

REFERENCE: B-5898/B-3186

PROJECT: 48030

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

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LINE	STATION	PLAN
-L.LT-	6+89.01 TO 40+74.50	4-6
-L.RT-	6+86.51 TO 44.61+60	4-6
-Y.LRT-	10+00 TO 28+83.27	6
EXISTING	N/A	7-9

APPENDICES

APPENDIX	TITLE	SHEETS
A	BORING LOGS AND CORE REPORTS	10 TO 57
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

ROADWAY
SUBSURFACE INVESTIGATION

COUNTY HAYWOOD
PROJECT DESCRIPTION B-3186, BRIDGES 430155 AND
430158 OVER RICHLAND CREEK ON US23/74
B-5898, BRIDGE 430168 OVER US 1923 ON US23/74
INVENTORY

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

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 1901 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.

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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.

PERSONNEL

RYAN DOYLE

ALEX LOZADA

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INVESTIGATED BY ALEX LOZADA

DRAWN BY ALEX LOZADA

CHECKED BY RYAN DOYLE

SUBMITTED BY AECOM

DATE SEPTEMBER 2023



DocuSigned by:
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CDBB60B5C3BF42A
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 (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 (≤ 30% PASSING #200)						SILT-CLAY MATERIALS (> 30% 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											
2 PASSING #10	50	50	50	50	50	50	50	50	50		
40 #200	15	25	10	35	35	35	35	35	35		
GROUP INDEX	0	0	0	4	8	12	16	10	0		
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND		SILTY SOILS		CLAYEY SOILS		
GENERAL RATING AS SUBGRADE	EXCELLENT TO GOOD			FAIR TO POOR			FAIR TO POOR	POOR	UNSATURATED		

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
	4.75	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	MM 305 IN. 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 LIMIT PL - PLASTIC LIMIT	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- 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

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 1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE 10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME 20 - 35%
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY 35% AND ABOVE
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
	SLOPE INDICATOR INSTALLATION		AUGER BORING
	CONE PENETROMETER TEST		CORE BORING
	SOUNDING ROD		MONITORING WELL
	TEST BORING WITH CORE		PIEZOMETER INSTALLATION
	SPT N-VALUE		

RECOMMENDATION SYMBOLS			
	UNDERCUT		UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
	SHALLOW UNDERCUT		UNCLASSIFIED EXCAVATION - ACCEPTABLE 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	F - FINE	FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES	FRAGS. - FRAGMENTS	HI. - HIGHLY
MED. - MEDIUM	MICA - MICACEOUS	MOD. - MODERATELY
NP - NON PLASTIC	ORG. - ORGANIC	PMT - PRESSUREMETER TEST
SAP. - SAPROLITE	SD. - SAND, SANDY	SL. - SILT, SILTY
SLI. - SLIGHTLY	TCR - TRICONE REFUSAL	V - MOISTURE CONTENT
W - WEATHERED	UNIT WEIGHT	DRY UNIT WEIGHT
VST - VANE SHEAR TEST	WEA. - WEATHERED	

EQUIPMENT USED ON SUBJECT PROJECT		
<input checked="" type="checkbox"/> GTC3277 CME-75	<input type="checkbox"/> CLAY BITS	<input checked="" type="checkbox"/> AUTOMATIC
<input checked="" type="checkbox"/> GTC8295 CME-95	<input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER	<input type="checkbox"/> MANUAL
<input checked="" type="checkbox"/> GTC983 CME-958x	<input checked="" type="checkbox"/> 8" HOLLOW AUGERS	
<input checked="" type="checkbox"/> SUM3123 CME-958x	<input type="checkbox"/> HARD FACED FINGER BITS	
<input type="checkbox"/> PORTABLE MOIST	<input type="checkbox"/> TUNG-CARBIDE INSERTS	
	<input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER	
	<input type="checkbox"/> TRICONE <input type="checkbox"/> STEEL TEETH	
	<input type="checkbox"/> TRICONE <input type="checkbox"/> TUNG-CARB.	
	<input type="checkbox"/> CORE BIT	

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 60 BLOWS 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 TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	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 SEDIMENTARY ROCK (CPS)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.
WEATHERING	
FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SL.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SL.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL.
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.

ROCK HARDNESS	
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 GROVED 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.

FRACTURE SPACING		BEDDING	
TERM	SPACING	TERM	THICKNESS
VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	4 FEET
WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET
MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET
CLOSE	0.16 TO 1 FOOT	VERY THINLY BEDDED	0.03 - 0.16 FEET
VERY CLOSE	LESS THAN 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET
		THINLY LAMINATED	< 0.008 FEET

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, 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 (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 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 60 BLOWS PER FOOT.
STRATA CORE RECOVERY (SCRC)	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.

BENCH MARK: N/A	
ELEVATION:	FEET
NOTES:	
FIAD - FILLED IMMEDIATELY AFTER DRILLING	
ROADWAY BORING ELEVATIONS BASED OFF	
D3186_b5898.br02022.f4047.is.tfn DATED 6/17/2022	

CONTRACT: C204684 TIP PROJECT: B-3186 / B-5898

See Sheet 1A For Index of Sheets

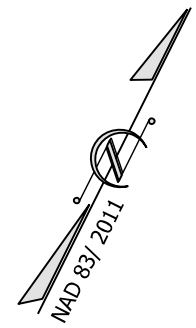
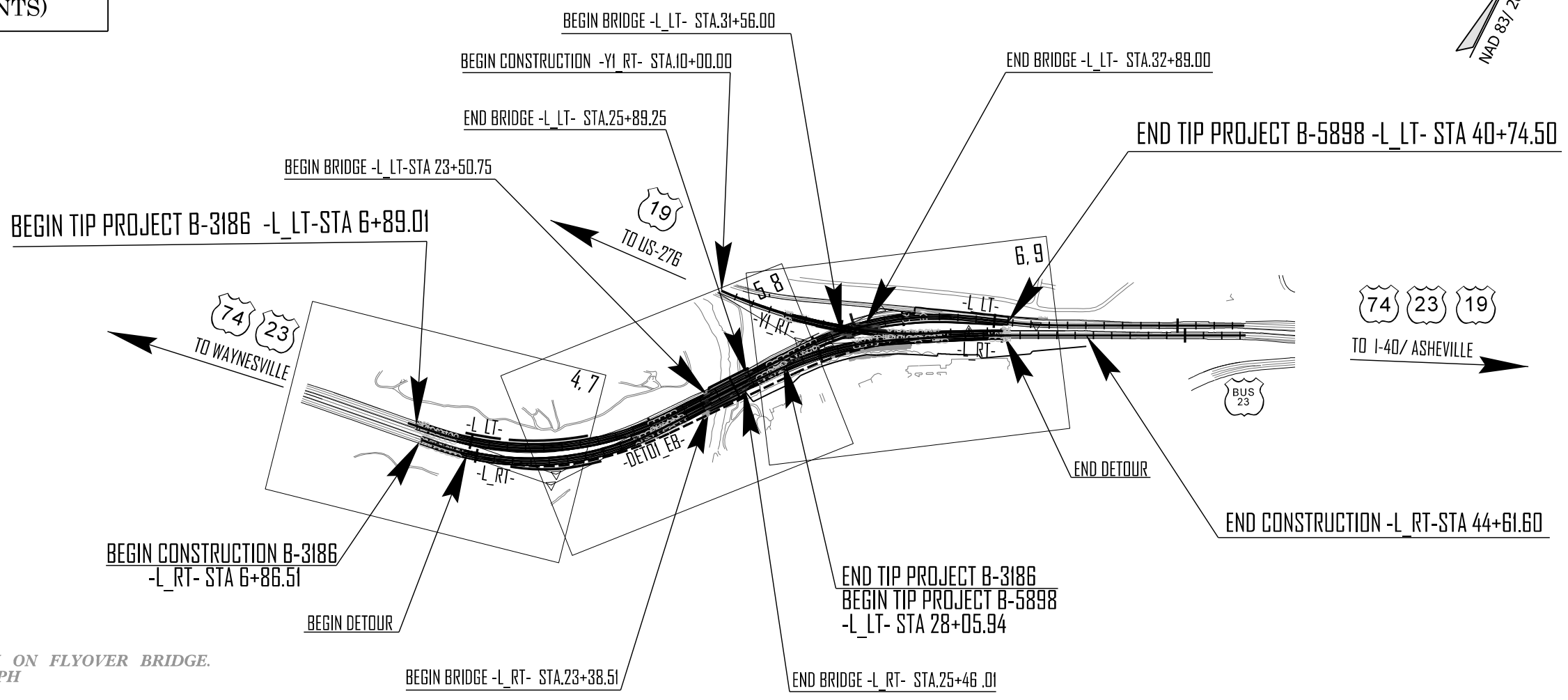
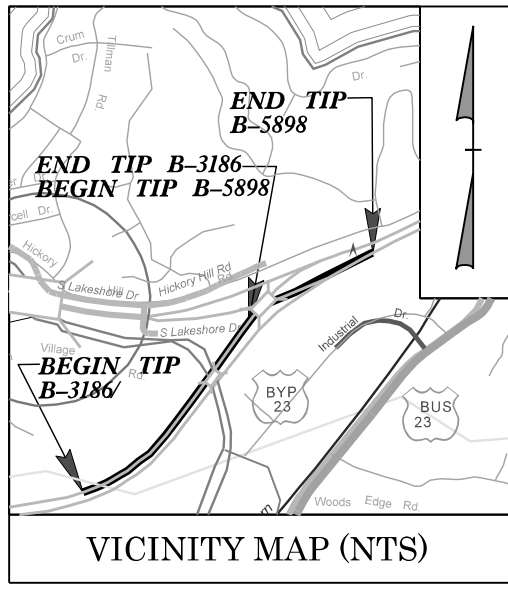
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

HAYWOOD COUNTY

LOCATION: *B-3186, BRIDGES 430155 AND 430158 OVER RICHLAND CREEK ON US 23/74*
B-5898, BRIDGE 430168 OVER US 19/23 ON US 23/74

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, AND STRUCTURES*

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3186/ B-5898	3	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
38332.1.FS1 (B-3186)	BRNHP-0023(32)	P.E.	
48030.1.FS1 (B-5898)	BRSTP-0019(49)	P.E.	
38332.2.1 (B-3186)	BRNHP-0023(32)	RW/UTILITY	
48030.2.1 (B-5898)	BRSTP-0019(49)	RW/UTILITY	
38332.3.1 (B-3186)	BRNHP-0023(32)	CONST.	
48030.3.1 (B-5898)	BRSTP-0019(49)	CONST.	



** HORIZONTAL SSD EXCEPTION ON FLYOVER BRIDGE.
INSIDE SHOULDER MEETS 55 MPH

THIS IS A CONTROLLED-ACCESS PROJECT WITH
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<p>GRAPHIC SCALES</p> <p>50 25 0 50 100 PLANS</p> <p>50 25 0 50 100 PROFILE (HORIZONTAL)</p> <p>10 5 0 10 20 PROFILE (VERTICAL)</p>	<p>DESIGN DATA</p> <p>ADT 2023 = 48,800 ADT 2043 = 60,800</p> <p>K = 8 % D = 55 % T = 5 % * V = 65 MPH **</p> <p>* TTST = 2% DUAL 3% FUNC CLASS = FREEWAY STATEWIDE TIER</p>	<p>PROJECT LENGTH</p> <p>LENGTH ROADWAY TIP PROJECT B-3186 = 0.352 MI LENGTH STRUCTURE TIP PROJECT B-3186 = 0.045 MI TOTAL LENGTH TIP PROJECT B-3186 = 0.401 MI</p> <p>LENGTH ROADWAY TIP PROJECT B-5898 = 0.215 MI LENGTH STRUCTURE TIP PROJECT B-5898 = 0.025 MI TOTAL LENGTH TIP PROJECT B-5898 = 0.240 MI (LENGTHS BASED ON L-LT ALIGNMENT)</p>	<p>Prepared in the Office of: AECOM NC FIRM LICENSE No: F-0342 5438 Wade Park Blvd., Suite 200 Raleigh, NC 27607 (919) 854-6200 • (919) 854-6259(FAX)</p> <p>2018 STANDARD SPECIFICATIONS</p> <p>RIGHT OF WAY DATE: N/A</p> <p>LETTING DATE: DECEMBER 19, 2023</p>	<p>HYDRAULICS ENGINEER</p> <p>_____ SIGNATURE: _____ P.E.</p> <p>ROADWAY DESIGN ENGINEER</p> <p>_____ SIGNATURE: _____ P.E.</p>	
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AECOM – North Carolina
5438 Wade Park Blvd Suite 200
Raleigh, NC 27607
Tel: 919-854-6200

August 11, 2023

WBS NO.: 48030.1.FS1
NCDOT TIP: B-3186/B-5898
COUNTY: Haywood

DESCRIPTION: B-3186, Bridges 430155 and 430158 Over Richland Creek on US23/74
B-5898, Bridge 430168 Over US 19/23 on US23/74

SUBJECT: Geotechnical Report – Roadway Inventory

Project Description

The project area lies in the town of Lake Junaluska, NC between Highway 276 and NC 209. A geotechnical investigation was conducted by HDR at the site from January to April 2021. The HDR investigation was conducted to support a design which included upgrading US 74 to a six-lane, median divided facility from east of the US 276 Interchange to the US 23 Business Interchange and upgrading US 19 with full depth paved, 10-ft shoulders from east of Holston Village Road to the US 74 Interchange. However, this design did not go to construction and NCDOT contracted AECOM to redesign the project area. The AECOM design includes the replacement of Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23, resulting in a shift of US23/74 just to the south in this area. AECOM reviewed the data collected by HDR prior to developing a boring plan to determine where additional investigation would be necessary to support AECOM's design. Both AECOM and relevant HDR borings were used to develop this Roadway Inventory Report.

