

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

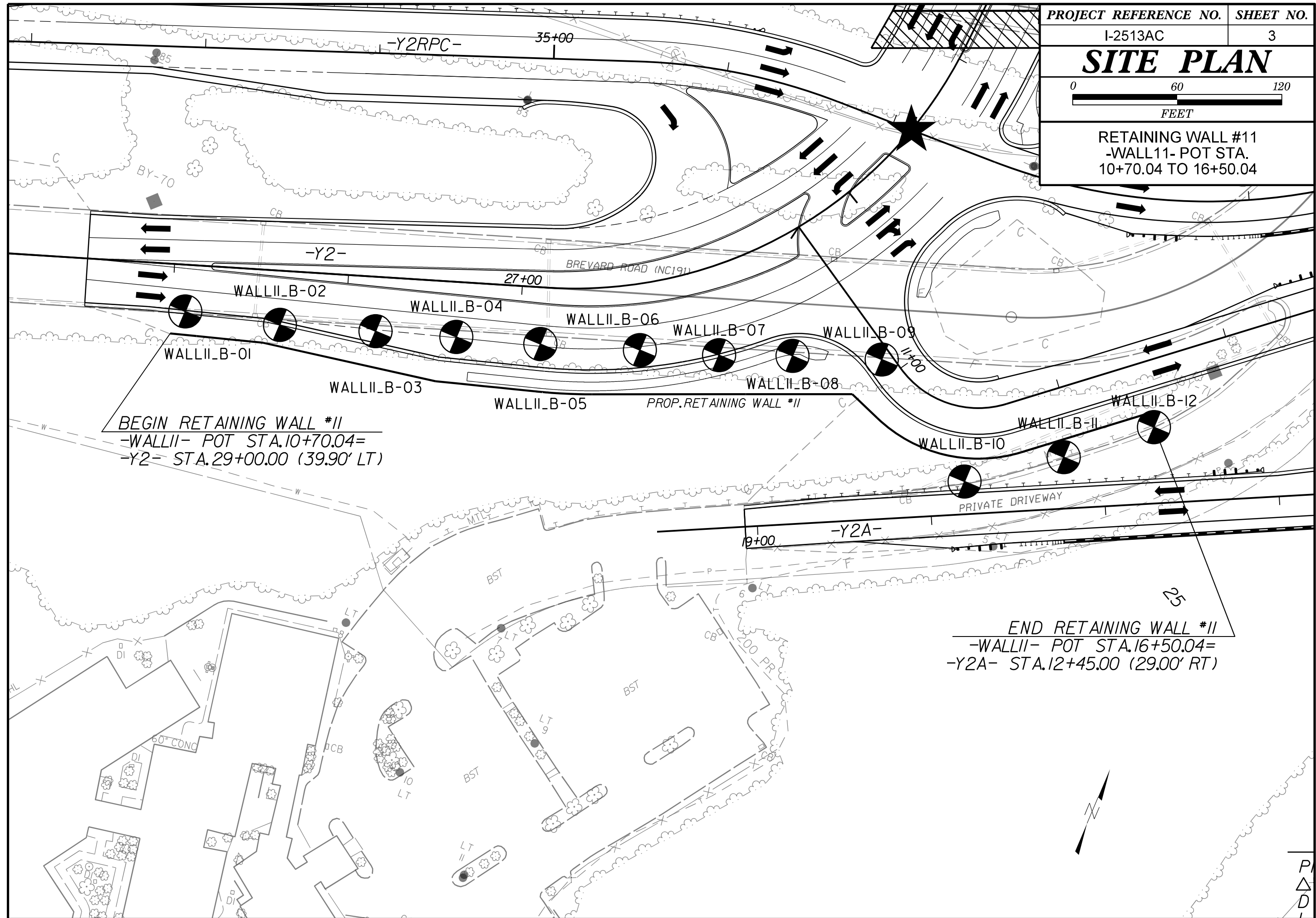
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
SOIL 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 206, 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, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>										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.										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:										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 (ROD) - 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. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N 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 MATERIAL.									
SOIL LEGEND AND AASHTO CLASSIFICATION										MINERALOGICAL COMPOSITION										WEATHERING																			
GENERAL CLASS.										MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.										FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.																			
GROUP CLASS.										COMPRESSIBILITY										VERY SLIGHT (V SL.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.																			
SYMBOL										PERCENTAGE OF MATERIAL										SLIGHT (SL.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.																			
%										GROUND WATER										MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.																			
MATERIAL PASSING #40 LL PI										MISCELLANEOUS SYMBOLS										MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL																			
GROUP INDEX										RECOMMENDATION SYMBOLS										SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF																			
USUAL TYPES OF MAJOR MATERIALS										ABBREVIATIONS										VERY SEVERE (V SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF																			
GEN. RATING AS SUBGRADE										EQUIPMENT USED ON SUBJECT PROJECT										COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.																			
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30																				ROCK HARDNESS																			
CONSISTENCY OR DENSENESS																				VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.																			
PRIMARY SOIL TYPE																				HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.																			
COMPACTNESS OR CONSISTENCY																				MODERATELY HARD CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.																			
RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)																				MEDIUM HARD CAN BE GROUVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.																			
RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)																				SOFT CAN BE GROUVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.																			
TEXTURE OR GRAIN SIZE																				VERY SOFT CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.																			
U.S. STD. SIEVE SIZE OPENING (MM)																				FRACTURE SPACING																			
BOULDER (BLDR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE. SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)																				BEDDING																			
GRAIN SIZE																																							
SOIL MOISTURE - CORRELATION OF TERMS																																							
SOIL MOISTURE SCALE (ATTERBERG LIMITS)																																							
FIELD MOISTURE DESCRIPTION																																							
GUIDE FOR FIELD MOISTURE DESCRIPTION																																							
LL - LIQUID LIMIT																																							
PL - PLASTIC LIMIT																																							
OM - OPTIMUM MOISTURE SHRINKAGE LIMIT																																							
SL - SHRINKAGE LIMIT																																							
PLASTICITY																																							
NON PLASTIC																																							
SLIGHTLY PLASTIC																																							
MODERATELY PLASTIC																																							
HIGHLY PLASTIC																																							
COLOR																																							
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.																																							

PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	3
SITE PLAN	
0 60 120 FEET	
RETAINING WALL #11 -WALL11- POT STA. 10+70.04 TO 16+50.04	



GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST A. Blackmore						
SITE DESCRIPTION RETAINING WALL NO. 11, STA. -Y2- to 29+00.00 TO -Y2A- 12+45.00									GROUND WTR (ft)						
BORING NO. WALL11_B-01			STATION 10+77			OFFSET 13 ft LT			ALIGNMENT -WALL11-			0 HR.	Dry		
COLLAR ELEV. 2,059.4 ft			TOTAL DEPTH 10.0 ft			NORTHING 678,985			EASTING 930,866			24 HR.	Dry		
DRILL RIG/HAMMER EFF./DATE GEO366 Diedrich D-50 80% 03/18/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER J. Messick			START DATE 11/16/22			COMP. DATE 11/16/22			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
2060														2,059.4	GROUND SURFACE 0.0
2055	2,058.4	1.0	6	6	7							M		RESIDUAL Medium Dense to Dense, White-Tan, Silty Fine to Coarse SAND (A-2-4)	
	2,055.9	3.5	8	17	21							M			
	2,053.4	6.0	8	16	22							M			
2050	2,050.9	8.5	6	8	12							M		2,049.4	10.0
Boring Terminated at Elevation 2,049.4 ft In Residual Sandy SILT (A-4)															
Surficial Organic Soil from 0.0 to 0.3 feet.															

