

REFERENCE: I-2513AC

PROJECT: 34165

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2, 2A	LEGEND
3	SITE PLAN
4	PROFILE
5-8	BORE LOGS

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY BUNCOMBE
PROJECT DESCRIPTION I-26I-40I-240 INTERCHANGE TO
SR 3548 (HAYWOOD RD)

SITE DESCRIPTION RETAINING WALL NO. 10, FROM
-Y2B- STA. 11 + 56.91 TO -Y2B- STA. 15 + 50.00

STATE	TOWN OF HOLLY SPRINGS PROJECT NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-2513AC	1	9

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

CG2

GOODNIGHT, D.J.

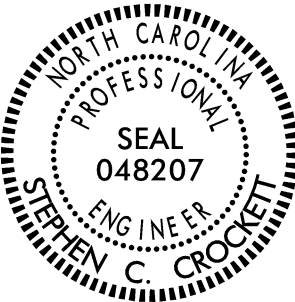
INVESTIGATED BY FALCON ENG.

DRAWN BY CROCKETT, S.C.

CHECKED BY HUNSBERGER, W.S.

SUBMITTED BY FALCON ENG.

DATE JULY 2024



DocuSigned by:

Stephen Crockett

7/22/2024

C6CA6FED48E0436
SIGNATURE

DATE

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 DISLODGED 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 (SROQ) - 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.									
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																			
GROUP CLASS.										SLIGHTLY COMPRESSIBLE										VERY SLIGHT (V SL.)																			
SYMBOL										PERCENTAGE OF MATERIAL										SLIGHT (SL.)																			
%										GROUND WATER										MODERATE (MOD.)																			
MATERIAL PASSING #40 #200										MISCELLANEOUS SYMBOLS										MODERATELY SEVERE (MOD. SEV.)																			
GROUP INDEX										RECOMMENDATION SYMBOLS										SEVERE (SEV.)																			
USUAL TYPES OF MAJOR MATERIALS										ABBREVIATIONS										VERY SEVERE (V SEV.)																			
GEN. RATING AS SUBGRADE										EQUIPMENT USED ON SUBJECT PROJECT										COMPLETE																			
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																			
PRIMARY SOIL TYPE																				HARD																			
GENERALLY GRANULAR MATERIAL (NON-COHESSIVE)																				MODERATELY HARD																			
GENERALLY SILT-CLAY MATERIAL (COHESSIVE)																				MEDIUM HARD																			
TEXTURE OR GRAIN SIZE																				SOFT																			
U.S. STD. SIEVE SIZE OPENING (MM)																				VERY SOFT																			
BOULDER (BLDR.)																				MEDIUM STIFF																			
COBBLE (COB.)																				STIFF																			
GRAVEL (GR.)																				VERY STIFF																			
COARSE SAND (CSE. SD.)																				HARD																			
FINE SAND (F SD.)																																							
SILT (SL.)																																							
CLAY (CL.)																																							
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																																							
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.																																							

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

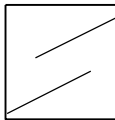
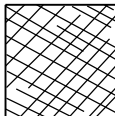
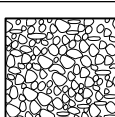
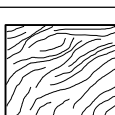
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES
FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000) From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. Note that the table does not apply to structurally controlled failures. Where weak planar structural planes are present in an unfavorable orientation with respect to the excavation face, these will dominate the rock mass behaviour. The shear strength of surfaces in rocks that are prone to deterioration as a result of changes in moisture content will be reduced if water is present. When working with rocks in the fair to very poor categories, a shift to the right may be made for wet conditions. Water pressure is dealt with by effective stress analysis.		SURFACE CONDITIONS VERY GOOD Very rough, fresh unweathered surfaces GOOD Rough, slightly weathered, iron stained surfaces FAIR Smooth, moderately weathered and altered surfaces POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments VERY POOR Slickensided, highly weathered surfaces with soft clay coatings or fillings		DECREASING SURFACE QUALITY ➡		GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos, P and Hoek E., 2000) From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.		SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes) VERY GOOD - Very Rough, fresh unweathered surfaces GOOD - Rough, slightly weathered surfaces FAIR - Smooth, moderately weathered and altered surfaces POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments VERY POOR - Very smooth, slicken-sided or highly weathered surfaces with soft clay coatings or fillings	
STRUCTURE						COMPOSITION AND STRUCTURE			
 INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities  BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets  VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets  BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity  DISINTEGRATED - poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces  LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes		DECREASING INTERLOCKING OF ROCK PIECES ⇓		 A. Thick bedded, very blocky sandstone The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass. In shallow tunnels or slopes these bedding planes may cause structurally controlled instability.  B. Sandstone with thin inter-layers of siltstone  C. Sandstone and siltstone in similar amounts  D. Siltstone or silty shale with sandstone layers  E. Weak siltstone or clayey shale with sandstone layers C, D, E, and G - may be more or less folded than illustrated but this does not change the strength. Tectonic deformation, faulting and loss of continuity moves these categories to F and H.   G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers  H. Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces. — Means deformation after tectonic disturbance		70 60 50 40 30 20 10			

