

REFERENCE: I-2513AC

PROJECT: 34165

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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 ROAD)

SITE DESCRIPTION BRIDGE NO. 242 ON NC 191
(BREVARD ROAD) OVER I-26I-240
-Y2- STA. 22 + 70.15

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-2513AC	1	20

CAUTION NOTICE

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- 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.

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GEOLOGIC EXPLORATION

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INVESTIGATED BY ECS SOUTHEAST, LLC

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SUBMITTED BY ECS SOUTHEAST, LLC

DATE JULY 2025

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Signed by:

Amanda R. Suttle P.G. 7/25/2025
399DBE4297A994... SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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 YIELDED 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 DISLOGGED 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 (ISAP.) - 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 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 (SRC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - 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																			
GENERAL CLASS.		GRANULAR MATERIALS (≤ 35% PASSING #200)				SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS									
GROUP CLASS.	A-1	A-3	A-2	A-2	A-2	A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7								
SYMBOL																			
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX 10 MX	51 MN 35 MX 35 MX	35 MX 35 MX 35 MX	35 MX 35 MX 35 MX	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN	36 MN 36 MN 36 MN										
PASSING #40 LL PI	- 6 MX	- NP	40 MX 10 MX 10 MN	41 MN 10 MN 11 MN	40 MX 11 MN 11 MN	40 MX 10 MX 10 MN	41 MN 10 MN 11 MN	40 MX 11 MN 11 MN	41 MN 11 MN 11 MN										
GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX											
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND			SILTY SOILS			CLAYEY SOILS										
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD				FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE								
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30																			
CONSISTENCY OR DENSENESS																			
PRIMARY SOIL TYPE		COMPACTNESS OR CONSISTENCY		RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)		RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FI ²)													
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)		VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE		< 4 4 TO 10 10 TO 30 30 TO 50 > 50		N/A													
GENERALLY SILT-CLAY MATERIAL (COHESIVE)		VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD		< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30		< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4													
TEXTURE OR GRAIN SIZE																			
U.S. STD. SIEVE SIZE OPENING (MM)		4 4.76	10 2.00	40 0.42	60 0.25	200 0.075	270 0.053												
BOULDER (BLDR.)		COBBLE (COB.)		GRAVEL (GR.)		COARSE SAND (CSE. SD.)		FINE SAND (F SD.)		SILT (SL.)		CLAY (CL.)							
GRAIN SIZE		MM IN.	305 12	75 3	2.0	0.25	0.05	0.005											
SOIL MOISTURE - CORRELATION OF TERMS																			
SOIL MOISTURE SCALE (ATTERBERG LIMITS)		FIELD MOISTURE DESCRIPTION		GUIDE FOR FIELD MOISTURE DESCRIPTION															
LL LIQUID RANGE (PI) PL		LIQUID LIMIT		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE															

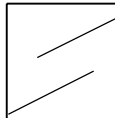
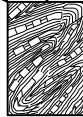
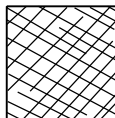
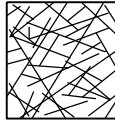
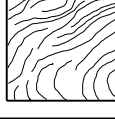
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

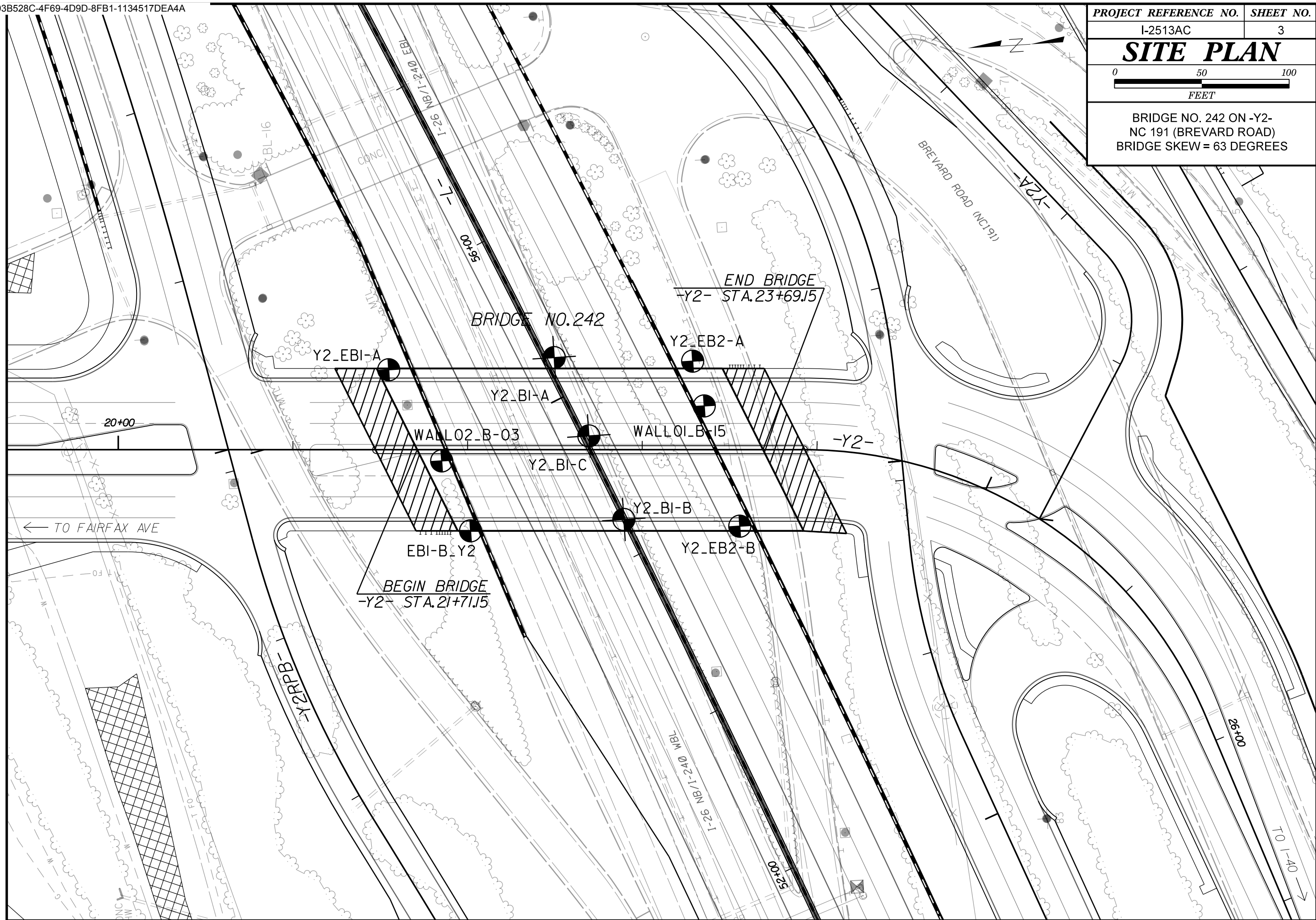
SUBSURFACE INVESTIGATION

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)

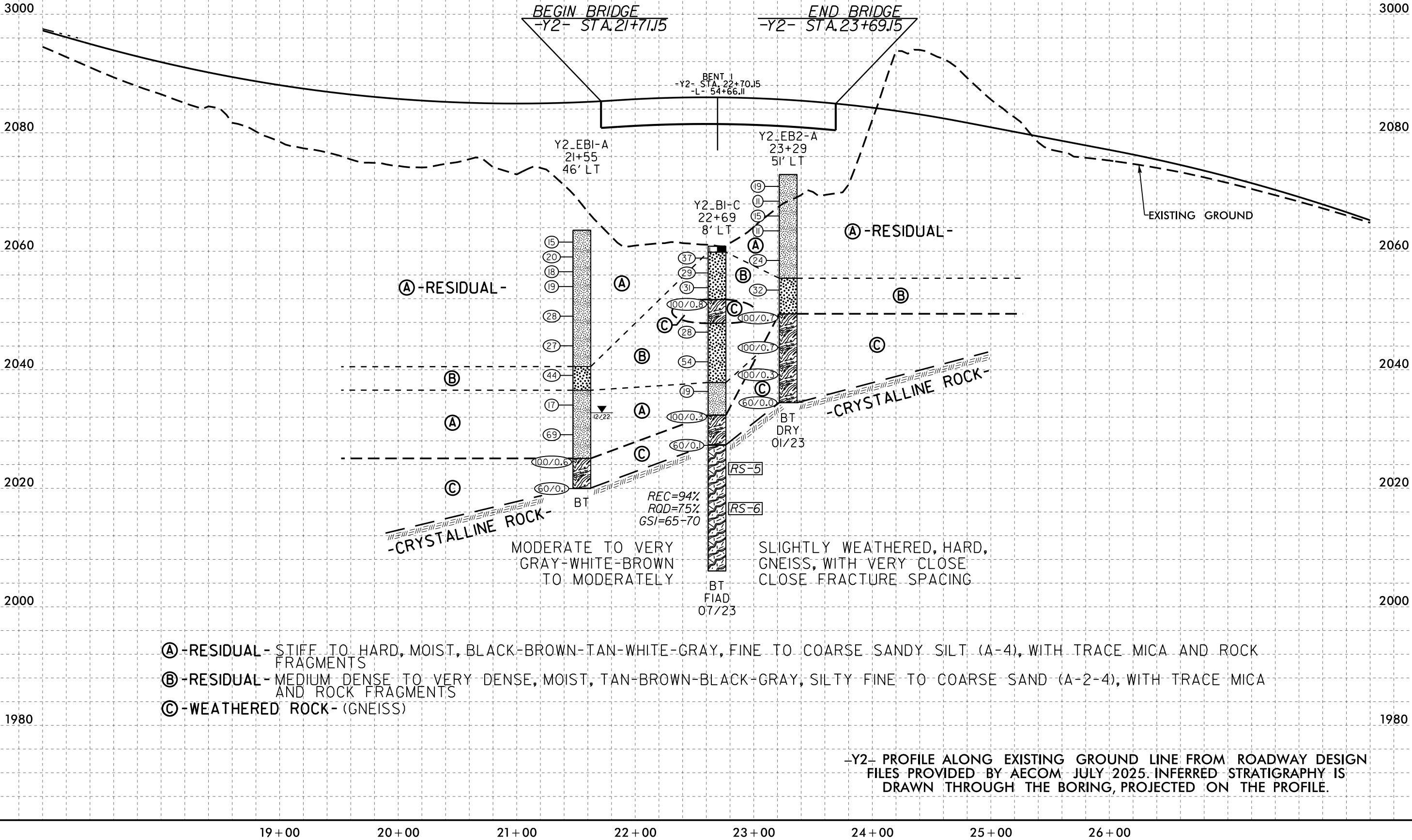
AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

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					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, slickensided or highly weathered surfaces with soft clay coatings or fillings				
STRUCTURE		DECREASING SURFACE QUALITY ➡					COMPOSITION AND STRUCTURE									
 INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities		90 80 70 60 50 40 30 20 10 N/A N/A					 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  F. Tectonically deformed, intensively folded/faulted, sheared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure  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.					70 60 50 40 30 20 10				
 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																





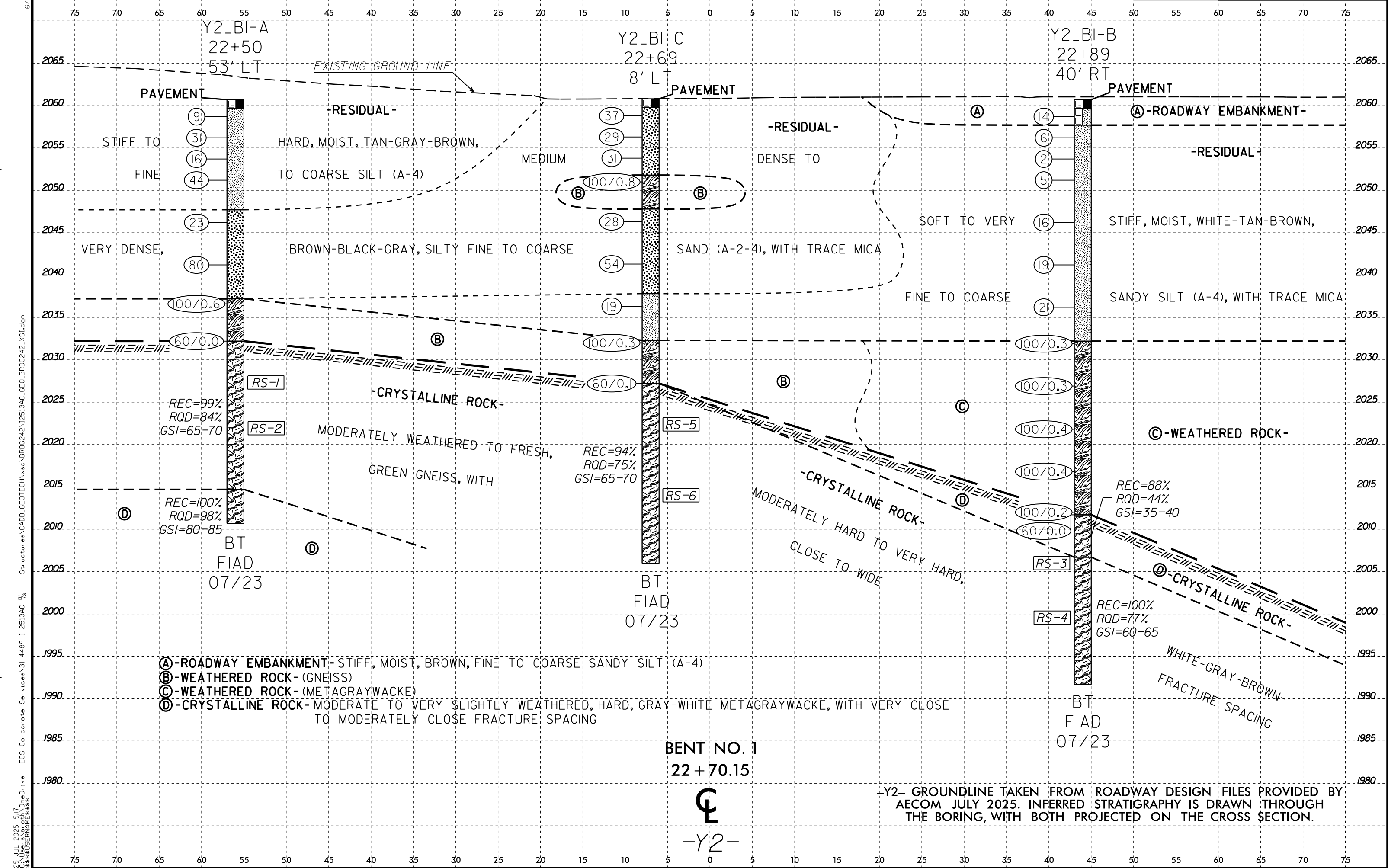
-Y2-



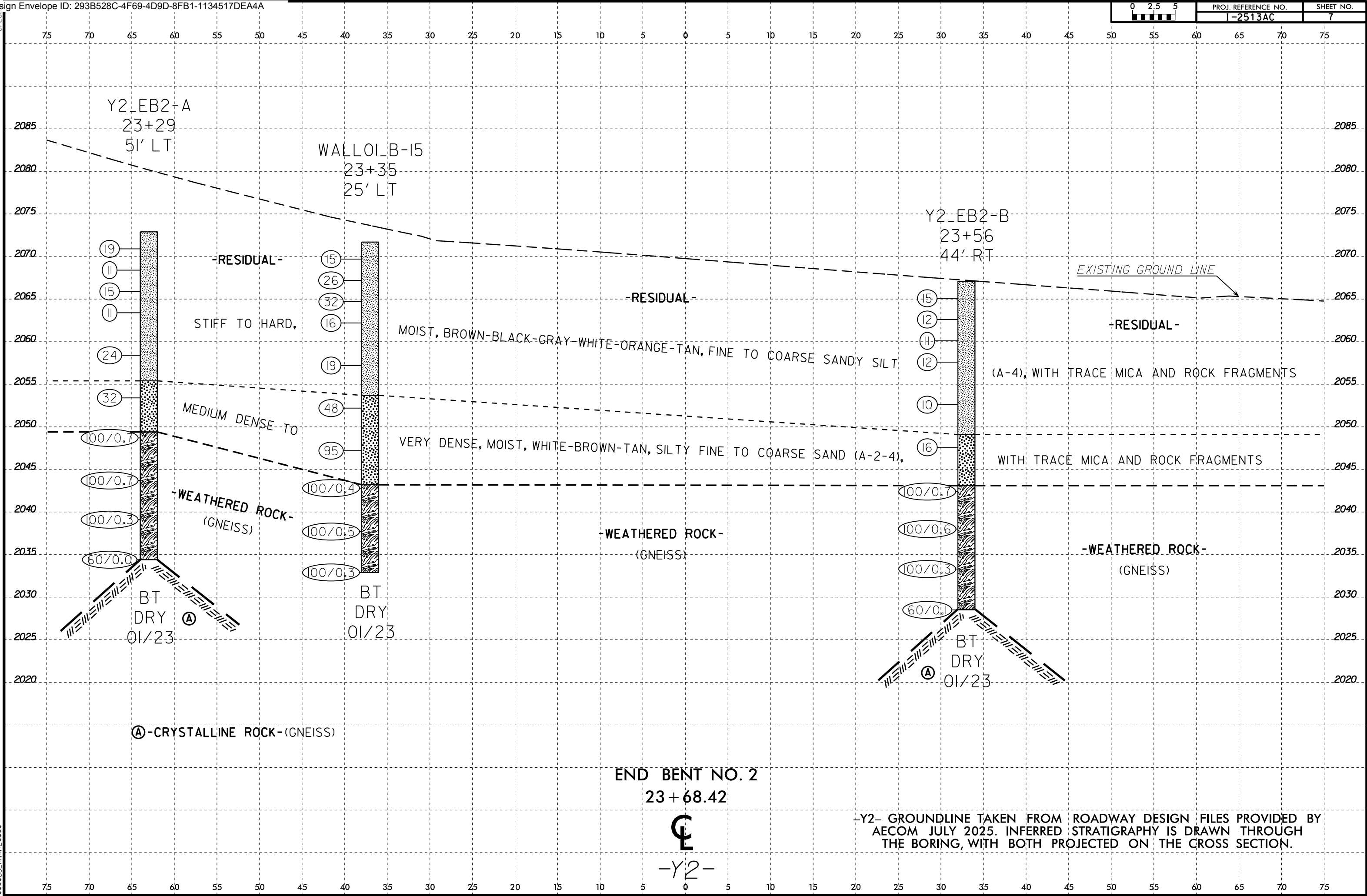




-Y2- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY AECOM JULY 2025. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE CROSS SECTION.



25-JUL-2025 15:17
C:\Users\jg10e\OneDrive - ECS Corporate Services\31-4489 I-2513AC 1%
Structures\CA00.GEOTECH\XSC\BROG242\12513AC_GEO.BROG242.XSI.dgn





8

WBS: 34165.1.13	TIP: I-2513AC	COUNTY: BUNCOMBE	GEOLOGIST: A. Blackmore
SITE DESCRIPTION: BRIDGE NO. 242 ON NC 191 (BREVARD ROAD) OVER I-26/I-240			GROUND WTR (ft)
BORING NO.: WALL02_B-03	STATION: 21+85	OFFSET: 6 ft RT	ALIGNMENT: -Y2-
COLLAR ELEV.: 2,062.0 ft	TOTAL DEPTH: 34.8 ft	NORTHING: 679,506	EASTING: 931,226
			0 HR. 29.3
			24 HR. Dry

DRILL RIG/HAMMER EFF./DATE: ECS0888 CME-750X 93% 12/02/2022	DRILL METHOD: H.S. Augers	HAMMER TYPE: Automatic
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DRILLER: T. Cook	START DATE: 12/01/22	COMP. DATE: 12/01/22	SURFACE WATER DEPTH: N/A
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ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼ MOI	L O G	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2065															
	2,061.0	1.0	6	10	12									2,062.0	GROUND SURFACE
2060	2,058.5	3.5	13	23	31									2,056.5	RESIDUAL Medium Dense to Very Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica
2055	2,056.0	6.0	11	9	12										Stiff to Hard, Brown, Fine to Coarse Sandy SILT (A-4), with trace mica
	2,053.5	8.5	30	19	48										
2050	2,048.5	13.5	22	8	7										
2045	2,043.5	18.5	16	30	37									2,044.0	Very Dense, Orange-Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with trace rock fragments
2040	2,038.5	23.5	11	8	10									2,039.0	Very Stiff to Hard, Brown-Black, Fine to Coarse Sandy SILT (A-4), with little mica
2035	2,033.5	28.5	12	21	22										
2030	2,028.5	33.5	25	49	51/0.3									2,028.0	
														2,027.2	WEATHERED ROCK

NCDOT BORE DOUBLE I2513AC GEO BRDG242 ECS.GPJ ECS GINT DATA-TEMPLATE.GDT 7/25/25



I-2513AC

9



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WBS: 34165.1.13	TIP: I-2513AC	COUNTY: BUNCOMBE	GEOLOGIST: A. Blackmore	
SITE DESCRIPTION: BRIDGE NO. 242 ON NC 191 (BREVARD ROAD) OVER I-26/I-240				GROUND WTR (ft)
BORING NO.: Y2_B1-A	STATION: 22+50	OFFSET: 53 ft LT	ALIGNMENT: -Y2-	0 HR. N/A
COLLAR ELEV.: 2,060.7 ft	TOTAL DEPTH: 50.0 ft	NORTHING: 679,438	EASTING: 931,281	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE: ECS0888 CME 750X 93% 12/02/2022		DRILL METHOD: NW Casing W/SPT & Core		HAMMER TYPE: Automatic
DRILLER: T. Hibdon	START DATE: 07/10/23	COMP. DATE: 07/10/23	SURFACE WATER DEPTH: N/A	

CORE SIZE: NQ-2					TOTAL RUN: 21.5 ft								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS		
					REC. (ft) %	ROD (ft) %		REC. (ft) %	ROD (ft) %		ELEV. (ft)	DEPTH (ft)	
2032.2	2,032.2	28.5	1.5	0:52/1.0	(1.5)	(1.5)		(17.4)	(14.7)		2,032.2	Begin Coring @ 28.5 ft	28.5
2030	2,030.7	30.0	5.0	0:32/0.5	100%	100%		99%	84%		CRYSTALLINE ROCK		
				0:55/1.0	(5.0)	(3.9)					Slightly Weathered to Fresh, Moderately Hard to Very Hard, White-Gray-Green GNEISS, with Very Close to Wide Fracture Spacing		
				0:37/1.0	100%	78%					GSI = 65-70		
				0:54/1.0			RS-1				RS-1: 33.4' - 33.8'		
				0:49/1.0							Unit Weight = 166.8 pcf		
				1:03/1.0							Unconfined Compressive Strength = 5,750psi / 828		
2025	2,025.7	35.0	5.0	1:01/1.0	(5.0)	(4.0)							
				1:00/1.0	100%	80%							
				1:04/1.0			RS-2						
2020	2,020.7	40.0	5.0	0:57/1.0	(5.0)	(5.0)							
				0:58/1.0	100%	100%							
				1:05/1.0									
				1:02/1.0									
2015	2,015.7	45.0	5.0	1:10/1.0	(4.9)	(4.2)					2,014.7	Very Slightly Weathered, Hard, White METAGRAYWACKE, with Close to Moderately Close Fracture Spacing	46.0
				1:05/1.0	98%	84%		(4.0)	(3.9)				
				0:58/1.0				100%	98%				
				1:02/1.0									
	2,010.7	50.0		1:11/1.0							2,010.7	GSI = 80-85	50.0
												Boring Terminated at Elevation 2,010.7 ft In Crystalline Rock (METAGRAYWACKE)	

