

REFERENCE: U-2579AB

PROJECT: 34839

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3-7	PLAN & PROFILE SHEETS
8-14	BORELOGS

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY FORSYTH
PROJECT DESCRIPTION WINSTON-SALEM BELTWAY
FROM US 421/40 BUS TO I-40

SITE DESCRIPTION SOUND WALL 17/18/19

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AB	1	14

CAUTION NOTICE

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

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:

- THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
- BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

A. SUTTLE, G.I.T.

TOTAL DEPTH DRILLING

J. GARRICK, G.I.T.

E. SUSANTO

P. DONNELLY

INVESTIGATED BY ECS SOUTHEAST, LLP

DRAWN BY K. DE MONTBRUN, P.E.

CHECKED BY M. WALKO, P.E.

SUBMITTED BY ECS SOUTHEAST, LLP

DATE JULY 2021

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ENGINEERING
FIRM # F-1078



DocuSigned by:

Kelly de Montbrun 7/13/2021

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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

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

Table with columns for General Class, Granular Materials (A-1 to A-7), Silty-Clay Materials (A-4 to A-7), Organic Materials (A-1, A-2, A-3, A-4, A-5, A-6, A-7), and Soil Symbols. Includes a legend for soil types like Granular Soils, Silty-Clay Soils, and Muck/Peat.

CONSISTENCY OR DENSENESS

Table mapping Primary Soil Type (e.g., Generally Granular Material, Silty-Clay Material) to Consistency (e.g., Very Loose, Medium Dense, Very Dense) and Range of Standard Penetration Resistance (N-value).

TEXTURE OR GRAIN SIZE

Table showing U.S. Std. Sieve Size (mm) and corresponding grain size ranges for Boulder, Cobble, Gravel, Coarse Sand, Fine Sand, Silt, and Clay.

SOIL MOISTURE - CORRELATION OF TERMS

Table correlating Soil Moisture Scale (Atterberg Limits), Field Moisture Description (e.g., Saturated, Wet, Moist, Dry), and Guide for Field Moisture Description (e.g., Usually Liquid, Semisolid, Solid).

PLASTICITY

Table showing Plasticity Index (PI) ranges (Non-plastic to Highly plastic) and corresponding Dry Strength (Very Low to 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

Table showing percentages for Organic Material, Granular Soils, Silty-Clay Soils, and Other Material.

GROUND WATER

Water level symbols: 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

Diagrammatic symbols for Roadway Embankment, Soil Symbol, Artificial Fill, Inferred Soil Boundary, Inferred Rock Line, Alluvial Soil Boundary, Dip and Dip Direction, Test Boring, Auger Boring, Core Boring, Monitoring Well, Piezometer Installation, Slope Indicator, Cone Penetrometer Test, Sounding Rod, Test Boring with Core, SPT N-value.

RECOMMENDATION SYMBOLS

Symbols for 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, FRAGMENTS, HI. - HIGHLY, MED. - MEDIUM, MICA - MICACEOUS, MOD. - MODERATELY, NP - NON PLASTIC, ORG. - ORGANIC, PMT - PRESSUREMETER TEST, SAP. - SAPROLITIC, SD. - SAND, SANDY, SL. - SILTY, SILTY, SLI. - SLIGHTLY, TCR - TRICONE REFUSAL, w - MOISTURE CONTENT, V - VERY, VST - VANE SHEAR TEST, WEA. - WEATHERED, UNIT WEIGHT, DRY UNIT WEIGHT, SAMPLE ABBREVIATIONS: S - BULK, SS - SPLIT SPOON, ST - SHELBY TUBE, RS - ROCK, RT - RECOMPACTED TRIAXIAL, CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

- DRILL UNITS: CME-45C, CME-55, CME-550, VANE SHEAR TEST, PORTABLE HOIST, CME-75. ADVANCING TOOLS: CLAY BITS, 6" CONTINUOUS FLIGHT AUGER, 8" HOLLOW AUGERS, HARD FACED FINGER BITS, TUNG-CARBIDE INSERTS, CASING w/ ADVANCER, TRICONE STEEL TEETH, TRICONE TUNG-CARB., CORE BIT. HAMMER TYPE: AUTOMATIC, MANUAL. CORE SIZE: B, H, N. HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST.

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:

Diagrams and descriptions for Weathered Rock (WR), Crystalline Rock (CR), Non-Crystalline Rock (NCR), and Coastal Plain Sedimentary Rock (CP). Includes descriptions of grain sizes and material types.

WEATHERING

Descriptions of weathering states: FRESH (rock fresh, crystals bright), VERY SLIGHT (S.L.I.) (rock generally fresh, joints stained), SLIGHT (S.L.I.) (rock generally fresh, joints stained and discoloration extends), MODERATE (MOD.) (significant portions of rock show discoloration), MODERATELY SEVERE (MOD. SEV.) (all rock except quartz discolored or stained), SEVERE (SEV.) (all rock except quartz discolored or stained, rock fabric clear), VERY SEVERE (V. SEV.) (all rock except quartz discolored or stained, rock fabric elements discernible), COMPLETE (rock reduced to soil, rock fabric not discernible).

ROCK HARDNESS

VERY HARD (cannot be scratched by knife or sharp pick), HARD (can be scratched by knife or pick only with difficulty), MODERATELY HARD (can be scratched by knife or pick, gouges or grooves to 0.25 inches deep), MEDIUM HARD (can be grooved or gouged 0.05 inches deep), SOFT (can be grooved or gouged readily by knife or pick), VERY SOFT (can be carved with knife, can be excavated readily).

FRACTURE SPACING

Table mapping Fracture Spacing (Very Wide to Very Close) to Bedding Thickness (Very Thickly Bedded to Thinly Laminated).

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. Descriptions for Friable, Moderately Indurated, Indurated, and Extremely Indurated.

