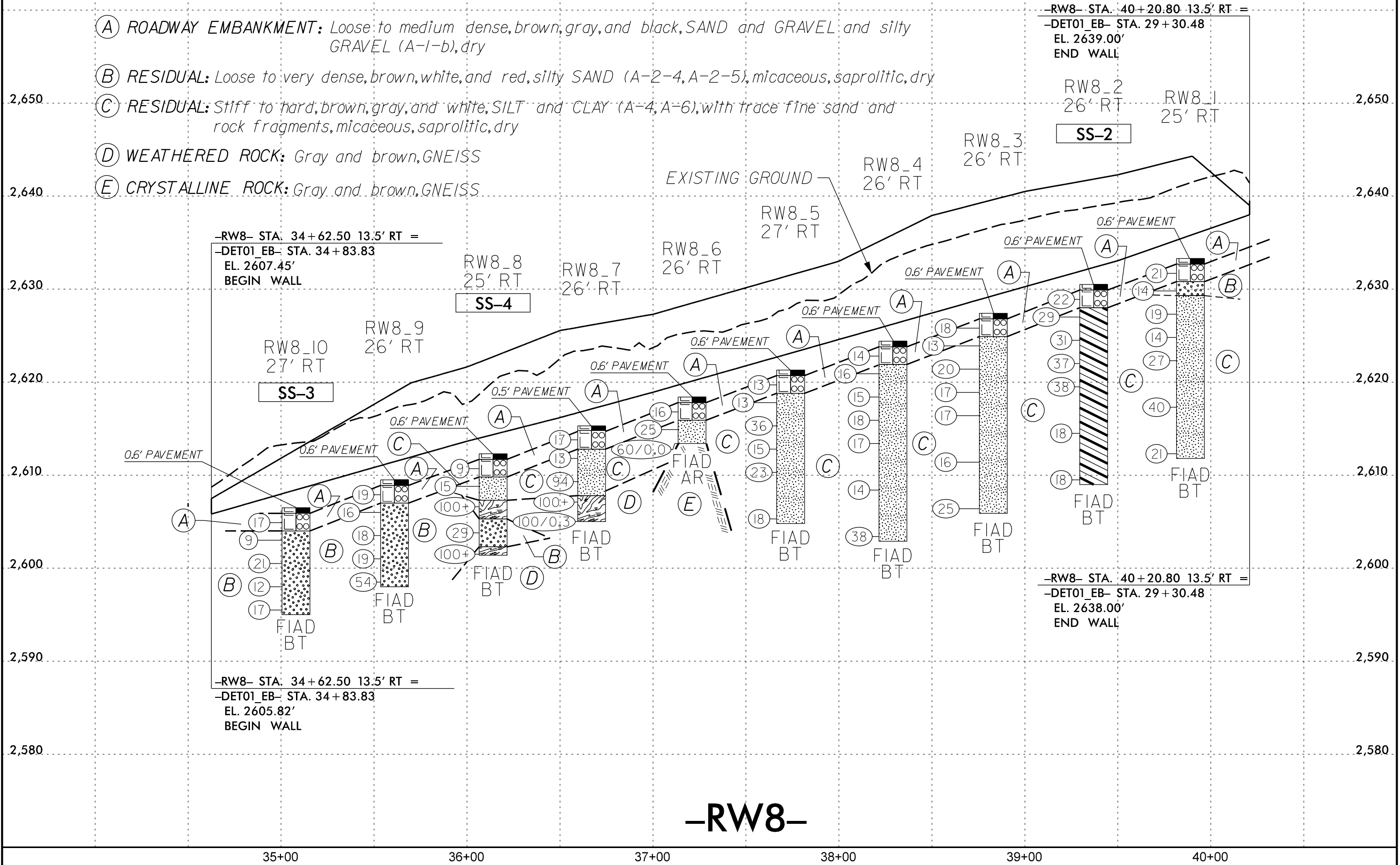
-RW8- STA. 40+05.74 =
-DET01_EB- STA. 29+30.48
END WALL





SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-3	27' RT	35+08	2.5' - 4.0'	A-2-5	44	7	54.2	24.3	14.6	6.9	95.1	55.9	25.7	26	-
SS-4	25' RT	36+14	7.5' - 9.0'	A-2-4	28	6	54.4	23.4	15.4	6.8	87.7	50.7	24.3	10	-
SS-2	26' RT	39+37	2.5' - 4.0'	A-6 (2)	34	13	33.6	31.1	30.2	5.1	96.0	76.0	41.0	15	-

- (A) ROADWAY EMBANKMENT: Loose to medium dense, brown, gray, and black, SAND and GRAVEL and silty GRAVEL (A-1-b), dry
- (B) RESIDUAL: Loose to very dense, brown, white, and red, silty SAND (A-2-4, A-2-5), micaceous, saprolitic, dry
- (C) RESIDUAL: Stiff to hard, brown, gray, and white, SILT and CLAY (A-4, A-6), with trace fine sand and rock fragments, micaceous, saprolitic, dry
- (D) WEATHERED ROCK: Gray and brown, GNEISS
- (E) CRYSTALLINE ROCK: Gray and brown, GNEISS