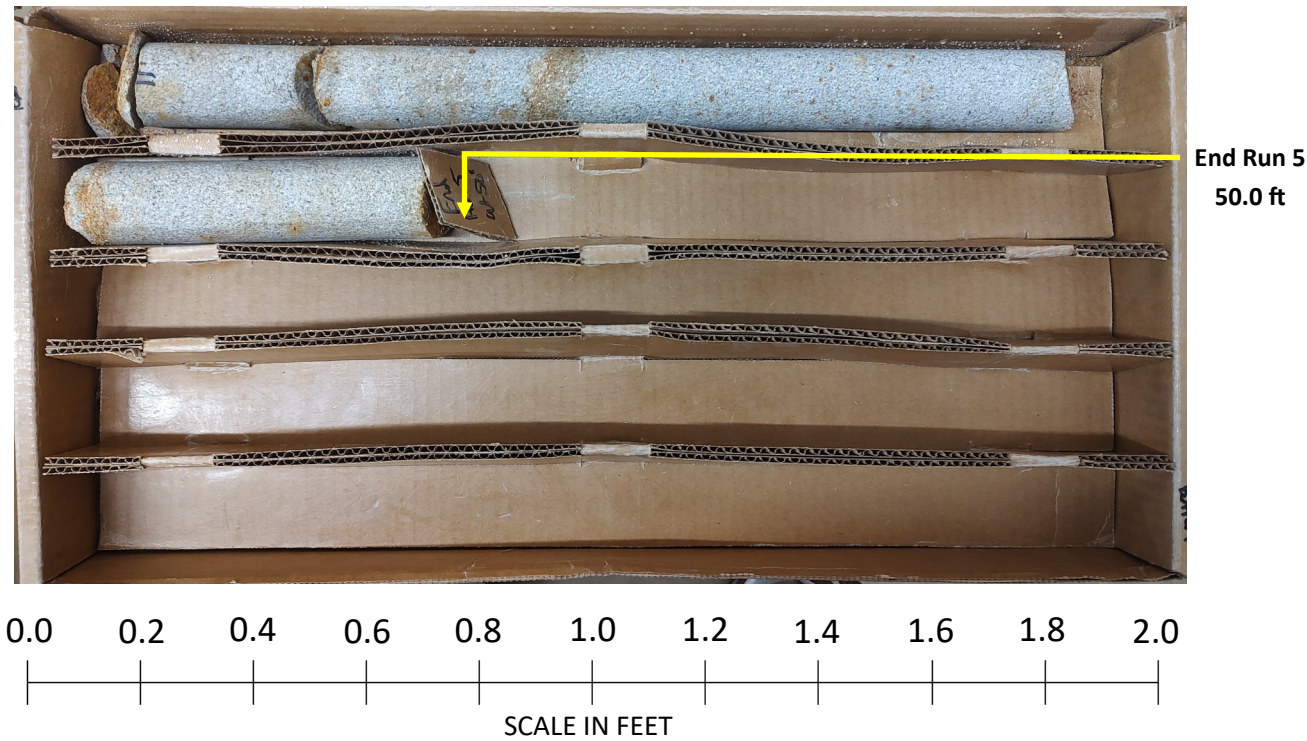
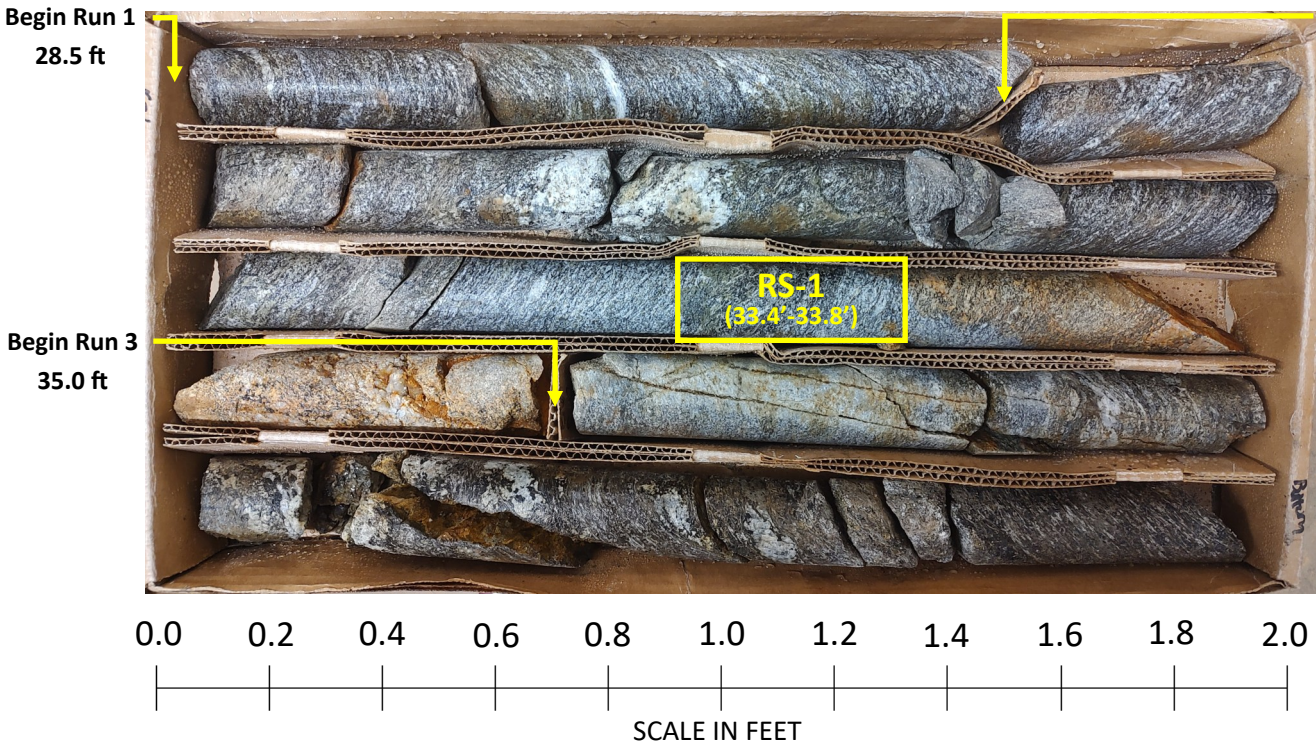


Bridge No. 242 on NC 191 (Brevard Road) over I-26/I-240

WBS - 34165 TIP No. I-2513AC

Rock Core Photographs: Boring - Y2_B1-A

Station: 22+50 Offset: 53' LT



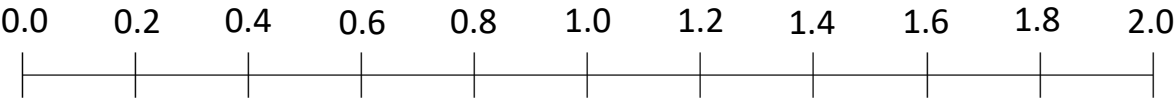


Bridge No. 242 on NC 191 (Brevard Road) over I-26/I-240

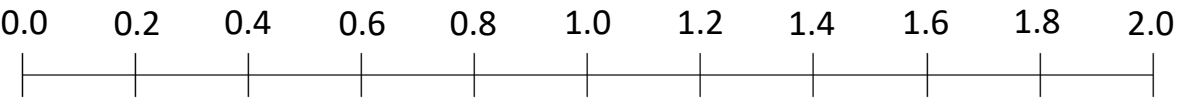
WBS - 34165 TIP No. I-2513AC

Rock Core Photographs: Boring - Y2_B1-C

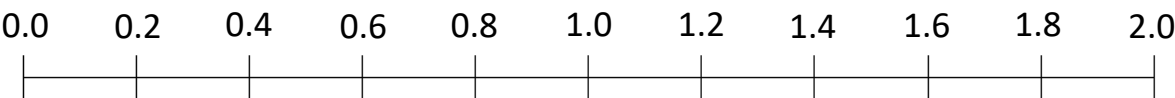
Station: 22+69 Offset: 8' LT



SCALE IN FEET



SCALE IN FEET



SCALE IN FEET



I-2513AC

14

WBS: 34165.1.13					TIP: I-2513AC					COUNTY: BUNCOMBE					GEOLOGIST: A. West											
SITE DESCRIPTION: BRIDGE NO. 242 ON NC 191 (BREVARD ROAD) OVER I-26/I-240															GROUND WTR (ft)											
BORING NO.: Y2_B1-B					STATION: 22+89					OFFSET: 40 ft RT					ALIGNMENT: -Y2-					0 HR.	N/A					
COLLAR ELEV.: 2,060.7 ft					TOTAL DEPTH: 69.0 ft					NORTHING: 679,404					EASTING: 931,186					24 HR.	FIAD					
DRILL RIG/HAMMER EFF./DATE: ECS3518 CME 750X 96% 07/21/2022										DRILL METHOD: NW Casing W/SPT & Core					HAMMER TYPE: Automatic											
DRILLER: W. King					START DATE: 07/10/23					COMP. DATE: 07/11/23					SURFACE WATER DEPTH: N/A											
CORE SIZE: NQ-2					TOTAL RUN: 20.0 ft																					
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) RQD (ft) %		SAMP. NO.	STRATA REC. (ft) RQD (ft) %		L O G	DESCRIPTION AND REMARKS															
											ELEV. (ft)															DEPTH (ft)
2011.7											Begin Coring @ 49.0 ft															
2010	2,011.7	49.0	5.0	0:55/1.0 0:52/1.0 0:58/1.0 1:02/1.0 1:08/1.0	(4.4) 88%	(2.2) 44%		(4.4) 88%	(2.2) 44%		2,011.7	CRYSTALLINE ROCK Moderate to Slightly Weathered, Hard, Gray-White METAGRAYWACKE, with Very Close to Close Fracture Spacing														49.0
	2,006.7	54.0		1:03/1.0 0:56/1.0 1:38/1.0 1:40/1.0 1:29/1.0	(5.0) 100%	(3.3) 66%		(15.0) 100%	(11.9) 79%		2,006.7	GSI = 35-40														54.0
2005			5.0	1:03/1.0 0:56/1.0 1:38/1.0 1:40/1.0 1:29/1.0	(5.0) 100%	(3.3) 66%	RS-3	(15.0) 100%	(11.9) 79%		CRYSTALLINE ROCK Moderately Weathered to Fresh, Hard to Very Hard, Gray-White GNEISS, with Very Close to Moderately Close Fracture Spacing															
	2,001.7	59.0		2:02/1.0 1:58/1.0 1:30/1.0 1:45/1.0 1:36/1.0	(5.0) 100%	(4.3) 86%					GSI = 60-65															
2000			5.0	2:02/1.0 1:58/1.0 1:30/1.0 1:45/1.0 1:36/1.0	(5.0) 100%	(4.3) 86%	RS-4				RS-3: 54.7' - 55.1' Unit Weight = 163.0 pcf Unconfined Compressive Strength = 2,290 psi / 330 k															
	1,996.7	64.0		2:31/1.0 2:02/1.0 2:10/1.0 1:50/1.0 2:32/1.0	(5.0) 100%	(4.3) 86%																				
1995			5.0	2:31/1.0 2:02/1.0 2:10/1.0 1:50/1.0 2:32/1.0	(5.0) 100%	(4.3) 86%																				
	1,991.7	69.0									1,991.7	Boring Terminated at Elevation 1,991.7 ft In Crystalline Rock (GNEISS)														69.0

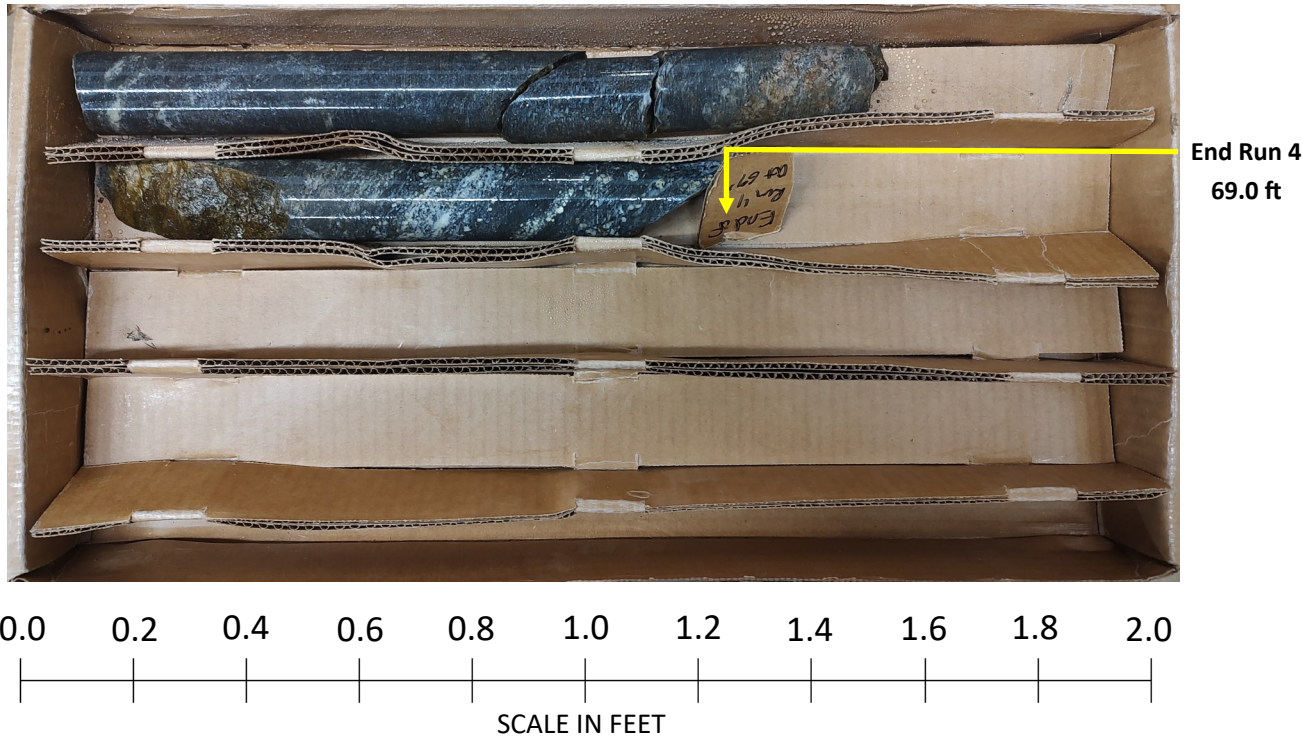
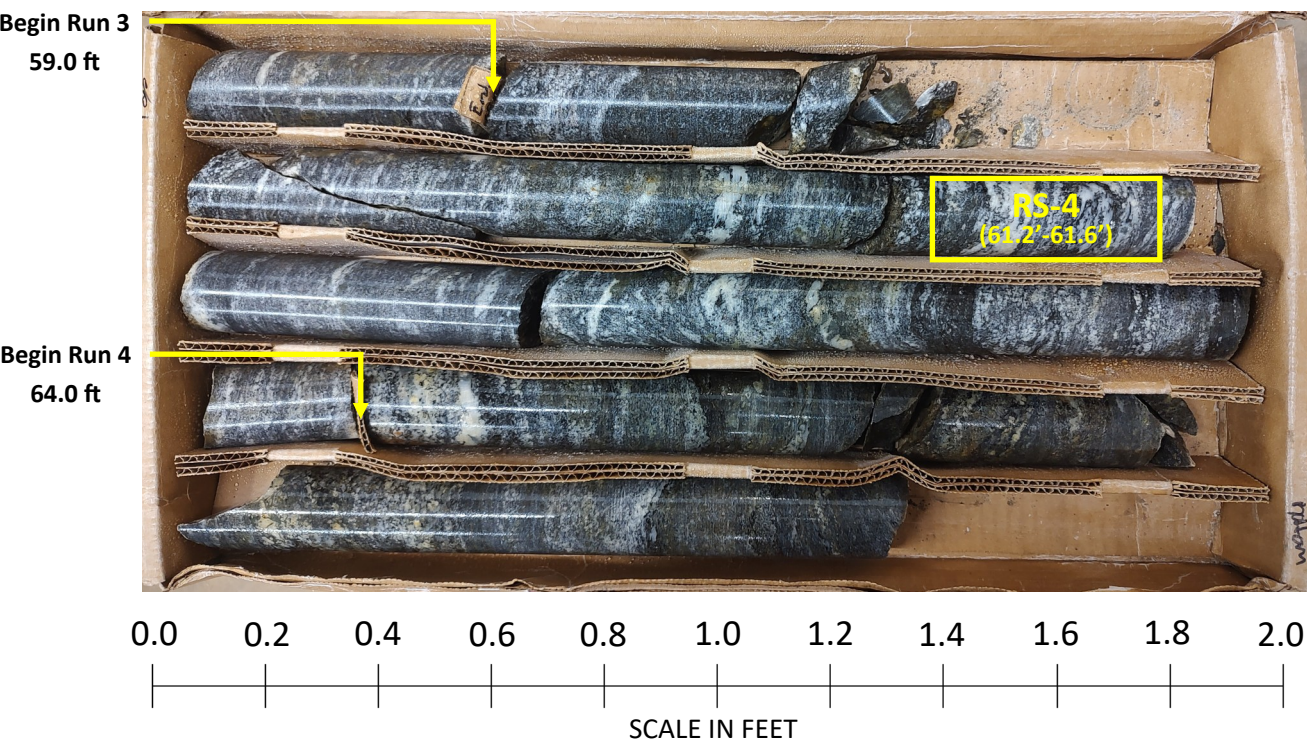
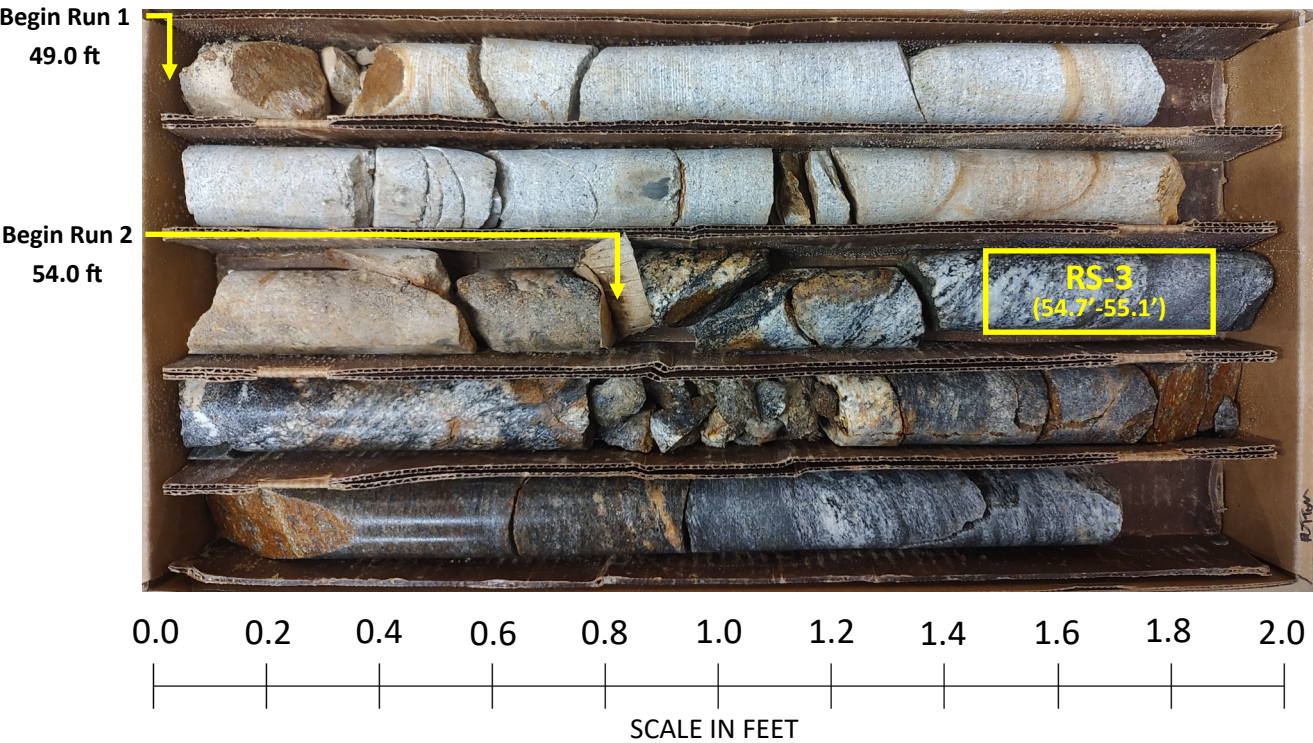


Bridge No. 242 on NC 191 (Brevard Road) over I-26/I-240

WBS - 34165 TIP No. I-2513AC

Rock Core Photographs: Boring - Y2_B1-B

Station: 22+89 Offset: 40' RT





16

WBS: 34165.1.13	TIP: I-2513AC	COUNTY: BUNCOMBE	GEOLOGIST: A. Blackmore	
SITE DESCRIPTION: BRIDGE NO. 242 ON NC 191 (BREVARD ROAD) OVER I-26/I-240				GROUND WTR (ft)
BORING NO.: WALL01_B-15	STATION: 23+35	OFFSET: 25 ft LT	ALIGNMENT: -Y2-	0 HR. Dry
COLLAR ELEV.: 2,071.7 ft	TOTAL DEPTH: 38.8 ft	NORTHING: 679,354	EASTING: 931,248	24 HR. Dry

DRILL RIG/HAMMER EFF./DATE: GEO366 Diedrich D-50 80% 03/18/2022	DRILL METHOD: H.S. Augers	HAMMER TYPE: Automatic
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DRILLER: J. Messick	START DATE: 01/26/23	COMP. DATE: 01/26/23	SURFACE WATER DEPTH: N/A
----------------------------	-----------------------------	-----------------------------	---------------------------------

[illegible]

0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0

00/0.3

100/0.3

Boring Terminated at Elevation 2,032.9 ft In
Weathered Rock (GNEISS)

Surficial Organic Soil 0.0 to 0.3 feet

NCNDOT BORE DOUBLE I2513AC GEO BRDG242 ECS.GPJ ECS GINT DATA-TEMPLATE.GDT 7/25/25



GEOTECHNICAL BORING REPORT
BORE LOG

WBS: 34165.1.13		TIP: I-2513AC		COUNTY: BUNCOMBE		GEOLOGIST: A. Blackmore			
SITE DESCRIPTION: BRIDGE NO. 242 ON NC 191 (BREVARD ROAD) OVER I-26/I-240								GROUND WTR (ft)	
BORING NO.: Y2_EB2-B		STATION: 23+56		OFFSET: 44 ft RT		ALIGNMENT: -Y2-			
COLLAR ELEV.: 2,067.1 ft		TOTAL DEPTH: 38.6 ft		NORTHING: 679,338		EASTING: 931,178		0 HR.	Dry
								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: 01/25/23		COMP. DATE: 01/25/23		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)
2070															
														2,067.1	0.0
														GROUND SURFACE	
2065	2,066.1	1.0	5	6	9	15						M	RESIDUAL		
						12						M	Stiff, Brown-Tan-Orange-Gray, Fine to		
	2,063.6	3.5	7	7	5							M	Coarse Sandy SILT (A-4), with trace mica		
2060	2,061.1	6.0	5	6	5	11						M			
	2,058.6	8.5	5	5	7	12						M			
2055															
	2,053.6	13.5	4	5	5	10						M			
2050															
	2,048.6	18.5	4	7	9	16						M	2,049.1	18.0	Medium Dense, Tan-White-Brown, Silty Fine to Coarse SAND (A-2-4)
2045														2,043.1	24.0
	2,043.6	23.5	19	73	27/0.2								WEATHERED ROCK		
2040										100/0.7			Gray (GNEISS)		
	2,038.6	28.5	76	24/0.1						100/0.6					
2035															
	2,033.6	33.5	100/0.3							100/0.3					
2030															
	2,028.6	38.5	60/0.1							60/0.1			CRYSTALLINE ROCK		
													(GNEISS)		
													Boring Terminated with Standard Penetration Test Refusal at Elevation 2,028.5 ft In Crystalline Rock (GNEISS)		
													Suficial Organic Soil 0.0 to 0.3 feet		

NC DOT BORE DOUBLE I-2513AC_GEO_BRDG242_ECS.GPJ ECS_GINT_DATA_TEMPLATE.GDT 7/25/25

ROCK TEST RESULTS												
BORING ID.	SAMPLE NO.	ALIGN.	STATION	OFFSET	EASTING (US FT.)	NORTHING (US FT.)	DEPTH INTERVAL	RUN REC (%)	RUN RQD (%)	ROCK TYPE	UNIT WEIGHT (LB/FT3)	UNCONFINED COMPRESSIVE STRENGTH (PSI/KSF)
Y2_B1-A	RS-1	-Y2-	22+50	41' LT	931,269	679,439	33.4-33.8	100	78	Muscovite-Biotite Gneiss	166.8	5,750 psi / 828 ksf
Y2_B1-A	RS-2	-Y2-	22+50	41' LT	931,269	679,439	38.8-39.2	100	80	Muscovite-Biotite Gneiss	175.9	4,360 psi / 628 ksf
Y2_B1-B	RS-3	-Y2-	22+91	41' RT	931,185	679,403	54.7-55.1	100	66	Muscovite-Biotite Gneiss	163.0	2,290 psi / 330 ksf
Y2_B1-B	RS-4	-Y2-	22+91	41' RT	931,185	679,403	61.2-61.6	100	86	Muscovite-Biotite Gneiss	168.6	7,630 psi / 1,099 ksf
Y2_B1-C	RS-5	-Y2-	22+70	CL	931,227	679,421	38.5-38.9	100	100	Muscovite-Biotite Gneiss	188.3	6,600 psi / 951 ksf
Y2_B1-C	RS-6	-Y2-	22+70	CL	931,227	679,421	45.2-45.6	100	86	Muscovite-Biotite Gneiss	181.3	3,590 psi / 517 ksf

RS = NQ2 Rock Core Barrel Sample (ASTM D-2113)

SITE PHOTOGRAPHS



PHOTO 1: VIEW FROM PROPOSED BRIDGE 242 AT END BENT 2, FACING NORTH-NORTHEAST



PHOTO 2: VIEW FROM PROPOSED BRIDGE 242 AT END BENT 1, FACING SOUTH-SOUTHWEST



PHOTO 3: VIEW FROM PROPOSED BRIDGE 242 ALONG I-26/I-240 (-L-), FACING DOWNSTATION



PHOTO 4: VIEW FROM PROPOSED BRIDGE 242 ALONG I-26/I-240 (-L-), FACING UPSTATION

REFERENCE: I-2513AC

PROJECT: 34165

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5-6	CROSS SECTIONS
7-9	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 ROAD)

SITE DESCRIPTION DUAL BRIDGES NO. 898 & 899 ON
I-26I-240 (-L-) OVER SR 3556 (AMBOY ROAD, -Y3-)
-L- STA. 83 + 50.80

STATE	STATE PROJECT REFERENCE 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 PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. 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.

SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE. INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA AND BOREHOLE INFORMATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS. 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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS 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

A. BLACKMORE

D. HAMILTON

TOTAL DEPTH DRILLING

TERRACON CONSULTANTS

INVESTIGATED BY ECS SOUTHEAST, LLC

DRAWN BY A. SUTTLE, P.E.

CHECKED BY M. MULLA, P.E.