DATE: 8-19-16

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FEET

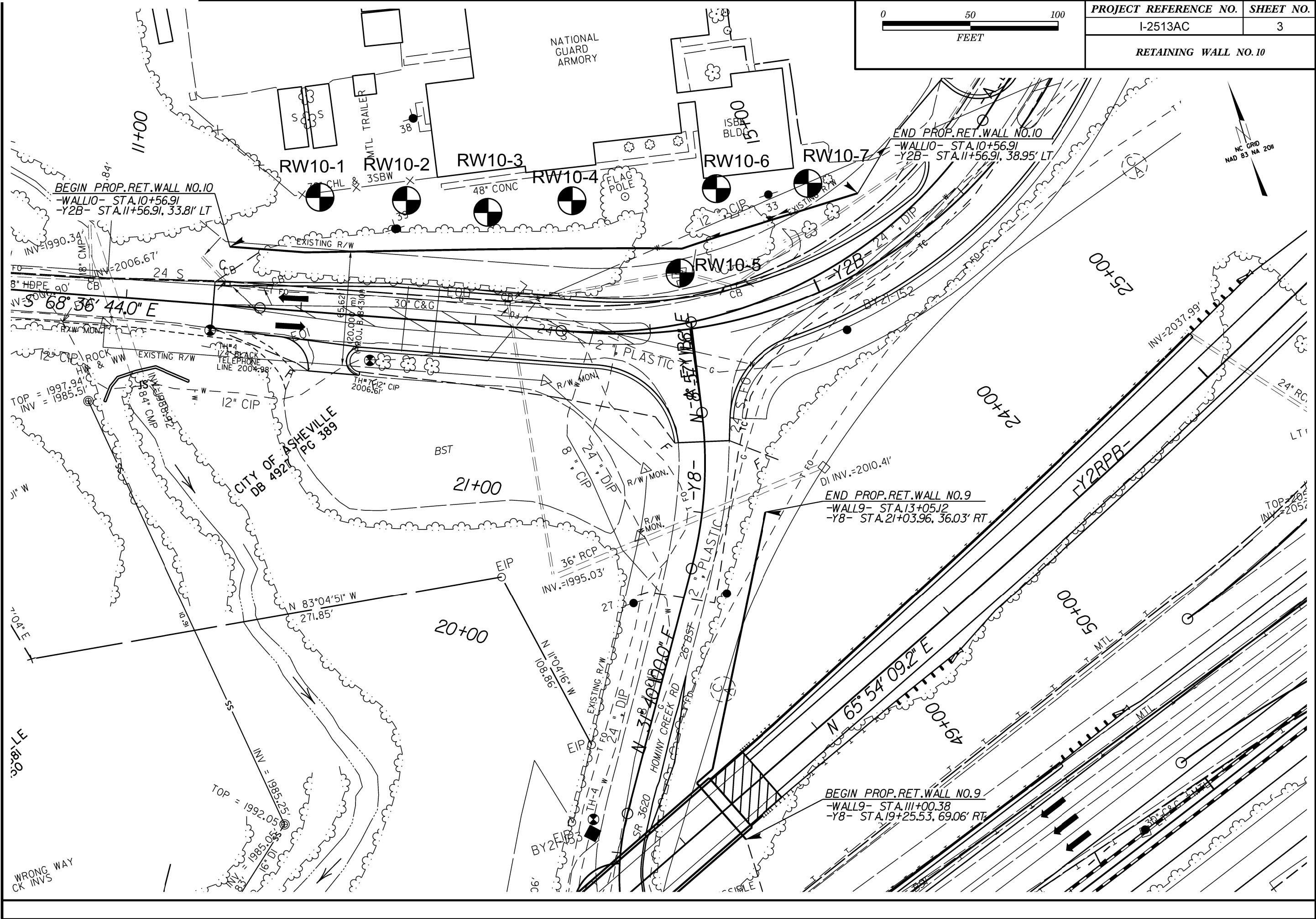