The AECOM geotechnical field investigation was conducted from February to May 2023. A CME 550X drill rig with oversized ATV tires and equipped with an automatic hammer was used to advance borings for the subsurface exploration. Hollow stem auger drilling procedures were used to advance borings to the required depths. Standard Penetration Tests were generally performed at 2.5-ft intervals in the top 10-ft and 5-ft intervals thereafter. Boring termination depths were based on the proposed design and the material encountered in the field (e.g. if loose/soft material was encountered, boring extended further until denser/harder material was encountered; or if rock was encountered, boring terminated on rock.) Representative soil samples were collected for visual classification in the field and selected samples were submitted to a NCDOT certified materials and testing laboratory for analysis.

The following alignments were explored:

<u>Line</u>	<u>Station(±)</u>
-L_LT-	6+89.01 to 40+74.50
-L_RT-	6+86.51 to 44.61.60
-Y1_RT-	10+00.00 to 28+83.27

Physiography and Geology

The project is located in the Blue Ridge Physiographic Province and within the Central Blue Ridge terranes. Along the project corridor the terrain is mountainous and mostly consists of existing roadways, adjacent commercial businesses, private properties, and woods. According to the US Geological Survey¹, the near surface geology consists primarily of metamorphic rock belonging to the Coweeta Group (Biotite Gneiss) (ZYbn). This group is described as migmatic; interlayered and gradational with biotite-garnet gneiss and amphibolite; locally abundant quartz and alumino-silicates. The stratigraphic position is uncertain. The geologic age is Middle/Late Proterozoic. Alluvial material is also located within the project limits as Richland Creek flows underneath US 23/US 74. These alluvial deposits are non-homogeneous and consists of varying size soil deposits with sand lenses intermixed.

Soil Properties

Soils encountered at the project site include roadway embankment, artificial fill, alluvial, residual, weathered metamorphic rock, and crystalline metamorphic rock.

Roadway Embankment soils were mainly encountered along the existing sections of US 74 and US 19 and consisting of gray, red, and brown, very soft to very stiff silt and clay (A-4, A-5, A-6, A-7) and loose to medium dense, clayey and silty sand and gravel (A-2-6, A-2-4, A-3, A-1-b). N-values ranged from 1 to 34 blows per foot (bpf) with an average N-value of 8 bpf.

Artificial fill soils consist of brown, orange, and gray, very soft to stiff, silt and clay (A-4, A-6, A-7-6), and loose to medium dense, sand and gravel (A-3, A-1-b). N-values range from 1 to 35 bpf with an average N-value of 10 bpf. The artificial fill is underlain by residual soils.

Alluvial deposits are located within the floodplains of Richland Creek and nearby streams within the project limits. These soils are black, gray, and brown, very soft to very stiff, silt and clay (A-4, A-5, A-7), and very loose to dense, sand and gravel and silty sand (A-1-b, A-1-a, A-2-4, A-2-6, A-3). N-values range from 0 to 46 bpf with an average N-value of 5 bpf.

Residual soils were encountered throughout the project. These soils consist primarily of red, tan, and brown, soft to hard silt and clay (A-4, A-5, A-7), and loose to very dense, silty and clayey sand (A-2-4, A-2-5, A-2-6, A-2-7, A-3). N-values range from 2 to 84 bpf with an average N-value of 25 bpf.

Rock Properties

Weathered rock was encountered during the roadway investigation at elevations ranging from approximately 2608 to 2537 feet. It originates from the underlying metamorphic rock, specifically Gneiss.

Crystalline rock was encountered during the roadway investigation at elevations ranging from approximately 2613 to 2535 feet and consists of Gneiss. Refer to the "Areas of Special Geotechnical Interest" for areas of rock encountered within 6 feet of proposed grade.

¹<https://mrdata.usgs.gov/geology/state/state.php?state=NC>

Groundwater Properties

Groundwater was encountered in multiple borings and ranges in elevation from approximately 2621 to 2564 feet. Groundwater may fluctuate with seasonal precipitation.

Areas of Special Geotechnical Interest

- 1) **Shallow Rock:** Crystalline rock was encountered within 6 feet of existing grade at the following locations:

<u>Line</u>	<u>Stations (±)</u>	<u>Offset</u>
-L_RT-	13+80	RT
-L_LT-	20+75 to 20+95	LT

- 2) **Highly Plastic Soils:** Highly plastic soils were generally not encountered within the project area; however, one lab sample did come back as highly plastic - S1_EB2_B (HDR), SS-8, 25.0'-26.5'. This sample is well below the design elevations and should not have an adverse impact to the project.

- 3) **Loose/Soft Soils:** Very soft or very loose soils were encountered during the investigation. Such soils (N-value < 4) could have the potential to cause embankment/subgrade and/or slope stability problems during construction. These soils were encountered along the following intervals:

<u>Line</u>	<u>Stations (±)</u>	<u>Offset</u>
-L_LT-	36+00	RT
-L_LT-	25+79 - 29+50	RT
-L_LT-	31+40 - 34+30	RT
-L_RT-	29+50 - 31+50	RT
-Y1_RT-	18+90	RT

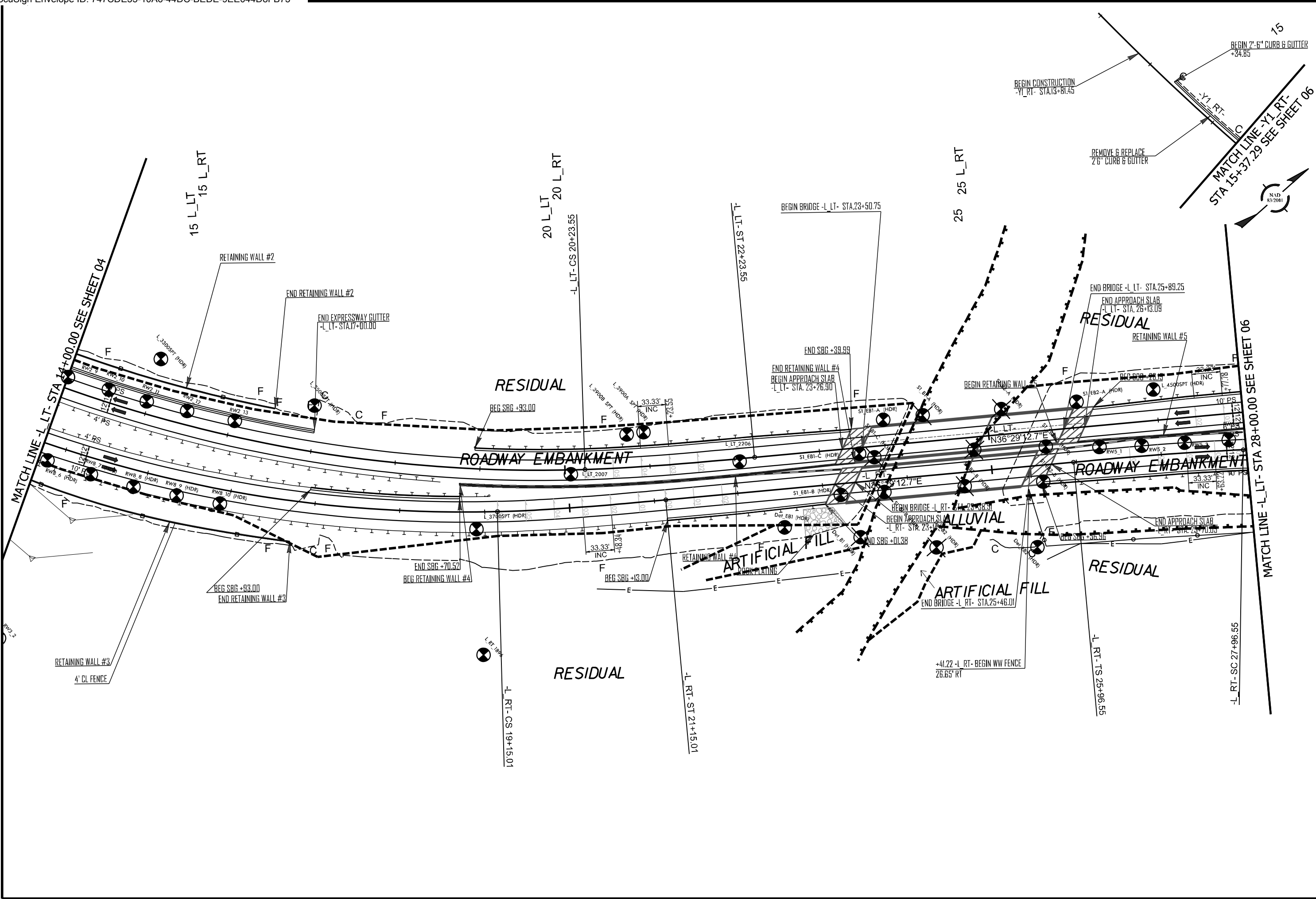
- 4) **High Groundwater:** The following areas encountered water within 6-ft of existing grade:

<u>Line</u>	<u>Stations (±)</u>	<u>Offset</u>
-L_LT-	29+77	RT

Additionally, around streams and creeks, seasonal high ground water can create the potential for groundwater related construction problems.

- 5) **Ponds:** No ponds were found or identified on or within close proximity of right of way on this project.
- 6) **Water Wells:** Water wells were not found or identified within or in close proximity to the proposed right of way.

5/26/20



B-3186/B-5898
 PSH 05
 NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 HAYWOOD COUNTY