SUBMITTED BY ECS SOUTHEAST, LLC

DATE MARCH 2024

Prepared in the Office of:



ECS SOUTHEAST, LLC
1812 CENTER PARK DRIVE, SUITE D
CHARLOTTE, NC 28217
(704) 525-5152 [PHONE]
(704) 357-0023 [FAX]
NC REGISTERED
ENGINEERING
FIRM # F-1519



Signed by: Amanda R. Suttle, P.E. 6/30/2026

BDAF14CE SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

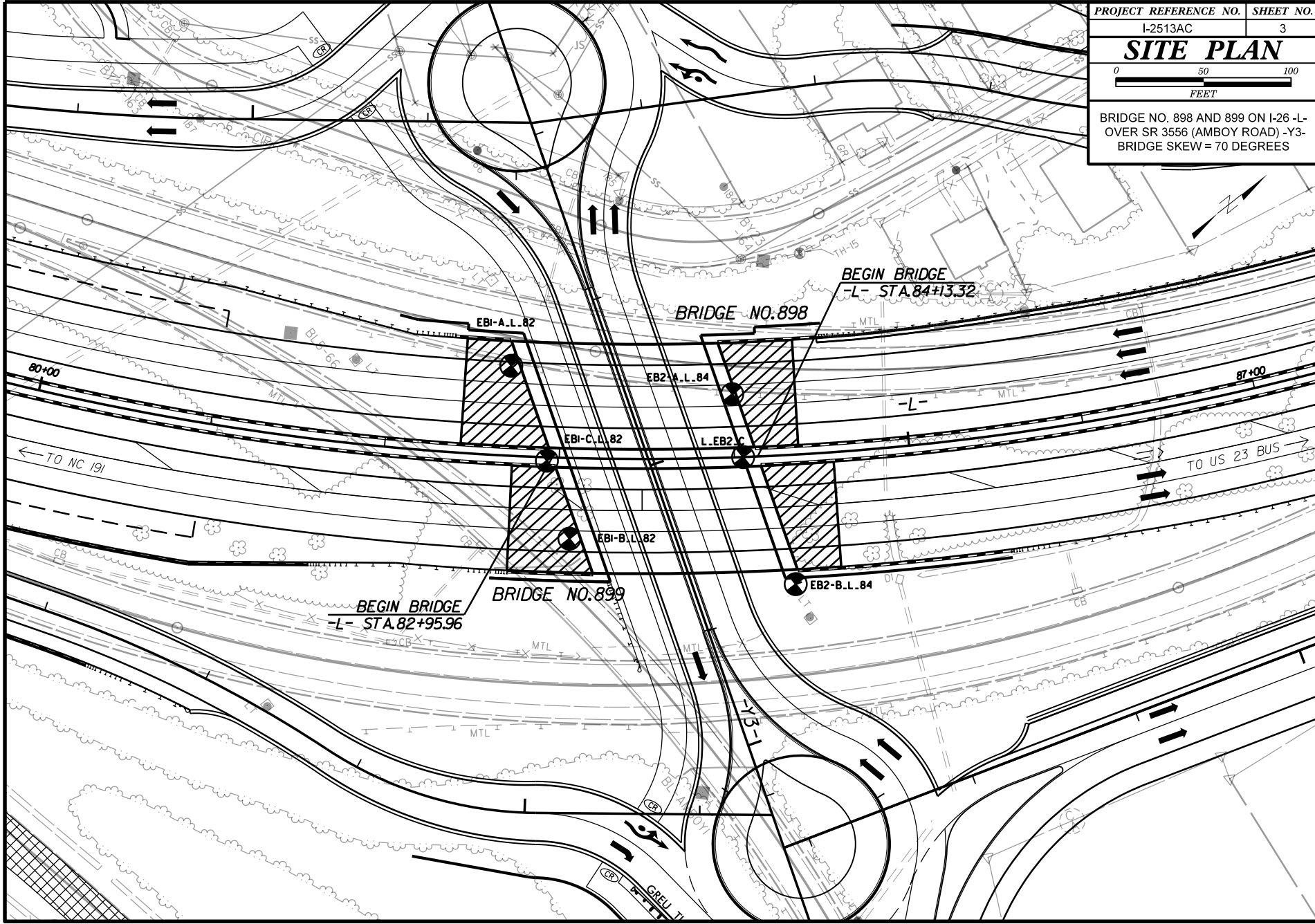
GEOTECHNICAL ENGINEERING UNIT

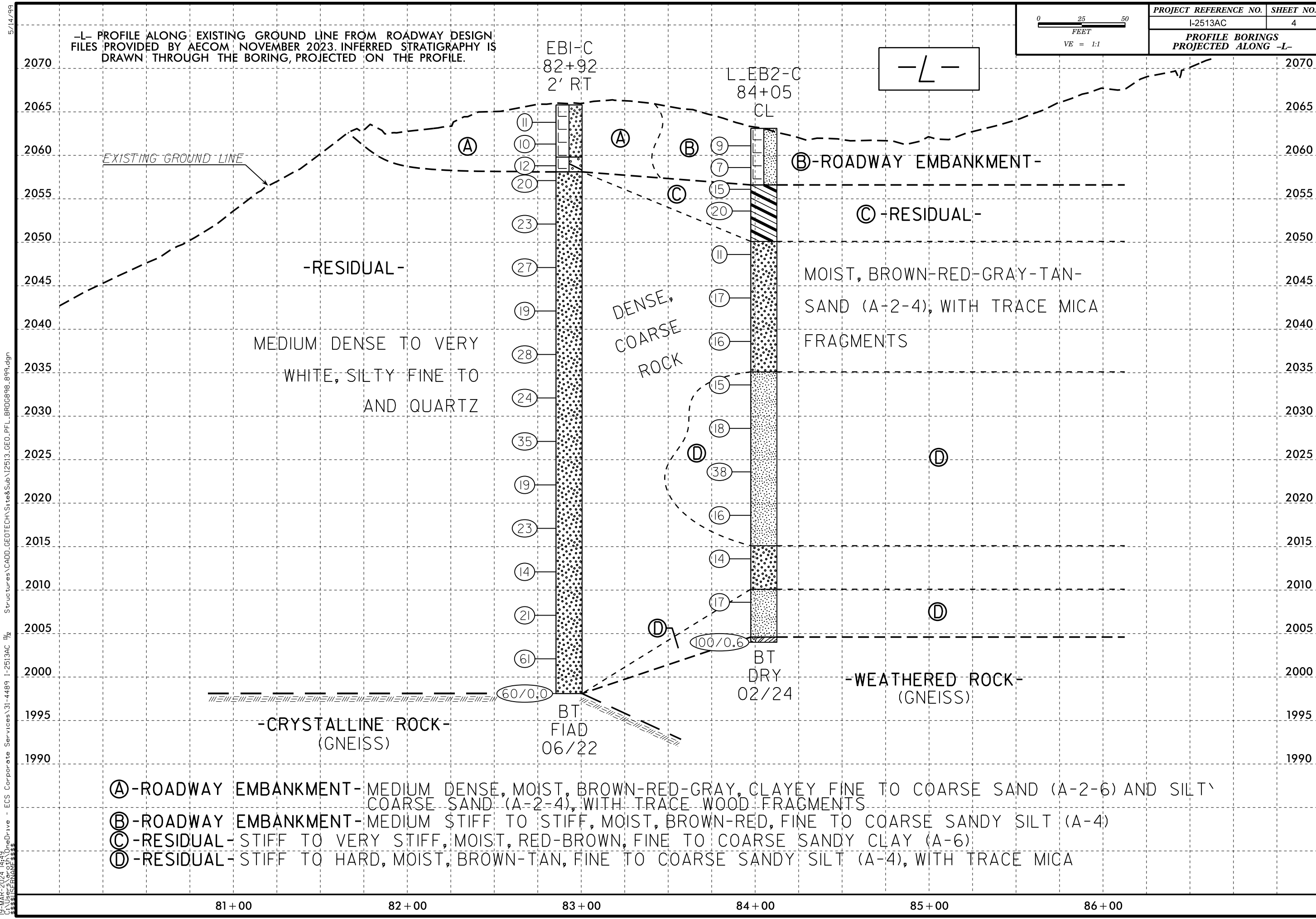
SUBSURFACE INVESTIGATION

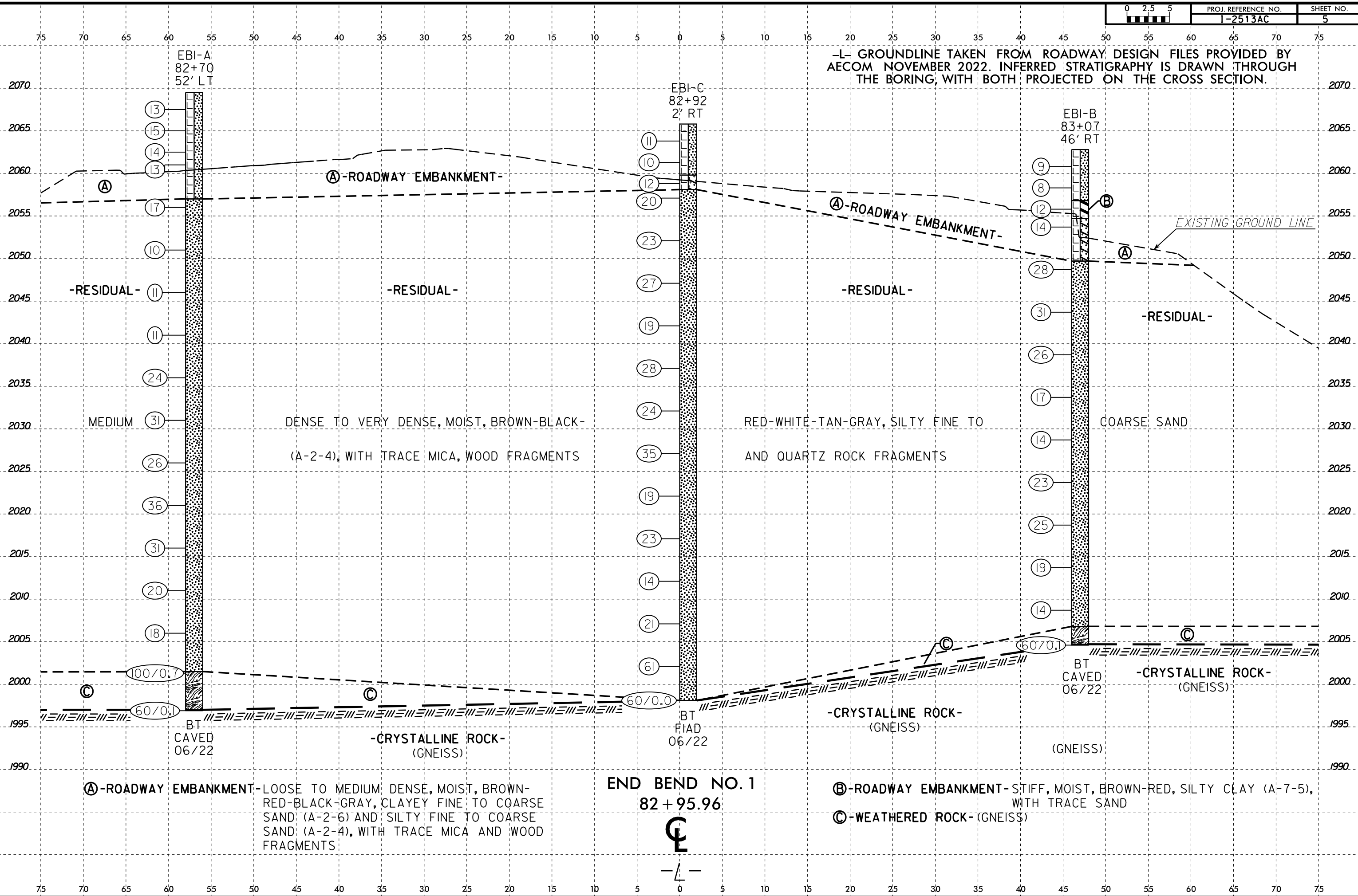
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

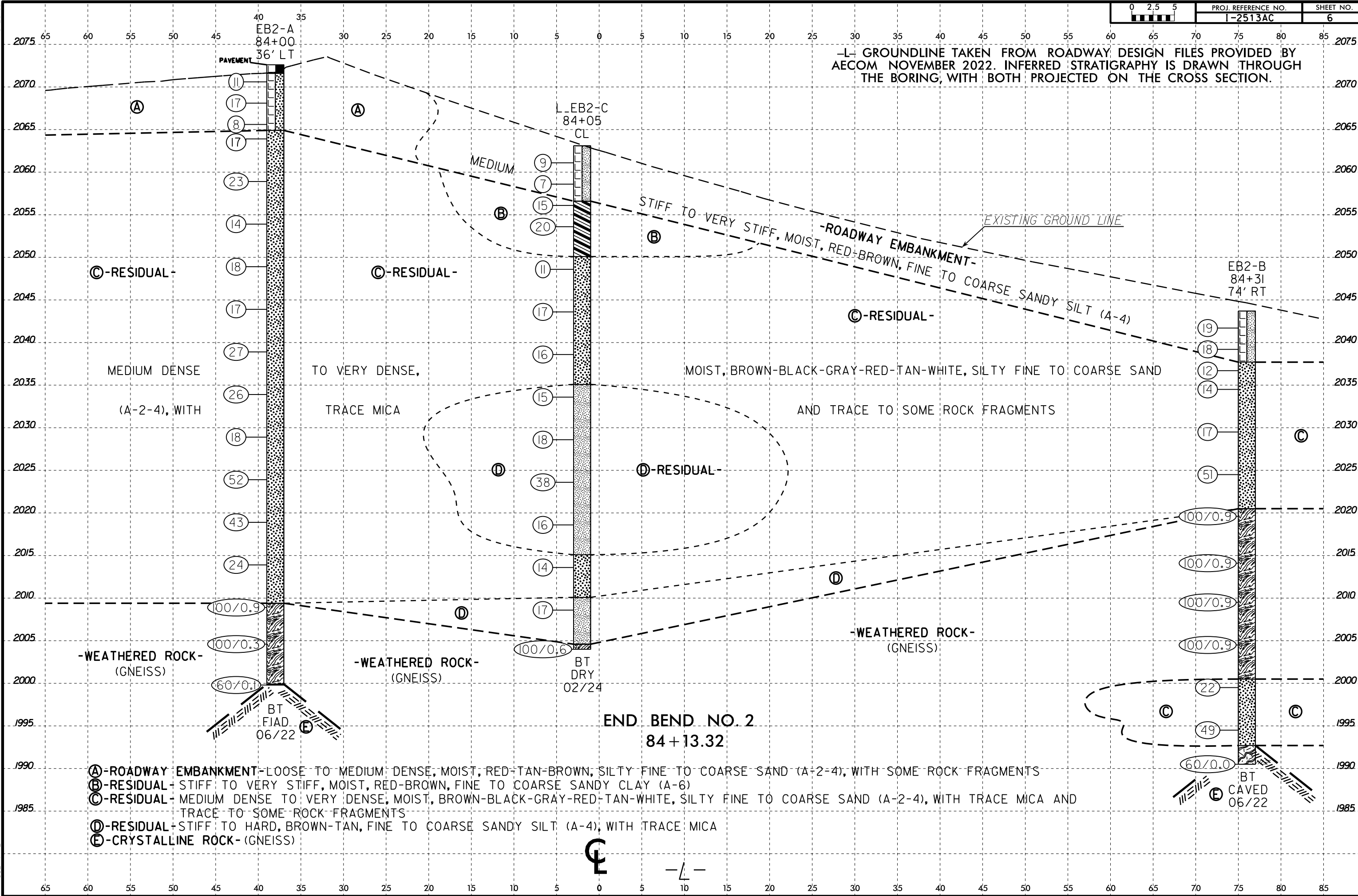
SOIL DESCRIPTION												GRADATION												ROCK DESCRIPTION												TERMS AND DEFINITIONS											
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING 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 DISLOOGED 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 MATTER.											
SOIL LEGEND AND AASHTO CLASSIFICATION												MINERALOGICAL COMPOSITION												WEATHERING																							
GENERAL CLASS.		GRANULAR MATERIALS (≤ 35% PASSING #200)						SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS				CRYSTALLINE ROCK (CR)		NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.		FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.																											
GROUP CLASS.		A-1		A-1-b		A-3		A-2-4		A-2		A-2-5		A-2-6		A-2-7		A-4		A-5		A-6		A-7		A-1, A-2		A-4, A-5		A-6, A-7																	
SYMBOL																																															
% PASSING #10 #40 #200		50 MX 30 MX 15 MX		50 MX 25 MX 10 MX		51 MN 10 MX		35 MX 35 MX		35 MX 35 MX		35 MX 35 MX		36 MN 36 MN		36 MN 36 MN		36 MN 36 MN		36 MN 36 MN		36 MN 36 MN		36 MN 36 MN		GRANULAR SOILS		SILT-CLAY SOILS		MUCK, PEAT																	
MATERIAL PASSING #40 LL PI		— 6 MX		— NP		40 MX 10 MX		41 MN 10 MX		40 MX 11 MN		41 MN 11 MN		40 MX 10 MX		41 MN 10 MX		40 MX 11 MN		41 MN 11 MN		40 MX 10 MX		41 MN 10 MX		SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS																			
GROUP INDEX		0		0		0		4 MX		8 MX		12 MX		16 MX		NO MX																															
USUAL TYPES OF MAJOR MATERIALS		STONE FRAGS, GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS																																			
GEN. RATING AS SUBGRADE		EXCELLENT TO GOOD						FAIR TO POOR						FAIR TO POOR		POOR		UNSUITABLE																													
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30																																															
CONSISTENCY OR DENSENESS												MISCELLANEOUS SYMBOLS												ROCK HARDNESS																							
PRIMARY SOIL TYPE		COMPACTNESS OR CONSISTENCY		RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)				RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)				ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION		25/025 DIP & DIP DIRECTION OF ROCK STRUCTURES		SLOPE INDICATOR INSTALLATION		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		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		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.																			
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)		VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE		< 4 4 TO 10 10 TO 30 30 TO 50				N/A				SOIL SYMBOL		TEST BORING		CONE PENETROMETER TEST																															
GENERALLY SILT-CLAY MATERIAL (COHESIVE)		VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD		2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30				< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4				INFERRED SOIL BOUNDARY		CORE BORING		SOUNDING ROD																															
												INFERRED ROCK LINE		MONITORING WELL		TEST BORING WITH CORE																															
												ALLUVIAL SOIL BOUNDARY		PIEZOMETER INSTALLATION		SPT N-VALUE																															
TEXTURE OR GRAIN SIZE												RECOMMENDATION SYMBOLS												ROCK HARDNESS																							
U.S. STD. SIEVE SIZE OPENING (MM)		4 4.76		10 2.00		40 0.42		60 0.25		200 0.075		270 0.053		UNCLASIFIED EXCAVATION - UNSUITABLE WASTE		UNCLASIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK		UNCLASIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL		VERY HARD		CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.		HARD		CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.		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.		MEDIUM HARD		CAN BE GROOVED 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.		SOFT		CAN BE GROVED 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.		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.					
BOULDER (BLDR.)		COBBLE (COB.)		GRAVEL (GR.)		COARSE SAND (CSE. SD.)		FINE SAND (F SD.)		SILT (SL.)		CLAY (CL.)		SHALLOW UNDERCUT		UNCLASIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK		UNCLASIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL																													
GRAIN SIZE		MM 305 IN. 12		75 3		2.0		0.25		0.05		0.005																																			
SOIL MOISTURE - CORRELATION OF TERMS												ABBREVIATIONS												ROCK HARDNESS																							
SOIL MOISTURE SCALE (ATTERBERG LIMITS)		FIELD MOISTURE DESCRIPTION		GUIDE FOR FIELD MOISTURE DESCRIPTION								AR - AUGER REFUSAL		MED. - MEDIUM		VST - VANE SHEAR TEST		CL. - CLAY		MICA - MICACEOUS		WEA. - WEATHERED		HARD		CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.		MODERATELY HARD		CAN BE GROOVED 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.		SOFT		CAN BE GROVED 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.		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.									
CPT - CONE PENETRATION TEST		CSE. - COARSE		CPT - CONE PENETRATION TEST								DPT - DILATOMETER TEST		SAP. - SAPROLITIC		SD. - SAND, SANDY		SL. - SILT, SILTY		SLI. - SLIGHTLY		TCR - TRICONE REFUSAL		W - MOISTURE CONTENT		V - VERY																					
DPT - DYNAMIC PENETRATION TEST		e - VOID RATIO		DPT - DYNAMIC PENETRATION TEST								F - FINE		FOSS. - FOSSILIFEROUS		FRAC. - FRACTURED, FRACTURES		FRAGS. - FRAGMENTS		HL. - HIGHLY																											
LL - LIQUID LIMIT		PL - PLASTIC LIMIT		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE								DPT - DILATOMETER TEST		SAP. - SAPROLITIC		SD. - SAND, SANDY		SL. - SILT, SILTY		SLI. - SLIGHTLY		TCR - TRICONE REFUSAL		W - MOISTURE CONTENT		V - VERY																					
OM - OPTIMUM MOISTURE		SL - SHRINKAGE LIMIT		SOLID; AT OR NEAR OPTIMUM MOISTURE								DPT - DILATOMETER TEST		SAP. - SAPROLITIC		SD. - SAND, SANDY		SL. - SILT, SILTY		SLI. - SLIGHTLY		TCR - TRICONE REFUSAL		W - MOISTURE CONTENT		V - VERY																					
- SATURATED - (SAT.)		- WET - (W)		USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE								DPT - DILATOMETER TEST		SAP. - SAPROLITIC		SD. - SAND, SANDY		SL. - SILT, SILTY		SLI. - SLIGHTLY		TCR - TRICONE REFUSAL		W - MOISTURE CONTENT		V - VERY																					
- MOIST - (M)		- DRY - (D)		SOLID; AT OR NEAR OPTIMUM MOISTURE								DPT - DILATOMETER TEST		SAP. - SAPROLITIC		SD. - SAND, SANDY		SL. - SILT, SILTY		SLI. - SLIGHTLY		TCR - TRICONE REFUSAL		W - MOISTURE CONTENT		V - VERY																					
- DRY - (D)				REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE								DPT - DILATOMETER TEST		SAP. - SAPROLITIC		SD. - SAND, SANDY		SL. - SILT, SILTY		SLI. - SLIGHTLY		TCR - TRICONE REFUSAL		W - MOISTURE CONTENT		V - VERY																					
PLASTICITY												EQUIPMENT USED ON SUBJECT PROJECT												ROCK HARDNESS																							
PLASTICITY INDEX (PI)		DRY STRENGTH		PLASTICITY INDEX (PI)								DRILL UNITS:		ADVANCING TOOLS:		HAMMER TYPE:		CORE SIZE:		HAND TOOLS:		FRIABLE		RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.		MODERATELY INDURATED		GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.		INDURATED		GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.		EXTREMELY INDURATED		SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.											
NON PLASTIC		VERY LOW		0-5								CME-45C		CLAY BITS		AUTOMATIC		-B		POST HOLE DIGGER																											
SLIGHTLY PLASTIC		SLIGHT		6-15								CME-75		6" CONTINUOUS FLIGHT AUGER		MANUAL		-H		HAND AUGER																											
MODERATELY PLASTIC		MEDIUM		16-25								CME-550		HARD FACED FINGER BITS						SOUNDING ROD																											
HIGHLY PLASTIC		HIGH		26 OR MORE								VANE SHEAR TEST		TUNG.-CARBIDE INSERTS						VANE SHEAR TEST																											
												PORTABLE HOIST		CASING		W/ ADVANCER																															
												DIEDRICH D50		TRICONE		STEEL TEETH																															
														TRICONE		TUNG.-CARB.																															
														CORE BIT																																	
														MUD ROTARY																																	
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.	I-2513AC	SHEET NO.	3
SITE PLAN			
BRIDGE NO. 898 AND 899 ON I-26 -L- OVER SR 3556 (AMBOY ROAD) -Y3- BRIDGE SKEW = 70 DEGREES			









NCDOT BORE DOUBLE I2513AC GEO RDWY TERRACON.GPJ NC DOT.GDT 3/19/24

WBS			34165.1.2			TIP			I-2513AC			COUNTY			BUNCOMBE			GEOLOGIST			CHITTICK, N.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
SITE DESCRIPTION																		I-26 CONNECTOR (I-40 TO US 19 - 23 - 70 NORTH OF ASHEVILLE)						GROUND WTR (ft)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
BORING NO.			EB1-C			STATION			82+92			OFFSET			2 ft RT			ALIGNMENT			-L-			0 HR.		N/A																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
COLLAR ELEV.			2,065.8 ft			TOTAL DEPTH			67.7 ft			NORTHING			680,785			EASTING			933,686			24 HR.		FIAD																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
DRILL RIG/HAMMER EFF./DATE												TER373 DIEDRICH D-50 95% 02/06/2021						DRILL METHOD						Mud Rotary			HAMMER TYPE			Automatic																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
DRILLER			TURNAGE, J. R.			START DATE			06/16/22			COMP. DATE			06/16/22			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																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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NCDOT BORE DOUBLE I2513AC GEO RDWY TERRACON.GPJ NC DOT.GDT 3/19/24

[illegible]