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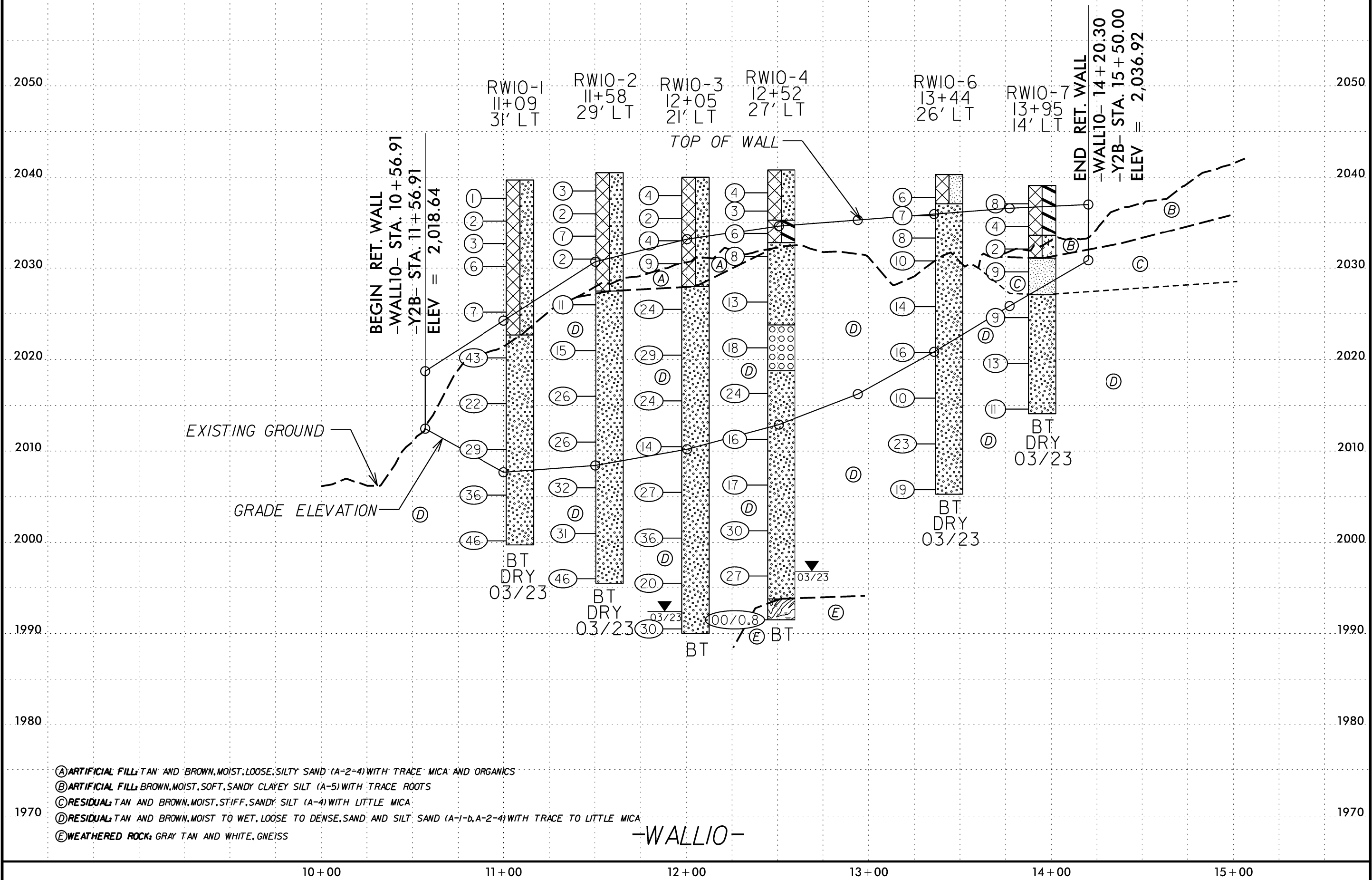
SHEET NO.