TERMS AND DEFINITIONS

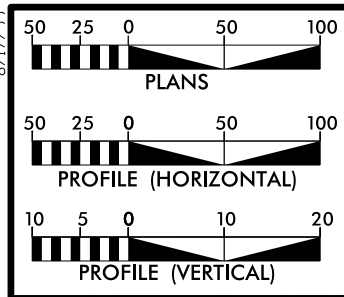
- ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
AQUIFER - A WATER BEARING FORMATION OR STRATA.
ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION.
ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED.
CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS.
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.
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.
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.

BENCH MARK: N/A

ELEVATION: N/A FEET

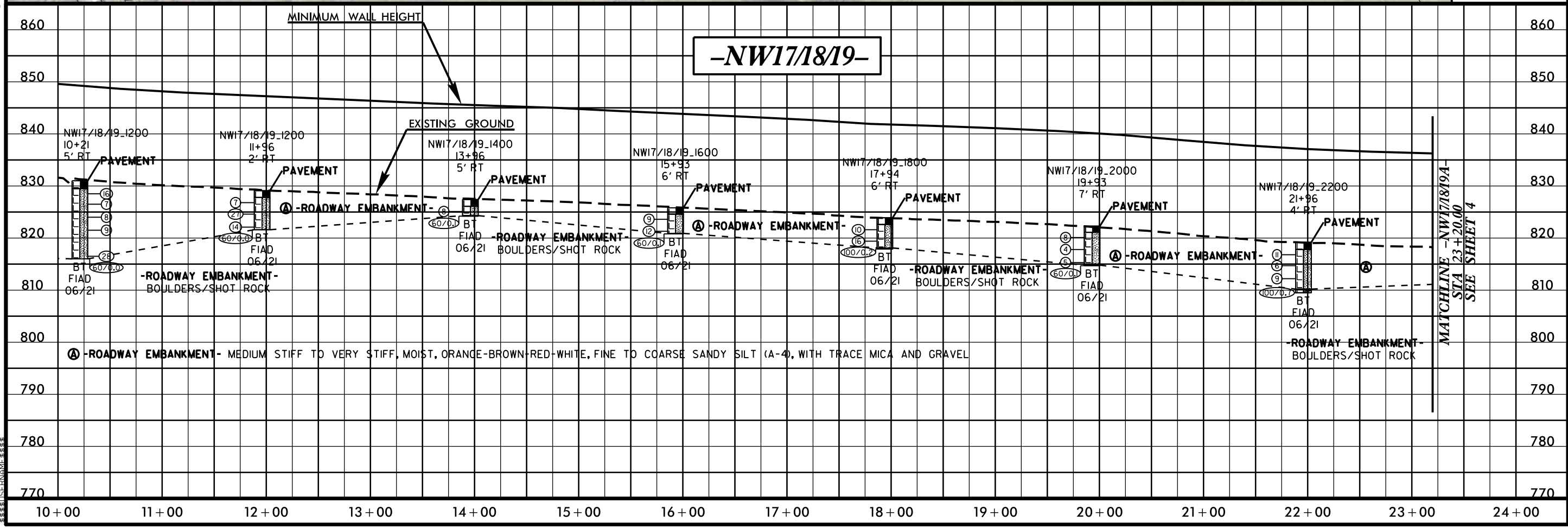
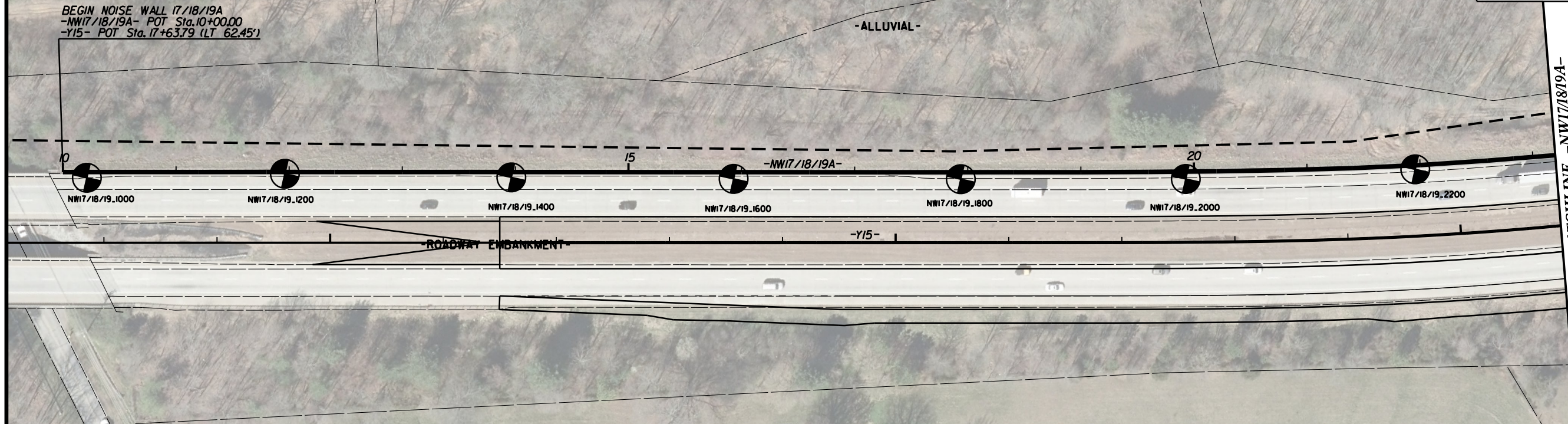
NOTES:

ROADWAY DESIGN FILES, .TIN, AND GPK FILE PROVIDED BY NCDOT
NORTHING AND EASTING OBTAINED USING A TRIMBLE GEO7X.
ELEVATIONS OBTAINED USING PROVIDED SURVEY INFORMATION.
FIAD= FILLED IN AFTER DRILLING