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.13		TIP I-2513AC		COUNTY BUNCOMBE		GEOLOGIST A. Blackmore									
SITE DESCRIPTION I-26/I-40/I-240 Interchange to SR 3548 (Haywood Road)							GROUND WTR (ft)								
BORING NO. L_EB2-C		STATION 84+05		OFFSET CL		ALIGNMENT -L-		0 HR.	Dry						
COLLAR ELEV. 2,063.1 ft		TOTAL DEPTH 59.1 ft		NORTHING 680,875		EASTING 933,754		24 HR.	Dry						
DRILL RIG/HAMMER EFF./DATE TDD417 CME75 82.7% 06/15/2021				DRILL METHOD H.S. Augers			HAMMER TYPE Automatic								
DRILLER D. Hamilton		START DATE 02/22/24		COMP. DATE 02/22/24		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)
2065															
	2,062.1	1.0												2,063.1	GROUND SURFACE 0.0
2060	2,059.6	3.5	2	4	5							M		ROADWAY EMBANKMENT Medium Stiff to Stiff, Brown-Red, Fine to Coarse Sandy SILT (A-4)	
	2,057.1	6.0	2	3	4							M			
2055	2,054.6	8.5	4	6	9							M		2,056.6	RESIDUAL 6.5
	2,054.6	8.5	7	10	10							M		Stiff to Very Stiff, Red-Brown, Fine to Coarse Sandy CLAY (A-6)	
2050	2,049.6	13.5										M		2,050.1	13.0
	2,049.6	13.5	2	5	6									Medium Dense, Brown-Gray, Silty Fine to Coarse SAND (A-2-4), with trace mica	
2045	2,044.6	18.5	5	9	8							M			
2040	2,039.6	23.5										M			
	2,039.6	23.5	7	8	8							M			
2035	2,034.6	28.5										M		2,035.1	28.0
	2,034.6	28.5	6	8	7							M		Stiff to Hard, Brown-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica	
2030	2,029.6	33.5	8	8	10							M			
	2,029.6	33.5										M			
2025	2,024.6	38.5	12	17	21							M			
	2,024.6	38.5										M			
2020	2,019.6	43.5	6	7	9							M			
	2,019.6	43.5										M			
2015	2,014.6	48.5	8	8	6							M		2,015.1	48.0
	2,014.6	48.5										M		Medium Dense, Tan-White, Silty Fine to Coarse SAND (A-2-4), with trace mica	
2010	2,009.6	53.5	8	7	10							M		2,010.1	53.0
	2,009.6	53.5										M		Very Stiff, Brown-Tan, Fine to Coarse Sandy SILT (A-4), with trace mica	
2005	2,004.6	58.5												2,004.6	58.5
	2,004.6	58.5	35	65/0.1										2,004.0	59.1
														WEATHERED ROCK Brown (GNEISS) Boring Terminated at Elevation 2,004.0 ft In Weathered Rock (GNEISS) Suficial Organic Soil 0.0 to 0.2 feet	

WBS 34165.1.2		TIP I-2513AC		COUNTY BUNCOMBE		GEOLOGIST CHITTICK, N.								
SITE DESCRIPTION I-26 CONNECTOR (I-40 TO US 19 - 23 - 70 NORTH OF ASHEVILLE)							GROUND WTR (ft)							
BORING NO. EB2-B		STATION 84+31		OFFSET 74 ft RT		ALIGNMENT -L-		0 HR. N/A						
COLLAR ELEV. 2,043.7 ft		TOTAL DEPTH 53.2 ft		NORTHING 680,854		EASTING 933,830		24 HR. Caved						
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 95% 02/06/2021				DRILL METHOD Mud Rotary			HAMMER TYPE Automatic							
DRILLER TURNAGE, J. R.		START DATE 06/21/22		COMP. DATE 06/22/22		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)
2045														
	2,042.7	1.0	12	9	10								2,043.7	GROUND SURFACE 0.0
2040	2,040.2	3.5	11	9	9							M		ROADWAY EMBANKMENT VERY STIFF, RED, BROWN, FINE SANDY SILT, MOIST (A-4)
	2,037.7	6.0	4	5	7							M		
2035	2,035.5	8.2	6	6	8							M		RESIDUAL MEDIUM DENSE TO VERY DENSE, BROWN, RED, BLACK, SILTY FINE TO COARSE SAND, TRACE MICA, MOIST (A-2-4)
2030	2,030.5	13.2	7	7	10							M		
2025	2,025.5	18.2	23	26	25							M		
2020	2,020.5	23.2	64	36/0.4									2,020.5	WEATHERED ROCK 23.2 (BROWN, BLACK, GNEISS)
2015	2,015.5	28.2	28	46	54/0.4						100/0.9			
											100/0.9			
2010	2,010.5	33.2	19	27	73/0.4						100/0.9			
											100/0.9			
2005	2,005.5	38.2	33	38	62/0.4						100/0.9			
2000	2,000.5	43.2	8	10	12							M	2,000.5	RESIDUAL 43.2 MEDIUM DENSE TO DENSE, BROWN WITH BLACK, SILTY FINE TO COARSE SAND, MOIST (A-2-4)
1995	1,995.5	48.2	19	22	27							M		
	1,990.5	53.2	60/0.0								60/0.0		1,992.7	CRYSTALLINE ROCK 51.0 (GNEISS)
													1,990.5	53.2 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,990.5 ft IN CRYSTALLINE ROCK (GNEISS) CAVED DRY @ 28.5' TOPSOIL 3"

NCDOT BORE DOUBLE I2513AC_GEO_RDWY_TERRACON.GPJ NC DOT GDT 3/19/24

REFERENCE: I-2513AC

PROJECT: 34165

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3-4	SITE PLAN AND PROFILES
5-13	BORING 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 NOISEWALL 3, FROM -L- STA.
24 + 10.24, 81.00' LT TO -L- STA. 41 + 01.27, 169.57' LT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-2513AC	1	13

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.

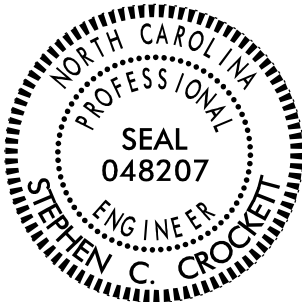
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND 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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS 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
GOODNIGHT, D.J.
TRIGON EXP.

INVESTIGATED BY FALCON ENG.
DRAWN BY CROCKETT, S.C.
CHECKED BY HAMM, J.R.
SUBMITTED BY FALCON ENG.
DATE NOVEMBER 2025

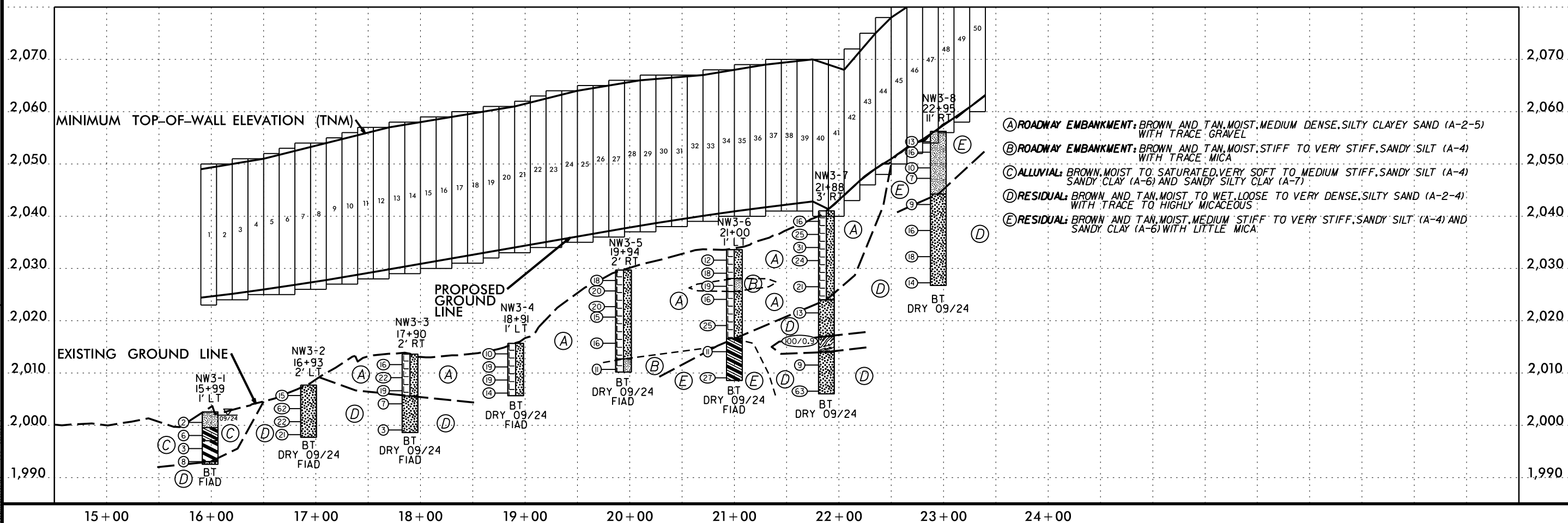


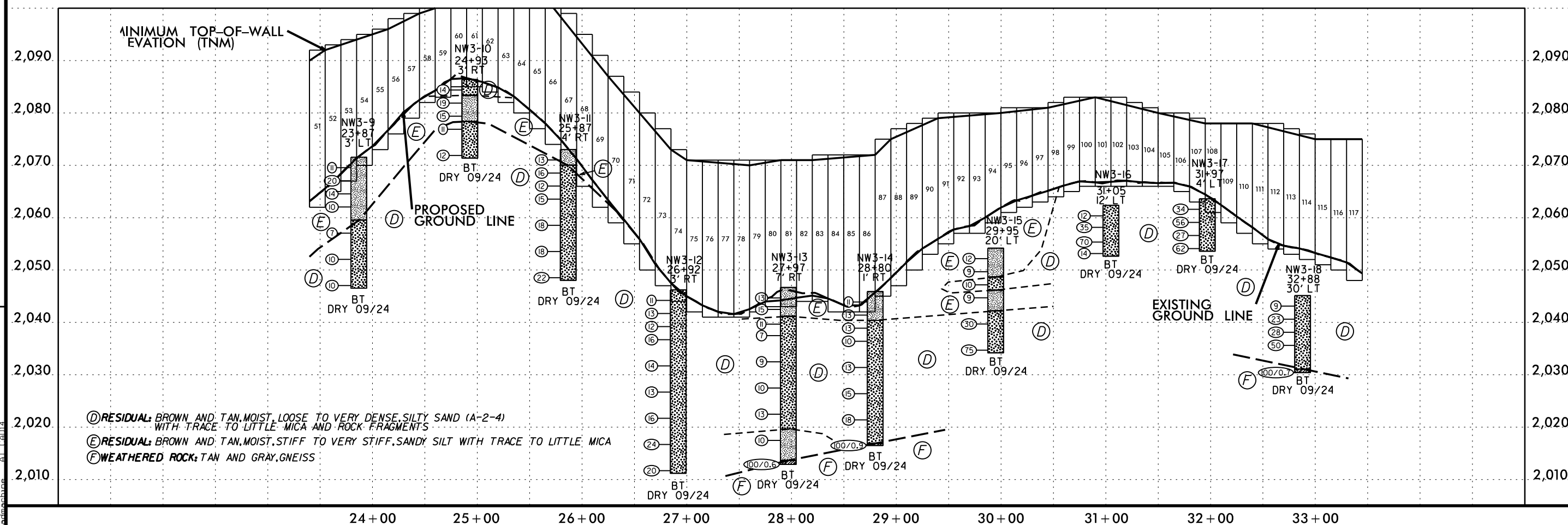
DocuSigned by:
Stephen Crockett 11/26/2025
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SIGNATURE DATE

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

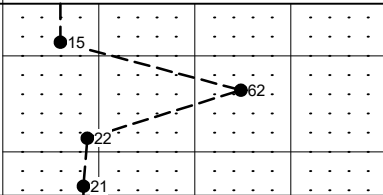
DATE: 8-15-14

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





WBS 34165		TIP I-2513AC		COUNTY BUNCOMBE		GEOLOGIST GOODNIGHT, D.							
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT							GROUND WTR (ft)						
BORING NO. NW3-1		STATION 15+99		OFFSET 1 ft LT		ALIGNMENT -NW3-							
COLLAR ELEV. 2,002.6 ft		TOTAL DEPTH 10.0 ft		NORTHING 678,541		EASTING 928,309							
						0 HR. 0.6							
						24 HR. FIAD							
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic							
DRILLER TOOTHMAN, R.		START DATE 09/19/24		COMP. DATE 09/19/24		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	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			
2005													
	2,001.6	1.0											2,002.6 0.5' TOPSOIL 0.0
2000	1,999.1	3.5	1	WOH	2						W		1,999.6 BROWN, V. SOFT TO SOFT, SANDY SILT (A-4) 3.0
	1,999.1	3.5	2	4	2						M		1,997.1 BROWN, MED. STIFF, SANDY CLAY (A-6) 5.5
	1,996.6	6.0	WOH	1	2						Sat.		1,997.1 BROWN, SOFT, SANDY SILTY CLAY (A-7) 5.5
1995	1,994.1	8.5	WOH	2	6						W		1,993.1 9.5
													1,992.6 10.0
RESIDUAL BROWN AND TAN, LOOSE, SILTY SAND (A-2-4) Boring Terminated at Elevation 1,992.6 ft IN RESIDUAL: (A-2-4)													

WBS 34165		TIP I-2513AC		COUNTY BUNCOMBE		GEOLOGIST GOODNIGHT, D.							
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT							GROUND WTR (ft)						
BORING NO. NW3-2		STATION 16+93		OFFSET 2 ft LT		ALIGNMENT -NW3-		0 HR. Dry					
COLLAR ELEV. 2,007.7 ft		TOTAL DEPTH 10.0 ft		NORTHING 678,572		EASTING 928,398		24 HR. FIAD					
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024				DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER TOOTHMAN, R.		START DATE 09/19/24		COMP. DATE 09/19/24		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			
2010													
	2,006.7	1.0											2,007.7 0.3' TOPSOIL 0.0
2005	2,004.2	3.5	2	8	7						M		RESIDUAL TAN AND BROWN, MED. DENSE TO V. DENSE, SILTY SAND (A-2-4)
	2,001.7	6.0	10	26	36						M		
2000	1,999.2	8.5	31	12	10						W		
			7	13	8						M		
													1,997.7 10.0
Boring Terminated at Elevation 1,997.7 ft IN RESIDUAL: (A-2-4)													

NCDOT BORE DOUBLE I-1213AC_GEO_NOISEWALL_3.GPJ NC_DOT_GDT 11/21/25

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST GOODNIGHT, D.						
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT									GROUND WTR (ft)						
BORING NO. NW3-3			STATION 17+90			OFFSET 2 ft RT			ALIGNMENT -NW3-			0 HR. Dry			
COLLAR ELEV. 2,013.6 ft			TOTAL DEPTH 15.0 ft			NORTHING 678,601			EASTING 928,491			24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER TOOTHMAN, R.			START DATE 09/19/24			COMP. DATE 09/19/24			SURFACE WATER DEPTH N/A						
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2015															
	2,012.6	1.0												2,013.6	0.3' TOPSOIL 0.0
2010	2,010.1	3.5	4	8	8										
	2,010.1		6	10	12										
	2,007.6	6.0													
2005	2,005.1	8.5	11	11	8									2,005.6	8.0
			3	4	3										
2000	2,000.1	13.5	1	1	2										
		</													

NCDOT BORE DOUBLE I-1213AC_GEO_NOISEWALL_3.GPJ NC_DOT.GDT 11/21/25

WBS 34165			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST GOODNIGHT, D.					
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT									GROUND WTR (ft)					
BORING NO. NW3-4			STATION 18+91			OFFSET 1 ft LT			ALIGNMENT -NW3-			0 HR. Dry		
COLLAR ELEV. 2,015.7 ft			TOTAL DEPTH 10.0 ft			NORTHING 678,637			EASTING 928,585			24 HR. FIAD		
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER TOOTHMAN, R.			START DATE 09/19/24			COMP. DATE 09/19/24			SURFACE WATER DEPTH N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	L O G	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2020														
2015	2,014.7	1.0	3	4	6									2,015.7 0.2' TOPSOIL 0.0
	2,012.2	3.5	5	10	9									ROADWAY EMBANKMENT BROWN TO TAN, LOOSE TO MED. DENSE, SILTY CLAYEY SAND (A-2-5) WITH TRACE GRAVEL
2010	2,009.7	6.0	5	10	9									
	2,007.2	8.5	4	6	8									
		</												

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST GOODNIGHT, D.						
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT									GROUND WTR (ft)						
BORING NO. NW3-5			STATION 19+94			OFFSET 2 ft RT			ALIGNMENT -NW3-			0 HR. Dry			
COLLAR ELEV. 2,029.7 ft			TOTAL DEPTH 19.5 ft			NORTHING 678,667			EASTING 928,683			24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER TOOTHMAN, R.			START DATE 09/19/24			COMP. DATE 09/19/24			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)
2030														2,029.7	0.0
2025	2,028.7	1.0	5	7	11						M		ROADWAY EMBANKMENT BROWN, MED. DENSE, SILTY CLAYEY SAND (A-2-5)		
	2,026.7	3.0	5	10	10										
2020	2,023.7	6.0	6	10	10						M		BROWN, V. STIFF, SANDY SILT (A-4) WITH TRACE MICA		
	2,021.7	8.0	4	6	9										
2015	2,016.7	13.0	4	7	9						M		TAN-BROWN, STIFF, SANDY SILT (A-4) WITH TRACE MICA		
	2,011.7	18.0	3	5	6										
														2,012.7	17.0
														2,010.2	19.5
Boring Terminated at Elevation 2,010.2 ft IN RESIDUAL: (A-4)															

WBS 34165			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST GOODNIGHT, D.					
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT									GROUND WTR (ft)					
BORING NO. NW3-6			STATION 21+00			OFFSET 1 ft LT			ALIGNMENT -NW3-			0 HR. Dry		
COLLAR ELEV. 2,033.6 ft			TOTAL DEPTH 25.0 ft			NORTHING 678,704			EASTING 928,784			24 HR. FIAD		
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER TOOTHMAN, R.			START DATE 09/19/24			COMP. DATE 09/19/24			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				
2035														
	2,032.6	1.0	5	6	6									2,033.6 0.3' TOPSOIL 0.0
2030	2,030.1	3.5	6	8	10									2,028.1 5.5
	2,027.6	6.0	6	9	10									2,025.6 8.0
2025	2,025.1	8.5	5	7	9									
														2,016.6 17.0
2020	2,020.1	13.5	4	9	16									
	2,015.1	18.5	4	5	6									2,008.6 25.0
2015														
2010	2,010.1	23.5	7	12	15									

NCDOT BORE DOUBLE I-1213AC_GEO_NOISEWALL_3.GPJ NC_DOT.GDT 11/21/25

[illegible]

WBS 34165			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST GOODNIGHT, D.					
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT											GROUND WTR (ft)			
BORING NO. NW3-8			STATION 22+95			OFFSET 11 ft RT			ALIGNMENT -NW3-			0 HR.	Dry	
COLLAR ELEV. 2,056.3 ft			TOTAL DEPTH 29.5 ft			NORTHING 678,800			EASTING 928,940			24 HR.	Dry	
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER TOOTHMAN, R.			START DATE 09/18/24			COMP. DATE 09/18/24			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				
2060														
2055	2,055.3	1.0												2,056.3 0.2' TOPSOIL 0.0
2050	2,053.3	3.0	3	6	7	13						M		RESIDUAL BROWN, MED. STIFF TO V. STIFF, SANDY SILT (A-4), WITH LITTLE MICA
	2,053.3		5	8	8	16						M		
2045	2,050.3	6.0	4	5	5	10						M		2,044.3 12.0
	2,048.3	8.0	3	3	4	7						M		
2040														BROWN AND TAN, LOOSE TO MED. DENSE, SILTY SAND (A-2-4) WITH LITTLE QUARTZ FRAGS AND LITTLE MICA
	2,043.3	13.0	5	4	5	9						M		
2035	2,038.3	18.0	5	7	9	16						M		
	2,033.3	23.0	5	8	10	18						M		
2030														Boring Terminated at Elevation 2,026.8 ft IN RESIDUAL: (A-2-4)
	2,028.3	28.0	5	7	7	14						M		
														2,026.8 29.5

NCDOT BORE DOUBLE I-1213AC_GEO_NOISEWALL_3.GPJ NC_DOT_GDT 11/21/25

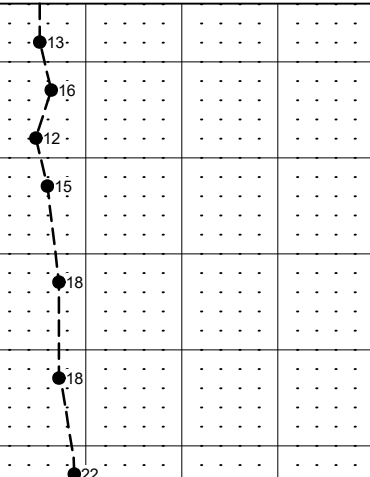
GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST GOODNIGHT, D.						
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT												GROUND WTR (ft)			
BORING NO. NW3-9			STATION 23+87			OFFSET 3 ft LT			ALIGNMENT -NW3-			0 HR.	Dry		
COLLAR ELEV. 2,071.5 ft			TOTAL DEPTH 25.0 ft			NORTHING 678,868			EASTING 929,006			24 HR.	Dry		
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER TOOTHMAN, R.			START DATE 09/18/24			COMP. DATE 09/18/24			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)
2075															
2070	2,070.5	1.0												2,071.5	0.0
2065	2,068.0	3.5	3	5	6	11						M	RESIDUAL BROWN, STIFF TO V. STIFF, SANDY SILT (A-4) WITH TRACE TO LITTLE MICA		
	2,065.5	6.0	6	9	11	20						M			
	2,063.0	8.5	4	7	7	14						M			
2060	2,058.0	13.5	3	5	5	10						M	TAN-BROWN, LOOSE TO MED. DENSE, SILTY SAND (A-2-4) WITH LITTLE MICA		12.0
	2,053.0	18.5	3	3	4	7						M			
2055													Boring Terminated at Elevation 2,046.5 ft IN RESIDUAL: (A-2-4)		
2050	2,048.0	23.5	4	4	6	10						M			
			4	5	5	10						M	2,046.5	25.0	

NCDOT BORE DOUBLE I-1213AC_GEO_NOISEWALL_3.GPJ NC_DOT.GDT 11/21/25

WBS 34165			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST GOODNIGHT, D.					
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT												GROUND WTR (ft)		
BORING NO. NW3-10			STATION 24+93			OFFSET 3 ft RT			ALIGNMENT -NW3-			0 HR.	Dry	
COLLAR ELEV. 2,086.4 ft			TOTAL DEPTH 15.0 ft			NORTHING 678,915			EASTING 929,098			24 HR.	Dry	
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER TOOTHMAN, R.			START DATE 09/18/24			COMP. DATE 09/18/24			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				
2090														
2085	2,085.4	1.0												2,086.4 0.2' TOPSOIL 0.0
2080	2,082.9	3.5	4	6	8	14						M		RESIDUAL BROWN, MED. DENSE, SILTY CLAYEY SAND (A-2-5) 3.0
	2,080.4	6.0	5	9	10	19						M		BROWN, STIFF TO V. STIFF, SANDY SILT (A-4), WITH TRACE MICA 3.0
	2,077.9	8.5	4	6	9	15						M		2,078.4 TAN-BROWN, MED. DENSE SILTY SAND (A-2-4) WITH LITTLE MICA 8.0
2075	2,072.9	13.5	3	5	6	11						M		2,071.4 Boring Terminated at Elevation 2,071.4 ft IN RESIDUAL: (A-2-4) 15.0
			4	5	7	12						M		

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST GOODNIGHT, D.							
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT												GROUND WTR (ft)				
BORING NO. NW3-11			STATION 25+87			OFFSET 4 ft RT			ALIGNMENT -NW3-			0 HR. Dry				
COLLAR ELEV. 2,073.0 ft			TOTAL DEPTH 25.0 ft			NORTHING 929,190			EASTING 678,915			24 HR. Dry				
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic							
DRILLER TOOTHMAN, R.			START DATE 09/18/24			COMP. DATE 09/18/24			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)	
2075																
2070	2,072.0	1.0	3	6	7									2,073.0	0.2' TOPSOIL	0.0
	2,069.5	3.5	6	8	8							M		2,070.0	RESIDUAL BROWN, STIFF, SANDY SILT (A-4) WITH LITTLE MICA	3.0
	2,067.0	6.0	5	5	7							M		TAN-BROWN, MED. DENSE, SILTY SAND (A-2-4) WITH TRACE TO LITTLE MICA		
2065	2,064.5	8.5	5	8	7							M				
	2,059.5	13.5	4	8	10							M				
2055	2,054.5	18.5	5	8	10							M				
	2,049.5	23.5	9	11	11							M		2,048.0	Boring Terminated at Elevation 2,048.0 ft IN RESIDUAL: (A-2-4)	25.0

WBS 34165			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST GOODNIGHT, D.					
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT												GROUND WTR (ft)		
BORING NO. NW3-12			STATION 26+92			OFFSET 3 ft RT			ALIGNMENT -NW3-			0 HR. Dry		
COLLAR ELEV. 2,046.2 ft			TOTAL DEPTH 35.0 ft			NORTHING 929,291			EASTING 678,890			24 HR. Dry		
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER TOOTHMAN, R.			START DATE 09/18/24			COMP. DATE 09/18/24			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				
2050														
2045	2,045.2	1.0												2,046.2 0.3' TOPSOIL 0.0
	2,042.7	3.5	3	6	5									RESIDUAL TAN-BROWN, MED. DENSE, SILTY SAND (A-2-4) WITH LITTLE MICA
	2,040.2	6.0	4	7	6									
2040	2,040.2	6.0	5	6	6									
	2,037.7	8.5	5	8	8									
2035														
	2,032.7	13.5	4	7	7									
2030														
	2,027.7	18.5	4	6	7									
2025														
	2,022.7	23.5	5	7	9									
2020														
	2,017.7	28.5	7	13	11									
2015														
	2,012.7	33.5	4	10	10									