3

RETAINING WALL NO.10



PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	4
RETAINING WALL NO. 10	



GEOTECHNICAL BORING REPORT

BORE LOG

WBS			34165.1.2			TIP			1-2513AC			COUNTY			BUNCOMBE			GEOLOGIST			Goodnight, D.J.																																		
SITE DESCRIPTION																	RETAINING WALL NO. 10 FROM -Y2B- STA. 11+56.91 TO -Y2B- STA. 15+50.00																	GROUND WTR (ft)																					
BORING NO.					RW10-1					STATION					11+09					OFFSET					31 ft LT					ALIGNMENT					-WALL10-					0 HR.		Dry													
COLLAR ELEV.					2,039.6 ft					TOTAL DEPTH					40.0 ft					NORTHING					679,721					EASTING					930,406					24 HR.		Dry													
DRILL RIG/HAMMER EFF./DATE												CG20446 Diedrich D50 87% 05/10/2022												DRILL METHOD					H.S. Augers					HAMMER TYPE					Auto																
DRILLER						Odom, C.						START DATE						03/07/23						COMP. DATE						03/07/23						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										DEPTH (ft)																				
						0.5ft 0.5ft 0.5ft			0 25 50 75 100																ELEV. (ft)																														
2040																									GROUND SURFACE										0.0																				
		2,038.6		1.0		1			WOH			1													M				ARTIFICIAL FILL																										
		2,036.1		3.5		1			1			1													M				TAN-BROWN, VERY LOOSE, SILTY SAND (A-2-4) WITH TRACE GRAVEL																										
		2,033.6		6.0		1			1			2													M																														
		2,031.1		8.5		2			3			3													M																														
2030																																																							
		2,026.1		13.5		3			3			4													M																														
2025																																																							
		2,021.1		18.5		9			17			26													M				2,022.6										17.0																
2020																									RESIDUAL																														
		2,016.1		23.5		8			10			12													M				TAN, DENSE, SILTY SAND (A-2-4) WITH TRACE MICA																										
2015																																																							
		2,011.1		28.5		9			16			13													M																														
2010																																																							
		2,006.1		33.5		11			17			19													M																														
2005																																																							
		2,001.1		38.5		14			20			26																																											
2000																																																							
																									Boring Terminated at Elevation 1,999.6 ft in RESIDUAL: SILTY SAND																														

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34165.1.2				TIP 1-2513AC				COUNTY BUNCOMBE				GEOLOGIST Goodnight, D.J.					
SITE DESCRIPTION RETAINING WALL NO. 10 FROM -Y2B- STA. 11+56.91 TO -Y2B- STA. 15+50.00														GROUND WTR (ft)			
BORING NO. RW10-2				STATION 11+58				OFFSET 29 ft LT				ALIGNMENT -WALL 10-				0 HR. Dry	
COLLAR ELEV. 2,040.4 ft				TOTAL DEPTH 45.0 ft				NORTHING 679,704				EASTING 930,452				24 HR. Dry	
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022								DRILL METHOD H.S. Augers				HAMMER TYPE Auto					
DRILLER Odom, C.				START DATE 03/07/23				COMP. DATE 03/07/23				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			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100		MOI		ELEV. (ft)	DEPTH (ft)		
2045																	
2040																	
2035	2,039.4	1.0	1	2	1									2,040.4 GROUND SURFACE 0.0			
	2,036.9	3.5	2	1	1						M	X		ARTIFICIAL FILL TAN-BROWN, VERY LOOSE, SILTY SAND (A-2-4) WITH TRACE GRAVEL, MICA, AND ORGANICS (ROOTS)			
	2,034.4	6.0	2	3	4						M	X					
2030	2,031.9	8.5	3	1	1						M	X					
	2,026.9	13.5	4	5	6						M	X		2,027.4 RESIDUAL 13.0			
2025														TAN-BROWN, MEDIUM DENSE, SILTY SAND (A-2-4) WITH LITTLE MICA			
2020	2,021.9	18.5	5	6	9						M						
	2,016.9	23.5	7	12	14						M						
2015																	
2010	2,011.9	28.5	7	13	13						M						
	2,006.9	33.5	7	14	18						M						
2005																	
2000	2,001.9	38.5	7	11	20						M						
	1,996.9	43.5	17	23	23						M			1,995.4 45.0			
														Boring Terminated at Elevation 1,995.4 ft in RESIDUAL: SILTY SAND			