WBS 34165.1.13			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST A. Blackmore					
SITE DESCRIPTION RETAINING WALL NO. 11, STA. -Y2- to 29+00.00 TO -Y2A- 12+45.00									GROUND WTR (ft)					
BORING NO. WALL11_B-02			STATION 11+31			OFFSET 12 ft LT			ALIGNMENT -WALL11-			0 HR.	Dry	
COLLAR ELEV. 2,064.1 ft			TOTAL DEPTH 15.0 ft			NORTHING 678,999			EASTING 930,919			24 HR.	Dry	
DRILL RIG/HAMMER EFF./DATE GEO366 Diedrich D-50 80% 03/18/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER J. Messick			START DATE 11/15/22			COMP. DATE 11/15/22			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2065														
	2,063.1	1.0	6	8	9						M			
2060	2,060.6	3.5	8	9	15						M			
	2,058.1	6.0	8	8	12						M			
2055	2,055.6	8.5	9	12	12						M			
2050	2,050.6	13.5	18	18	12						M			

NCDOT BORE DOUBLE I2513AC_GEO_GTM.GPJ NC_DOT.GDT 8/5/24

NCDOT BORE DOUBLE I2513AC GEO GTM.GPJ NC DOT.GDT 8/5/24

WBS 34165.1.13		TIP I-2513AC		COUNTY BUNCOMBE		GEOLOGIST A. Blackmore									
SITE DESCRIPTION RETAINING WALL NO. 11, STA. -Y2- to 29+00.00 TO -Y2A- 12+45.00								GROUND WTR (ft)							
BORING NO. WALL11_B-04		STATION 12+34		OFFSET 26 ft LT		ALIGNMENT -WALL11-		0 HR.	Dry						
COLLAR ELEV. 2,069.9 ft		TOTAL DEPTH 20.0 ft		NORTHING 679,032		EASTING 931,015		24 HR.	Dry						
DRILL RIG/HAMMER EFF./DATE GEO366 Diedrich D-50 80% 03/18/2022				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER J. Messick			START DATE 11/14/22		COMP. DATE 11/14/22		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2070														2,069.9 GROUND SURFACE 0.0	
2065	2,066.4	3.5	7	7	12						M		Very Stiff to Hard, Brown-Black-White-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica and rock fragments		
	2,063.9	6.0	15	18	21										
2060	2,061.4	8.5	15	14	10										
	2,056.4	13.5	9	8	11										
2055	2,051.4	18.5	4	10	12										
2050														2,049.9 20.0	
														Boring Terminated at Elevation 2,049.9 ft In Residual Sandy SILT (A-4)	
														Surficial Organic Soil from 0.0 to 0.3 feet.	
														Hand Auger Probe from 0.0 to 3.0 feet due to close proximity to underground utilities.	

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34165.1.13			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST A. Blackmore							
SITE DESCRIPTION RETAINING WALL NO. 11, STA. -Y2- to 29+00.00 TO -Y2A- 12+45.00											GROUND WTR (ft)					
BORING NO. WALL11_B-05			STATION 12+83			OFFSET 27 ft LT			ALIGNMENT -WALL 11-			0 HR.	Dry			
COLLAR ELEV. 2,072.5 ft			TOTAL DEPTH 25.0 ft			NORTHING 679,047			EASTING 931,061			24 HR.	Dry			
DRILL RIG/HAMMER EFF./DATE GEO366 Diedrich D-50 80% 03/18/2022						DRILL METHOD H.S. Augers				HAMMER TYPE Automatic						
DRILLER J. Messick			START DATE 11/14/22			COMP. DATE 11/14/22			SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
2075																
2070	2,071.5	1.0	4	5	8						M			2,072.5	GROUND SURFACE 0.0	
	2,069.0	3.5	81	19/0.2						2,069.0				RESIDUAL Stiff, White-Gray, Fine to Coarse Sandy SILT (A-4) 3.5		
2065	2,066.5	6.0	38	62/0.4							M			2,064.5	WEATHERED ROCK Gray-White (GNEISS) 8.0	
	2,064.0	8.5	54	30	25									2,058.5	RESIDUAL Very Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4) 14.0	
2060	2,059.0	13.5	34	56	44/0.2						M			2,054.5	WEATHERED ROCK Brown-Gray (GNEISS) 18.0	
	2,054.0	18.5	21	11	28									2,049.5	RESIDUAL Hard, Brown-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica 23.0	
2050	2,049.0	23.5	31	30	62						M			2,047.5	Very Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with trace rock fragments 25.0	
														Boring Terminated at Elevation 2,047.5 ft In Residual Silty SAND (A-2-4)		
															Surficial Organic Soil from 0.0 to 0.2 feet.	