NCDOT BORE DOUBLE I-1213AC_GEO_NOISEWALL_3.GPJ NC_DOT.GDT 11/21/25

WBS 34165		TIP I-2513AC		COUNTY BUNCOMBE		GEOLOGIST GOODNIGHT, D.								
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT							GROUND WTR (ft)							
BORING NO. NW3-13		STATION 27+97		OFFSET 7 ft RT		ALIGNMENT -NW3-		0 HR. Dry						
COLLAR ELEV. 2,046.7 ft		TOTAL DEPTH 33.8 ft		NORTHING 929,392		EASTING 678,915		24 HR. Dry						
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024				DRILL METHOD H.S. Augers			HAMMER TYPE Automatic							
DRILLER TOOTHMAN, R.		START DATE 09/16/24		COMP. DATE 09/16/24		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)
2050														
2045	2,045.7	1.0	6	6	7								2,046.7	0.2' TOPSOIL
2040	2,043.5	3.2	5	7	8									
	2,040.7	6.0	5	6	5								2,041.2	5.5
2035	2,038.5	8.2	4	3	4									
	2,033.5	13.2	3	4	5									
2030	2,028.5	18.2	3	5	5									
	2,023.5	23.2	7	7	6									
2020	2,018.5	28.2	2	4	6								2,019.7	27.0
	2,013.5	33.2	40	60/0.1									2,013.7	33.0
2015													2,012.9	33.8
													WEATHERED ROCK TAN, GNEISS Boring Terminated at Elevation 2,012.9 ft IN PARTILLAY WEATHERED ROCK: GNEISS	

[illegible]

NCDOT BORE DOUBLE I-1213AC_GEO_NOISEWALL_3.GPJ NC_DOT_GDT 11/21/25

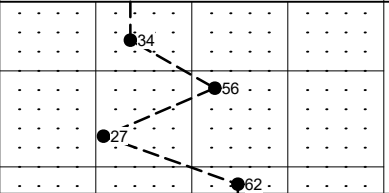
GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST GOODNIGHT, D.						
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT												GROUND WTR (ft)			
BORING NO. NW3-15			STATION 29+95			OFFSET 20 ft LT			ALIGNMENT -NW3-			0 HR.	Dry		
COLLAR ELEV. 2,054.2 ft			TOTAL DEPTH 20.0 ft			NORTHING 929,555			EASTING 679,031			24 HR.	Dry		
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER TOOTHMAN, R.			START DATE 09/16/24			COMP. DATE 09/16/24			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)
2055														2,054.2	0.0
2050	2,053.2	1.0	5	6	6									0.2' TOPSOIL	
	2,050.7	3.5	4	4	5							M		RESIDUAL BROWN, STIFF, SANDY SILT (A-4)	
	2,048.2	6.0	4	5	5							M		2,048.7	5.5
2045	2,045.7	8.5	3	5	4							M		2,046.2	8.0
												M		TAN, LOOSE TO MED. DENSE, SILTY SAND (A-2-4)	
2040	2,040.7	13.5	9	17	13							M		2,042.2	12.0
												M		TAN, MED. DENSE TO V. DENSE SILTY SAND (A-2-4)	
2035	2,035.7	18.5	14	46	29							M		2,034.2	20.0
														Boring Terminated at Elevation 2,034.2 ft IN RESIDUAL: (A-2-4)	

NCDOT BORE DOUBLE I-1213AC_GEO_NOISEWALL_3.GPJ NC_DOT.GDT 11/21/25

WBS 34165			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST GOODNIGHT, D.					
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT												GROUND WTR (ft)		
BORING NO. NW3-16			STATION 31+05			OFFSET 12 ft LT			ALIGNMENT -NW3-			0 HR. Dry		
COLLAR ELEV. 2,062.4 ft			TOTAL DEPTH 9.7 ft			NORTHING 929,658			EASTING 679,075			24 HR. Dry		
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER TOOTHMAN, R.			START DATE 09/16/24			COMP. DATE 09/16/24			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				
2065														
2060	2,061.4	1.0	6	5	7									2,062.4 0.3' TOPSOIL 0.0
	2,059.2	3.2	10	15	20									RESIDUAL TAN, MED. DENSE TO V. DENSE SILTY SAND (A-2-4)
	2,056.4	6.0	31	32	38									
	2,054.2	8.2	9	7	7									
2055														
														2,052.7 9.7
Boring Terminated at Elevation 2,052.7 ft IN RESIDUAL: (A-2-4)														

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST GOODNIGHT, D.							
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT											GROUND WTR (ft)					
BORING NO. NW3-17			STATION 31+97			OFFSET 4 ft LT			ALIGNMENT -NW3-			0 HR.	Dry			
COLLAR ELEV. 2,063.6 ft			TOTAL DEPTH 10.0 ft			NORTHING 929,750			EASTING 679,097			24 HR.	Dry			
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic							
DRILLER TOOTHMAN, R.			START DATE 09/13/24			COMP. DATE 09/13/24			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)	
2065																
	2,062.6	1.0												2,063.6	0.3' TOPSOIL	0.0
2060	2,060.1	3.5	12	16	18							M		RESIDUAL TAN, MED. DENSE TO V. DENSE. SILTY SAND (A-2-4)		
	2,057.6	6.0	26	34	22							M				
	2,055.1	8.5	9	12	15							M				
2055			14	25	37							M			2,053.6	10.0
														Boring Terminated at Elevation 2,053.6 ft IN RESIDUAL: (A-2-4)		

NCDOT BORE DOUBLE I-1213AC_GEO_NOISEWALL_3.GPJ NC_DOT.GDT 11/21/25

WBS 34165			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST GOODNIGHT, D.					
SITE DESCRIPTION NOISEWALL 3, FROM -L- STA. 24+10.24, 81.00' LT TO -L- STA. 41+01.27, 169.57' LT									GROUND WTR (ft)					
BORING NO. NW3-18			STATION 32+88			OFFSET 30 ft LT			ALIGNMENT -NW3-			0 HR. Dry		
COLLAR ELEV. 2,045.1 ft			TOTAL DEPTH 14.7 ft			NORTHING 929,832			EASTING 679,139			24 HR. Dry		
DRILL RIG/HAMMER EFF./DATE TRI0472 CME-850 90% 05/13/2024						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic					
DRILLER TOOTHMAN, R.			START DATE 09/12/24			COMP. DATE 09/12/24			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				
2050														
2045														
	2,044.1	1.0												2,045.1 0.3' TOPSOIL 0.0
	2,041.6	3.5	3	5	4									
2040														
	2,041.6	3.5	12	12	11									
	2,039.1	6.0												
	2,039.1	6.0	10	14	14									
	2,036.6	8.5												
2035														
	2,031.6	13.5	11	21	29									
	2,031.6	13.5	39	34	66/0.2									2,031.1 14.0
														2,030.4 14.7

REFERENCE: I-2513AC

PROJECT: 34165

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3 - 6	SITE PLAN
7 - 10	PROFILE
11 - 19	BORE LOGS
20	LABORATORY TESTING SUMMARY

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY BUNCOMBE
PROJECT DESCRIPTION I-26 CONNECTOR (I-40 TO
US 19 – US 23 – US 70 NORTH TO ASHEVILLE)
SITE DESCRIPTION NOISE WALL NO. 68 FROM
STA. 9+40 –NW68– (STA. 18+73.09 –Y3RPD–, 127.03’ LT)
TO STA. 30+55.00 –NW68– (STA. 108+50.06 –L–, 77’ RT)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-2513AC	1	20

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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS 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
	<u>MARPLES, Z. J.</u>
	<u>TURNAGE, J. R.</u>
	<u>OXENDINE, J.</u>
INVESTIGATED BY	<u>MARPLES, Z. J.</u>
DRAWN BY	<u>FIELDS, W. D.</u>
CHECKED BY	<u>RIGGS, Jr., A. F.</u>
SUBMITTED BY	<u>TERRACON CONSULTANTS</u>
DATE	<u>JUNE 2026</u>

Prepared in the Office of:



3150 SPRING FOREST ROAD, SUITE 100
RALEIGH, NORTH CAROLINA 27616
NC REGISTERED ENGINEERING FIRM E-0869
NC REGISTERED GEOLOGIC FIRM C-367

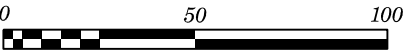


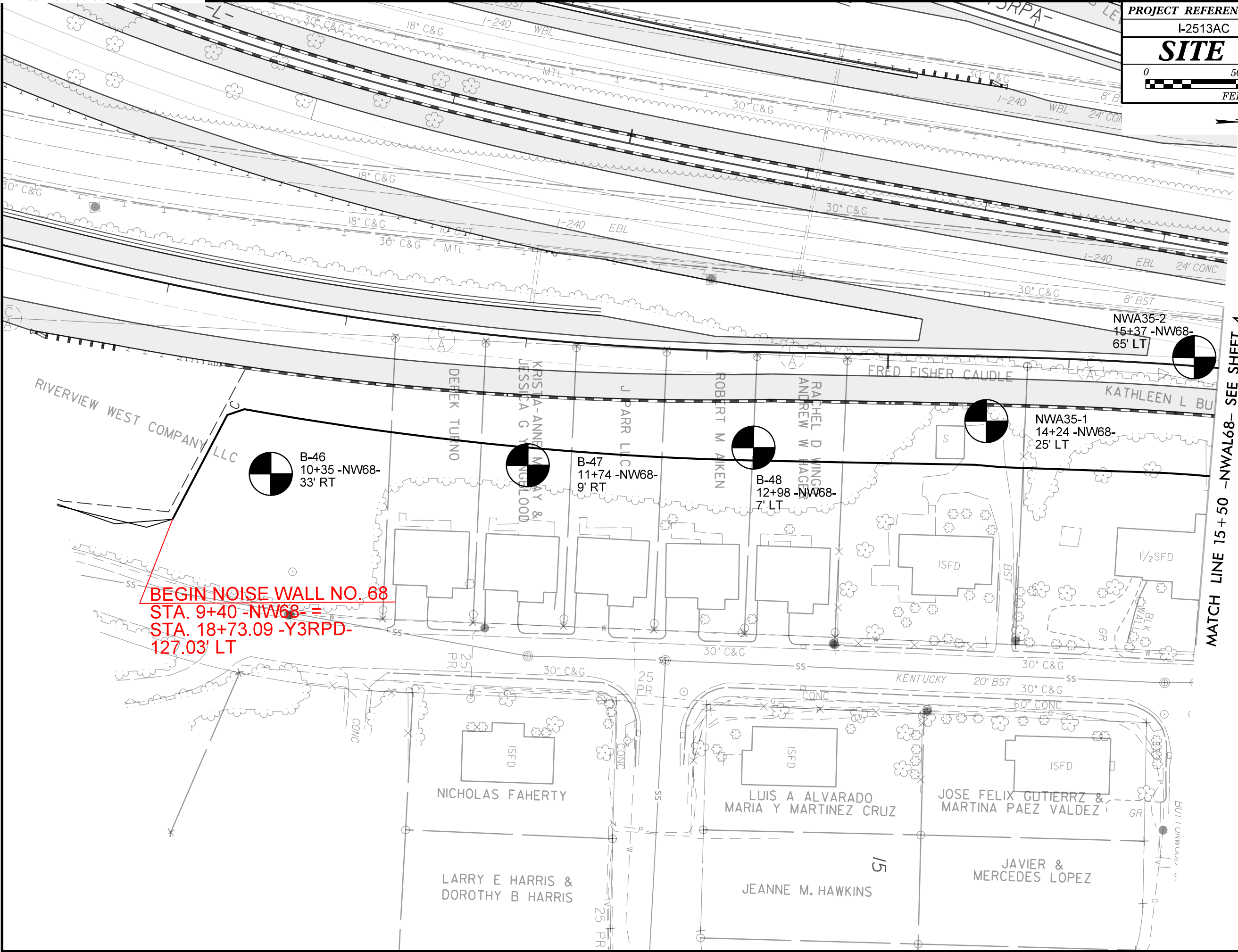
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Abner Riggs Jr. 7/22/2026
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SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

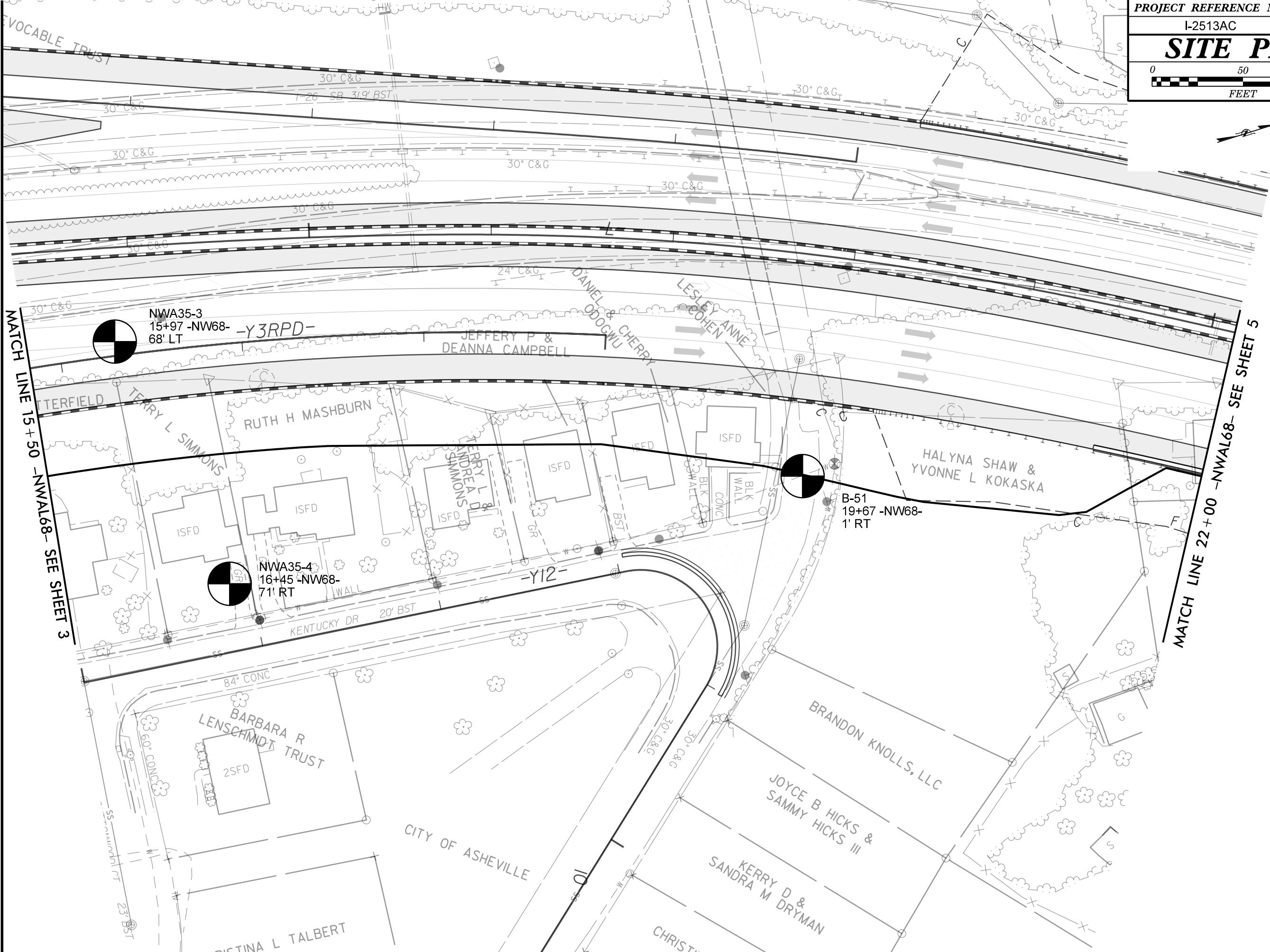
SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE 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: WEATHERED ROCK (WR) CRYSTALLINE ROCK (CR) NON-CRYSTALLINE ROCK (NCR) COASTAL PLAIN SEDIMENTARY ROCK (CP)										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 DISLOGGED 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 MATTER.									
SOIL LEGEND AND AASHTO CLASSIFICATION										MINERALOGICAL COMPOSITION										WEATHERING																			
GENERAL CLASS. SILT-CLAY MATERIALS (< 35% PASSING #200) ORGANIC MATERIALS										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. A-1, A-2, A-3, A-4, A-5, A-6, A-7, A-8, A-9, A-10, A-11, A-12, A-13, A-14, A-15, A-16, A-17, A-18, A-19, A-20, A-21, A-22, A-23, A-24, A-25, A-26, A-27, A-28, A-29, A-30, A-31, A-32, A-33, A-34, A-35, A-36, A-37, A-38, A-39, A-40, A-41, A-42, A-43, A-44, A-45, A-46, A-47, A-48, A-49, A-50, A-51, A-52, A-53, A-54, A-55, A-56, A-57, A-58, A-59, A-60, A-61, A-62, A-63, A-64, A-65, A-66, A-67, A-68, A-69, A-70, A-71, A-72, A-73, A-74, A-75, A-76, A-77, A-78, A-79, A-80, A-81, A-82, A-83, A-84, A-85, A-86, A-87, A-88, A-89, A-90, A-91, A-92, A-93, A-94, A-95, A-96, A-97, A-98, A-99, A-100, A-101, A-102, A-103, A-104, A-105, A-106, A-107, A-108, A-109, A-110, A-111, A-112, A-113, A-114, A-115, A-116, A-117, A-118, A-119, A-120, A-121, A-122, A-123, A-124, A-125, A-126, A-127, A-128, A-129, A-130, A-131, A-132, A-133, A-134, A-135, A-136, A-137, A-138, A-139, A-140, A-141, A-142, A-143, A-144, A-145, A-146, A-147, A-148, A-149, A-150, A-151, A-152, A-153, A-154, A-155, A-156, A-157, A-158, 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PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	3
SITE PLAN	
	
FEET	



MATCH LINE 15 + 50 -NWAL68- SEE SHEET 4

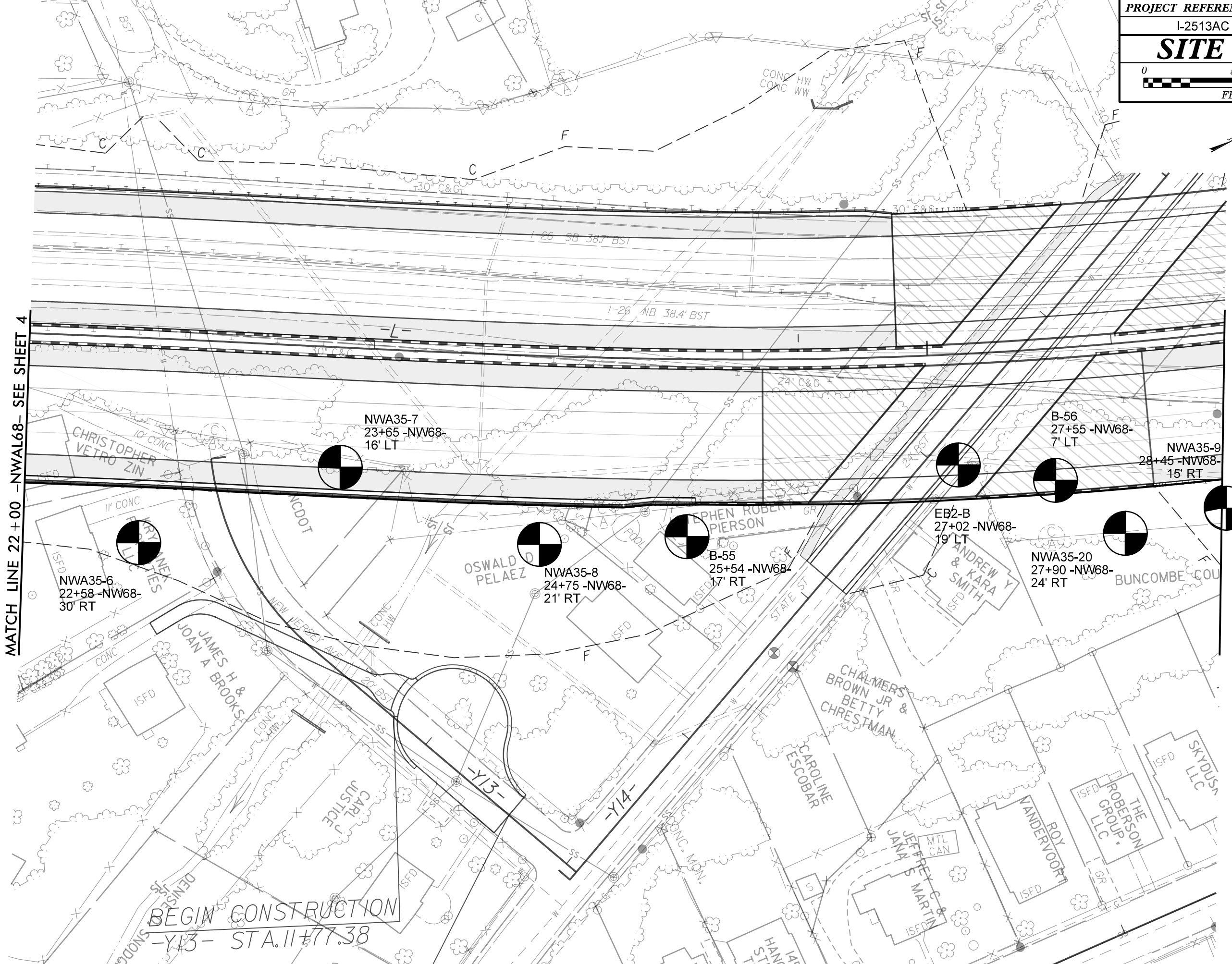
PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	4
SITE PLAN	
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PROJECT REFERENCE NO.	SHEET NO.
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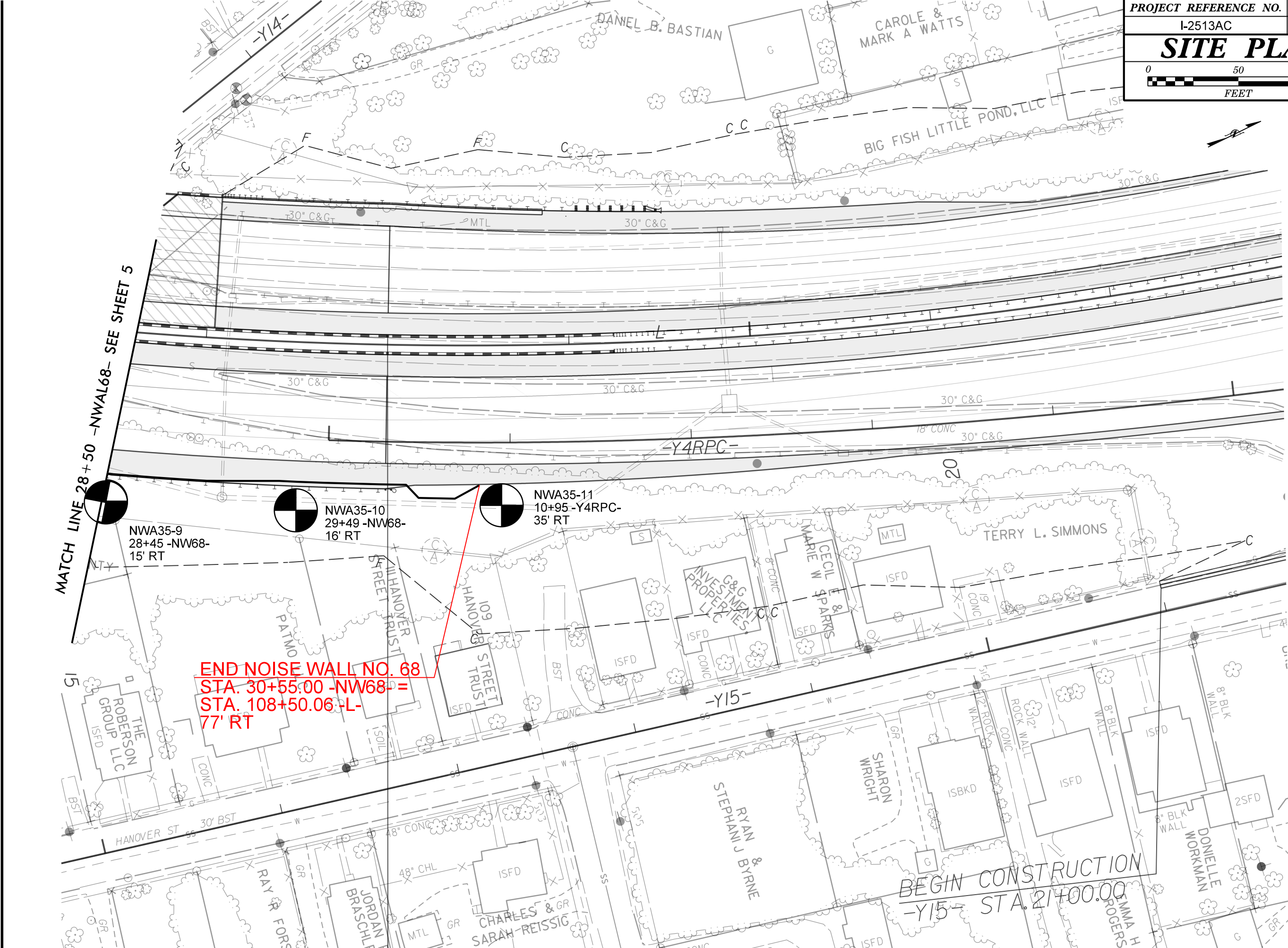
MATCH LINE 22+00 -NWAL68- SEE SHEET 4