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34165.1.2			TIP 1-2513AC			COUNTY BUNCOMBE			GEOLOGIST Goodnight, D.J.							
SITE DESCRIPTION RETAINING WALL NO. 10 FROM -Y2B- STA. 11+56.91 TO -Y2B- STA. 15+50.00												GROUND WTR (ft)				
BORING NO. RW10-3			STATION 12+05			OFFSET 21 ft LT			ALIGNMENT -WALL10-			0 HR.	47.6			
COLLAR ELEV. 2,039.9 ft			TOTAL DEPTH 50.0 ft			NORTHING 679,684			EASTING 930,495			24 HR.	47.6			
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Auto							
DRILLER Odom, C.			START DATE 03/07/23			COMP. DATE 03/07/23			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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2040														2,039.9	GROUND SURFACE	0.0
2035	2,038.9	1.0												ARTIFICIAL FILL TAN-BROWN, LOOSE, SILTY SAND (A-2-4) WITH TRACE MICA AND ORGANICS		
	2,036.4	3.5	1	2	2											
	2,033.9	6.0	1	1	1											
2030	2,033.9	6.0												RESIDUAL TAN, MEDIUM DENSE TO DENSE, SILTY SAND (A-2-4) WITH TRACE MICA		
	2,031.4	8.5	1	1	3											
	2,026.4	13.5	9	9	15											
2025	2,026.4	13.5												2,027.9		
	2,021.4	18.5	6	13	16											
	2,016.4	23.5	5	11	13											
2015	2,016.4	23.5												2,011.4		
	2,011.4	28.5	7	7	7											
	2,006.4	33.5	6	11	16											
2010	2,006.4	33.5												2,001.4		
	2,001.4	38.5	11	19	17											
	1,996.4	43.5	8	9	11											
2005	1,996.4	43.5												1,991.4		
	1,991.4	48.5	5	10	20											
	1,991.4	48.5														
1990														1,989.9	Boring Terminated at Elevation 1,989.9 ft in RESIDUAL: SILTY SAND	50.0

GEOTECHNICAL BORING REPORT

BORE LOG

WBS		34165.1.2		TIP		1-2513AC		COUNTY		BUNCOMBE		GEOLOGIST		Goodnight, D.J.																					
SITE DESCRIPTION													RETAINING WALL NO. 10 FROM -Y2B- STA. 11+56.91 TO -Y2B- STA. 15+50.00			GROUND WTR (ft)																			
BORING NO.			RW10-4			STATION			12+52			OFFSET			27 ft LT			ALIGNMENT			-WALL10-			0 HR.		44.0									
COLLAR ELEV.			2,040.7 ft			TOTAL DEPTH			49.3 ft			NORTHING			679,676			EASTING			930,543			24 HR.		44.0									
DRILL RIG/HAMMER EFF./DATE								CG20446 Diedrich D50 87% 05/10/2022								DRILL METHOD				H.S. Augers				HAMMER TYPE				Auto							
DRILLER				Odom, C.				START DATE				03/08/23				COMP. DATE				03/08/23				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)																				
2045																																			
2040																																			
2035	2,039.2	1.5	2	2	2																														
	2,037.2	3.5	1	1	2																														
	2,034.7	6.0	1	2	4																														
2030	2,032.2	8.5	2	3	5																														
	2,027.2	13.5	3	5	8																														
2025	2,022.2	18.5	6	8	10																														
2020	2,017.2	23.5	6	11	13																														
2015	2,012.2	28.5	6	7	9																														
2010	2,007.2	33.5	6	7	10																														
2000	2,002.2	38.5	9	15	15																														
	1,997.2	43.5	10	12	15																														
1995	1,992.2	48.5	78	22/0.3																															

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2			TIP 1-2513AC			COUNTY BUNCOMBE			GEOLOGIST Goodnight, D.J.						
SITE DESCRIPTION RETAINING WALL NO. 10 FROM -Y2B- STA. 11+56.91 TO -Y2B- STA. 15+50.00										GROUND WTR (ft)					
BORING NO. RW10-5			STATION 13+14			OFFSET 14 ft RT			ALIGNMENT -WALL10-			0 HR. Dry			
COLLAR ELEV. 2,018.6 ft			TOTAL DEPTH 20.5 ft			NORTHING 679,619			EASTING 930,589			24 HR. Dry			
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022						DRILL METHOD H.S. Augers				HAMMER TYPE Auto					
DRILLER Odom, C.			START DATE 03/08/23			COMP. DATE 03/08/23			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)
2020															
2015	2,017.1	1.5												2,018.6	GROUND SURFACE 0.0
	2,014.6	4.0	1	2	3							M		ARTIFICIAL FILL BROWN, LOOSE, SILTY SAND (A-2-4) WITH TRACE GRAVEL	
2010	2,011.6	7.0	2	2	2							M			2,012.6
	2,009.6	9.0	1	2	4							M	RESIDUAL TAN, LOOSE TO MEDIUM DENSE, SILTY SAND (A-2-4) WITH LITTLE MICA		
2005	2,004.6	14.0	3	4	5							M			
												M			
2000	1,999.6	19.0	3	4	5							M		1,998.1	20.5
												M		Boring Terminated at Elevation 1,998.1 ft in RESIDUAL: SILTY SAND	