WBS 34165.1.13		TIP I-2513AC		COUNTY BUNCOMBE		GEOLOGIST A. Blackmore								
SITE DESCRIPTION RETAINING WALL NO. 11, STA. -Y2- to 29+00.00 TO -Y2A- 12+45.00								GROUND WTR (ft)						
BORING NO. WALL11_B-06		STATION 13+43		OFFSET 25 ft LT		ALIGNMENT -WALL11-		0 HR.	Dry					
COLLAR ELEV. 2,074.8 ft		TOTAL DEPTH 18.0 ft		NORTHING 679,066		EASTING 931,115		24 HR.	Dry					
DRILL RIG/HAMMER EFF./DATE GEO366 Diedrich D-50 80% 03/18/2022				DRILL METHOD H.S. Augers			HAMMER TYPE Automatic							
DRILLER J. Messick			START DATE 11/14/22		COMP. DATE 11/14/22		SURFACE WATER DEPTH N/A							
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2075														
	2,073.8	1.0	18	43	36									2,074.8 GROUND SURFACE 0.0
	2,071.3	3.5	24	20	13									RESIDUAL Medium Dense to Very Dense, Brown-Gray-Tan-White, Silty Fine to Coarse SAND (A-2-4(0)), with trace to little rock fragments
2070	2,068.8	6.0	4	8	18						SS-91	7%		
	2,066.3	8.5	100/0.3											2,066.3 8.5
2065														WEATHERED ROCK White (GNEISS)
	2,061.3	13.5	100/0.4											
2060														2,056.8 18.0
	2,056.8	18.0	60/0.0											Boring Terminated with Standard Penetration Test Refusal at Elevation 2,056.8 ft On Crystalline Rock (GNEISS) Surficial Organic Soil from 0.0 to 0.3 feet.

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST A. Blackmore						
SITE DESCRIPTION RETAINING WALL NO. 11, STA. -Y2- to 29+00.00 TO -Y2A- 12+45.00												GROUND WTR (ft)			
BORING NO. WALL11_B-07			STATION 13+88			OFFSET 22 ft LT			ALIGNMENT -WALL11-			0 HR.	Dry		
COLLAR ELEV. 2,076.6 ft			TOTAL DEPTH 19.1 ft			NORTHING 679,081			EASTING 931,158			24 HR.	Dry		
DRILL RIG/HAMMER EFF./DATE GEO366 Diedrich D-50 80% 03/18/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER J. Messick			START DATE 11/14/22			COMP. DATE 11/14/22			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
2080															
2075														2,076.6	0.0
	2,073.1	3.5	7	7	19									GROUND SURFACE	
														RESIDUAL	
														Medium Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica	
2070	2,070.6	6.0	100/0.3											2,070.6	6.0
														WEATHERED ROCK	
	2,068.1	8.5	21	79/0.4										Gray-White (GNEISS)	
2065															
	2,063.1	13.5	32	68/0.2											
2060															
	2,058.1	18.5	43	57/0.1										2,057.5	19.1
														Boring Terminated at Elevation 2,057.5 ft In Weathered Rock (GNEISS)	
														Surficial Organic Soil from 0.0 to 0.3 feet.	
														Hand Auger Probe from 0.0 to 3.0 feet due to close proximity to underground utilities.	