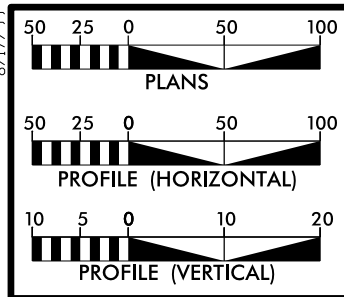


PLAN AND PROFILE OF NOISE WALL 17/18/19

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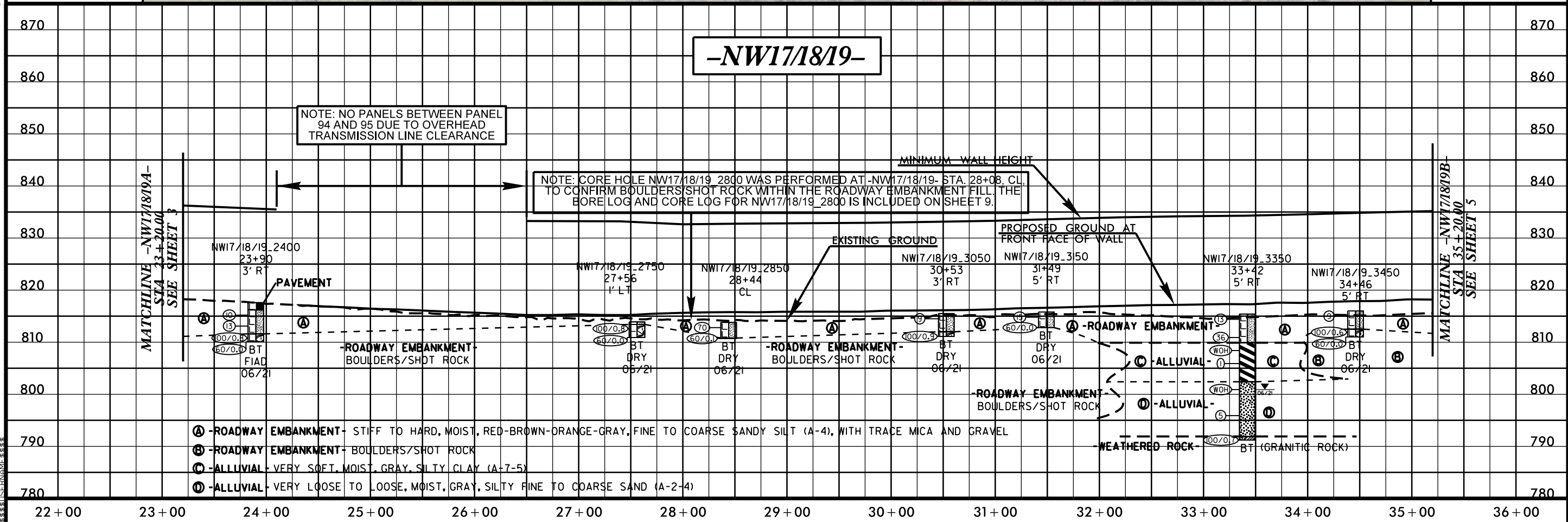
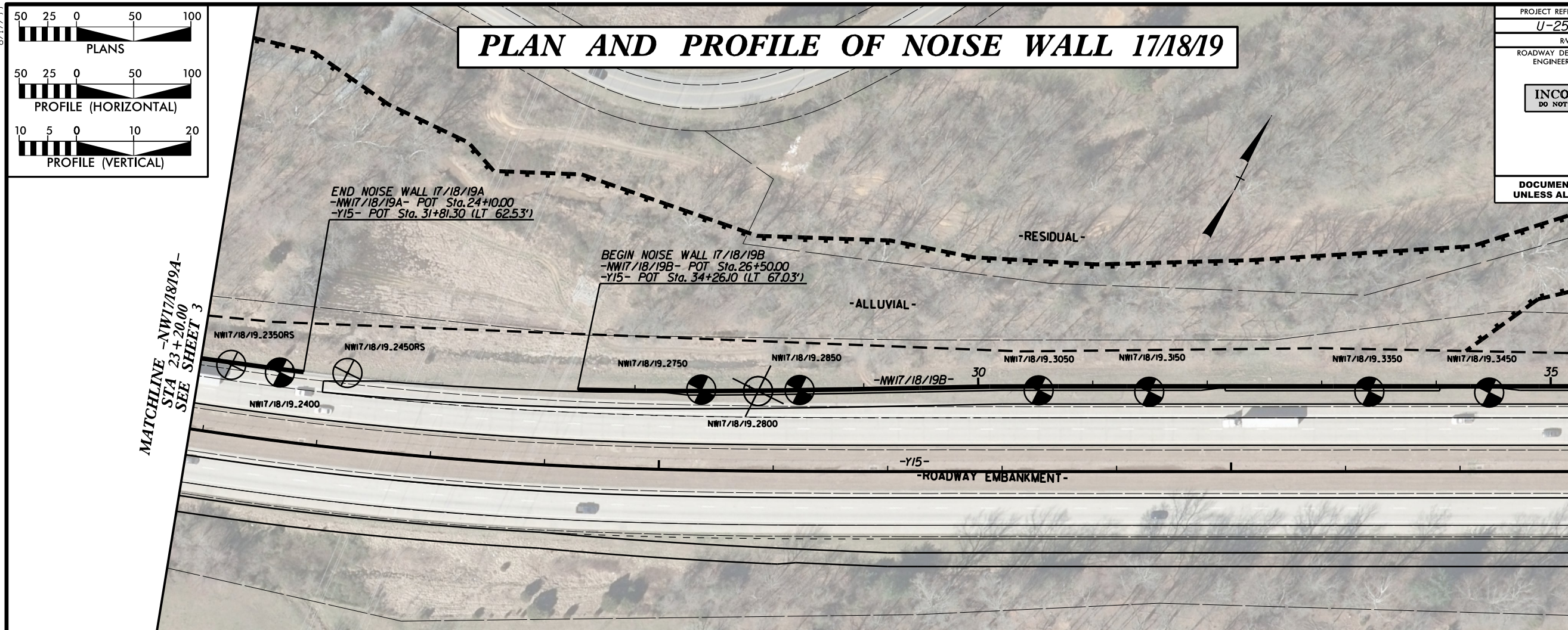