ROADWAY DESIGN UNIT
 ROADWAY DESIGN ENGINEER

PROFESSIONAL SEAL
 049634
 ENGINEER
 MOHAMMED FALLUJI

HYDRAULICS ENGINEER

PROFESSIONAL SEAL
 037863
 ENGINEER
 WENDE D. BUSCH

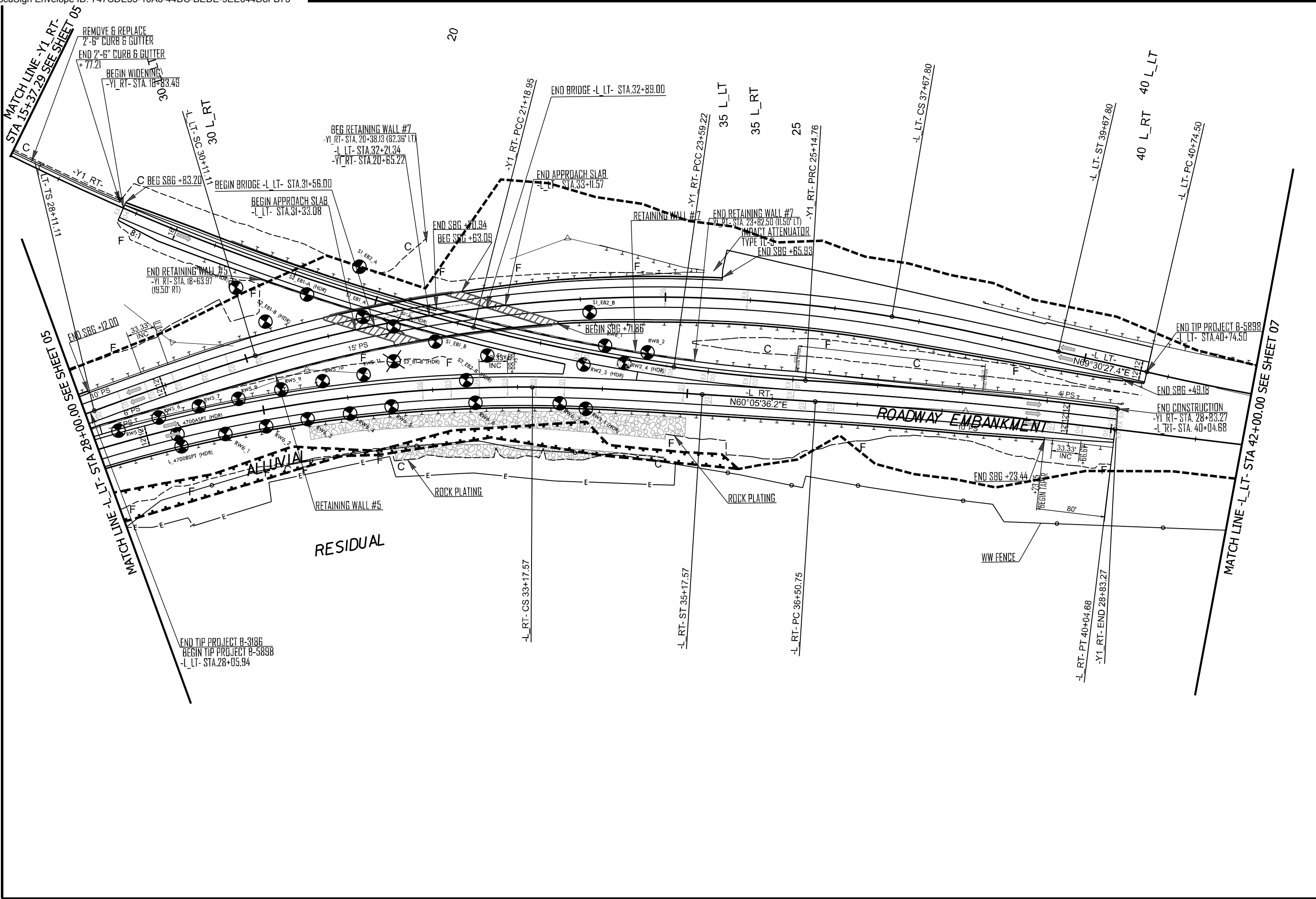
PREPARED BY

NC FIRM LICENSE No. F-0342
 5438 Woods Park Boulevard, Suite 200
 Raleigh, NC 27603
 (919) 854-2002 (FAX) 854-2003 (FAX)

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5/26/20



B-3186/B-5898

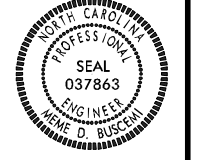
PSH 06
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HAYWOOD COUNTY



ROADWAY DESIGN UNIT
ROADWAY DESIGN
ENGINEER



HYDRAULICS
ENGINEER



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5/26/20

B-3186/B-5898

PSH 07

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
HAYWOOD COUNTY



ROADWAY DESIGN UNIT

ROADWAY DESIGN
ENGINEER



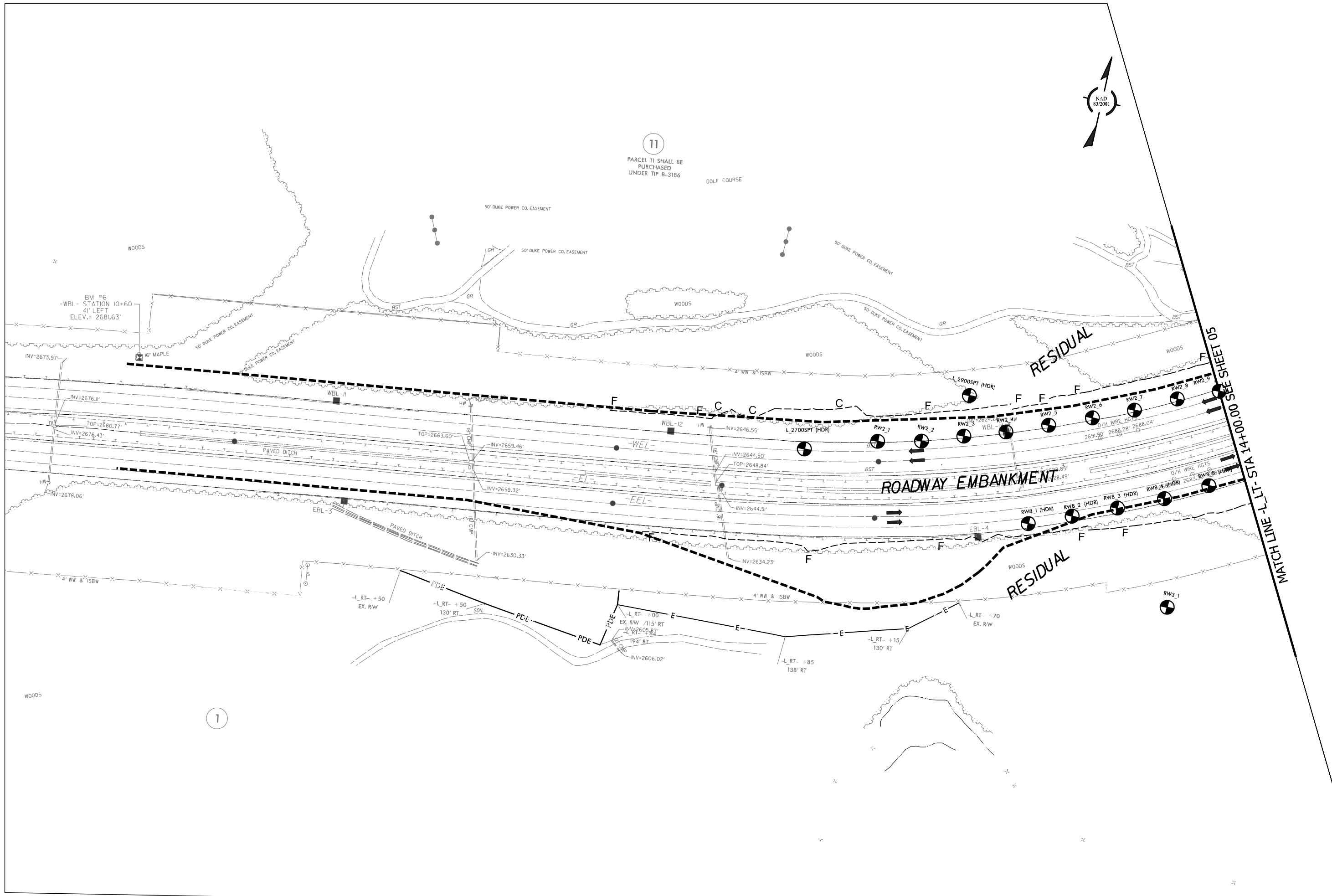
HYDRAULICS
ENGINEER



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Raleigh, NC 27603
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11
PARCEL 11 SHALL BE
PURCHASED
UNDER TIP B-3186
GOLF COURSE

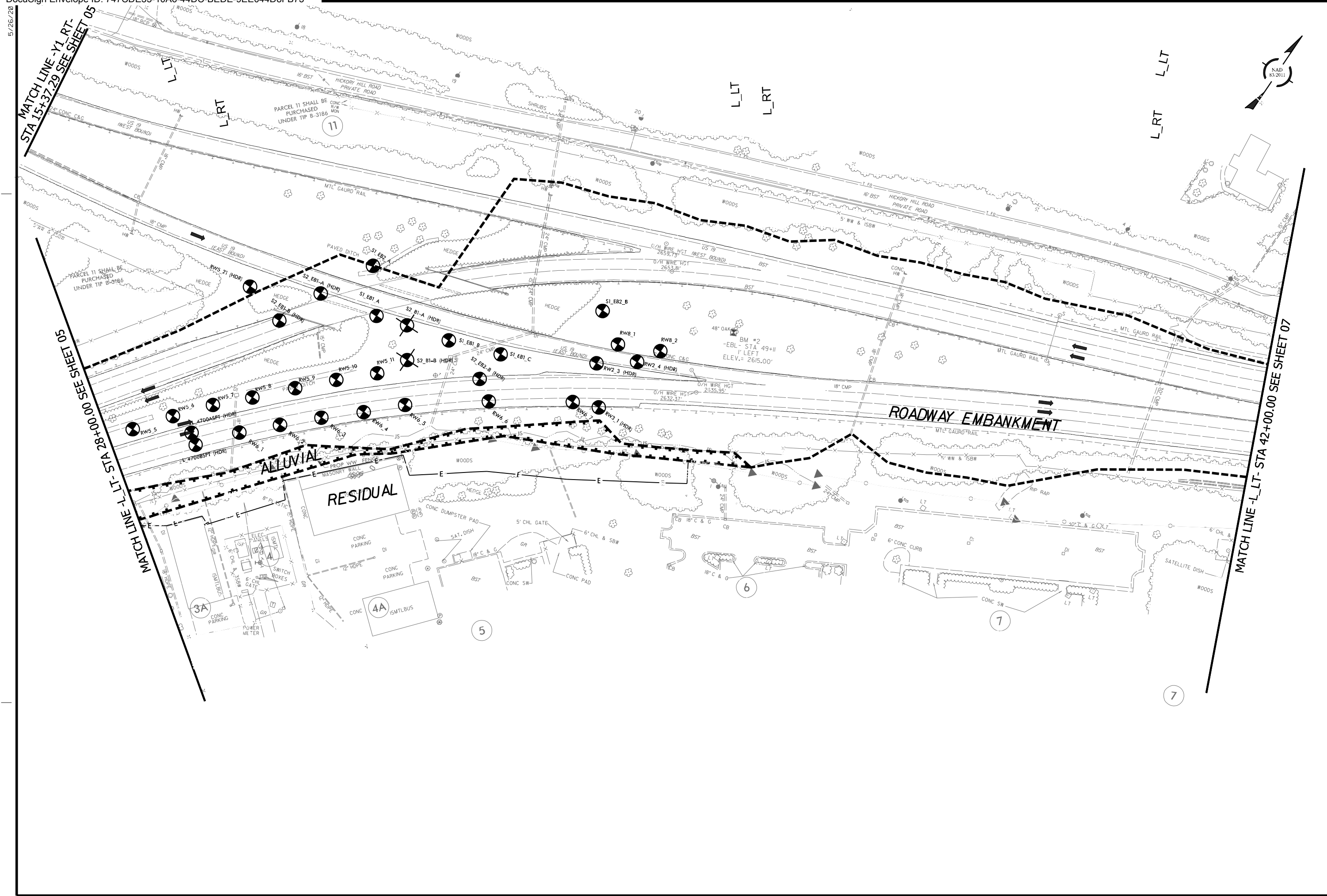


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REVISIONS

5/26/20



B-3186/B-5898

PSH 09

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION HAYWOOD COUNTY

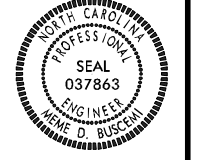


ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER



HYDRAULICS ENGINEER



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NC FIRM LICENSE No. F-0342 5438 Wade Park Boulevard, Suite 200 Raleigh, NC 27607 (919) 854-2202 (919) 854-2203 (FAX)

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B-5898/B-3186

10

REFERENCE: B-5898/B-3186

PROJECT: 48030

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

SUBSURFACE INVESTIGATION

***APPENDIX A
BORING LOGS AND CORE REPORTS***



GEOTECHNICAL BORING REPORT

CORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi					
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)				
BORING NO. Det_B1 (HDR)		STATION 23+39		OFFSET 65 ft RT		ALIGNMENT L_RT					
COLLAR ELEV. 2,567.0 ft		TOTAL DEPTH 43.0 ft		NORTHING 666,223		EASTING 818,945					
DRILL RIG/HAMMER EFF./DATE GTC8255 CME-55 93% (11/24/2020)				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic					
DRILLER L. Wansrath		START DATE 03/17/21		COMP. DATE 03/17/21		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 21.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)	REC. (%)	RQD (%)			
2545	2,545.0	22.0	3.0	1:17	(3.0)	(1.4)	(13.0)	(11.2)		2,545.0	22.0
	2,542.0	25.0		1:13 1:08	100%	47%	100%	86%		Begin Coring @ 22.0 ft CRYSTALLINE ROCK Light to medium gray and white with tan, m-c grained GRANITE with trace Biotite Gneiss xenoliths, slight to very slight weathering, moderately hard to hard, very close to close fracture spacing	
2540			5.0	1:38 1:59 2:08 2:04 2:07	(5.0)	(4.8)				Slight to fresh, hard, moderately close to wide fracture spacing RS-1 27.0' - 27.7' GSI= 85 - 95 Qu= 22,108 psi	
2535			5.0		(5.0)	(5.0)				RS-2	
2530			5.0		(5.0)	(5.0)					
	2,532.0	35.0		2:25 2:01 2:03 1:56 1:56	100%	100%	(7.0)	(7.0)		Light to dark gray with brown, Migmatitic Biotite GNEISS, slight to fresh weathering, hard, moderately close to wide fracture spacing	35.0
2525			3.0	1:36 1:49 2:36	(3.0)	(3.0)				RS-3 40.1 - 40.6' GSI= 85 - 95 Qu= 16,519 psi	
	2,524.0	43.0			100%	100%				Boring Terminated at Elevation 2,524.0 ft in Crystalline Rock (GNEISS)	43.0