WBS 34165.1.13			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST A. Blackmore					
SITE DESCRIPTION RETAINING WALL NO. 11, STA. -Y2- to 29+00.00 TO -Y2A- 12+45.00									GROUND WTR (ft)					
BORING NO. WALL11_B-08			STATION 14+30			OFFSET 22 ft LT			ALIGNMENT -WALL11-			0 HR. Dry		
COLLAR ELEV. 2,077.7 ft			TOTAL DEPTH 10.0 ft			NORTHING 679,097			EASTING 931,197			24 HR. Dry		
DRILL RIG/HAMMER EFF./DATE ECS052Diedrich D-70 86% 07/08/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER M. Eubank			START DATE 06/27/24			COMP. DATE 06/27/24			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2080														
	2,076.7	1.0	17	23	17									2,077.7 GROUND SURFACE 0.0
2075	2,074.2	3.5	11	16	15						M			RESIDUAL Dense, Brown-Black, Silty Fine to Coarse SAND (A-2-4)
	2,071.7	6.0	8	9	13						M			2,072.2 5.5
2070	2,069.2	8.5	12	9	9						M			Very Stiff, Brown-Black, Fine to Coarse Sandy SILT (A-4), with trace mica
											M			2,067.7 10.0
														Boring Terminated at Elevation 2,067.7 ft In Residual Sandy SILT (A-4)
														Surficial Organic Soil from 0.0 to 0.2 feet.

NCDOT BORE DOUBLE I2513AC_GEO_GTM.GPJ NC_DOT.GDT 8/5/24

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GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST A. Blackmore						
SITE DESCRIPTION RETAINING WALL NO. 11, STA. -Y2- to 29+00.00 TO -Y2A- 12+45.00												GROUND WTR (ft)			
BORING NO. WALL11_B-11			STATION 15+96			OFFSET 10 ft RT			ALIGNMENT -WALL11-			0 HR.	Dry		
COLLAR ELEV. 2,099.7 ft			TOTAL DEPTH 20.0 ft			NORTHING 679,104			EASTING 931,363			24 HR.	FIAD		
DRILL RIG/HAMMER EFF./DATE ECS052Diedrich D-70 86% 07/08/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER M. Eubank			START DATE 06/27/24			COMP. DATE 06/27/24			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)
2100															
2095	2,098.5	1.2	5	5	6										
	2,096.2	3.5	6	5	5						SS-9	16%			
2090	2,093.7	6.0	11	19	30										
	2,091.2	8.5	35	42	39	SS-11	7%								
2085	2,086.2	13.5	20	22	35										
	2,081.2	18.5	10	9	7										
2080															
				</											

WBS 34165.1.13			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST A. Blackmore					
SITE DESCRIPTION RETAINING WALL NO. 11, STA. -Y2- to 29+00.00 TO -Y2A- 12+45.00									GROUND WTR (ft)					
BORING NO. WALL11_B-12			STATION 16+50			OFFSET 9 ft RT			ALIGNMENT -WALL11-			0 HR. Dry		
COLLAR ELEV. 2,094.1 ft			TOTAL DEPTH 10.0 ft			NORTHING 679,140			EASTING 931,404			24 HR. FIAD		
DRILL RIG/HAMMER EFF./DATE ECS052Diedrich D-70 86% 07/08/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER M. Eubank			START DATE 06/27/24			COMP. DATE 06/27/24			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2095														
	2,093.1	1.0	20	15	17									2,094.1 GROUND SURFACE 0.0
														2,092.8 ROADWAY EMBANKMENT 1.3
														Asphalt (0.6'), Stonebase (0.7')
2090	2,090.6	3.5	11	15	31									RESIDUAL
														Dense, Gray-Tan, Silty Fine to Coarse Silty SAND (A-2-4), with some rock fragments
	2,088.1	6.0	23	63	37/0.2									2,087.6 6.5
														WEATHERED ROCK
														Tan-Gray (GNEISS)
2085	2,085.6	8.5	11	11	11									2,086.1 8.0
														RESIDUAL
														2,084.1 10.0
														Medium Dense, Tan-Brown, Silty Fine to Coarse SAND (A-2-4)
														Boring Terminated at Elevation 2,084.1 ft In Residual Silty SAND (A-2-4)

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