MATCH LINE 28+50 -NWAL68- SEE SHEET 6

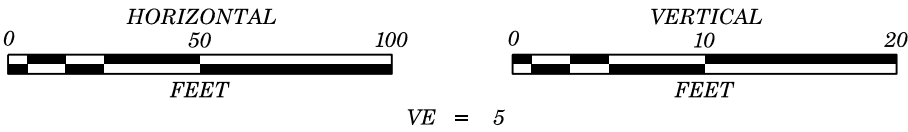


BEGIN CONSTRUCTION
-Y13- STA. 11+77.38

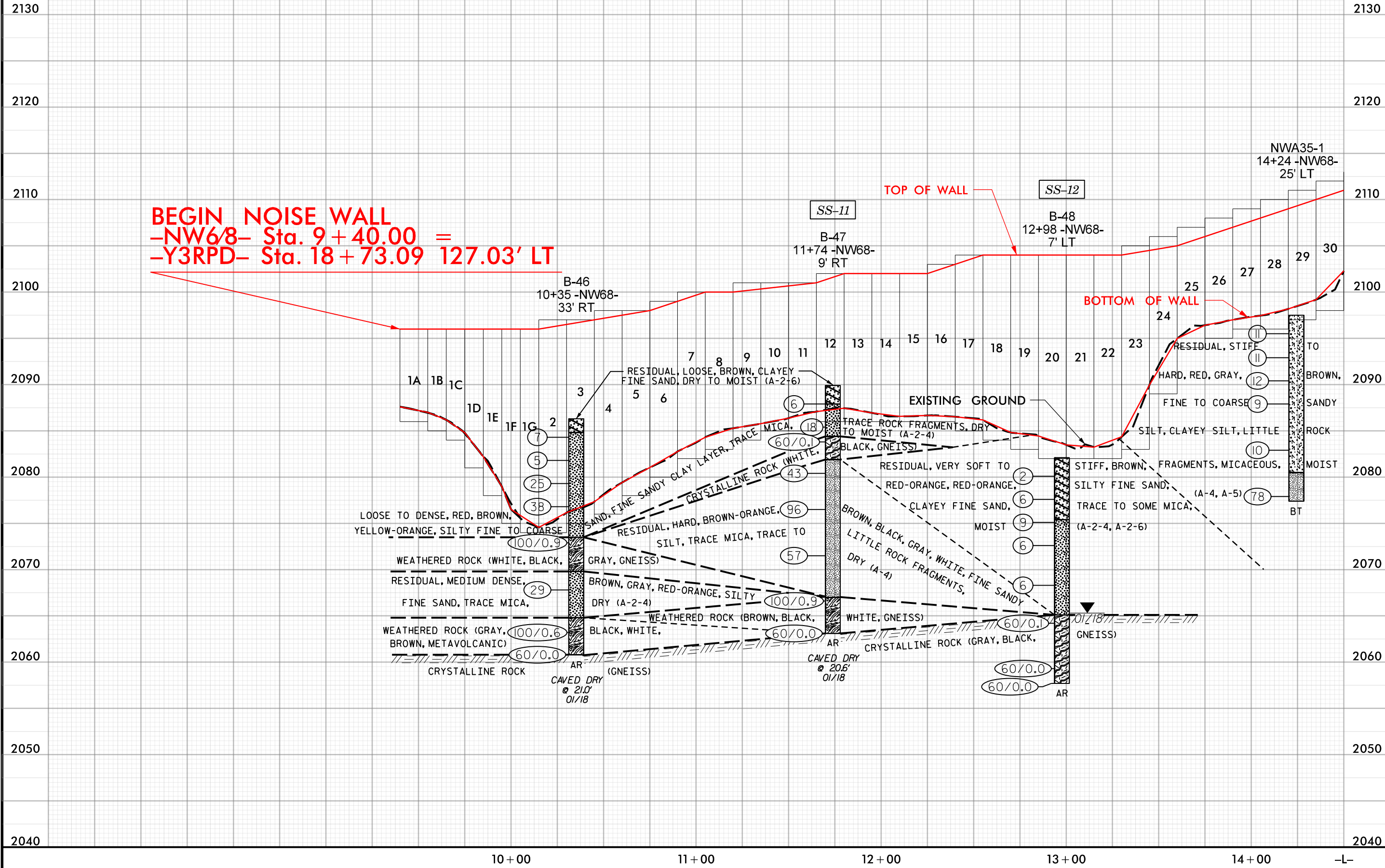
PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	6
SITE PLAN	
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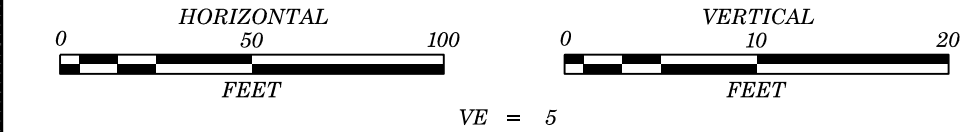
NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ON TO THE EXISTING GROUND PROFILE ALONG THE CENTERLINE OF -NW68- TAKEN FROM THE PROVIDED PROJECT TIN FILE i2513_ls_tin.tin DATED 05/12/2022.



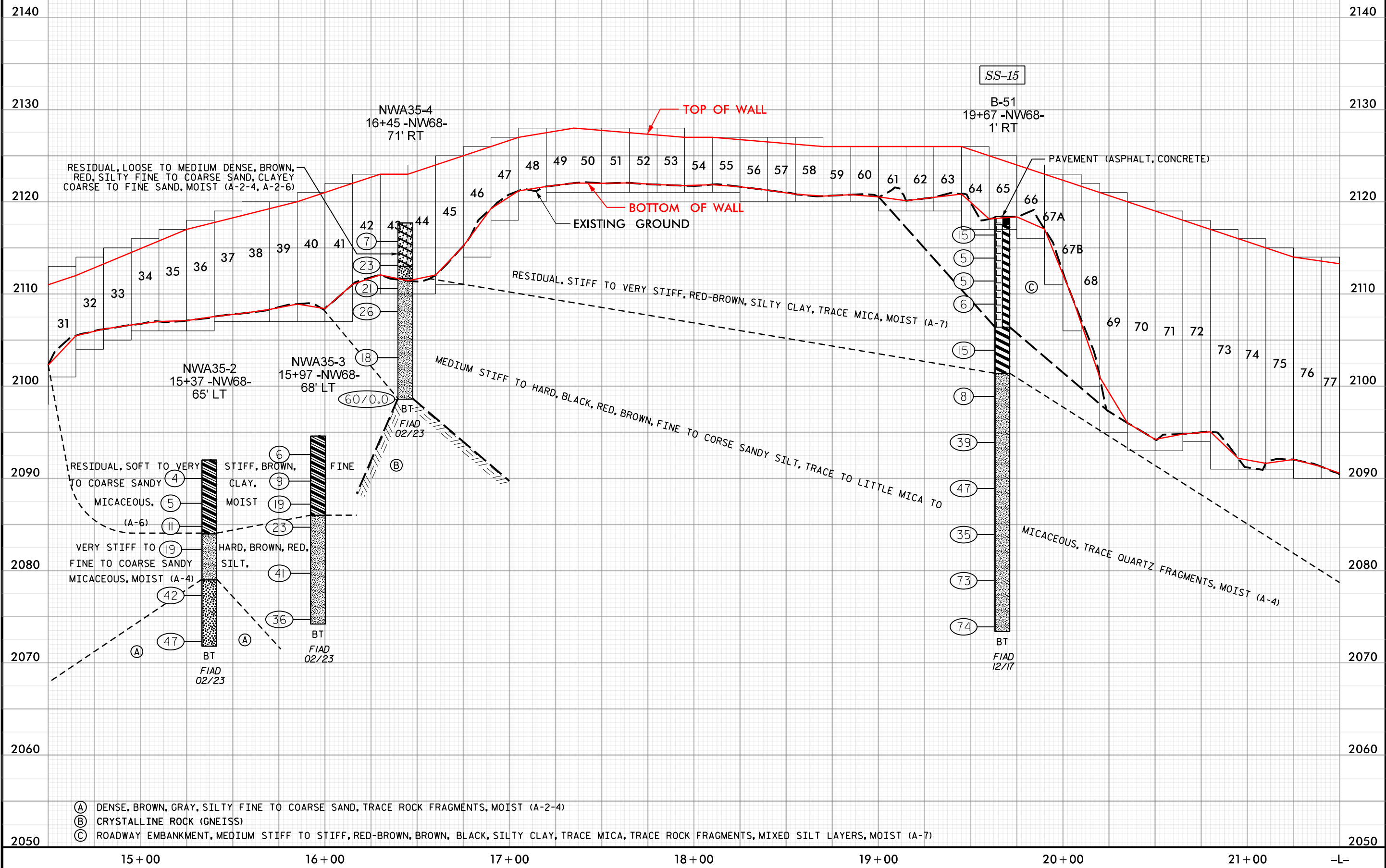
PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	7
CENTERLINE PROFILE ALONG -NW68- AT STA. 9+40 TO STA. 30+55 = STA. -Y3RPD- 18+73.09, 127' LT TO -L- STA, 108+50.06, 77' RT	

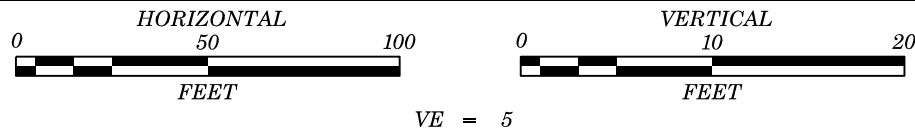


NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ON TO THE EXISTING GROUND PROFILE ALONG THE CENTERLINE OF -L- TAKEN FROM THE PROVIDED PROJECT TIN FILE (r2582a_ls_tin.tin).

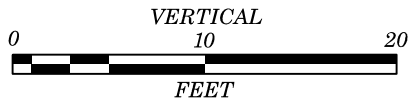


PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	8
CENTERLINE PROFILE ALONG -NW68- AT STA. 9+40 TO STA. 30+55 = STA. -Y3RPD- 18+73.09, 127' LT TO -L- STA, 108+50.06, 77' RT	



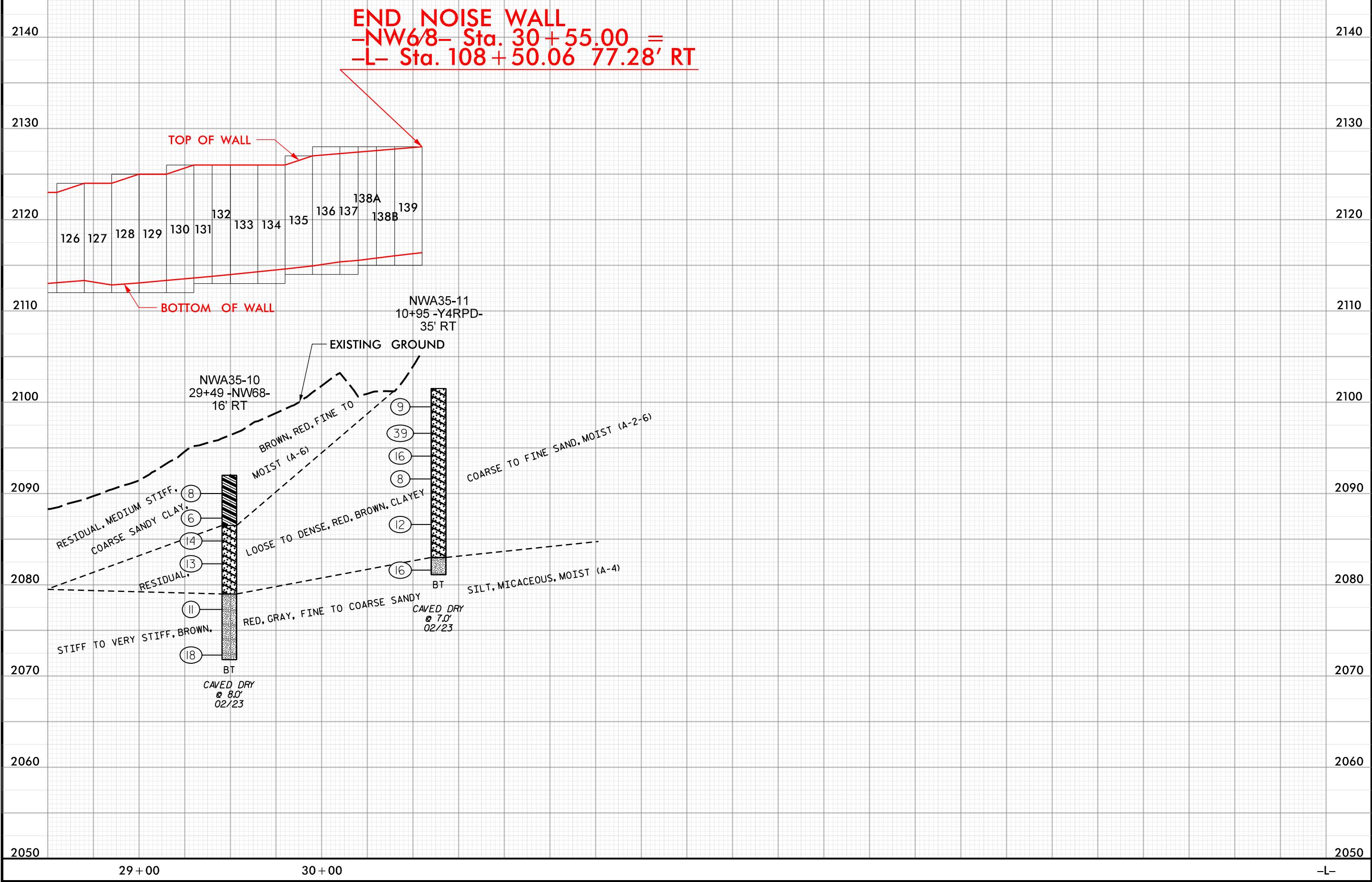


NOTE: INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ON TO THE EXISTING GROUND PROFILE ALONG THE CENTERLINE OF -NW68- TAKEN FROM THE PROVIDED PROJECT TIN FILE i2513_ls_tin.tin DATED 05/12/2022.



VE = 5

PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	10
CENTERLINE PROFILE ALONG -NW68- AT STA. 9+40 TO STA. 30+55 = STA. -Y3RPD- 18+73.09, 127' LT TO -L- STA, 108+50.06, 77' RT	



NCDOT BORE SINGLE I2513AC GEO SWAL WALL68.GPJ NC DOT.GDT 6/12/26

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.6			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST BUNCH, C.M.						
SITE DESCRIPTION NOISE WALL NO. 68 FROM STA. 9+57.85 -NW68- TO STA. 30+45.00 -NW68- ON I-26 CONNECTOR												GROUND WTR (ft)			
BORING NO. B-48			STATION 12+97			OFFSET 7 ft LT			ALIGNMENT -NW68-			0 HR.	20.0		
COLLAR ELEV. 2,082.1 ft			TOTAL DEPTH 24.4 ft			NORTHING 681,469			EASTING 934,176			24 HR.	16.8		
DRILL RIG/HAMMER EFF./DATE TER92-0 ACKER RENEGADE 94% 03/09/2017						DRILL METHOD H.S. Augers				HAMMER TYPE Automatic					
DRILLER DUGGINS, W.T.			START DATE 01/03/18			COMP. DATE 01/03/18			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)
2085															
2080	2,081.1	1.0	1	1	1	2								2,082.1	GROUND SURFACE 0.0
	2,078.6	3.5	2	3	3	6						M			RESIDUAL BROWN AND RED-ORANGE, CLAYEY FINE SAND, TRACE MICA
2075	2,076.1	6.0	3	4	5	9						M		2,075.4	
	2,073.6	8.5	3	3	3	6						M			BROWN, BROWN-ORANGE, AND RED-ORANGE, SILTY FINE SAND, TRACE TO SOME MICA
2070	2,069.3	12.8	3	3	3	6						M			
2065	2,064.3	17.8	60/0.1							60/0.1				2,065.1	17.0
															CRYSTALLINE ROCK (GRAY AND BLACK, GNEISS)
2060	2,059.3	22.8	60/0.0							60/0.0					
	2,057.7	24.4	60/0.0							60/0.0				2,057.7	24.4
			60/0.0							60/0.0					Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 2,057.7 ft IN CRYSTALLINE ROCK (GNEISS)

NCDOT BORE SINGLE I2513AC_GEO_SWAL_WALL68.GPJ NC_DOT.GDT 6/12/26

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.6			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST MARPLES, Z. J.						
SITE DESCRIPTION NOISE WALL NO. 68 FROM STA. 9+57.85 -NW68- TO STA. 30+45.00 -NW68- ON I-26 CONNECTOR												GROUND WTR (ft)			
BORING NO. NWA35-1			STATION 14+24			OFFSET 25 ft LT			ALIGNMENT -NW68-			0 HR. Caved			
COLLAR ELEV. 2,097.5 ft			TOTAL DEPTH 20.1 ft			NORTHING 681,598			EASTING 934,169			24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 93% 01/28/2022						DRILL METHOD H.S. Augers				HAMMER TYPE Automatic					
DRILLER TURNAGE, J. R.			START DATE 12/14/22			COMP. DATE 12/14/22			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)
2100															
2095	2,096.5	1.0	3	6	5									2,097.5	GROUND SURFACE 0.0
	2,093.9	3.6	6	6	5							M		RESIDUAL STIFF, RED, BROWN, CLAYEY SILT, MOIST, LITTLE ROCK FRAGMENTS, MICACEOUS (A-5)	
	2,091.4	6.1	4	6	6							M			
2090	2,091.4	6.1	4	6	6							M			
	2,088.9	8.6	4	3	6							M			
2085	2,088.9	8.6	4	3	6							M			
	2,083.9	13.6	4	4	6							M			
2080	2,083.9	13.6	4	4	6							M			
	2,078.9	18.6	19	47	31							M			
														2,080.5	17.0
														2,077.4	20.1
														Boring Terminated at Elevation 2,077.4 ft IN RESIDUAL SANDY SILT	

NCDOT BORE SINGLE I2513AC_GEO_SWAL_WALL68.GPJ NC_DOT.GDT 6/12/26

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.6			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST MARPLES, Z. J.						
SITE DESCRIPTION NOISE WALL NO. 68 FROM STA. 9+57.85 -NW68- TO STA. 30+45.00 -NW68- ON I-26 CONNECTOR												GROUND WTR (ft)			
BORING NO. NWA35-2			STATION 15+37			OFFSET 65 ft LT			ALIGNMENT -NW68-			0 HR. Caved			
COLLAR ELEV. 2,092.0 ft			TOTAL DEPTH 20.2 ft			NORTHING 681,715			EASTING 934,141			24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 93% 01/28/2022						DRILL METHOD H.S. Augers			HAMMER TYPE Automatic						
DRILLER TURNAGE, J. R.			START DATE 02/16/23			COMP. DATE 02/16/23			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)
2095															
													</		

NCDOT BORE SINGLE I2513AC_GEO_SWAL_WALL68.GPJ NC_DOT.GDT 6/12/26

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.6			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST MARPLES, Z. J.						
SITE DESCRIPTION NOISE WALL NO. 68 FROM STA. 9+57.85 -NW68- TO STA. 30+45.00 -NW68- ON I-26 CONNECTOR												GROUND WTR (ft)			
BORING NO. NWA35-3			STATION 15+97			OFFSET 68 ft LT			ALIGNMENT -NW68-			0 HR. Caved			
COLLAR ELEV. 2,094.6 ft			TOTAL DEPTH 20.4 ft			NORTHING 681,777			EASTING 934,148			24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 93% 01/28/2022						DRILL METHOD H.S. Augers				HAMMER TYPE Automatic					
DRILLER TURNAGE, J. R.			START DATE 02/16/23			COMP. DATE 02/16/23			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)
2095															
	2,093.6	1.0													
			2	3	3										
2090	2,090.7	3.9	3	4	5										
	2,088.2	6.4	7	10	9										
2085	2,085.7	8.9	7	9	14										
2080	2,080.7	13.9	13	17	24										
2075	2,075.7	18.9	7	14	22										

NCDOT BORE SINGLE I2513AC_GEO_SWAL_WALL68.GPJ NC_DOT.GDT 6/12/26

NCDOT BORE SINGLE I2513AC GEO SWAL WALL68.GPJ NC DOT.GDT 6/12/26

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.6			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST MARPLES, Z. J.						
SITE DESCRIPTION NOISE WALL NO. 68 FROM STA. 9+57.85 -NW68- TO STA. 30+45.00 -NW68- ON I-26 CONNECTOR												GROUND WTR (ft)			
BORING NO. NWA35-6			STATION 22+58			OFFSET 30 ft RT			ALIGNMENT -NW68-			0 HR. Caved			
COLLAR ELEV. 2,078.4 ft			TOTAL DEPTH 20.0 ft			NORTHING 682,363			EASTING 934,456			24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 93% 01/28/2022						DRILL METHOD H.S. Augers				HAMMER TYPE Automatic					
DRILLER TURNAGE, J. R.			START DATE 12/14/22			COMP. DATE 12/14/22			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															
	2,077.4	1.0	2	3	3									2,078.4	0.0
2075	2,074.9	3.5	4	6	9							M		RESIDUAL MEDIUM STIFF TO STIFF, BROWN, RED, SILTY CLAY, MOIST (A-7-6)	
	2,072.4	6.0	5	8	8							M		2,072.9	5.5
2070	2,069.9	8.5	5	5	7							M		STIFF TO VERY STIFF, RED, BROWN, FINE TO COARSE SANDY CLAY, MOIST (A-6)	
												M			
2065	2,064.9	13.5	3	3	6							M		2,065.4	13.0
														STIFF, BROWN, CLAYEY SILT, MOIST (A-5)	
2060	2,059.9	18.5	3	4	4							M		2,058.4	20.0
														Boring Terminated at Elevation 2,058.4 ft IN RESIDUAL CLAYEY SILT	

NCDOT BORE SINGLE I2513AC_GEO_SWAL_WALL68.GPJ NC_DOT.GDT 6/12/26

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.6			TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST MARPLES, Z. J.						
SITE DESCRIPTION NOISE WALL NO. 68 FROM STA. 9+57.85 -NW68- TO STA. 30+45.00 -NW68- ON I-26 CONNECTOR											GROUND WTR (ft)				
BORING NO. NWA35-7			STATION 23+65			OFFSET 16 ft LT			ALIGNMENT -NW68-			0 HR.	Caved		
COLLAR ELEV. 2,069.8 ft			TOTAL DEPTH 20.3 ft			NORTHING 682,478			EASTING 934,473			24 HR.	12.6		
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 93% 01/28/2022						DRILL METHOD H.S. Augers				HAMMER TYPE Automatic					
DRILLER TURNAGE, J. R.			START DATE 12/14/22			COMP. DATE 12/14/22			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)
2070														2,069.8	GROUND SURFACE 0.0
	2,068.8	1.0	3	2	3									MEDIUM STIFF, BROWN, RED, SILTY CLAY, MOIST (A-7-6)	
	2,066.0	3.8	3	5	7										
2065	2,063.5	6.3	4	5	6									2,064.3	5.5
	2,061.0	8.8	3	3	3										
2060															
	2,056.0	13.8	4	3	7										
2055															
	2,051.0	18.8	4	5	6										
2050														2,049.5	20.3
														Boring Terminated at Elevation 2,049.5 ft IN RESIDUAL CLAYEY SILT	

NCDOT BORE SINGLE I2513AC_GEO_SWAL_WALL68.GPJ NC_DOT.GDT 6/12/26

NCDOT BORE SINGLE I2513AC GEO SWAL WALL68.GPJ NC DOT.GDT 6/12/26

NCDOT BORE SINGLE I2513AC GEO SWAL WALL68.GPJ NC DOT.GDT 6/12/26

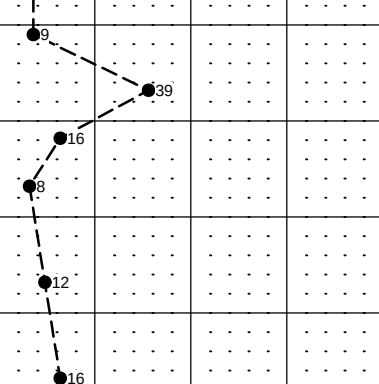
NCDOT BORE SINGLE I2513AC GEO SWAL WALL68.GPJ NC DOT.GDT 6/12/26

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.6				TIP I-2513AC		COUNTY BUNCOMBE		GEOLOGIST MARPLES, Z. J.								
SITE DESCRIPTION NOISE WALL NO. 68 FROM STA. 9+57.85 -NW68- TO STA. 30+45.00 -NW68- ON I-26 CONNECTOR										GROUND WTR (ft)						
BORING NO. NWA35-10			STATION 29+49			OFFSET 16 ft RT			ALIGNMENT -NW68-		0 HR. Caved					
COLLAR ELEV. 2,092.0 ft			TOTAL DEPTH 20.2 ft			NORTHING 682,987			EASTING 934,759		24 HR. Caved					
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 93% 01/28/2022						DRILL METHOD H.S. Augers				HAMMER TYPE Automatic						
DRILLER TURNAGE, J. R.			START DATE 02/21/23			COMP. DATE 02/21/23			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)	
2095																
2090	2,091.0	1.0												2,092.0 GROUND SURFACE 0.0		
	2,088.3	3.7	2	4	4	8						M		RESIDUAL MEDIUM STIFF, BROWN, RED, FINE TO COARSE SANDY CLAY (A-6)		
2085	2,085.8	6.2	2	2	4	6						M		2,086.5	5.5	MEDIUM DENSE, RED, BROWN, CLAYEY COARSE TO FINE SAND, MOIST (A-2-6)
	2,083.3	8.7	4	7	7	14						M				
2080			7	6	7	13						M		2,079.0	13.0	STIFF TO VERY STIFF, BROWN, GRAY, FINE TO COARSE SANDY SILT, MOIST, MICACEOUS (A-4)
	2,078.3	13.7	3	4	7	11						M				
2075	2,073.3	18.7	6	8	10	18						M		2,071.8	20.2	Boring Terminated at Elevation 2,071.8 ft IN RESIDUAL SANDY SILT CAVED DRY @ 8.0'

NC DOT BORE SINGLE I2513AC_GEO_SWAL_WALL68.GPJ NC_DOT.GDT 6/12/26

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.6				TIP I-2513AC			COUNTY BUNCOMBE			GEOLOGIST MARPLES, Z. J.						
SITE DESCRIPTION NOISE WALL NO. 68 FROM STA. 9+57.85 -NW68- TO STA. 30+45.00 -NW68- ON I-26 CONNECTOR												GROUND WTR (ft)				
BORING NO. NWA35-11				STATION 10+95				OFFSET 35 ft RT				ALIGNMENT -Y4RPC-			0 HR.	Caved
COLLAR ELEV. 2,101.5 ft				TOTAL DEPTH 20.4 ft				NORTHING 683,096				EASTING 934,791			24 HR.	Caved
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 93% 01/28/2022								DRILL METHOD H.S. Augers					HAMMER TYPE Automatic			
DRILLER TURNAGE, J. R.				START DATE 02/21/23				COMP. DATE 02/21/23				SURFACE WATER DEPTH N/A				
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼ MOI	L O G	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)	
2105																
2100	2,100.5	1.0												2,101.5	GROUND SURFACE 0.0	
2095	2,097.6	3.9	3	5	4								M	RESIDUAL LOOSE TO DENSE, RED, BROWN, CLAYEY COARSE TO FINE SAND, MOIST (A-2-6)		
	2,095.1	6.4	3	37	2								M			
2090	2,092.6	8.9	4	12	4								M			
			3	3	5								M			
2085	2,087.6	13.9	6	6	6								M			
	2,082.6	18.9	3	6	10								M		2,083.0 18.5	
														2,081.1 20.4	VERY STIFF, BROWN, FINE TO COARSE SANDY SILT, MOIST, MICACEOUS (A-4)	
														Boring Terminated at Elevation 2,081.1 ft IN RESIDUAL SANDY SILT		
														CAVED DRY @ 7.0'		

NC DOT BORE SINGLE I2513AC_GEO_SWAL_WALL68.GPJ NC_DOT.GDT 6/12/26

LABORATORY TESTING SUMMARY

PROJECT NUMBER: 34165.1.6

TIP: I-2513AC

COUNTY: BUNCOMBE

DESCRIPTION:	NOISE WALL NO. 68, STA. 9+40.00 -NW68- (STA. 18+73.09 -Y3RPD, 127.03' LT) TO STA. 30+55.00.00 -NW68- (STA. 108+50.06 -L-, 77' RT)
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[illegible]

N/D - NOT DETERMINED

Stephanie H. Huffman
Certified Lab Technician Signature

114-01-1203
Certification Number

REFERENCE: I-2513AC

PROJECT: 34165

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3 - 4	SITE PLAN
5	PROFILE
6 - 11	BORE LOGS
12	LABORATORY SUMMARY SHEET

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY BUNCOMBE
PROJECT DESCRIPTION I-26 CONNECTOR (I-40 TO
US 19 – US 23 – US 70 NORTH TO ASHEVILLE)
SITE DESCRIPTION NOISE WALL NO. 7C FROM
STA. 20 + 05.00 –NWAL7C– (STA. 99 + 91.62 –L–) TO
STA. 28 + 85 –NWAL7C– (STA. 108 + 90.37 –L–)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-2513AC	1	12

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT, AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE 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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS 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

MARPLES, Z. J.