-RW8-

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38330.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)									
BORING NO. RW8_10		STATION 35+08		OFFSET 27 ft RT		ALIGNMENT -RW8-										
COLLAR ELEV. 2,606.5 ft		TOTAL DEPTH 11.5 ft		NORTHING 665,687		EASTING 818,414										
DRILL RIGHAMMER EFF./DATE GTC CME550X 9083			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 01/26/21		COMP. DATE 01/26/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2610																
2605	2,605.9	0.6	7	10	7											
	2,604.0	2.5	4	4	5											
	2,601.5	5.0	6	8	13											
2600	2,599.0	7.5	5	5	7											
	2,596.5	10.0	6	7	10											
2595																

WBS 38330.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)									
BORING NO. RW8_9		STATION 35+61		OFFSET 26 ft RT		ALIGNMENT -RW8-										
COLLAR ELEV. 2,609.5 ft		TOTAL DEPTH 11.5 ft		NORTHING 665,656		EASTING 818,373										
DRILL RIGHAMMER EFF./DATE GTC CME550X 9083			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 01/27/21		COMP. DATE 01/27/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2610																
	2,608.9	0.6	7	11	8											
	2,607.0	2.5	4	9	7											
2605	2,604.5	5.0	8	8	10											
	2,602.0	7.5	4	8	11											
2600	2,599.5	10.0	16	32	22											

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC_DOT.GDT 5/26/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38330.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)								
BORING NO. RW8_8		STATION 36+14		OFFSET 25 ft RT		ALIGNMENT -RW8-									
COLLAR ELEV. 2,612.3 ft		TOTAL DEPTH 10.9 ft		NORTHING 665,625		EASTING 818,331									
DRILL RIGHAMMER EFF./DATE GTC CME550X 9083			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 01/27/21		COMP. DATE 01/27/21		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					
2615															
	2,611.7	0.6	6	4	5									2,612.3	0.0
	2,609.8	2.5	8	7	8									2,611.7	0.6
2610														2,609.8	2.5
	2,607.3	5.0	64	54/0.5										2,607.3	5.0
2605														2,605.3	7.0
	2,604.8	7.5	10	15	14									2,602.3	10.0
	2,602.3	10.0	24	100/0.4										2,601.4	10.9

WBS 38330.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)								
BORING NO. RW8_7		STATION 36+67		OFFSET 26 ft RT		ALIGNMENT -RW8-									
COLLAR ELEV. 2,615.3 ft		TOTAL DEPTH 10.3 ft		NORTHING 665,597		EASTING 818,287									
DRILL RIGHAMMER EFF./DATE GTC CME550X 9083			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 01/27/21		COMP. DATE 01/27/21		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					
2620															
	2,614.8	0.5	6	8	9									2,615.3	0.0
2615														2,614.8	0.5
	2,612.8	2.5	5	6	7									2,612.8	2.5
2610														2,610.3	5.0
	2,607.8	7.5	32	100/0.4										2,607.8	7.5
2605														2,605.3	10.0

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC_DOT.GDT 5/26/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38330.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)								
BORING NO. RW8_6		STATION 37+21		OFFSET 26 ft RT		ALIGNMENT -RW8-									
COLLAR ELEV. 2,618.4 ft		TOTAL DEPTH 5.0 ft		NORTHING 665,570		EASTING 818,241									
DRILL RIGHAMMER EFF./DATE GTC CME550X 9083			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 01/27/21		COMP. DATE 01/27/21		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					
2620															
	2,617.8	0.6	9	6	10										
2615	2,615.9	2.5	9	10	15										
	2,613.4	5.0	60/0.0												

2,618.4 GROUND SURFACE 0.0

2,617.8 0.6

2,615.9 ROADWAY EMBANKMENT 2.5

2,613.4 RESIDUAL 5.0

Very stiff, brown, black, and gray, SILT (A-4), saprolitic

Boring Terminated with Standard Penetration Test Refusal at Elevation 2,613.4 ft on Crystalline Rock (GNEISS)

WBS 38330.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)								
BORING NO. RW8_5		STATION 37+74		OFFSET 27 ft RT		ALIGNMENT -RW8-									
COLLAR ELEV. 2,621.3 ft		TOTAL DEPTH 16.5 ft		NORTHING 665,545		EASTING 818,196									
DRILL RIGHAMMER EFF./DATE GTC CME550X 9083			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 01/27/21		COMP. DATE 01/27/21		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					
2625															
	2,620.7	0.6													
2620	2,620.7	0.6	6	6	7										
	2,618.8	2.5	8	6	7										
	2,616.3	5.0	18	21	15										
2615	2,613.8	7.5	5	5	10										
	2,611.3	10.0	8	10	13										
2610															
	2,606.3	15.0	5	7	11										
2605															