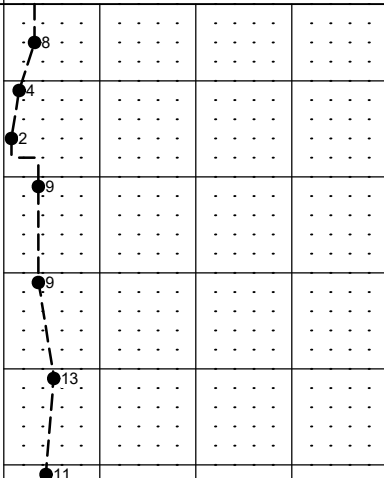
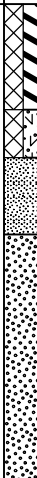
NCDOT BORE SINGLE I-213AC_GEO_RWALS.GPJ NC_DOT.GDT 4/19/24

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2			TIP 1-2513AC			COUNTY BUNCOMBE			GEOLOGIST Goodnight, D.J.						
SITE DESCRIPTION RETAINING WALL NO. 10 FROM -Y2B- STA. 11+56.91 TO -Y2B- STA. 15+50.00											GROUND WTR (ft)				
BORING NO. RW10-6			STATION 13+44			OFFSET 26 ft LT			ALIGNMENT -WALL10-			0 HR.	Dry		
COLLAR ELEV. 2,040.2 ft			TOTAL DEPTH 35.0 ft			NORTHING 679,659			EASTING 930,623			24 HR.	Dry		
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Auto						
DRILLER Odom, C.			START DATE 03/08/23			COMP. DATE 03/08/23			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)
2045															
2040															
2035	2,038.7	1.5													
	2,036.7	3.5	2	3	3										
	2,034.2	6.0	3	3	4										
2030	2,031.7	8.5	4	4	4										
	2,026.7	13.5	2	4	6										
	2,021.7	18.5	12	7	7										
2020	2,016.7	23.5	5	7	9										
	2,011.7	28.5	2	5	5										
	2,006.7	33.5	8	8	11										
											</				

NCDOT BORE SINGLE I-213AC_GEO_RWALS.GPJ NC_DOT.GDT 4/19/24

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2			TIP 1-2513AC			COUNTY BUNCOMBE			GEOLOGIST Goodnight, D.J.						
SITE DESCRIPTION RETAINING WALL NO. 10 FROM -Y2B- STA. 11+56.91 TO -Y2B- STA. 15+50.00												GROUND WTR (ft)			
BORING NO. RW10-7			STATION 13+95			OFFSET 14 ft LT			ALIGNMENT -WALL10-			0 HR.	Dry		
COLLAR ELEV. 2,039.0 ft			TOTAL DEPTH 25.0 ft			NORTHING 679,646			EASTING 930,674			24 HR.	Dry		
DRILL RIG/HAMMER EFF./DATE CG20446 Diedrich D50 87% 05/10/2022						DRILL METHOD H.S. Augers				HAMMER TYPE Auto					
DRILLER Odom, C.			START DATE 03/08/23			COMP. DATE 03/08/23			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)
2040															
2035	2,038.0	1.0	3	4	4									2,039.0 GROUND SURFACE 0.0	
	2,035.5	3.5	1	2	2						M			ARTIFICIAL FILL BROWN, MEDIUM STIFF TO SOFT, SANDY, SILTY CLAY (A-7) WITH TRACE GRAVEL	
2030	2,033.0	6.0	1	1	1						M		2,033.5	5.5	
	2,030.5	8.5	2	4	5						W		2,031.0	8.0	
2025	2,025.5	13.5	4	3	6						M		2,027.0	12.0	
	2,020.5	18.5	3	6	7						M				
2020															
	2,015.5	23.5	3	5	6						M				
2015															
														Boring Terminated at Elevation 2,014.0 ft in RESIDUAL: SILTY SAND	

NCDOT BORE DOUBLE I-1213AC_GEO_RWALS.GPJ NC_DOT.GDT 4/18/24