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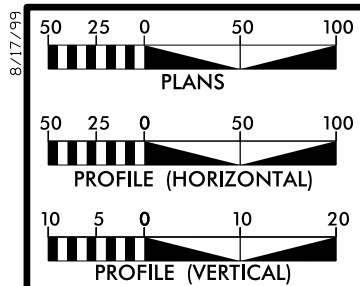


PLAN AND PROFILE OF NOISE WALL 17/18/19

PROJECT REFERENCE NO. U-2579AB	SHEET NO. 4
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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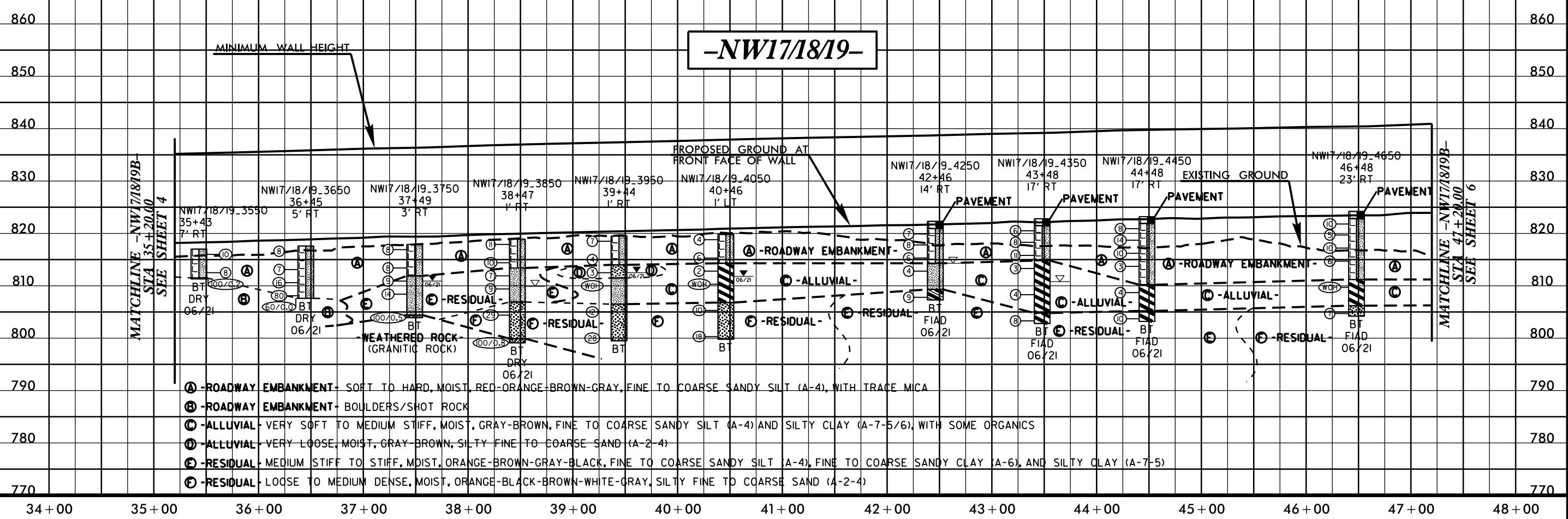
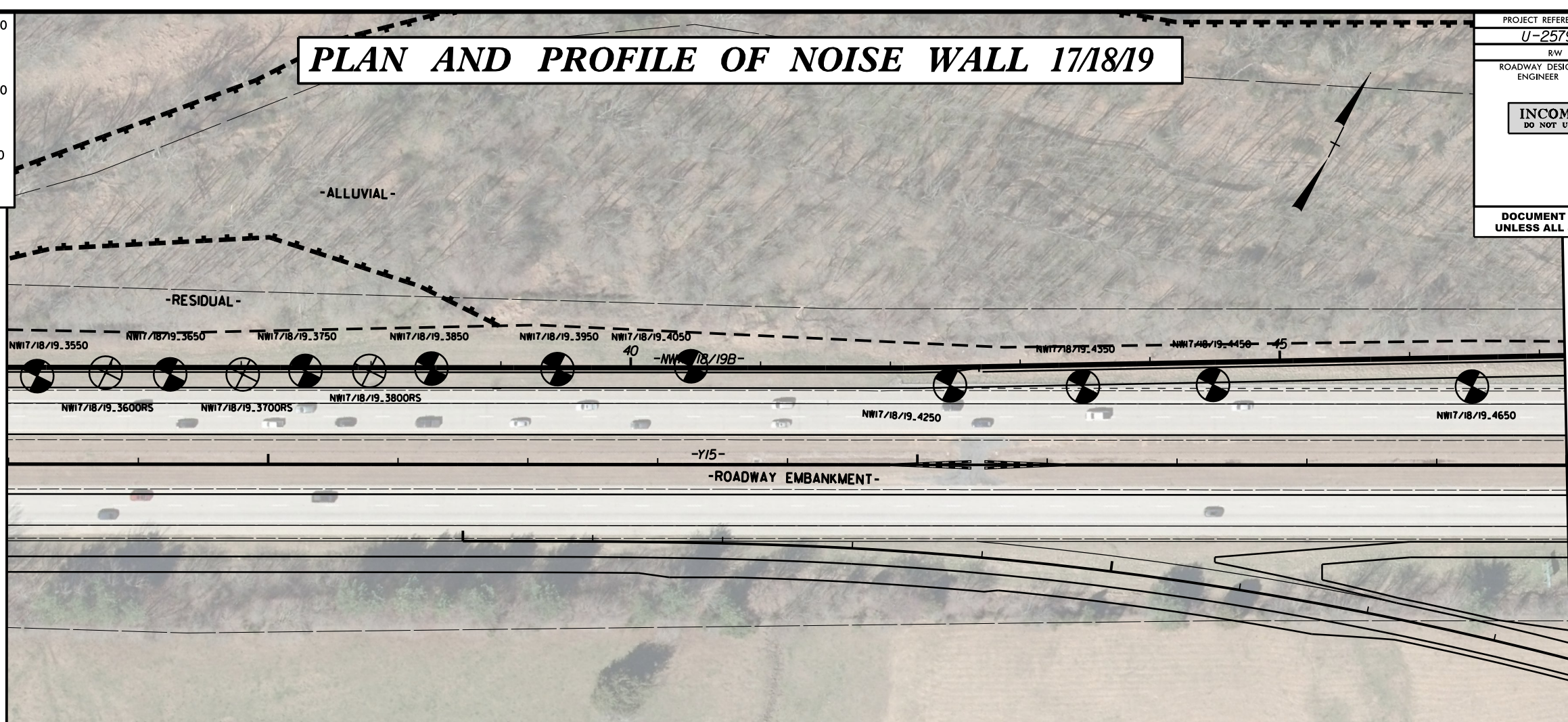