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi					
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)				
BORING NO. Det_B2 (HDR)		STATION 24+27		OFFSET 85 ft RT		ALIGNMENT L_RT					
COLLAR ELEV. 2,568.0 ft		TOTAL DEPTH 49.5 ft		NORTHING 666,281		EASTING 819,014					
DRILL RIG/HAMMER EFF./DATE GTC8255 CME-55 93% (11/24/2020)				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic					
DRILLER L. Wansrath		START DATE 03/11/21		COMP. DATE 03/11/21		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 30.5 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)	REC. (%)	RQD (%)			
2549	2,549.0	19.0	5.5	-0:5 1:38 1:18 1:01 0:58 1:00	(1.3)	(0.6)	(17.9)	(11.5)		2,549.0	19.0
				24% 11%			59%	38%		Begin Coring @ 19.0 ft CRYSTALLINE ROCK Light to dark gray, white, and brown, Migmatitic Biotite GNEISS interlayered with weathered rock seams and high concentrations of felsic dikes, with trace fault breccia moderately severe to moderate weathering, moderately hard to hard, very close to close fracture spacing	
2545			5.0	0:38 0:12 0:20 0:12 0:31	(2.9)	(0.5)				4.2' core loss	
2540			5.0		58%	10%				2.1' core loss	
	2,538.5	29.5		0:57 0:48 0:49 0:53 1:00	(1.4)	(0.4)				3.6' core loss	
2535			5.0		72%	56%				Moderate to slight weathering, hard, very close to moderately close fracture spacing, with few healed fractures	
2530			5.0	1:11 1:15 1:10 1:23 1:27	(3.6)	(2.8)				1.4' core loss	
	2,528.5	39.5		1:29 1:25 1:32 1:49 1:45	(4.4)	(2.9)				<1cm normal-sense displacement on healed subvertical fracture	
2525			5.0		88%	58%				0.6' core loss RS-4 40.2' - 41.0" GSI= 65 - 75 Qu= 8,866 psi	
2520			5.0	1:49 1:47 1:48 1:19 1:26	(4.3)	(4.3)				0.7' core loss	
	2,518.5	49.5							RS-5 48.5' - 49.0' GSI= 65 - 75 Qu= 8,369	49.5	
Boring Terminated at Elevation 2,518.5 ft in Crystalline Rock (GNEISS)											

NCDOT CORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST R. Dugger									
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)								
BORING NO. Det_EB1 (HDR)		STATION 22+51		OFFSET 45 ft RT		ALIGNMENT L_RT									
COLLAR ELEV. 2,570.8 ft		TOTAL DEPTH 24.0 ft		NORTHING 666,164		EASTING 818,877									
DRILL RIG/HAMMER EFF./DATE GTC8255 CME-55 93% (11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wansrath		START DATE 03/22/21		COMP. DATE 03/22/21		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					
2575															
2570	2,570.8	0.0	1	1	1									GROUND SURFACE	0.0
	2,568.3	2.5	10	11	7									ARTIFICIAL FILL	2.0
	2,565.8	5.0	10	3	2									Very soft, brown and orange, silty CLAY (A-7-6), micaceous	
	2,563.3	7.5	3	3	4									Loose to medium dense, brown and gray, SAND and GRAVEL (A-1-b)	7.0
2565	2,560.8	10.0	2	3	8									Medium stiff, brown, and tan, silty CLAY (A-7-6)	9.5
	2,555.8	15.0	6	8	7									RESIDUAL	
	2,550.8	20.0	22	15	85/0.3									Stiff, brown and orange, SILT (A-4), with trace clay, contains little rock fragments	20.5
	2,546.8	24.0	60/0.0											WEATHERED ROCK	24.0
														Brown, GNEISS	
														Boring Terminated with Standard Penetration Test Refusal at Elevation 2,546.8 ft on Crystalline Rock (GNEISS)	

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)								
BORING NO. Det_EB2 (HDR)		STATION 25+45		OFFSET 96 ft RT		ALIGNMENT L_RT									
COLLAR ELEV. 2,584.5 ft		TOTAL DEPTH 43.3 ft		NORTHING 666,370		EASTING 819,092									
DRILL RIG/HAMMER EFF./DATE GTC8255 CME-55 93% (11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wansrath		START DATE 03/11/21		COMP. DATE 03/11/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2585															
	2,584.5	0.0	3	2	2									GROUND SURFACE	0.0
	2,582.0	2.5	1	1	2									ARTIFICIAL FILL	2.0
2580	2,579.5	5.0	2	3	4									Soft, red and brown, sandy CLAY (A-6), micaceous	
	2,577.0	7.5	4	3	3									Very loose to loose, red, brown, and gray, clayey SAND (A-2-6), micaceous	7.0
2575	2,574.5	10.0	2	2	2									Loose, red, brown, and gray, silty SAND (A-2-4), micaceous	
	2,569.5	15.0	1	1	2									Soft, gray, clayey SILT (A-5), micaceous	13.0
2570	2,566.5	20.0	1	1	3									Soft, gray, lean CLAY (A-7-6)	18.0
2565	2,561.5	25.0	14	86	24/0.5									Very dense, gray, white and tan, SAND and GRAVEL (A-1-b)	23.0
2560	2,559.0	28.0	8	15	16									WEATHERED ROCK	25.5
	2,556.5	30.0	15	9	11									Gray, white, and tan, GNEISS	28.0
	2,554.5	35.0	8	15	16									RESIDUAL	
	2,549.5	40.0	6	7	25									Very stiff to hard, white, gray, tan and brown, SILT (A-4), micaceous, saprolitic	43.2
2555	2,541.3	43.2	60/0.1											CRYSTALLINE ROCK	43.3
														Gray, white, and brown, GNEISS	
														Boring Terminated with Standard Penetration Test Refusal at Elevation 2,541.2 ft in Crystalline Rock (GNEISS)	

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)									
BORING NO. L_3700SPT (HDR)		STATION 18+90		OFFSET 20 ft LT		ALIGNMENT L_RT										
COLLAR ELEV. 2,589.5 ft		TOTAL DEPTH 15.0 ft		NORTHING 665,892		EASTING 818,637										
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER K. Boone		START DATE 01/30/21		COMP. DATE 01/30/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2590	2,589.1	0.4	2	9	8										2,589.5	0.0
	2,587.0	2.5	5	5	5										2,587.5	2.0
2585	2,584.5	5.0	2	3	3										2,585.0	4.5
	2,582.0	7.5	3	3	4										2,582.5	7.0
2580	2,579.5	10.0	4	4	7										2,580.0	9.5
	2,576.0	13.5	9	6	3										2,574.5	15.0
Boring Terminated at Elevation 2,574.5 ft in SILT																

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST C. Swafford										
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)									
BORING NO. L_3900A SPT (HDR)		STATION 20+75		OFFSET 39 ft LT		ALIGNMENT L_LT										
COLLAR ELEV. 2,580.6 ft		TOTAL DEPTH 5.0 ft		NORTHING 666,115		EASTING 818,683										
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER K. Boone		START DATE 03/01/21		COMP. DATE 03/01/21		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						
2585																
2580	2,580.0	0.6	9	12	7										2,580.6	0.0
															2,580.0	0.6
	2,577.3	3.3	3	4	5										2,577.6	3.0
															2,575.6	5.0
Boring Terminated by Auger Refusal at Elevation 2,575.6 ft on Crystalline Rock (GNEISS)																

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST R. Dugger									
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)								
BORING NO. L_3900B SPT (HDR)		STATION 20+95		OFFSET 40 ft LT		ALIGNMENT L_LT									
COLLAR ELEV. 2,581.2 ft		TOTAL DEPTH 3.5 ft		NORTHING 666,098		EASTING 818,672									
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER L. Wanstrath		START DATE 03/01/21		COMP. DATE 03/01/21		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					
2585															
2580	2,580.5	0.7	12	7	5									2,581.2 GROUND SURFACE 0.0	
	2,578.7	2.5												2,580.5 0.7	
	2,577.7	3.5	100/0.3											2,578.7 ROADWAY EMBANKMENT 2.5	
		60/0.0												2,577.7 Stiff, brown, SILT (A-4), with little gravel, micaceous 3.5	
														WEATHERED ROCK Brown, GNEISS	
														Boring Terminated by Auger Refusal at Elevation 2,577.7 ft on Crystalline Rock (GNEISS)	

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST C. Swafford									
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)								
BORING NO. L_4500SPT (HDR)		STATION 26+98		OFFSET 36 ft LT		ALIGNMENT L_LT									
COLLAR ELEV. 2,582.5 ft		TOTAL DEPTH 10.1 ft		NORTHING 666,595		EASTING 819,045									
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER K. Boone		START DATE 03/01/21		COMP. DATE 03/01/21		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					
2585															
2580	2,581.7	0.8	10	9	5									2,582.5 GROUND SURFACE 0.0	
	2,578.9	3.6												2,581.7 0.8	
	2,576.8	5.7	4	5	5									2,579.5 ROADWAY EMBANKMENT 3.0	
2575	2,573.9	8.6	2	2	4									2,576.5 Stiff, brown and orange, SILT (A-4), micaceous, mottled 6.0	
			4	4	2									2,574.5 Medium stiff, gray and orange with brown, silty CLAY (A-6), with trace sand, micaceous 8.0	
														2,572.4 ALLUVIAL 10.1	
														Loose, gray, SAND (A-3), micaceous	
														Boring Terminated at Elevation 2,572.4 ft in SAND	

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)								
BORING NO. L_4700ASPT (HDR)		STATION 28+95		OFFSET 7 ft RT		ALIGNMENT L_RT									
COLLAR ELEV. 2,580.5 ft		TOTAL DEPTH 15.0 ft		NORTHING 666,696		EASTING 819,238									
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER K. Boone		START DATE 02/10/21		COMP. DATE 02/10/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2585															
2580	2,579.8	0.7	14	13	7										
2575	2,577.0	3.5	6	4	5										
2570	2,574.5	6.0	5	4	7										
	2,572.0	8.5	6	5	4										
	2,567.0	13.5	3	1	1										

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST R. Dugger									
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)								
BORING NO. L_4700BSPT (HDR)		STATION 28+96		OFFSET 22 ft RT		ALIGNMENT L_RT									
COLLAR ELEV. 2,579.5 ft		TOTAL DEPTH 16.5 ft		NORTHING 666,687		EASTING 819,250									
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 01/28/21		COMP. DATE 01/28/21		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					
2580															
	2,578.6	0.9	12	11	9										
	2,577.0	2.5	11	5	6										
2575	2,574.5	5.0	7	8	8										
	2,572.0	7.5	3	4	3										
2570	2,569.5	10.0	2	1	2										
2565	2,564.5	15.0	1	2	2										

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. L_LT_2007		STATION 20+07		OFFSET 5 ft RT		ALIGNMENT L_LT										
COLLAR ELEV. 2,583.5 ft		TOTAL DEPTH 20.0 ft		NORTHING 666,018		EASTING 818,663										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Michael Moseley		START DATE 02/23/23		COMP. DATE 02/23/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2585																2,583.5
	2,582.5	1.0	4	4	4											2,583.5
2580	2,580.0	3.5	3	4	4											2,580.0
	2,577.5	6.0	4	4	6											2,577.5
2575	2,575.0	8.5	3	4	6											2,575.0
2570	2,570.0	13.5	4	5	6											2,570.0
2565	2,565.0	18.5	100/0.8													2,563.5

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. L_LT_2206		STATION 22+06		OFFSET 3 ft RT		ALIGNMENT L_LT										
COLLAR ELEV. 2,577.6 ft		TOTAL DEPTH 20.0 ft		NORTHING 666,176		EASTING 818,784										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Michael Moseley		START DATE 02/23/23		COMP. DATE 02/23/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2580																2,577.6
	2,576.6	1.0	8	9	8											2,577.6
2575	2,574.1	3.5	3	2	3											2,574.1
	2,571.6	6.0	8	7	7											2,571.6
2570	2,569.1	8.5	100/0.8													2,570.0
2565	2,564.1	13.5	5	19	12											2,568.3
2560	2,559.1	18.5	5	31	46											2,559.1

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait									
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)								
BORING NO. L_RT_1896		STATION 18+96		OFFSET 168 ft RT		ALIGNMENT L_RT									
COLLAR ELEV. 2,676.3 ft		TOTAL DEPTH 10.0 ft		NORTHING 665,800		EASTING 818,753									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Michael Moseley		START DATE 03/01/23		COMP. DATE 03/01/23		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					
2680															
2675	2,675.3	1.0	6	6	8									2,676.3	0.0
	2,672.8	3.5	3	2	2										
2670	2,670.3	6.0	2	2	4									2,670.3	6.0
	2,667.8	8.5	5	10	28									2,666.8	9.5
														2,666.3	10.0

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait									
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)								
BORING NO. RW2_1		STATION 10+00		OFFSET 19 ft LT		ALIGNMENT L_LT									
COLLAR ELEV. 2,637.6 ft		TOTAL DEPTH 15.0 ft		NORTHING 665,513		EASTING 817,815									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Michael Moseley		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.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2640															
2635	2,636.6	1.0	2	5	6									2,637.6	0.0
	2,634.1	3.5	4	5	7									2,636.6	1.0
2630	2,629.1	8.5	4	5	6									2,634.1	3.5
2625	2,624.6	13.0	9	14	16									2,629.1	8.5
														2,622.6	15.0

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW2_4		STATION 11+49		OFFSET 17 ft LT		ALIGNMENT L_LT										
COLLAR ELEV. 2,629.0 ft		TOTAL DEPTH 10.0 ft		NORTHING 665,555		EASTING 817,956										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Michael Moseley		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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2630															2,629.0	0.0
	2,628.0	1.0	3	2	4											
2625	2,625.5	3.5	3	4	6											
	2,623.0	6.0	4	7	11											
2620	2,620.5	8.5	4	5	5											
															2,619.0	10.0
Boring Terminated at Elevation 2,619.0 ft in sandy silt.																