TURNAGE, J. R.

OXENDINE, J.

INVESTIGATED BY MARPLES, Z. J.

DRAWN BY FIELDS, W. D.

CHECKED BY RIGGS, Jr., A. F.

SUBMITTED BY TERRACON CONSULTANTS

DATE APRIL 2026

Prepared in the Office of:



2401 BRENTWOOD ROAD, SUITE 107
RALEIGH, NORTH CAROLINA 27604
NC REGISTERED ENGINEERING FIRM: E-0869
NC REGISTERED GEOLOGIC FIRM: C-367



DocuSigned by:

Abner Riggs Jr. 7/7/2026

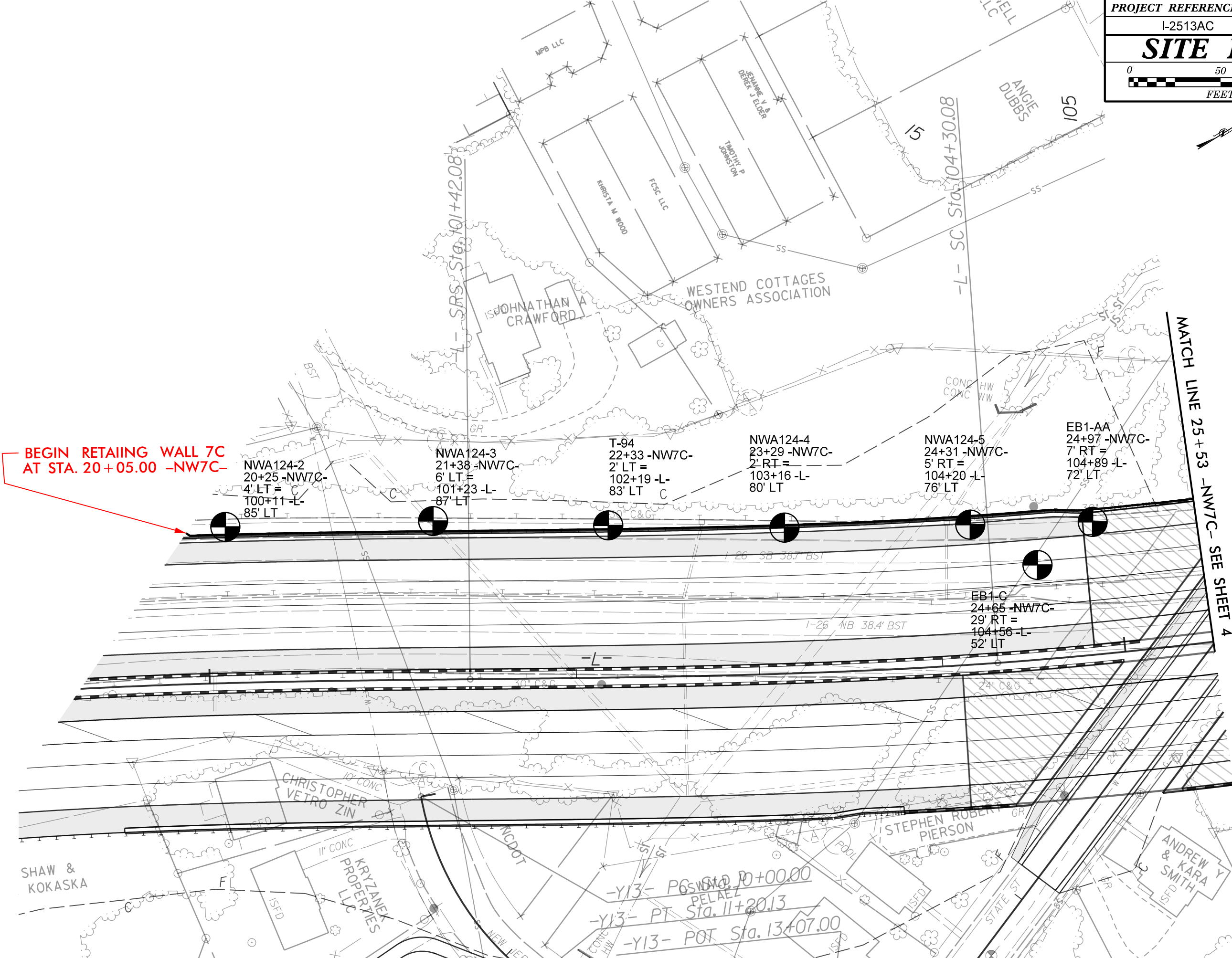
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DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

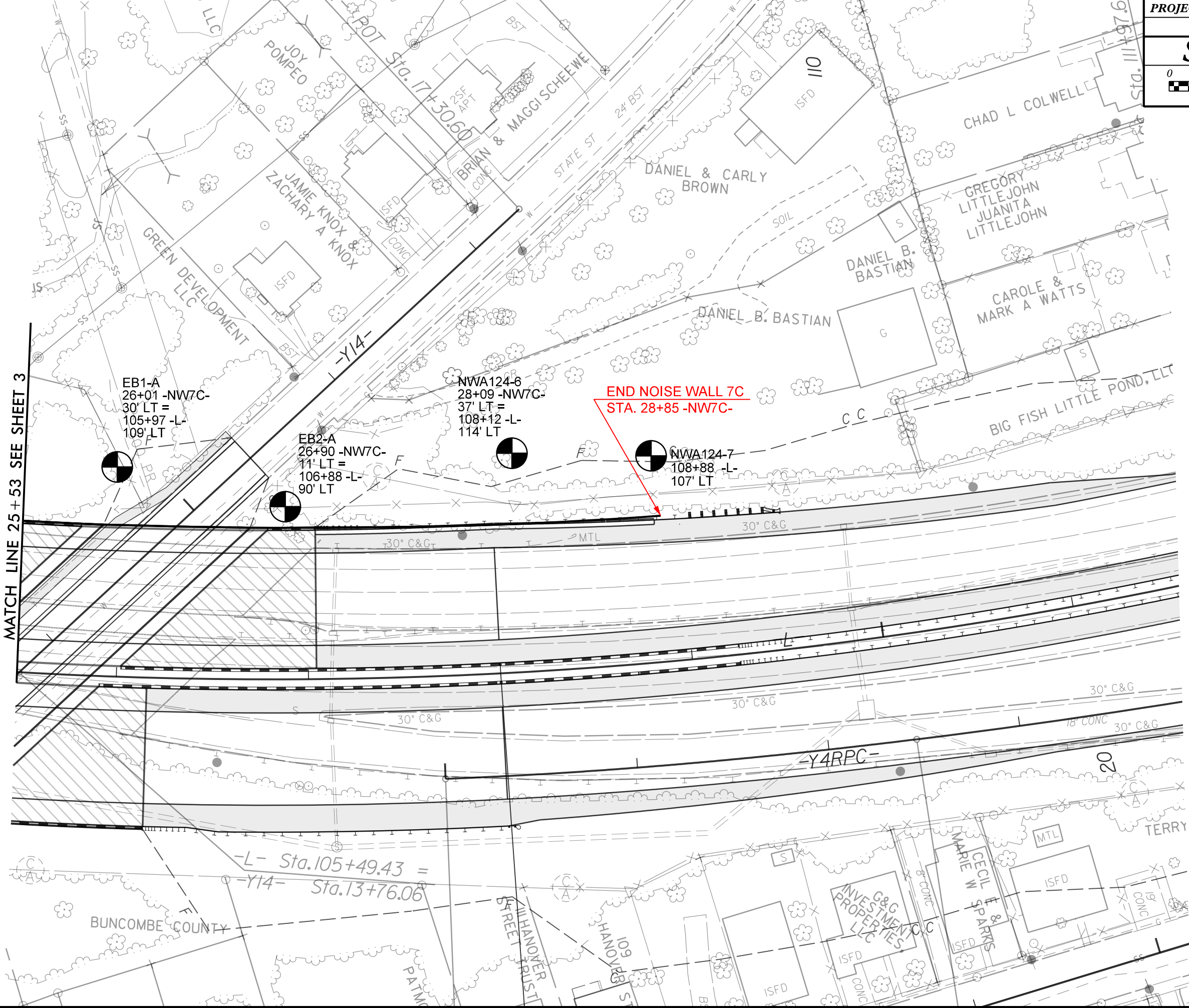
SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS									
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD 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 DISLOGGED 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 (ROQ) - 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 (SRQD) - 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										ANGULARITY OF GRAINS										WEATHERED ROCK (WR)										CRYSTALLINE ROCK (CR)									
GENERAL CLASS.		GRANULAR MATERIALS (< 35% PASSING #200)					SILT-CLAY MATERIALS (> 35% PASSING #200)					ORGANIC MATERIALS					FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.			FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.			COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.			WEATHERING							FRESH						
GROUP CLASS.		A-1-a	A-1-b	A-3	A-2-4	A-2	A-2-5	A-2-6	A-2-7	A-4	A-5	A-6	A-7	A-1-A-2	A-3	A-4, A-5	VERY SLIGHT (V SL.)			MODERATE (MOD.)			MODERATELY SEVERE (MOD. SEV.)			VERY SEVERE (V SEV.)			COMPLETE			SEVERE (SEV.)							
SYMBOL																																							

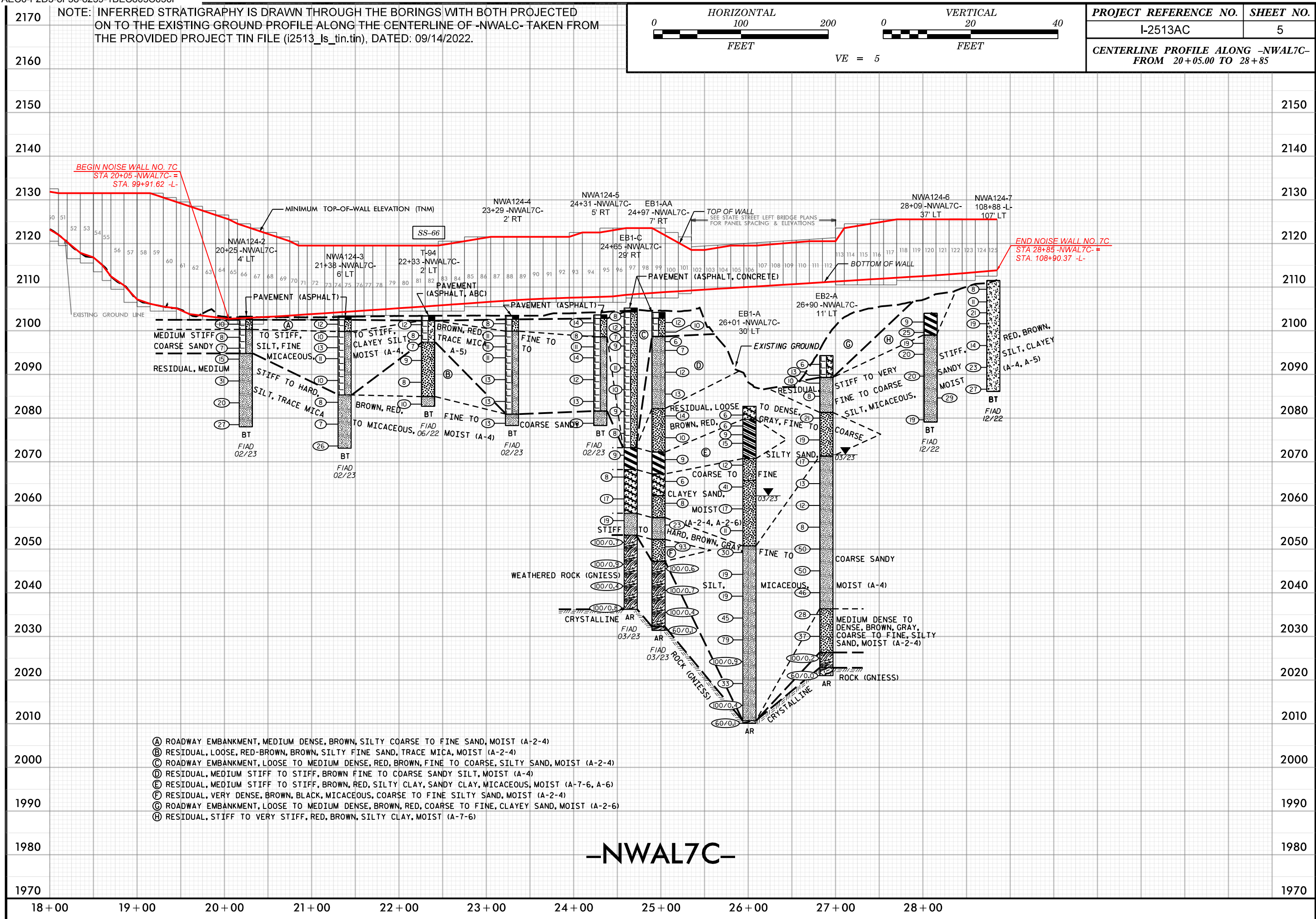
PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	3
SITE PLAN	
0 50 100 FEET	

BEGIN RETAINING WALL 7C
AT STA. 20+05.00 -NW7C-



PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	4
SITE PLAN	
0 50 100 FEET	





NCDOT BORE SINGLE I2513AC GEO SWAL NW7C.GPJ NC DOT.GDT 11/7/25

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.6				TIP I-2513AC				COUNTY BUNCOMBE				GEOLOGIST MARPLES, Z. J.					
SITE DESCRIPTION NOISE WALL NO. 7C, FROM STA. 10+00 -NWAL7C- TO STA. 18+52.29 -NWAL7C-												GROUND WTR (ft)					
BORING NO. NWA124-4				STATION 23+29				OFFSET 2 ft RT				ALIGNMENT -NWAL7C-				0 HR. Caved	
COLLAR ELEV. 2,102.9 ft				TOTAL DEPTH 25.1 ft				NORTHING 682,665				EASTING 934,416				24 HR. FIAD	
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 93% 01/28/2022								DRILL METHOD H.S. Augers				HAMMER TYPE Automatic					
DRILLER TURNAGE, J.				START DATE 02/07/23				COMP. DATE 02/07/23				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			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
2105																	
	2,102.1	0.8												2,102.9	GROUND SURFACE 0.0		
2100			8	4	4									2,102.1	PAVEMENT(0.8' ASPHALT) 0.8		
	2,099.3	3.6										M					
	2,099.3		4	4	7									2,099.4	ROADWAY EMBANKMENT		
	2,096.8	6.1										M			LOOSE, BROWN, SILTY FINE TO COARSE SAND, MOIST (A-2-4)		
2095			4	5	6												
	2,096.8											M			STIFF, BROWN, RED, FINE TO COARSE SANDY SILT, MOIST, MICACEOUS (A-4)		
	2,094.3	8.6															
			4	5	6							M					
2090																	
	2,089.3	13.6															
			4	6	7							M					
2085																	
	2,084.3	18.6															
			5	6	7							M					
2080																	
	2,079.3	23.6												2,080.4	RESIDUAL 22.5		
			5	5	8							M					
														2,077.8	STIFF, BROWN, RED, FINE TO COARSE SANDY SILT, MOIST, MICACEOUS (A-4) 25.1		
															Boring Terminated at Elevation 2,077.8 ft IN RESIDUAL SANDY SILT		

NCDOT BORE SINGLE I2513AC_GEO_SWAL_NW7C.GPJ NC_DOT.GDT 11/7/25

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.6				TIP I-2513AC				COUNTY BUNCOMBE				GEOLOGIST MARPLES, Z. J.					
SITE DESCRIPTION NOISE WALL NO. 7C, FROM STA. 10+00 -NWAL7C- TO STA. 18+52.29 -NWAL7C-												GROUND WTR (ft)					
BORING NO. NWA124-5				STATION 24+31				OFFSET 5 ft RT				ALIGNMENT -NWAL7C-				0 HR. Caved	
COLLAR ELEV. 2,103.1 ft				TOTAL DEPTH 25.3 ft				NORTHING 682,751				EASTING 934,469				24 HR. FIAD	
DRILL RIG/HAMMER EFF./DATE TER373 DIEDRICH D-50 93% 01/28/2022								DRILL METHOD H.S. Augers				HAMMER TYPE Automatic					
DRILLER TURNAGE, J.				START DATE 02/07/23				COMP. DATE 02/07/23				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			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
2105																	
2100	2,102.3	0.8												2,103.1 GROUND SURFACE 0.0			
														2,102.3 PAVEMENT(0.8' ASPHALT) 0.8			
2095	2,099.3	3.8		19	9	5							M		ROADWAY EMBANKMENT		
															MEDIUM DENSE, BROWN, RED, SILTY		
2090	2,096.8	6.3		5	4	4							M		COARSE TO FINE SAND, MOIST, SOME GRAVEL (A-2-4)		
															5.0		
2085	2,094.3	8.8		4	4	7							M		MEDIUM STIFF TO STIFF, BROWN, FINE TO COARSE SANDY SILT, MOIST, MICACEOUS (A-4)		
2080	2,089.3	13.8		4	6	8							M				
2075	2,084.3	18.8		4	5	7							M				
2070	2,079.3	23.8		4	6	7							M		2,081.1 RESIDUAL 22.0		
2065	2,077.8	25.3		6	7	9							M		2,077.8 VERY STIFF, BROWN, RED, FINE TO COARSE SANDY SILT, MOIST, MICACEOUS (A-4) 25.3		
															Boring Terminated at Elevation 2,077.8 ft IN RESIDUAL SANDY SILT		

NCDOT BORE SINGLE I2513AC_GEO_SWAL_NW7C.GPJ NC_DOT.GDT 11/7/25

NCDOT BORE SINGLE I2513AC GEO SWAL NW7C.GPJ NC DOT.GDT 11/7/25

NCDOT BORE SINGLE I2513AC GEO SWAL NW7C.GPJ NC DOT.GDT 11/7/25

NCDOT BORE SINGLE I2513AC GEO SWAL NW7C.GPJ NC DOT.GDT 11/7/25

NCDOT BORE SINGLE I2513AC GEO SWAL NW7C.GPJ NC DOT.GDT 11/7/25

Certificate Of Completion

Envelope Id: 4FFFAEC6-F2D3-8F58-8259-1BEC805C636F
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 Source Envelope:
 Document Pages: 12
 Certificate Pages: 1
 AutoNav: Enabled
 Envelopeld Stamping: Enabled
 Time Zone: (UTC-08:00) Pacific Time (US & Canada)

Status: Completed

Envelope Originator:
 Abner Riggs Jr.
 Abner.RiggsJr@terracon.com
 IP Address: 136.61.77.214

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 7/7/2026 11:30:37 AM

Holder: Abner Riggs Jr.
 Abner.RiggsJr@terracon.com

Location: DocuSign

Signer Events

Abner Riggs Jr.
 Abner.RiggsJr@terracon.com
 Senior Geotechnical Engineer/APR
 Security Level: Email, Account Authentication (None)

Signature

DocuSigned by:

 C2F6ACA84D274B1...

Signature Adoption: Pre-selected Style
 Using IP Address: 136.61.77.214

Timestamp

Sent: 7/7/2026 11:32:36 AM
 Viewed: 7/7/2026 11:32:47 AM
 Signed: 7/7/2026 11:33:15 AM
 Freeform Signing

Electronic Record and Signature Disclosure:
 Not Offered via Docusign

In Person Signer Events

Signature

Timestamp

Editor Delivery Events

Status

Timestamp

Agent Delivery Events

Status

Timestamp

Intermediary Delivery Events

Status

Timestamp

Certified Delivery Events

Status

Timestamp

Carbon Copy Events

Status

Timestamp

Witness Events

Signature

Timestamp

Notary Events

Signature

Timestamp

Envelope Summary Events

Status

Timestamps

Envelope Sent	Hashed/Encrypted	7/7/2026 11:32:36 AM
Certified Delivered	Security Checked	7/7/2026 11:32:47 AM
Signing Complete	Security Checked	7/7/2026 11:33:15 AM
Completed	Security Checked	7/7/2026 11:33:15 AM

Payment Events

Status

Timestamps

PROJECT: 34165

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4-5	PROFILE
6-12	BORE LOGS
13	SOIL TEST RESULTS

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY BUNCOMBE

PROJECT DESCRIPTION *I-26/I-40/I-240 INTERCHANGE*
TO SR 3548 (HAYWOOD ROAD)

SITE DESCRIPTION **RETAINING WALL NO.1**
-WALL1- STA. 12+11.57 (-L- STA. 48+60.00) TO
-WALL1- STA. 18+97.35 (-L- STA. 55+42.00)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-2513AC	1	13

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 USED. SOIL WATER LEVEL DATA MAY BE AVAILABLE FROM OTHER INVESTIGATIONS. OTHER 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 PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS TO DETERMINE THE ACTUAL EXTENT OF THE MATERIALS AND CONDITIONS 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

4. BLACKMORE

GEOLOGIC EXPLORATION

INVESTIGATED BY **ECS SOUTHEAST, LLC**DRAWN BY A. SUTTLE, P.G.

CHECKED BY S. HUDSON, P.G.

SUBMITTED BY **ECS SOUTHEAST, LLC**DATE *JUNE 2025*

Prepared in the Office of



ECS SOUTHEAST, LLC
1812 CENTER PARK DRIVE, SUITE D
CHARLOTTE, NC 28217
(704) 525-5152 [PHONE]
(704) 357-0023 [FAX]
NC REGISTERED
ENGINEERING
FIRM # F-1519



Signed by:

Amanda R. Suttle PG 6/30/2020

399DBE42934A194

DATE _____

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

***NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS***

SOIL DESCRIPTION

SOIL 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,
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)				SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS			
GROUP CLASS.	A-1	A-3	A-2		A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5		
SYMBOL												
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 35 MX	35 MX 35 MX	35 MX 35 MX	35 MX 36 MN	36 MN 36 MN	36 MN 36 MN	36 MN		GRANULAR SOILS	SILT-CLAY SOILS
MATERIAL PASSING #40 LL PI	— 6 MX		— NP		40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER	
GROUP INDEX	0		0		4 MX		8 MX	12 MX	16 MX	NO MX	HIGHLY ORGANIC SOILS	
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND		SILTY SOILS		CLAYEY SOILS			
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD				FAIR TO POOR				FAIR TO POOR		POOR	UNSUITABLE

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE OPENING (MM)	4	10	40	60	200	270
	4.76	2.00	0.42	0.25	0.075	0.053
BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F. SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	305 IN.	75 IN.	2.0	0.25	0.05	0.005
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SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
PLASTIC RANGE (PI) LL PL	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
OM SL	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

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.