PLAN AND PROFILE OF NOISE WALL 17/18/19

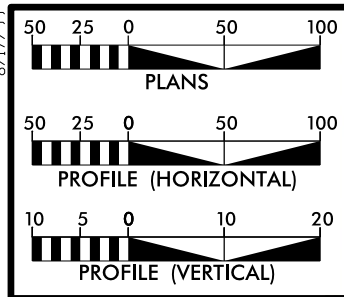
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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MATCHLINE -NW17/18/19B- STA 35+20.00 SEE SHEET 4

MATCHLINE -NW17/18/19B- STA 47+20.00 SEE SHEET 6

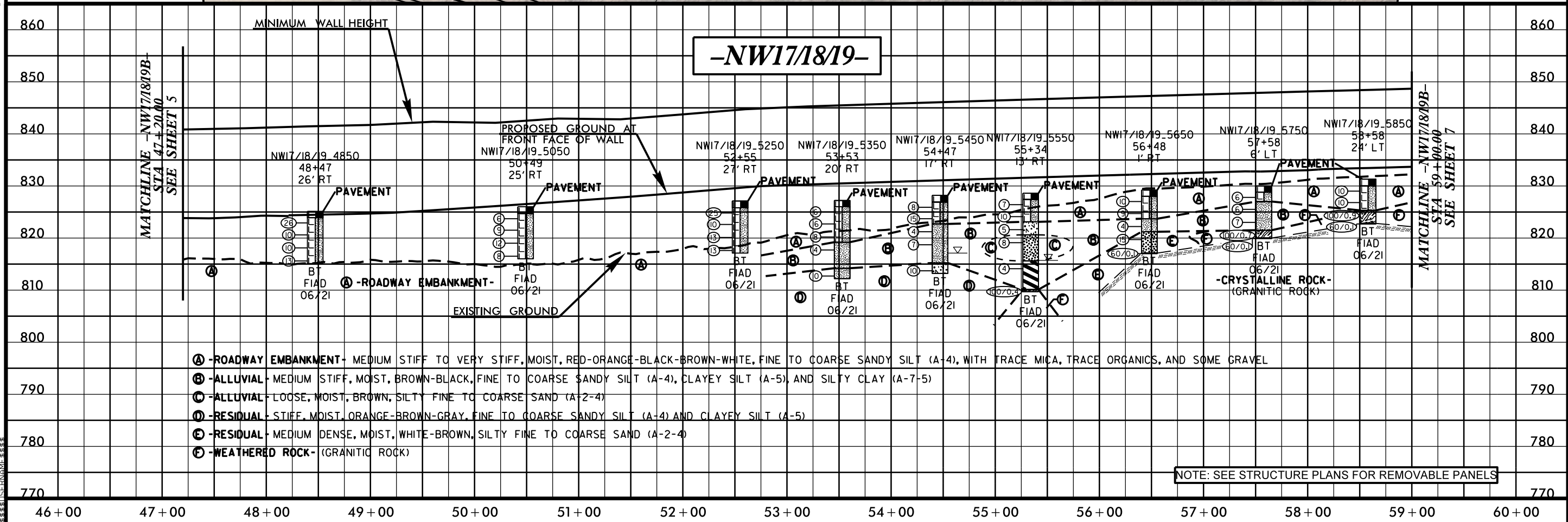


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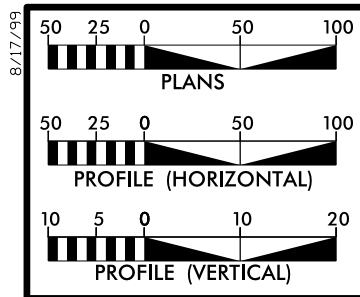