2,621.3 GROUND SURFACE 0.0

2,620.7 0.6

2,618.8 ROADWAY EMBANKMENT 2.5

RESIDUAL

Stiff to hard, white, gray and brown, SILT (A-4), with trace clay, micaceous, saprolitic

Boring Terminated at Elevation 2,604.8 ft in SILT

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC_DOT.GDT 5/26/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38330.1.FS1	TIP B-3186 / B-5898	COUNTY HAYWOOD	GEOLOGIST N. Yacobi
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48			GROUND WTR (ft)
BORING NO. RW8_4	STATION 38+29	OFFSET 26 ft RT	ALIGNMENT -RW8-
COLLAR ELEV. 2,624.4 ft	TOTAL DEPTH 21.5 ft	NORTHING 665,520	EASTING 818,149
DRILL RIGHAMMER EFF./DATE GTC/CME550X 9083		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER L. Wanstrath	START DATE 01/27/21	COMP. DATE 01/27/21	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					
2625															
	2,623.8	0.6	6	7	7									2,624.4	0.0
	2,621.9	2.5	7	8	8									2,623.8	0.6
2620	2,619.4	5.0	4	6	9									2,621.9	2.5
	2,616.9	7.5	10	10	8										
2615	2,614.4	10.0	7	7	10										
	2,609.4	15.0	6	6	8										
2610															
2605	2,604.4	20.0	12	15	23										
														2,602.9	21.5
Boring Terminated at Elevation 2,602.9 ft in SILT															

WBS 38330.1.FS1	TIP B-3186 / B-5898	COUNTY HAYWOOD	GEOLOGIST N. Yacobi
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48			GROUND WTR (ft)
BORING NO. RW8_3	STATION 38+83	OFFSET 26 ft RT	ALIGNMENT -RW8-
COLLAR ELEV. 2,627.4 ft	TOTAL DEPTH 21.5 ft	NORTHING 665,498	EASTING 818,099
DRILL RIGHAMMER EFF./DATE GTC/CME550X 9083		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER L. Wanstrath	START DATE 01/27/21	COMP. DATE 01/27/21	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					
2630															
	2,626.8	0.6	10	10	8									2,627.4	0.0
	2,624.9	2.5	8	7	6									2,626.8	0.6
2625	2,622.4	5.0	9	9	11									2,624.9	2.5
	2,619.9	7.5	7	8	9										
2620	2,617.4	10.0	8	8	9										
	2,612.4	15.0	8	8	8										
2615															
2610	2,607.4	20.0	12	13	12										
														2,605.9	21.5
Boring Terminated at Elevation 2,605.9 ft in SILT															

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC_DOT.GDT 5/26/21

GEOTECHNICAL BORING REPORT BORE LOG

WBS 38330.1.FS1			TIP B-3186 / B-5898			COUNTY HAYWOOD			GEOLOGIST N. Yacobi							
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48								GROUND WTR (ft)								
BORING NO. RW8_2		STATION 39+37		OFFSET 26 ft RT		ALIGNMENT -RW8-		0 HR. Dry								
COLLAR ELEV. 2,630.5 ft		TOTAL DEPTH 21.5 ft		NORTHING 665,477		EASTING 818,051		24 HR. FIAD								
DRILL RIG/HAMMER EFF./DATE GTC CME550X 9083			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wanstrath			START DATE 01/26/21		COMP. DATE 01/27/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2635																
2630	2,629.9	0.6	11	12	10								D		2,630.5	0.0
	2,628.0	2.5	8	12	17								D		2,628.0	2.5
2625	2,625.5	5.0	9	15	16							SS-2	15%			
	2,623.0	7.5	11	16	21								D			
2620	2,620.5	10.0	15	17	21								D			
	2,615.5	15.0	6	9	9								D			
2610	2,610.5	20.0	8	7	11								D		2,609.0	21.5
Boring Terminated at Elevation 2,609.0 ft in CLAY																

WBS 38330.1.FS1			TIP B-3186 / B-5898			COUNTY HAYWOOD			GEOLOGIST N. Yacobi							
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48								GROUND WTR (ft)								
BORING NO. RW8_1		STATION 39+89		OFFSET 25 ft RT		ALIGNMENT -RW8-		0 HR. Dry								
COLLAR ELEV. 2,633.3 ft		TOTAL DEPTH 21.5 ft		NORTHING 665,458		EASTING 818,003		24 HR. FIAD								
DRILL RIG/HAMMER EFF./DATE GTC CME550X 9083			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wanstrath			START DATE 01/26/21		COMP. DATE 01/26/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2635																
2630	2,632.7	0.6	10	11	10								D		2,633.3	0.0
	2,630.8	2.5	8	6	8								D		2,631.3	2.0
	2,628.3	5.0	7	9	10								D		2,629.3	4.0
2625	2,625.8	7.5	5	8	6								D			
	2,623.3	10.0	4	12	15								D			
2620	2,618.3	15.0	12	17	23								D			
2615	2,613.3	20.0	9	10	11								D		2,611.8	21.5
Boring Terminated at Elevation 2,611.8 ft in SILT																