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW2_5		STATION 11+99		OFFSET 18 ft LT		ALIGNMENT L_LT										
COLLAR ELEV. 2,626.1 ft		TOTAL DEPTH 25.0 ft		NORTHING 665,573		EASTING 818,002										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Michael Moseley		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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2630															2,626.1	0.0
	2,625.1	1.0	3	5	7											
2625	2,622.6	3.5	3	5	5											
2620	2,620.1	6.0	3	6	7											
	2,617.6	8.5	5	7	8											
2615	2,612.6	13.5	5	9	12											
2610	2,607.6	18.5	5	6	6											
2605	2,602.6	23.5	6	4	5											
															2,601.1	25.0
Boring Terminated at Elevation 2,601.1 ft in sandy silt.																

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW2_6		STATION 12+50		OFFSET 18 ft LT		ALIGNMENT L_LT										
COLLAR ELEV. 2,623.0 ft		TOTAL DEPTH 25.0 ft		NORTHING 665,592		EASTING 818,049										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Michael Moseley		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)	
2625																2,623.0 GROUND SURFACE 0.0
2620	2,622.0	1.0	4	8	10								M			RESIDUAL Brown, medium dense, silty sand (A-2-4), fine to coarse grained sand
	2,619.5	3.5	7	9	11								SS-148	18%		2,619.5 Brown, very stiff, sandy silt (A-4), fine to medium grained sand, trace clay and gravel, micaceous
	2,617.0	6.0	7	10	12								M			
2615	2,614.5	8.5	4	8	9								M			
	2,609.5	13.5	6	6	11								M			
2610	2,604.5	18.5	5	5	6								SS-152	30%		2,604.5 Brown, stiff, silt (A-4), some clay, trace sand
	2,599.5	23.5	7	6	11								M			2,598.0 Boring Terminated at Elevation 2,598.0 ft in silt.

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW2_7		STATION 13+00		OFFSET 16 ft LT		ALIGNMENT L_LT										
COLLAR ELEV. 2,620.4 ft		TOTAL DEPTH 25.0 ft		NORTHING 665,611		EASTING 818,094										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Michael Moseley		START DATE 02/22/23		COMP. DATE 02/22/23		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)	
2625																2,620.4 GROUND SURFACE 0.0
	2,619.4	1.0	5	6	8								M			2,619.4 ROADWAY EMBANKMENT ABC Stone
2620	2,616.9	3.5	3	5	6								M			RESIDUAL Brown, medium dense, silty sand (A-2-4), fine to coarse grained sand, trace gravel, micaceous
	2,614.4	6.0	6	8	10								M			
2615	2,611.9	8.5	6	8	12								M			2,611.9 Brown, very stiff to hard, sandy silt (A-4), fine to medium grained sand, micaceous
	2,606.9	13.5	3	6	8								SS-158	25%		2,606.9 Brown to white, stiff, silt (A-4), trace sand and clay
2610	2,601.9	18.5	3	5	8								M			
	2,596.9	23.5	9	12	14								M			2,596.9 Brown, medium dense, silty sand (A-2-4), fine to coarse grained sand, trace clay, micaceous
2600	2,595.4	25.0														2,595.4 Boring Terminated at Elevation 2,595.4 ft in silty sand.

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW2_8		STATION 13+51		OFFSET 17 ft LT		ALIGNMENT L_LT										
COLLAR ELEV. 2,617.4 ft		TOTAL DEPTH 25.0 ft		NORTHING 665,634		EASTING 818,139										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Michael Moseley		START DATE 02/22/23		COMP. DATE 02/22/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2620														2,617.4	0.0	GROUND SURFACE
2615	2,616.4	1.0	2	6	8								M	2,617.4		RESIDUAL Brown, medium dense, silty sand, (A-2-4), fine to coarse grained sand, trace clay, trace gravel
	2,613.9	3.5	5	8	13								M			
2610	2,611.4	6.0	7	11	11								M	2,611.4	6.0	Brown, very stiff to hard, sandy silt (A-4), fine to coarse grained sand, micaceous
	2,608.9	8.5	10	21	31								M			
2605	2,603.9	13.5	10	10	10								M	2,603.9	13.5	Brown, medium to very stiff, silt (A-5), trace to some sand, trace to some clay, micaceous
2600	2,598.9	18.5	3	4	5								M			
2595	2,593.9	23.5	6	10	15								M	2,592.4	25.0	Boring Terminated at Elevation 2,592.4 ft in silt.

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW2_9		STATION 14+00		OFFSET 13 ft LT		ALIGNMENT L_LT										
COLLAR ELEV. 2,615.1 ft		TOTAL DEPTH 20.0 ft		NORTHING 665,653		EASTING 818,184										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Michael Moseley		START DATE 02/22/23		COMP. DATE 02/22/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2620														2,615.1	0.0	GROUND SURFACE
2615	2,614.1	1.0	8	6	6								M	2,614.1	1.0	ROADWAY EMBANKMENT 0.4' Asphalt 0.6' ABC Stone RESIDUAL Brown, stiff, sandy silt (A-4), fine to coarse grained sand, trace gravel
	2,611.6	3.5	8	5	7								M			
2610	2,609.1	6.0	3	4	5								M	2,609.1	6.0	Brown, stiff, sandy silt (A-4), fine to coarse grained sand, trace gravel
	2,606.6	8.5	8	9	14								M			
2605	2,601.6	13.5	5	7	8								M	2,601.6	13.5	Brown, stiff, silt (A-5), trace sand, trace clay, micaceous
2600	2,596.6	18.5	10	13	17								M	2,596.6	18.5	Brown, very stiff, sandy silt, (A-4), fine to medium grained sand, trace clay
	2,595.1	20.0											M	2,595.1	20.0	Boring Terminated at Elevation 2,595.1 ft in sandy silt.

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait								
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)							
BORING NO. RW2_10		STATION 14+51		OFFSET 14 ft LT		ALIGNMENT L_LT								
COLLAR ELEV. 2,612.1 ft		TOTAL DEPTH 20.0 ft		NORTHING 665,679		EASTING 818,227								
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER Michael Moseley		START DATE 02/22/23		COMP. DATE 02/22/23		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2615														
2610	2,611.1	1.0	7	6	8								M	GROUND SURFACE ROADWAY EMBANKMENT 0.4' Asphalt
	2,608.6	3.5	5	6	7								M	0.5' ABC Stone
2605	2,606.1	6.0	5	7	8								M	RESIDUAL Brown, medium dense, silty sand (A-2-4), fine to coarse grained sand, micaceous
	2,603.6	8.5	4	5	8								M	SS-176 19% Brown to reddish brown, stiff to very stiff, sandy silt (A-4), fine to medium grained sand, trace clay, micaceous
2600	2,598.6	13.5	5	7	9								M	
2595	2,593.6	18.5	4	10	9								M	
														Boring Terminated at Elevation 2,592.1 ft in sandy silt.

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait								
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)							
BORING NO. RW2_11		STATION 14+98		OFFSET 15 ft LT		ALIGNMENT L_LT								
COLLAR ELEV. 2,609.6 ft		TOTAL DEPTH 20.0 ft		NORTHING 665,703		EASTING 818,267								
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER Michael Moseley		START DATE 02/22/23		COMP. DATE 02/22/23		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2610	2,608.6	1.0	7	9	9									
2605	2,606.1	3.5	7	8	10								M	GROUND SURFACE ROADWAY EMBANKMENT 0.4' Asphalt
	2,603.6	6.0	5	6	9								M	0.6' ABC Stone
2600	2,601.1	8.5	6	9	10								M	RESIDUAL Brown, very stiff, sandy silt (A-4), fine to coarse grained sand, trace gravel, micaceous
2595	2,596.1	13.5	7	9	11								M	Brown, very stiff, sandy silt (A-4), fine to coarse grained sand, micaceous
2590	2,591.1	18.5	7	11	11								M	Brown, moist, medium dense, silty sand (A-2-4), fine to coarse grained sand, trace gravel, micaceous
														Boring Terminated at Elevation 2,589.6 ft in silty sand.
														SS-181 had no recovery.

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW2_12		STATION 15+47		OFFSET 17 ft LT		ALIGNMENT L_LT										
COLLAR ELEV. 2,606.7 ft		TOTAL DEPTH 15.0 ft		NORTHING 665,731		EASTING 818,307										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Michael Moseley		START DATE 02/22/23		COMP. DATE 02/22/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2610																
2605	2,605.7	1.0	5	6	7											
	2,603.2	3.5	4	6	7											
2600	2,600.7	6.0	5	6	6											
	2,598.2	8.5	5	7	10											
2595	2,593.2	13.5	3	3	4											

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW2_13		STATION 16+05		OFFSET 18 ft LT		ALIGNMENT L_LT										
COLLAR ELEV. 2,603.2 ft		TOTAL DEPTH 10.0 ft		NORTHING 665,765		EASTING 818,353										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Michael Moseley		START DATE 02/22/23		COMP. DATE 02/22/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2605																
	2,602.2	1.0	6	7	7											
2600	2,599.7	3.5	6	5	5											
	2,597.2	6.0	6	9	9											
2595	2,594.7	8.5	7	8	10											

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW3_1		STATION 12+56		OFFSET 142 ft RT		ALIGNMENT L_RT										
COLLAR ELEV. 2,673.0 ft		TOTAL DEPTH 50.0 ft		NORTHING 665,399		EASTING 818,179										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Michael Moseley		START DATE 02/28/23		COMP. DATE 02/28/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2675																
	2,672.0	1.0	3	3	4										2,673.0	0.0
2670	2,669.5	3.5	2	2	2											
	2,667.0	6.0	2	3	3											
2665	2,664.5	8.5	2	3	4											
	2,659.5	13.5	4	4	4											
2655	2,654.5	18.5	3	4	6											
	2,649.5	23.5	4	5	6											
2645	2,644.5	28.5	15	17	31											
	2,639.5	33.5	20	26	23											
2635	2,634.5	38.5	8	11	13											
	2,629.5	43.5	11	16	16											
2625	2,624.5	48.5	15	22	41											

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW3_2		STATION 13+94		OFFSET 235 ft RT		ALIGNMENT L_RT										
COLLAR ELEV. 2,642.7 ft		TOTAL DEPTH 36.5 ft		NORTHING 665,388		EASTING 818,359										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Michael Moseley		START DATE 03/01/23		COMP. DATE 03/01/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2645																
	2,641.7	1.0	10	7	6										2,642.7	0.0
2640	2,639.2	3.5	4	7	11											
	2,636.7	6.0	6	3	3											
2635	2,634.2	8.5	11	12	12											
	2,629.2	13.5	10	13	13											
2625	2,624.2	18.5	10	10	8											
	2,619.2	23.5	12	100/0.9												
2615	2,614.2	28.5	100/0.9													
	2,609.2	33.5	100/0.4													
2610	2,606.2	36.5	60/0.0													