PLAN AND PROFILE OF NOISE WALL 17/18/19

PROJECT REFERENCE NO. U-2579AB	SHEET NO. 6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
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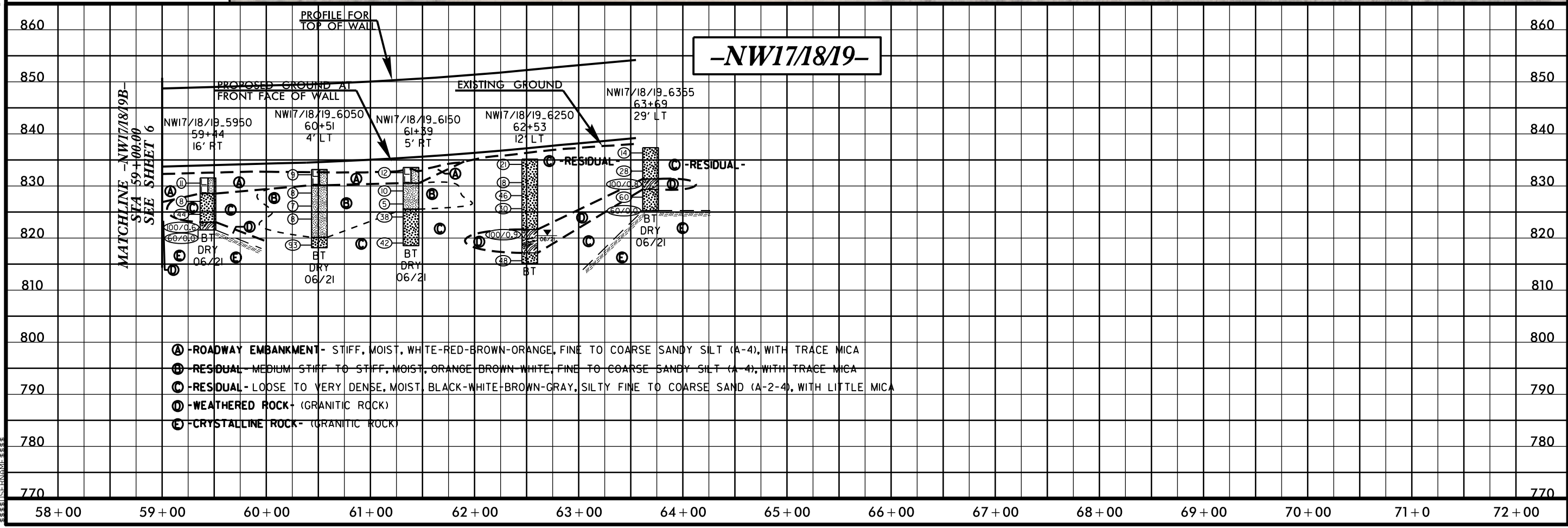
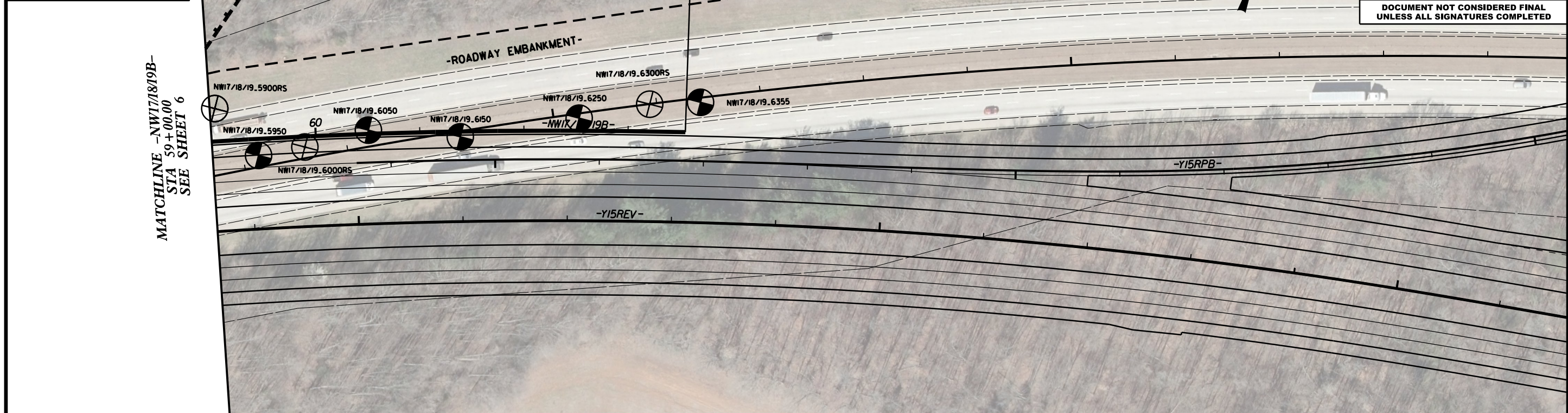


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PLAN AND PROFILE OF NOISE WALL 17/18/19

PROJECT REFERENCE NO. U-2579AB	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
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GEOTECHNICAL BORING REPORT BORE LOG

WBS 34839.1.8												TIP U-2579AB				COUNTY FORSYTH				GEOLOGIST J. Garrick			
SITE DESCRIPTION Winston-Salem Beltway from US 421/I-40 Business to I-40																GROUND WTR (ft)							
BORING NO. NW17/18/19_2350R								STATION 23+47				OFFSET 2 ft RT				ALIGNMENT -NW17/18/19-				0 HR. Dry			
COLLAR ELEV. 818.0 ft								TOTAL DEPTH 7.6 ft				NORTHING 846,131				EASTING 1,657,853				24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE TDD5417 CME-75 83% 06/15/2021												DRILL METHOD H.S. Augers				HAMMER TYPE Automatic							
DRILLER D. Hamilton				START DATE 06/02/21				COMP. DATE 06/02/21				SURFACE WATER DEPTH N/A											

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
820														
													818.0 GROUND SURFACE 0.0	
													816.6 ROADWAY EMBANKMENT 1.4	
815													Concrete Pavement (0.9'), Stone Base (0.5') Orange-Brown, Fine to Coarse Sandy SILT (A-4)	
													810.5 Boulders/Shot Rock 7.5	
													810.4 Boulders/Shot Rock 7.6	
													Boring Terminated with Standard Penetration Test Refusal at Elevation 810.4 ft On Shot Rock/Boulders in Roadway Embankment	
		810.5			7.5									60/0.1

WBS 34839.1.8												TIP U-2579AB				COUNTY FORSYTH				GEOLOGIST J. Garrick			
SITE DESCRIPTION Winston-Salem Beltway from US 421/I-40 Business to I-40																GROUND WTR (ft)							
BORING NO. NW17/18/19_2450R								STATION 24+48				OFFSET 3 ft LT				ALIGNMENT -NW17/18/19-				0 HR. Dry			
COLLAR ELEV. 816.1 ft								TOTAL DEPTH 8.7 ft				NORTHING 846,170				EASTING 1,657,947				24 HR. FIAD			
DRILL RIG/HAMMER EFF./DATE TDD5417 CME-75 83% 06/15/2021												DRILL METHOD H.S. Augers				HAMMER TYPE Automatic							
DRILLER D. Hamilton				START DATE 06/02/21				COMP. DATE 06/02/21				SURFACE WATER DEPTH N/A											