GRADATION

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.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:
ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY

GROUND WATER

WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING

STATIC WATER LEVEL AFTER 24 HOURS

PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA

SPRING OR SEEP

MISCELLANEOUS SYMBOLS

ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION

SOIL SYMBOL

ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT

INFERRED SOIL BOUNDARY

INFERRED ROCK LINE

ALLUVIAL SOIL BOUNDARY

DIP & DIP DIRECTION OF ROCK STRUCTURES

TEST BORING

AUGER BORING

CORE BORING

MONITORING WELL

PIEZOMETER INSTALLATION

SLOPE INDICATOR INSTALLATION

CONE PENETROMETER TEST

SOUNDING ROD

TEST BORING WITH CORE

SPT N-VALUE

RECOMMENDATION SYMBOLS

UNDERCUT

SHALLOW UNDERCUT

UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE

UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK

UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HL - HIGHLY

MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY

VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

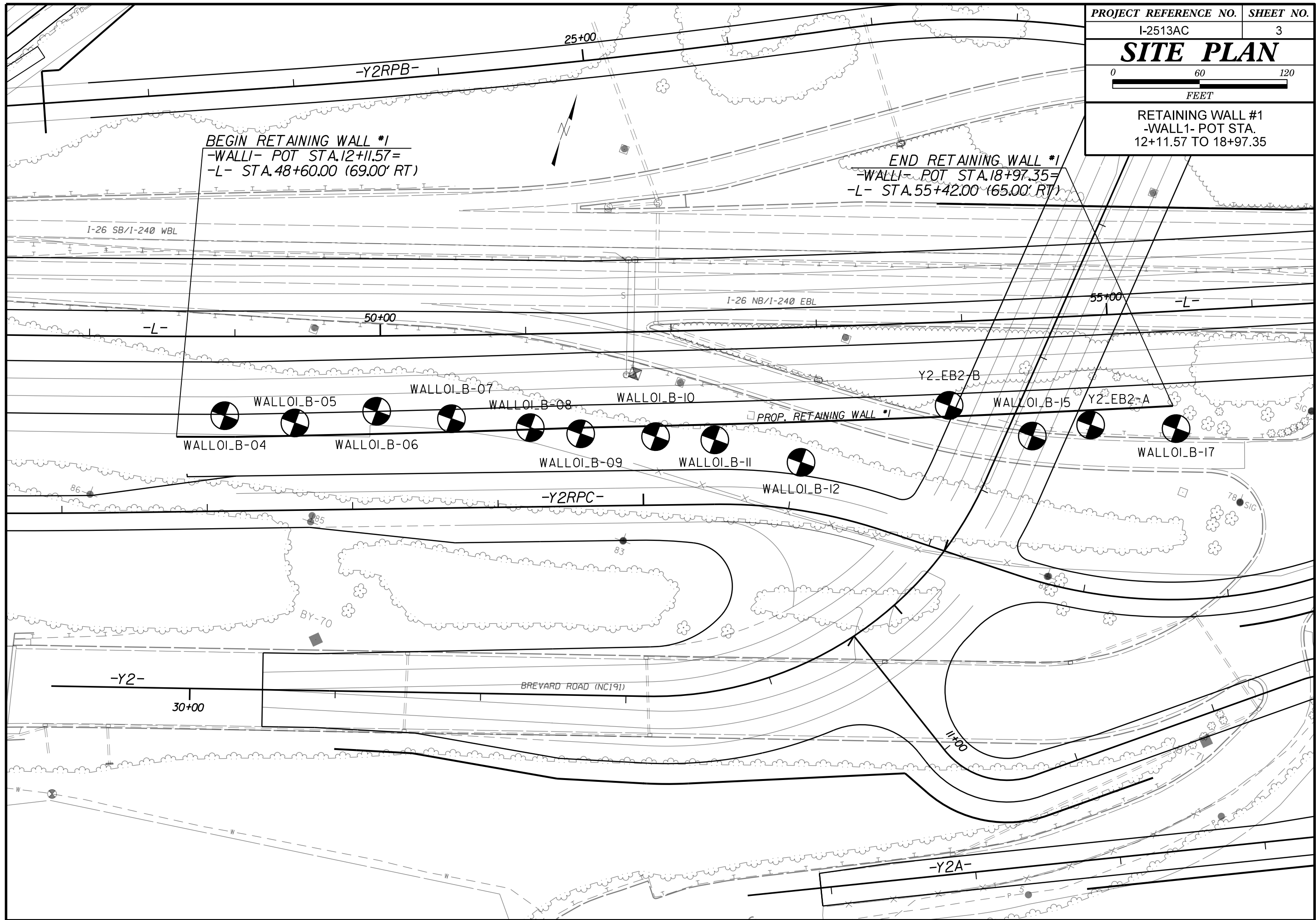
ROCK DESCRIPTION

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:

WEATHERED ROCK (WR)

NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TEST

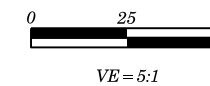
PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	3
SITE PLAN	
0 60 120 FEET	
RETAINING WALL #1 -WALL1- POT STA. 12+11.57 TO 18+97.35	



-WALL1- PROFILE ALONG EXISTING GROUND LINE FROM ROADWAY
DESIGN FILES, PROVIDED BY AECOM JUNE 2025 AND I2513 Is tn.tin. INFERRED
STRATIGRAPHY IS DRAWN THROUGH THE BORING, PROJECTED ON THE PROFILE.

-WALL1-

Prepared in the Office of:



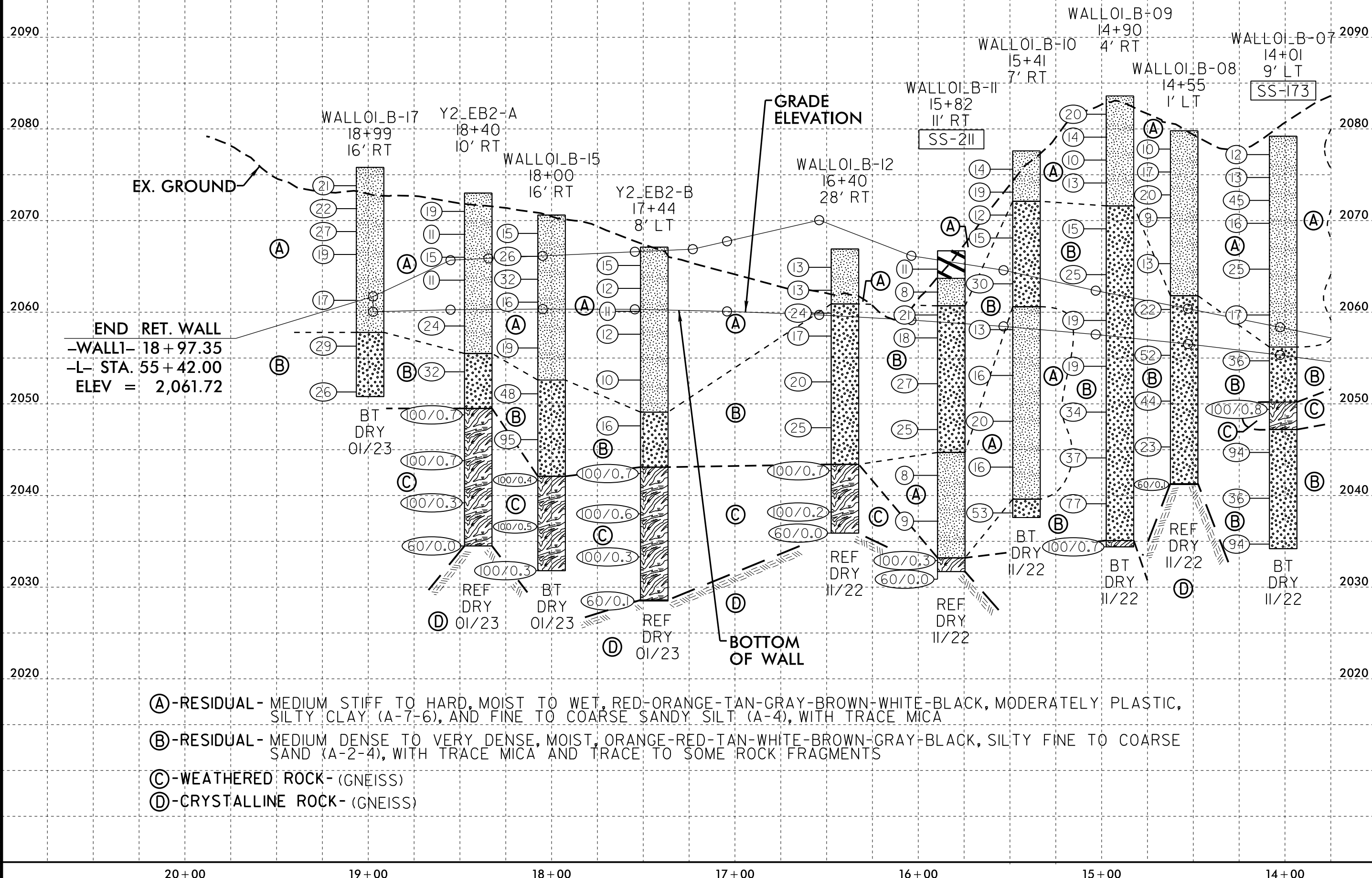
PROJECT REFERENCE NO.

I-2513AC

SHEET NO.

4

PROFILE BORINGS PROJECTED ON
-WALL1- ALONG WALL NO. 1

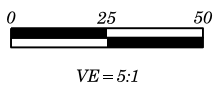


- (A)-RESIDUAL- MEDIUM STIFF TO HARD, MOIST TO WET, RED-ORANGE-TAN-GRAY-BROWN-WHITE-BLACK, MODERATELY PLASTIC, SILTY CLAY (A-7-6), AND FINE TO COARSE SANDY SILT (A-4), WITH TRACE MICA
- (B)-RESIDUAL- MEDIUM DENSE TO VERY DENSE, MOIST, ORANGE-RED-TAN-WHITE-BROWN-GRAY-BLACK, SILTY FINE TO COARSE SAND (A-2-4), WITH TRACE MICA AND TRACE TO SOME ROCK FRAGMENTS
- (C)-WEATHERED ROCK- (GNEISS)
- (D)-CRYSTALLINE ROCK- (GNEISS)

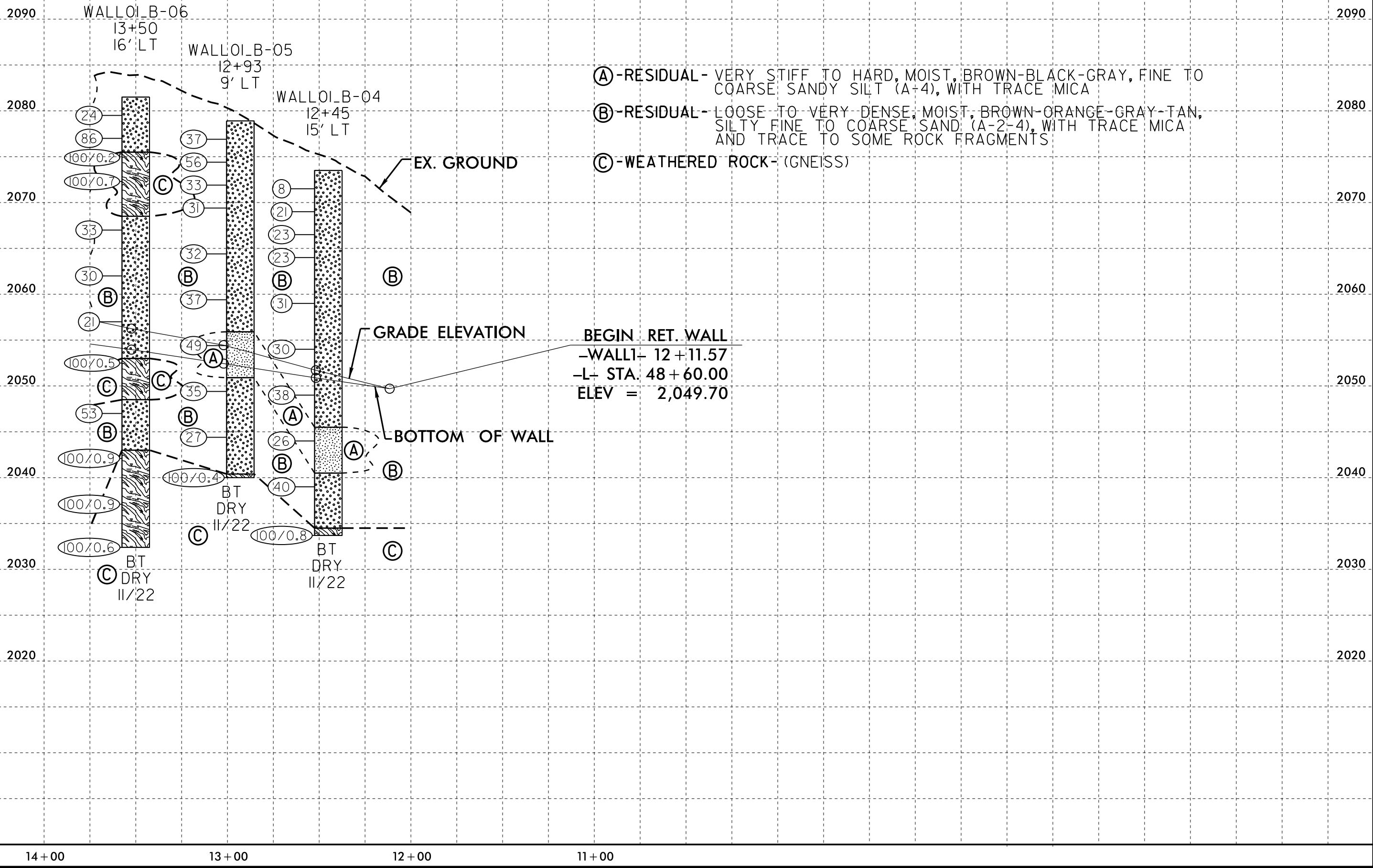
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\$\$\$\$\$1ST DRAFT\$\$\$\$\$

-WALL1- PROFILE ALONG EXISTING GROUND LINE FROM ROADWAY
DESIGN FILES, PROVIDED BY AECOM JUNE 2025 AND I2513 Is tn.tin. INFERRED
STRATIGRAPHY IS DRAWN THROUGH THE BORING, PROJECTED ON THE PROFILE.

-WALL1-



PROJECT REFERENCE NO.	SHEET NO.
I-2513AC	5
PROFILE BORINGS PROJECTED ON -WALL1- ALONG WALL NO. 1	



F-2513AC



SHEET

6

NCDOT BORE DOUBLE ECS WALL 1.GPJ ECS GINT DATA-TEMPLATE.GDT 6/16/25

WBS: 34165.1.13			TIP: I-2513AC			COUNTY: BUNCOMBE			GEOLOGIST: A. Blackmore					
SITE DESCRIPTION: RETAINING WALL NO. 1, STA. -L- 12+11.57 TO -L- STA. 18+97.35											GROUND WTR (ft)			
BORING NO.: WALL01_B-05			STATION: 12+93			OFFSET: 9 ft LT			ALIGNMENT: -WALL1-		0 HR.	Dry		
COLLAR ELEV.: 2,078.9 ft			TOTAL DEPTH: 38.9 ft			NORTHING: 679,171			EASTING: 930,760		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				
2080														
	2,077.9	1.0	4	11	26									2,078.9 GROUND SURFACE 0.0
2075	2,075.4	3.5	25	28	28									Dense to Very Dense, Brown-Gray, Silty Fine to Coarse SAND (A-2-4), with trace mica and some rock fragments
	2,072.9	6.0	10	17	16									
2070	2,070.4	8.5	8	14	17									
2065	2,065.4	13.5	17	13	19									
2060	2,060.4	18.5	17	17	20									
2055	2,055.4	23.5	35	22	27									2,055.9 23.0
														Hard, Brown-Gray, Fine to Coarse Sandy SILT (A-4), with trace mica
2050	2,050.4	28.5	26	17	18									2,050.9 28.0
														Medium Dense to Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica
2045	2,045.4	33.5	9	12	15									
2040	2,040.4	38.5	100/0.4											2,040.4 38.5
														2,040.6 38.9
														WEATHERED ROCK
														Brown (GNEISS)
														Boring Terminated at Elevation 2,040.0 ft In Weathered Rock (GNEISS)
														Surficial Organic Soil 0.0 to 0.3 feet

T-2513AC



SHEET

7

NCNDOT BORE DOUBLE ECS WALL 1.GPJ ECS GINT DATA-TEMPLATE.GDT 6/16/25

WBS: 34165.1.13			TIP: I-2513AC			COUNTY: BUNCOMBE			GEOLOGIST: A. Blackmore						
SITE DESCRIPTION: RETAINING WALL NO. 1, STA. -L- 12+11.57 TO -L- STA. 18+97.35									GROUND WTR (ft)						
BORING NO.: WALL01_B-07			STATION: 14+01			OFFSET: 9 ft LT			ALIGNMENT: -WALL1-			0 HR.	Dry		
COLLAR ELEV.: 2,079.2 ft			TOTAL DEPTH: 45.0 ft			NORTHING: 679,211			EASTING: 930,860			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: 11/17/22			COMP. DATE: 11/17/22			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					
2080														2,079.2 GROUND SURFACE 0.0	
	2,078.2	1.0	3	5	7									RESIDUAL Stiff to Hard, Brown-Red-Tan, Fine to Coarse Sandy SILT (A-4(0))	
2075	2,075.7	3.5	3	6	7							M			
	2,073.2	6.0	16	24	21							M			
2070	2,070.7	8.5	10	8	8							M			
	2,065.7	13.5	15	12	13							M			
2065															
2060	2,060.7	18.5	22	7	10						SS-173	17%			
	2,055.7	23.5	8	12	24							M		2,056.2 Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica 23.0	
2055															
2050	2,050.7	28.5	39	48	52/0.3									2,050.2 WEATHERED ROCK Brown (GNEISS) 29.0	
	2,045.7	33.5	20	30	64							M		2,047.2 RESIDUAL Dense to Very Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica 32.0	
2045															
2040	2,040.7	38.5	10	15	21							M			
	2,035.7	43.5	15	32	62							M			
2035														2,034.2 Boring Terminated at Elevation 2,034.2 ft In Residual Silty SAND (A-2-4) 45.0	
														Surficial Organic Soil 0.0 to 0.3 feet	

T-2513AC



SHEET

3

NCDDOT BORE DOUBLE ECS WALL 1.GPJ ECS GINT DATA-TEMPLATE.GDT 6/16/25

WBS: 34165.1.13			TIP: I-2513AC			COUNTY: BUNCOMBE			GEOLOGIST: A. Blackmore					
SITE DESCRIPTION: RETAINING WALL NO. 1, STA. -L- 12+11.57 TO -L- STA. 18+97.35											GROUND WTR (ft)			
BORING NO.: WALL01_B-09			STATION: 14+90			OFFSET: 4 ft RT			ALIGNMENT: -WALL1-			0 HR.	Dry	
COLLAR ELEV.: 2,083.6 ft			TOTAL DEPTH: 49.2 ft			NORTHING: 679,232			EASTING: 930,947			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: 11/17/22			COMP. DATE: 11/18/22			SURFACE WATER DEPTH: N/A					
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	▼ MOI	L O G	SOIL AND ROCK DESCRIPTION
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2085														GROUND SURFACE 0.0
	2,082.6	1.0	8	9	11									
2080	2,080.1	3.5	6	7	7							M		RESIDUAL Stiff to Very Stiff, Brown-Tan-Red, Fine to Coarse Sandy SILT (A-4), with trace mica
	2,077.6	6.0	4	5	5							M		
2075	2,075.1	8.5	5	5	8							M		2,071.6 12.0 Medium Dense to Very Dense, Gray-Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica
												M		
2070	2,070.1	13.5	7	7	8							M		
2065	2,065.1	18.5	13	12	13							M		
2060	2,060.1	23.5	10	10	9							M		
2055	2,055.1	28.5	6	7	12							M		
2050	2,050.1	33.5	12	15	19							M		
2045	2,045.1	38.5	16	14	23							M		
2040	2,040.1	43.5	12	28	49							M		
2035	2,035.1	48.5	75	25/0.2										2,035.1 48.5
														2,034.4 49.2
WEATHERED ROCK Brown (GNEISS) Boring Terminated at Elevation 2,034.4 ft In Weathered Rock (GNEISS) Surficial Organic Soil 0.0 to 0.3 feet														

T-2513AC



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NCDOT BORE DOUBLE ECS WALL 1.GPJ ECS GINT DATA-TEMPLATE.GDT 6/16/25

WBS: 34165.1.13			TIP: I-2513AC			COUNTY: BUNCOMBE			GEOLOGIST: A. Blackmore					
SITE DESCRIPTION: RETAINING WALL NO. 1, STA. -L- 12+11.57 TO -L- STA. 18+97.35											GROUND WTR (ft)			
BORING NO.: WALL01_B-11			STATION: 15+82			OFFSET: 11 ft RT			ALIGNMENT: -WALL1-			0 HR.	Dry	
COLLAR ELEV.: 2,066.7 ft			TOTAL DEPTH: 35.0 ft			NORTHING: 679,260			EASTING: 931,035			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: 11/18/22			COMP. DATE: 11/18/22			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														
2065	2,065.7	1.0												2,066.7 GROUND SURFACE 0.0
2060	2,063.2	3.5	3	3	8						SS-211	21%		RESIDUAL Stiff, Red-Brown, Moderately Plastic, Silty CLAY (A-7-6(13)) 3.0
	2,060.7	6.0	3	4	4							M		2,063.7 Medium Stiff, Brown, Fine to Coarse Sandy SILT (A-4) 3.0
	2,058.2	8.5	7	8	13							M		2,060.7 Medium Dense, Brown-Tan-White, Silty Fine to Coarse SAND (A-2-4), with trace mica 6.0
2055	2,053.2	13.5	10	11	7							M		
	2,048.2	18.5	11	13	14							M		
2050	2,043.2	23.5	10	9	16							M		
	2,038.2	28.5	5	4	4							M		2,044.7 Medium Stiff to Stiff, White-Tan-Gray-Brown, Fine to Coarse Sandy SILT (A-4), with trace rock fragments and mica 22.0
2040	2,033.2	33.5	3	4	5							W		
	2,031.7	35.0	100/0.3											2,033.2 WEATHERED ROCK 33.5 Gray-Brown (GNEISS) 35.0
Boring Terminated with Standard Penetration Test Refusal at Elevation 2,031.7 ft On Crystalline Rock (GNEISS)														
Surficial Organic Soil 0.0 to 0.3 feet														

T-2513AC



PROJECT REFERENCE

SHEET

I-2513AC

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NCDOT BORE DOUBLE ECS WALL 1.GPJ ECS GINT DATA-TEMPLATE.GDT 6/16/25

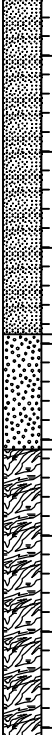
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T-2513AC



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NCDOT BORE DOUBLE ECS WALL 1.GPJ ECS GINT DATA-TEMPLATE.GDT 6/16/25

WBS: 34165.1.13			TIP: I-2513AC			COUNTY: BUNCOMBE			GEOLOGIST: A. Blackmore						
SITE DESCRIPTION: RETAINING WALL NO. 1, STA. -L- 12+11.57 TO -L- STA. 18+97.35									GROUND WTR (ft)						
BORING NO.: Y2_EB2-A			STATION: 18+40			OFFSET: 10 ft RT			ALIGNMENT: -WALL1-		0 HR. Dry				
COLLAR ELEV.: 2,073.0 ft			TOTAL DEPTH: 38.5 ft			NORTHING: 679,359			EASTING: 931,274		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: 01/26/23			COMP. DATE: 01/26/23			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					
2075															
	2,072.0	1.0	5	8	11									2,073.0 GROUND SURFACE 0.0	
2070	2,069.5	3.5	6	6	5							M		RESIDUAL Stiff to Very Stiff, Black-Brown-Gray-Tan-White, Fine to Coarse Sandy SILT (A-4), with trace rock fragments	
	2,067.0	6.0	4	6	9							M			
2065	2,064.5	8.5	6	5	6							M			
												M			
2060	2,059.5	13.5	5	11	13							M			
2055	2,054.5	18.5	12	17	15							M		2,055.5 Dense, Brown-Tan, Silty Fine to Coarse SAND (A-2-4), with trace mica and rock fragments 17.5	
2050	2,049.5	23.5	44	56/0.2										2,049.5 WEATHERED ROCK 23.5	
2045	2,044.5	28.5	87	13/0.2											Gray (GNEISS)
2040	2,039.5	33.5	100/0.3												
2035	2,034.5	38.5	60/0.0												
						60/0.0								Boring Terminated with Standard Penetration Test Refusal at Elevation 2,034.5 ft On Crystalline Rock (GNEISS) Surficial Organic Soil 0.0 to 0.2 feet	

F-2513AC



PROJECT REFERENCE

SHEET

I-2513AC

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NCDOT BORE DOUBLE ECS WALL 1.GPJ ECS GINT DATA-TEMPLATE.GDT 6/16/25

SOIL TEST RESULTS																
BORING NO.	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		
WALL1 B-07	SS-173	24' LT	14+01 -WALL1-	18.5 - 20.0	A-4(0)	35	NP	15.7	38.3	35.5	10.5	99.3	91.7	57.2	17.1	–
WALL1 B-11	SS-211	5' LT	15+82 -WALL1-	1.0 - 2.5	A-7-6(13)	47	19	15.7	20.5	34.7	29.1	98.5	88.5	69.3	21.1	–

LAB TECHNICIAN: DANIEL REEVE

NCDOT CERTIFICATION NO. 135-03-0816