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait									
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)								
BORING NO. RW5_1		STATION 26+29		OFFSET 25 ft RT		ALIGNMENT L_LT									
COLLAR ELEV. 2,576.1 ft		TOTAL DEPTH 25.6 ft		NORTHING 666,503		EASTING 819,053									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Michael Moseley		START DATE 02/28/23		COMP. DATE 02/28/23		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					
2580															
2575	2,575.1	1.0	5	6	6								M	GROUND SURFACE 0.0	
	2,572.6	3.5	7	7	4								M	ROADWAY EMBANKMENT Brown, medium dense, silty sand (A-2-4), fine to coarse grained sand, trace gravel	
2570	2,570.1	6.0	0	2	1								M	ALLUVIAL Dark gray, medium dense, silty sand (A-2-4), fine to medium grained sand, slightly micaceous	4.5
	2,567.6	8.5	0	0	0								M	ALLUVIAL Dark gray, soft, silty clay (A-7-5), trace fine sand, slightly micaceous	6.0
2565													SS-245		80%
	2,562.6	13.5	11	17	16								W	Dark gray, dense, gravelly sand (A-1-a), fine to coarse grained sand, fine to coarse grained gravel	13.5
2560													W		
	2,557.6	18.5	19	25	21								W	Dark gray, dense, silty sand (A-2-4), fine to coarse grained sand, trace gravel	18.5
2555													W		
	2,552.6	23.5	100/0.2										W	WEATHERED ROCK Dark gray, gneiss	23.5
	2,550.5	25.6	60/0.0										W	Boring Terminated by Auger Refusal at Elevation 2,550.5 ft on Rock.	25.6

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait									
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)								
BORING NO. RW5_2		STATION 26+79		OFFSET 28 ft RT		ALIGNMENT L_LT									
COLLAR ELEV. 2,583.7 ft		TOTAL DEPTH 25.7 ft		NORTHING 666,541		EASTING 819,085									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Michael Moseley		START DATE 02/24/23		COMP. DATE 02/24/23		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2585															
	2,582.7	1.0	3	4	4								M	GROUND SURFACE 0.0	
2580	2,580.2	3.5	4	5	4								M	ROADWAY EMBANKMENT Brown, medium stiff, sandy silt (A-4)	1.0
	2,577.7	6.0	4	4	4								M	ALLUVIAL Dark gray, medium stiff, sandy silt (A-4), fine to coarse grained sand, trace gravel	3.5
2575	2,575.2	8.5	2	2	3								M	ALLUVIAL Dark gray, loose, silty sand (A-2-4), fine to medium grained sand, trace gravel, micaceous	8.5
	2,570.2	13.5	2	8	9								W	Dark gray, medium stiff, sandy silt (A-4), fine grained sand, slightly micaceous	13.5
2570													W	Dark gray, very stiff, silt (A-5), trace fine grained sand	14.5
	2,565.2	18.5	14	5	4								W	Dark gray, medium dense, sandy gravel (A-1-a), fine to coarse grained gravel, fine to coarse grained sand	18.5
2560	2,560.2	23.5	7	10	40								W	Dark gray, loose, gravelly sand (A-1-a), fine to coarse grained sand, fine to coarse grained gravel	23.5
	2,558.0	25.7	60/0.0										M	RESIDUAL Brown, dense, silty sand, (A-2-4), fine to coarse grained sand, trace gravel	25.7
														Boring Terminated by Auger Refusal at Elevation 2,558.0 ft on Rock.	

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW5_3		STATION 27+29		OFFSET 29 ft RT		ALIGNMENT L_LT										
COLLAR ELEV. 2,577.1 ft		TOTAL DEPTH 18.5 ft		NORTHING 666,581		EASTING 819,116										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Michael Moseley		START DATE 02/24/23		COMP. DATE 02/24/23		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						
2580																
	2,576.1	1.0	5	5	7									2,577.1	0.0	GROUND SURFACE
2575	2,573.6	3.5	6	8	8									2,576.1	1.0	ROADWAY EMBANKMENT Brown, loose, silty sand (A-2-4)
	2,571.1	6.0	5	2	2											ALLUVIAL Dark gray, loose to medium dense, silty sand (A-2-4), fine to coarse grained sand, trace fine grained gravel, micaceous
2570	2,568.6	8.5	2	1	1									2,568.6	8.5	Dark gray, soft, sandy clay (A-6), micaceous
	2,563.6	13.5	3	3	2									2,563.6	13.5	Dark gray, loose, silty sand (A-2-4), fine to medium grained sand, micaceous
2560	2,558.6	18.5	60/0.0'			60/0.0'								2,558.6	18.5	Boring Terminated by Auger Refusal at Elevation 2,558.6 ft on Rock.

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW5_4		STATION 27+81		OFFSET 31 ft RT		ALIGNMENT L_LT										
COLLAR ELEV. 2,577.9 ft		TOTAL DEPTH 23.0 ft		NORTHING 666,622		EASTING 819,148										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Michael Moseley		START DATE 02/23/23		COMP. DATE 02/23/23		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						
2580																
	2,576.9	1.0	4	5	5									2,577.9	0.0	GROUND SURFACE
2575	2,574.4	3.5	3	7	9											ROADWAY EMBANKMENT Brown, loose to medium dense, silty sand (A-2-4), fine to coarse grained sand, trace gravel, fine to coarse grained gravel
	2,571.9	6.0	-	-	-											ALLUVIAL Dark gray, soft, sandy clay (A-7-5), trace fine grained sand
2570	2,569.4	8.5	2	2	2									2,569.4	8.5	Dark gray, soft, silty clay (A-7-5), trace fine grained sand
	2,564.4	13.5	2	2	2									2,564.4	13.5	Dark gray, soft, sandy, silt (A-4), fine grained sand, trace clay
2560	2,559.4	18.5	4	4	7									2,559.4	18.5	Dark gray, medium dense, sandy gravel (A-1-a), fine to coarse grained gravel, fine to coarse grained sand
2555	2,554.9	23.0	60/0.0'			60/0.0'								2,554.9	23.0	Boring Terminated by Auger Refusal at Elevation 2,554.9 ft on Rock.

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW5_5		STATION 28+29		OFFSET 32 ft RT		ALIGNMENT L_LT										
COLLAR ELEV. 2,578.4 ft		TOTAL DEPTH 21.5 ft		NORTHING 666,661		EASTING 819,178										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Michael Moseley		START DATE 02/23/23		COMP. DATE 02/23/23		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						
2580														2,578.4	GROUND SURFACE	0.0
	2,577.4	1.0	3	3	4								M		ROADWAY EMBANKMENT Brown, loose to medium dense, silty sand (A-2-4), fine to coarse grained sand, trace gravel, fine to medium grained gravel, trace clay	
2575	2,574.9	3.5	5	4	7								M			
	2,572.4	6.0	5	5	5								M			
2570	2,569.9	8.5	4	3	3								M		ALLUVIAL White, loose, sand (A-1-b), micaceous	6.5
	2,564.9	13.5	0	0	1								M		ALLUVIAL Dark gray, sandy silt (A-4), fine to coarse grained sand, trace gravel, micaceous	7.0
2565	2,564.9	13.5	0	0	1								M		ALLUVIAL Dark gray, very soft, silt (A-5), trace fine grained sand, trace clay	13.5
2560	2,559.9	18.5	7	12	11								W		SS-219 Dark gray, sandy gravel (A-1-A), fine to coarse grained gravel, fine to coarse grained sand	18.5
	2,556.9	21.5													Boring Terminated by Auger Refusal at Elevation 2,556.9 ft on Rock.	21.5
			60/0.0'													

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW5_6		STATION 28+80		OFFSET 33 ft RT		ALIGNMENT L_LT										
COLLAR ELEV. 2,579.4 ft		TOTAL DEPTH 22.9 ft		NORTHING 666,700		EASTING 819,209										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Michael Moseley		START DATE 02/23/23		COMP. DATE 02/23/23		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						
2580														2,579.4	GROUND SURFACE	0.0
	2,578.4	1.0	3	4	4								M		ROADWAY EMBANKMENT Brown to dark brown, loose to medium dense, silty sand (A-2-4), fine to coarse grained sand, trace gravel, trace clay	
2575	2,575.9	3.5	3	5	6								M			
	2,573.4	6.0	6	7	6								M			
2570	2,570.9	8.5	3	4	3								M		SS-209 White, loose, sand (A-1-b), trace clay, micaceous	9.0
	2,565.9	13.5	0	2	2								M		ALLUVIAL Dark gray, soft, silt (A-5), trace fine grained sand, trace clay, slightly micaceous	13.5
2560	2,560.9	18.5	0	2	2								W		ALLUVIAL Dark gray, loose, sand (A-1-b), fine to coarse grained sand, trace gravel	18.5
	2,556.5	22.9													Boring Terminated by Auger Refusal at Elevation 2,556.5 ft on Rock.	22.9
			60/0.0'													

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Alex Lozada									
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)								
BORING NO. RW5_7		STATION 29+30		OFFSET 36 ft RT		ALIGNMENT L_LT									
COLLAR ELEV. 2,580.4 ft		TOTAL DEPTH 26.1 ft		NORTHING 666,737		EASTING 819,241									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Michael Moseley		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.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2585															
2580	2,579.4	1.0	5	3	3									2,580.4	0.0
	2,576.9	3.5	4	4	6										
2575	2,574.4	6.0	8	9	11										
	2,571.9	8.5	4	4	4										
2570	2,566.9	13.5	1	1	1										
	2,561.9	18.5	1	10	8										
2565	2,556.9	23.5	100/0.3												
	2,554.3	26.1	60/0.0												

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Alex Lozada									
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)								
BORING NO. RW5_8		STATION 29+77		OFFSET 43 ft RT		ALIGNMENT L_LT									
COLLAR ELEV. 2,581.4 ft		TOTAL DEPTH 32.5 ft		NORTHING 666,770		EASTING 819,275									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Michael Moseley		START DATE 02/20/23		COMP. DATE 02/20/23		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2585															
2580	2,580.4	1.0	4	4	3									2,581.4	0.0
	2,577.9	3.5	2	3	4										
2575	2,575.4	6.0	4	4	6										
	2,572.9	8.5	5	5	6										
2570	2,567.9	13.5	0	2	3										
	2,562.9	18.5	1	1	4										
2565	2,557.9	23.5	100/0.3												
	2,552.9	28.5	33	27	32										
2555	2,548.9	32.5	60/0.0												

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Alex Lozada	
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)
BORING NO. RW5_9		STATION 30+29		OFFSET 47 ft RT		ALIGNMENT L_LT	
COLLAR ELEV. 2,582.4 ft		TOTAL DEPTH 36.5 ft		NORTHING 666,807		EASTING 819,311	
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Michael Moseley		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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2585																
	2,581.4	1.0	3	2	2										2,582.4	GROUND SURFACE
2580	2,578.9	3.5	4	5	11							SS-090	24%		2,582.4	ROADWAY EMBANKMENT Brown, loose, sandy silt (A-4), fine to medium grained sand
	2,576.4	6.0	4	7	11										2,576.4	ALLUVIAL Gray, medium dense, sand (A-1-B), trace silt
2575	2,573.9	8.5	4	6	8										2,573.9	ALLUVIAL Gray, medium dense, sand (A-1-B), trace silt
	2,568.9	13.5	2	2	2										2,568.9	Dark brown to black, soft, silt (A-4), trace sand
2565	2,563.9	18.5	2	2	4										2,563.9	Dark brown to black, soft, silt (A-4), trace to some organic matter
2560	2,558.9	23.5	9	8	7										2,558.9	Dark gray-brown, medium dense, gravel (A-1-A), angular gravel
2555	2,553.9	28.5	13	26	48										2,553.9	RESIDUAL Dark brown to tan-brown, very dense, silty sand (A-2-4)
2550	2,548.9	33.5	100/0.9												2,548.9	WEATHERED ROCK Weathered rock, dark brown, gneiss
	2,545.9	36.5	60/0.0												2,545.9	Boring Terminated by Auger Refusal at Elevation 2,545.9 ft on Rock.