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
820														
													816.1 GROUND SURFACE 0.0	
													814.9 ROADWAY EMBANKMENT 1.2	
815													Concrete Pavement (0.8'), Stone Base (0.4') Brown, Fine to Coarse Sandy SILT (A-4)	
810														
													807.4 Boring Terminated with Standard Penetration Test Refusal at Elevation 807.4 ft On Shot Rock/Boulders in Roadway Embankment	
														60/0.0
		807.4			8.7									

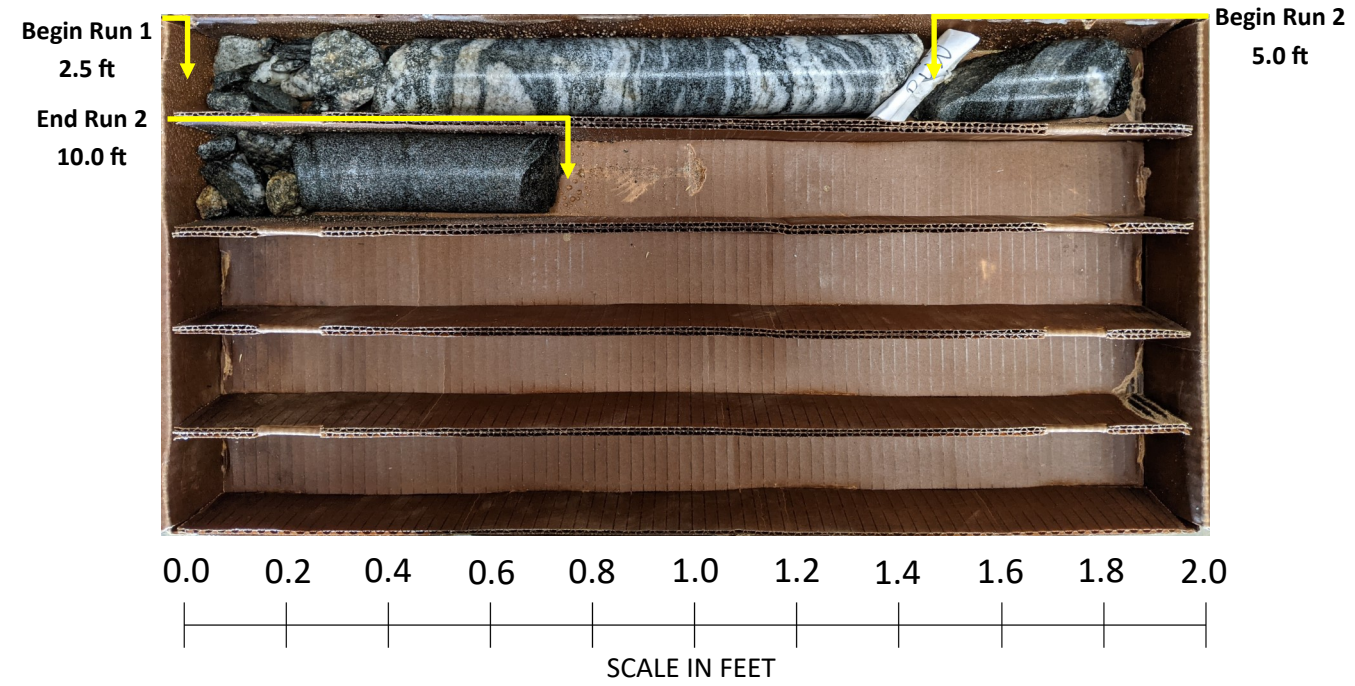


**Winston-Salem Beltway from
US 421/I-40 BUS to I-40**

WBS-34839 TIP No. U-2579AB

Rock Core Photographs: Boring - NW17/18/19_2800

Station: 28+08 Offset: CL



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST J. Garrick	
SITE DESCRIPTION Winston-Salem Beltway from US 421/I-40 Business to I-40							GROUND WTR (ft)
BORING NO. NW17/18/19_3600R		STATION 35+96		OFFSET 4 ft RT		ALIGNMENT -NW17/18/19-	
COLLAR ELEV. 816.6 ft		TOTAL DEPTH 5.0 ft		NORTHING 846,668		EASTING 1,658,980	
DRILL RIG/HAMMER EFF./DATE TDD5417 CME-75 83% 06/15/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic	
DRILLER D. Hamilton		START DATE 06/02/21		COMP. DATE 06/02/21		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
820															
815															
811.6		5.0													60/0.0

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST J. Garrick	
SITE DESCRIPTION Winston-Salem Beltway from US 421/I-40 Business to I-40							GROUND WTR (ft)
BORING NO. NW17/18/19_3700R		STATION 37+01		OFFSET 5 ft RT		ALIGNMENT -NW17/18/19-	
COLLAR ELEV. 817.9 ft		TOTAL DEPTH 11.0 ft		NORTHING 846,714		EASTING 1,659,075	
DRILL RIG/HAMMER EFF./DATE TDD5417 CME-75 83% 06/15/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic	
DRILLER D. Hamilton		START DATE 06/01/21		COMP. DATE 06/01/21		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
820															
815															
810															
806.9		11.0													60/0.0

NCDOT BORE DOUBLE U2579AB_SWAL_GEO.GPJ NC_DOT.GDT 6/23/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST J. Garrick										
SITE DESCRIPTION Winston-Salem Beltway from US 421/I-40 Business to I-40							GROUND WTR (ft)									
BORING NO. NW17/18/19_3800R		STATION 37+99		OFFSET 3 ft RT		ALIGNMENT -NW17/18/19-										
COLLAR ELEV. 818.5 ft		TOTAL DEPTH 16.9 ft		NORTHING 846,760		EASTING 1,659,161										
DRILL RIG/HAMMER EFF./DATE TDD5417 CME-75 83% 06/15/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER D. Hamilton		START DATE 06/01/21		COMP. DATE 06/01/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
820															818.5	0.0
815																
810															810.5	8.0
805																
	801.6	16.9	60/0.0											801.6	16.9	
Boring Terminated with Standard Penetration Test Refusal at Elevation 801.6 ft On Crystalline Rock (GRANITIC ROCK)																