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Alex Lozada	
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)
BORING NO. RW5_10		STATION 30+81		OFFSET 50 ft RT		ALIGNMENT L_LT	
COLLAR ELEV. 2,583.7 ft		TOTAL DEPTH 48.5 ft		NORTHING 666,842		EASTING 819,346	
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Michael Moseley		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	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2585																
	2,582.7	1.0	4	3	4										2,583.7	GROUND SURFACE
2580	2,580.2	3.5	4	4	5										2,580.2	ROADWAY EMBANKMENT Red-brown, loose, clayey sand (A-2-6), fine to medium grained sand, some rock fragments
	2,577.7	6.0	4	6	8										2,577.3	ALLUVIAL Gray-brown, medium dense, silty sand (A-2-4), fine to coarse grained sand
2575	2,575.2	8.5	5	6	5										2,575.2	ALLUVIAL Gray-brown, medium dense, silty sand (A-2-4), fine to coarse grained sand
	2,570.2	13.5	1	2	2										2,570.2	Dark brown to black, soft, silt (A-4), trace sand
2565	2,565.2	18.5	0	2	2										2,565.2	Dark brown to black, soft, silt (A-4), trace to some organic matter
2560	2,560.2	23.5	2	5	8										2,560.2	Dark gray-brown, medium dense, gravel (A-1-A), angular gravel
2555	2,555.2	28.5	5	100/0.8											2,555.2	RESIDUAL Dark brown to tan-brown, very dense, silty sand (A-2-4)
2550	2,550.2	33.5	100/0.8												2,550.2	WEATHERED ROCK Weathered rock, dark brown, gneiss
2545	2,545.2	38.5	6	100/0.9											2,545.2	Boring Terminated by Auger Refusal at Elevation 2,545.2 ft on Rock.
2540	2,540.2	43.5	100/0.5												2,540.2	Boring Terminated by Auger Refusal at Elevation 2,540.2 ft on Rock.
	2,535.2	48.5	60/0.0												2,535.2	Boring Terminated by Auger Refusal at Elevation 2,535.2 ft on Rock.

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ_NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait									
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)								
BORING NO. RW5_11		STATION 31+31		OFFSET 54 ft RT		ALIGNMENT L_LT									
COLLAR ELEV. 2,585.4 ft		TOTAL DEPTH 42.9 ft		NORTHING 666,875		EASTING 819,382									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Michael Moseley		START DATE 02/28/23		COMP. DATE 02/28/23		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					
2590															
2585	2,584.4	1.0	3	5	8										
2580	2,581.9	3.5	3	6	5										
2575	2,579.4	6.0	3	4	4										
2570	2,576.9	8.5	2	2	2										
2565	2,571.9	13.5	1	1	1										
2560	2,566.9	18.5	2	1	1										
2555	2,561.9	23.5	0	2	4										
2550	2,556.9	28.5	3	5	7										
2545	2,551.9	33.5	100/0.8												
	2,546.9	38.5	100/0.9												
	2,542.5	42.9	60/0.0												

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 5 from -Y1RT- STA 15+25 to 26+13							GROUND WTR (ft)								
BORING NO. RW5_21 (HDR)		STATION 30+12		OFFSET 83 ft LT		ALIGNMENT L_LT									
COLLAR ELEV. 2,582.4 ft		TOTAL DEPTH 32.5 ft		NORTHING 666,877		EASTING 819,201									
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER K. Boone		START DATE 02/14/21		COMP. DATE 02/14/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2585															
2580	2,582.4	0.0	3	2	4										
2575	2,577.4	5.0	3	2	3										
2570	2,574.9	7.5	2	1	2										
2565	2,572.4	10.0	2	3	2										
2560	2,567.4	15.0	7	6	6										
2555	2,562.4	20.0	3	5	15										
2550	2,557.4	25.0	14	18	43										
	2,552.4	30.0	18	35	65/0.5										
	2,549.9	32.5	60/0.0												

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ_NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait									
SITE DESCRIPTION Right Shoulder of US-74 E							GROUND WTR (ft)								
BORING NO. RW6_1		STATION 29+50		OFFSET 19 ft RT		ALIGNMENT L_RT									
COLLAR ELEV. 2,580.6 ft		TOTAL DEPTH 28.5 ft		NORTHING 666,727		EASTING 819,285									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Michael Moseley		START DATE 05/23/23		COMP. DATE 05/23/23		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2585															
2580	2,579.6	1.0	17	8	6							M	GROUND SURFACE ROADWAY EMBANKMENT 0.7' Asphalt, 0.3' ABC	0.0	
	2,577.1	3.5	4	5	7							M	Brown, medium dense, silty sand (A-2-4), fine to coarse grained, some gravel, trace clay	1.0	
2575	2,574.6	6.0	6	6	9							M	ALLUVIAL Brownish gray, medium dense, silty sand (A-2-4), fine grained sand	6.0	
	2,572.1	8.5	3	2	2							M	Dark gray, soft, sandy silt (A-4), trace fine sand, micaceous	8.5	
2570	2,567.1	13.5										M	Dark gray to black, soft, sandy silt (A-5), fine grained sand, micaceous, trace organics	13.5	
2565	2,562.1	18.5	1	1	1							M			
2560	2,557.1	23.5	2	2	2							M			
2555	2,552.1	28.5	8	8	10							W			
			60/0.0									NR	Boring Terminated by Auger Refusal at Elevation 2,552.1 ft on Rock.	28.5	

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait									
SITE DESCRIPTION Right Shoulder of US-74 E							GROUND WTR (ft)								
BORING NO. RW6_2		STATION 30+00		OFFSET 19 ft RT		ALIGNMENT L_RT									
COLLAR ELEV. 2,581.5 ft		TOTAL DEPTH 35.0 ft		NORTHING 666,761		EASTING 819,320									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Michael Moseley		START DATE 05/23/23		COMP. DATE 05/23/23		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2585															
2580	2,580.5	1.0	19	9	7							M	GROUND SURFACE ROADWAY EMBANKMENT 0.6' Asphalt	0.0	
	2,578.0	3.5	5	4	6							M	Brown, loose to medium dense, silty sand (A-2-4), fine to coarse grained, trace gravel, trace clay	6.0	
2575	2,575.5	6.0	5	6	10							M	ALLUVIAL Brownish gray, loose to medium dense, fine grained sand, silty sand (A-2-4)	6.0	
	2,573.0	8.5	4	4	4							M			
2570	2,568.0	13.5	0	2	1							M	Dark gray to black, soft to medium stiff, silt (A-5), trace fine grained sand, trace organics, micaceous	13.5	
2565	2,563.0	18.5	0	2	3							M			
2560	2,558.0	23.5	3	2	2							M	Dark gray, soft, sandy silt (A-4), fine to coarse grained sand, trace fine grained gravel	23.5	
2555	2,553.0	28.5	10	20	35							W	Dark gray, very dense, sand (A-1-b), fine to coarse grained sand, with fine grained gravel	28.5	
2550	2,548.0	33.5	22	36	30							M	RESIDUAL Brown, hard, sandy silt (A-4), fine to coarse grained sand, trace clay, trace fine grained gravel Boring Terminated at Elevation 2,546.5 ft in sandy silt	35.0	

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Right Shoulder of US-74 E							GROUND WTR (ft)									
BORING NO. RW6_3		STATION 30+50		OFFSET 18 ft RT		ALIGNMENT L_RT										
COLLAR ELEV. 2,582.8 ft		TOTAL DEPTH 32.3 ft		NORTHING 666,795		EASTING 819,356										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Michael Moseley		START DATE 05/23/23		COMP. DATE 05/23/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2585																
	2,581.8	1.0	17	12	7											
2580	2,579.3	3.5	6	5	5											
	2,576.8	6.0	3	4	7											
2575	2,574.3	8.5	6	9	9											
2570	2,569.3	13.5	0	2	2											
2565	2,564.3	18.5	0	0	3											
2560	2,559.3	23.5	4	5	6											
2555	2,554.3	28.5	9	12	19											
	2,550.5	32.3	60/0.0													60/0.0
Boring Terminated by Auger Refusal at Elevation 2,550.5 ft on Rock.																

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Right Shoulder of US-74 E							GROUND WTR (ft)									
BORING NO. RW6_4		STATION 31+00		OFFSET 19 ft RT		ALIGNMENT L_RT										
COLLAR ELEV. 2,584.4 ft		TOTAL DEPTH 38.5 ft		NORTHING 666,828		EASTING 819,394										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Michael Moseley		START DATE 05/23/23		COMP. DATE 05/23/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2585																
	2,583.4	1.0	14	12	7											
2580	2,580.9	3.5	3	5	6											
	2,578.4	6.0	6	10	13											
2575	2,575.9	8.5	5	4	6											
2570	2,570.9	13.5	0	2	1											
2565	2,565.9	18.5	1	2	2											
2560	2,560.9	23.5	8	9	13											
2555	2,555.9	28.5	7	6	12											
	2,550.9	33.5	9	14	22											
	2,545.9	38.5	60/0.0													60/0.0
Boring Terminated by Auger Refusal at Elevation 2,545.9 ft on Rock.																

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Addison Tait										
SITE DESCRIPTION Right Shoulder of US-74 E							GROUND WTR (ft)									
BORING NO. RW6_7		STATION 33+50		OFFSET 19 ft RT		ALIGNMENT L_RT										
COLLAR ELEV. 2,595.4 ft		TOTAL DEPTH 43.6 ft		NORTHING 666,974		EASTING 819,593										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Michael Moseley		START DATE 05/24/23		COMP. DATE 05/24/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2600																
2595	2,594.4	1.0	9	7	4											
2590	2,591.9	3.5	3	5	6											
	2,589.4	6.0	3	3	5											
	2,586.9	8.5	3	5	7											
2585	2,581.9	13.5														
2580	2,576.9	18.5	2	3	4											
2575	2,571.9	23.5	2	3	3											
2570	2,566.9	28.5	2	2	2											
2565	2,561.9	33.5	2	3	3											
2560	2,556.9	38.5	7	9	14											
2555	2,551.9	43.5	60/0.1													

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Alex Lozada										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. RW8_1		STATION 34+27		OFFSET 56 ft RT		ALIGNMENT L_LT										
COLLAR ELEV. 2,599.6 ft		TOTAL DEPTH 40.0 ft		NORTHING 667,060		EASTING 819,600										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Michael Moseley		START DATE 02/15/23		COMP. DATE 02/15/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2600																
	2,598.6	1.0	2	3	4											
2595	2,596.1	3.5	5	3	5											
	2,593.6	6.0	3	3	5											
2590	2,591.1	8.5	4	4	6											
	2,586.1	13.5	3	2	4											
2585	2,581.1	18.5	2	1	2											
2580	2,576.1	23.5	0	2	2											
2575	2,571.1	28.5	2	3	4											
2570	2,566.1	33.5	3	4	4											
2565	2,561.1	38.5	3	2	3											
2560																

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ_NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Alex Lozada									
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)								
BORING NO. RW8_2		STATION 34+78		OFFSET 65 ft RT		ALIGNMENT L_LT									
COLLAR ELEV. 2,602.5 ft		TOTAL DEPTH 40.0 ft		NORTHING 667,081		EASTING 819,646									
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER Michael Moseley		START DATE 02/15/23		COMP. DATE 02/15/23		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2605															
2600	2,601.5	1.0	5	3	4								M	2,602.5 GROUND SURFACE 0.0	
	2,599.0	3.5	4	3	4								M	2,600.0 ROADWAY EMBANKMENT Red-brown, medium stiff, sandy clay (A-6), low plasticity -2.5	
	2,596.5	6.0	4	7	7								M	Brown, loose to medium dense, silty sand (A-2-4), fine to coarse grained sand	
2595	2,594.0	8.5	4	4	3								M		
2590	2,589.0	13.5	3	2	4								M		
2585	2,584.0	18.5	2	2	3								M		
2580	2,579.0	23.5	3	2	3								W	2,578.3 ALLUVIAL Gray, medium stiff, sandy silt (A-4), fine grained sand 24.2	
2575	2,574.0	28.5	0	2	3								M	2,574.5 Dark gray-black, medium stiff, sandy silt (A-4), trace roots and organics 28.0	
2570	2,569.0	33.5	3	4	4								M	2,573.0 RESIDUAL Dark gray, medium stiff, sandy clay (A-6) 29.5	
2565	2,564.0	38.5	5	6	7								M	2,565.5 Dark gray, medium stiff, sandy silt (A-4) 37.0	
														2,562.5 Boring Terminated at Elevation 2,562.5 ft in sandy silt. 40.0	

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)								
BORING NO. RW8_1 (HDR)		STATION 11+24		OFFSET 20 ft RT		ALIGNMENT L_RT									
COLLAR ELEV. 2,633.3 ft		TOTAL DEPTH 21.5 ft		NORTHING 665,458		EASTING 818,003									
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 01/26/21		COMP. DATE 01/26/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2635															
	2,632.7	0.6	10	11	10								D	2,633.3 GROUND SURFACE 0.0	
	2,630.8	2.5	8	6	8								D	2,632.7 ROADWAY EMBANKMENT 0.6' PAVEMENT 0.6	
2630	2,628.3	5.0	7	9	10								D	2,631.3 ROADWAY EMBANKMENT Medium dense, gray and brown, silty GRAVEL (A-1-b) 2.0	
	2,625.8	7.5	5	8	6								D	2,629.3 RESIDUAL Medium dense, tan and brown, silty SAND (A-2-4), micaceous 4.0	
2625	2,623.3	10.0	4	12	15								D	Very stiff to hard, brown, tan and white, SILT (A-4), with trace sand, micaceous, saprolitic	
2620	2,618.3	15.0	12	17	23								D		
2615	2,613.3	20.0	9	10	11								D		
														2,611.8 Boring Terminated at Elevation 2,611.8 ft in SILT 21.5	