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST J. Garrick										
SITE DESCRIPTION Winston-Salem Beltway from US 421/I-40 Business to I-40							GROUND WTR (ft)									
BORING NO. NW17/18/19_5700R		STATION 57+09		OFFSET 7 ft LT		ALIGNMENT -NW17/18/19-										
COLLAR ELEV. 829.4 ft		TOTAL DEPTH 15.0 ft		NORTHING 847,605		EASTING 1,660,874										
DRILL RIG/HAMMER EFF./DATE TDD5417 CME-75 83% 06/15/2021			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER D. Hamilton		START DATE 06/07/21		COMP. DATE 06/07/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
830															829.4	0.0
															828.6	0.8
825															824.4	5.0
820															821.4	8.0
815																
															814.4	15.0
Boring Terminated at Elevation 814.4 ft In Residual Silty SAND (A-2-4)																
Notes: Boring offset onto shoulder due to drill rig access concerns.																

NCDOT BORE DOUBLE U2579AB_SWAL_GEO.GPJ NC_DOT.GDT 6/23/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST J. Garrick									
SITE DESCRIPTION Winston-Salem Beltway from US 421/I-40 Business to I-40							GROUND WTR (ft)								
BORING NO. NW17/18/19_5800R		STATION 58+06		OFFSET 19 ft LT		ALIGNMENT -NW17/18/19-									
COLLAR ELEV. 830.6 ft		TOTAL DEPTH 5.8 ft		NORTHING 847,653		EASTING 1,660,966									
DRILL RIG/HAMMER EFF./DATE TDD5417 CME-75 83% 06/15/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER D. Hamilton		START DATE 06/03/21		COMP. DATE 06/03/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
835															
830														830.6	0.0
														829.3	1.3
825	824.8	5.8												824.8	5.8
		60/0.0													
<p>Boring Terminated with Standard Penetration Test Refusal at Elevation 824.8 ft On Crystalline Rock (GRANITIC ROCK)</p> <p>Notes: Boring offset onto shoulder due to drill rig access concerns.</p>															

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST J. Garrick									
SITE DESCRIPTION Winston-Salem Beltway from US 421/I-40 Business to I-40							GROUND WTR (ft)								
BORING NO. NW17/18/19_5900R		STATION 59+05		OFFSET 32 ft LT		ALIGNMENT -NW17/18/19-									
COLLAR ELEV. 832.3 ft		TOTAL DEPTH 8.1 ft		NORTHING 847,692		EASTING 1,661,049									
DRILL RIG/HAMMER EFF./DATE TDD5417 CME-75 83% 06/15/2021				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER D. Hamilton		START DATE 06/03/21		COMP. DATE 06/03/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
835															
														832.3	0.0
830														831.0	1.3
825	824.3	8.0												824.3	8.0
		60/0.1												824.2	8.1
<p>ROADWAY EMBANKMENT Concrete Pavement (0.8'), Stone Base (0.5') Red-Brown, Fine to Coarse Sandy SILT (A-4)</p> <p>CRYSTALLINE ROCK White-Brown (GRANITIC ROCK) Boring Terminated with Standard Penetration Test Refusal at Elevation 824.2 ft In Crystalline Rock (GRANITIC ROCK)</p> <p>Notes: Boring offset onto shoulder due to drill rig access concerns.</p>															

NCDOT BORE DOUBLE U2579AB_SWAL_GEO.GPJ NC_DOT.GDT 6/23/21

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST J. Garrick	
SITE DESCRIPTION Winston-Salem Beltway from US 421/I-40 Business to I-40						GROUND WTR (ft)	
BORING NO. NW17/18/19_6000R		STATION 59+89		OFFSET 10 ft RT		ALIGNMENT -NW17/18/19-	
COLLAR ELEV. 832.0 ft		TOTAL DEPTH 15.0 ft		NORTHING 847,678		EASTING 1,661,142	
DRILL RIG/HAMMER EFF./DATE TDD5417 CME-75 83% 06/15/2021		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic			
DRILLER D. Hamilton		START DATE 06/09/21		COMP. DATE 06/09/21		SURFACE WATER DEPTH N/A	
0 HR. Dry		24 HR. Dry					

WBS 34839.1.8		TIP U-2579AB		COUNTY FORSYTH		GEOLOGIST J. Garrick	
SITE DESCRIPTION Winston-Salem Beltway from US 421/I-40 Business to I-40						GROUND WTR (ft)	
BORING NO. NW17/18/19_6300R		STATION 63+20		OFFSET 26 ft LT		ALIGNMENT -NW17/18/19-	
COLLAR ELEV. 835.8 ft		TOTAL DEPTH 6.0 ft		NORTHING 847,801		EASTING 1,661,452	
DRILL RIG/HAMMER EFF./DATE TDD5417 CME-75 83% 06/15/2021		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic			
DRILLER D. Hamilton		START DATE 06/08/21		COMP. DATE 06/08/21		SURFACE WATER DEPTH N/A	
0 HR. Dry		24 HR. Dry					

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
835														832.0	0.0
													ROADWAY EMBANKMENT White-Red-Brown, Fine to Coarse Sandy SILT (A-4)	829.0	3.0
													RESIDUAL Orange-Brown-White, Fine to Coarse Sandy SILT (A-4)		
820	817.0	15.0											Boring Terminated with Standard Penetration Test Refusal at Elevation 817.0 ft On Crystalline Rock (GRANITIC ROCK)		15.0

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
840														835.8	0.0
													RESIDUAL Black-White-Brown, Silty Fie to Coarse SAND (A-2-4)	829.8	6.0
													Boring Terminated with Standard Penetration Test Refusal at Elevation 829.8 ft On Crystalline Rock (GRANITIC ROCK)		6.0

NCDOT BORE DOUBLE U2579AB_SWAL_GEO.GPJ NC_DOT.GDT 6/23/21