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi								
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)							
BORING NO. RW8_2 (HDR)		STATION 11+74		OFFSET 19 ft RT		ALIGNMENT L_RT								
COLLAR ELEV. 2,630.5 ft		TOTAL DEPTH 21.5 ft		NORTHING 665,477		EASTING 818,051								
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER L. Wanstrath		START DATE 01/26/21		COMP. DATE 01/27/21		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2635														
2630	2,629.9	0.6	11	12	10									
	2,628.0	2.5	8	12	17									
2625	2,625.5	5.0	9	15	16									
	2,623.0	7.5	11	16	21									
2620	2,620.5	10.0	15	17	21									
2615	2,615.5	15.0	6	9	9									
2610	2,610.5	20.0	8	7	11									

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi								
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)							
BORING NO. RW8_3 (HDR)		STATION 12+26		OFFSET 19 ft RT		ALIGNMENT L_RT								
COLLAR ELEV. 2,627.4 ft		TOTAL DEPTH 21.5 ft		NORTHING 665,498		EASTING 818,099								
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER L. Wanstrath		START DATE 01/27/21		COMP. DATE 01/27/21		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2630														
	2,626.8	0.6	10	10	8									
2625	2,624.9	2.5	8	7	6									
	2,622.4	5.0	9	9	11									
2620	2,619.9	7.5	7	8	9									
	2,617.4	10.0	8	8	9									
2615	2,612.4	15.0	8	8	8									
2610	2,607.4	20.0	12	13	12									

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)								
BORING NO. RW8_4 (HDR)		STATION 12+80		OFFSET 20 ft RT		ALIGNMENT L_RT									
COLLAR ELEV. 2,624.4 ft		TOTAL DEPTH 21.5 ft		NORTHING 665,520		EASTING 818,149									
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 01/27/21		COMP. DATE 01/27/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2625	2,623.8	0.6	6	7	7									2,624.4	0.0
	2,621.9	2.5	7	8	8									2,623.8	0.6
2620	2,619.4	5.0	4	6	9									2,621.9	2.5
	2,616.9	7.5	10	10	8										
2615	2,614.4	10.0	7	7	10										
	2,609.4	15.0	6	6	8										
2610	2,604.4	20.0	12	15	23										
2605														2,602.9	21.5
Boring Terminated at Elevation 2,602.9 ft in SILT															

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)								
BORING NO. RW8_5 (HDR)		STATION 13+32		OFFSET 19 ft RT		ALIGNMENT L_RT									
COLLAR ELEV. 2,621.3 ft		TOTAL DEPTH 16.5 ft		NORTHING 665,545		EASTING 818,196									
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 01/27/21		COMP. DATE 01/27/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2625															
	2,620.7	0.6	6	6	7									2,621.3	0.0
2620	2,618.8	2.5	8	6	7									2,620.7	0.6
	2,616.3	5.0	18	21	15									2,618.8	2.5
2615	2,613.8	7.5	5	5	10										
	2,611.3	10.0	8	10	13										
2610															
2605	2,606.3	15.0	5	7	11										
														2,604.8	16.5
Boring Terminated at Elevation 2,604.8 ft in SILT															

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi								
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)							
BORING NO. RW8_6 (HDR)		STATION 13+83		OFFSET 19 ft RT		ALIGNMENT L_RT								
COLLAR ELEV. 2,618.4 ft		TOTAL DEPTH 5.0 ft		NORTHING 665,570		EASTING 818,241								
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 01/27/21		COMP. DATE 01/27/21		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2620														
	2,617.8	0.6	9	6	10									2,618.4 GROUND SURFACE 0.0
	2,615.9	2.5												2,617.8 0.6' PAVEMENT 0.6
2615			9	10	15									2,615.9 ROADWAY EMBANKMENT 2.5
	2,613.4	5.0												2,613.4 MEDIUM DENSE, BROWN AND GRAY, SAND AND GRAVEL (A-1-b) 5.0
			60/0.0											RESIDUAL 5.0
														Very stiff, brown, black, and gray, SILT (A-4), saprolitic
														Boring Terminated with Standard Penetration Test Refusal at Elevation 2,613.4 ft on Crystalline Rock (GNEISS)

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi								
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)							
BORING NO. RW8_7 (HDR)		STATION 14+36		OFFSET 19 ft RT		ALIGNMENT L_RT								
COLLAR ELEV. 2,615.3 ft		TOTAL DEPTH 10.3 ft		NORTHING 665,597		EASTING 818,287								
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 01/27/21		COMP. DATE 01/27/21		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2620														
	2,615.3	0.0												2,615.3 GROUND SURFACE 0.0
	2,614.7	0.6												2,614.7 0.6' PAVEMENT 0.6
2615														2,614.7 ROADWAY EMBANKMENT 2.5
	2,614.8	0.5	6	8	9									2,612.8 MEDIUM DENSE, BROWN AND GRAY, SAND AND GRAVEL (A-1-b) 2.5
	2,612.8	2.5	5	6	7									RESIDUAL 2.5
2610			10	53	41									2,610.3 STIFF TO HARD, BROWN AND GRAY, SILT (A-4), MICACEOUS, SAPROLITIC 7.0
	2,607.8	7.5	32	68/0.2										2,608.3 WEATHERED ROCK 7.0
2605			100/0.3											2,605.0 GRAY, GNEISS 10.3
														Boring Terminated at Elevation 2,605.0 ft in Weathered Rock (GNEISS)

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)								
BORING NO. RW8_8 (HDR)		STATION 14+88		OFFSET 20 ft RT		ALIGNMENT L_RT									
COLLAR ELEV. 2,612.3 ft		TOTAL DEPTH 10.9 ft		NORTHING 665,625		EASTING 818,331									
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 01/27/21		COMP. DATE 01/27/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2615															
	2,611.7	0.6	6	4	5									2,612.3	0.0
	2,609.8	2.5	8	7	8									2,611.7	0.6
2610	2,609.8	2.5	8	7	8									2,609.8	2.5
	2,607.3	5.0	64	36/0.2										2,607.8	4.5
	2,604.8	7.5	10	15	14									2,605.3	7.0
2605	2,604.8	7.5	10	15	14									2,603.3	9.0
	2,602.3	10.0	24	76/0.3										2,601.4	10.9

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 8 from -DET01_EB- STA 34+83.83 to 29+30.48							GROUND WTR (ft)								
BORING NO. RW8_9 (HDR)		STATION 15+39		OFFSET 18 ft RT		ALIGNMENT L_RT									
COLLAR ELEV. 2,609.5 ft		TOTAL DEPTH 11.5 ft		NORTHING 665,656		EASTING 818,373									
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 01/27/21		COMP. DATE 01/27/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2610															
	2,608.9	0.6	7	11	8									2,609.5	0.0
	2,607.0	2.5	4	9	7									2,608.9	0.6
2605	2,604.5	5.0	8	8	10									2,607.0	2.5
	2,602.0	7.5	4	8	11										
2600	2,599.5	10.0	16	32	22										

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST R. Dugger					
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)				
BORING NO. S1_B1-A (HDR)		STATION 24+25		OFFSET 31 ft LT		ALIGNMENT L_LT					
COLLAR ELEV. 2,564.5 ft		TOTAL DEPTH 27.5 ft		NORTHING 666,373		EASTING 818,887					
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic					
DRILLER L. Wanstrath		START DATE 02/28/21		COMP. DATE 02/28/21		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 20.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
2557	2,557.0	7.5	5.0	1:18	(5.0)	(4.4)	(8.9)	(8.3)		Begin Coring @ 7.5 ft	7.5
2555	2,555.0	12.5	5.0	1:58 1:35 1:58 2:00	100%	88%	100%	93%	RS-6	Light to dark gray with brown, m-c grained Biotite GNEISS, with trace garnets, slight weathering, hard, close to wide fracture spacing	
2550	2,552.0	17.5	5.0	1:28 2:05 2:15 2:15 2:10	100%	100%				Moderate to severe weathering, moderately hard, very close fracture spacing RS-6 11.0' - 11.5' GSI= 70 - 80 Qu= 18,520 psi	
2545	2,547.0	22.5	5.0	1:45 0:15 2:00 2:02 2:10	(4.4)	(3.9)	(10.5)	(9.3)	RS-7	Slight weathering, hard, close to wide fracture spacing	16.4
2540	2,542.0	27.5	5.0	1:33 1:35 1:33 2:10 2:30	100%	86%				Light to dark gray with brown, Migmatitic Biotite GNEISS, slight weathering, hard, close to wide fracture spacing RS-7 16.8' - 17.5' GSI= 70 - 80 Qu= 10,027 psi 0.6' core loss	
	2,537.0									Very severe weathering, moderately hard, very close fracture spacing Slight weathering, hard, close to wide fracture spacing	27.5
Boring Terminated at Elevation 2,537.0 ft in Crystalline Rock (GNEISS)											

NCDOT CORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST R. Dugger									
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)								
BORING NO. S1_B1-B (HDR)		STATION 23+72		OFFSET 14 ft RT		ALIGNMENT L_RT									
COLLAR ELEV. 2,565.6 ft		TOTAL DEPTH 35.7 ft		NORTHING 666,279		EASTING 818,924									
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)			DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 02/16/21		COMP. DATE 02/16/21		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					
2570															
2565	2,565.6	0.0	2	1	1								W	2,565.6 GROUND SURFACE 0.0	
2560	2,560.6	5.0	15	20	12								Sat.	2,562.6 ALLUVIAL Very loose, brown and orange, silty SAND, micaceous Medium dense to dense, brown, SAND (A-3), with little gravel 3.0	
2555	2,555.6	10.0	10	12	14								Sat.		
2550	2,550.6	15.0	10	100/0.0										2,550.1 CRYSTALLINE ROCK Brown, GNEISS Light to dark gray with brown, Migmatitic Biotite GNEISS 15.5	
2545															
2540															
2535															
2530														2,529.9 Boring Terminated at Elevation 2,529.9 ft in Crystalline Rock (GNEISS) 35.7	

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)								
BORING NO. S1_B1-C (HDR)		STATION 23+64		OFFSET 13 ft RT		ALIGNMENT L_LT									
COLLAR ELEV. 2,575.5 ft		TOTAL DEPTH 44.0 ft		NORTHING 666,298		EASTING 818,886									
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)			DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 03/10/21		COMP. DATE 03/10/21		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					
2580															
2575	2,575.5	0.0	1	1	2								D	2,575.5 GROUND SURFACE 0.0	
2570	2,573.0	2.5	3	3	3								D	2,573.5 ROADWAY EMBANKMENT Very soft, red and brown, sandy CLAY (A-6) Soft to medium stiff, red, gray, and brown, CLAY (A-7-6) 2.0	
2565	2,568.0	7.5	2	2	1								M		
2560	2,565.5	10.0	1	2	3								M		
2555	2,560.5	15.0	11	16	15								W	2,562.5 ALLUVIAL Dense, gray, SAND and GRAVEL (A-1-b) 13.0	
2550	2,555.5	20.0	87	50/0.5										2,557.5 WEATHERED ROCK Gray and black, GNEISS 18.0	
2545	2,551.5	24.0	60/0.0											2,551.5 CRYSTALLINE ROCK Gray, black, and white, Migmatitic Biotite GNEISS 24.0	
2540															
2535														2,531.5 Boring Terminated at Elevation 2,531.5 ft in Crystalline Rock (GNEISS) 44.0	

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST R. Dugger					
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)				
BORING NO. S1_B1-B (HDR)		STATION 23+72		OFFSET 14 ft RT		ALIGNMENT L_RT					
COLLAR ELEV. 2,565.6 ft		TOTAL DEPTH 35.7 ft		NORTHING 666,279		EASTING 818,924					
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic					
DRILLER L. Wanstrath		START DATE 02/16/21		COMP. DATE 02/16/21		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 20.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
2549.9	2,549.9	15.7	5.0	1:10 1:24 1:45 1:46 1:40	(4.8) 96%	(3.6) 72%	(19.4) 97%	(17.3) 87%		Begin Coring @ 15.7 ft CRYSTALLINE ROCK (continued) Light to dark gray with brown, Migmatitic Biotite GNEISS slight to moderate weathering, hard, close to moderately close fracture spacing 0.2' core loss	
2545	2,544.9	20.7	5.0	2:10 2:12 2:14 2:17 2:13	(4.6) 92%	(3.5) 70%					0.4' core loss; Moderately severe weathering, medium to moderately hard, very close fracture spacing Moderate to slight weathering, hard, close to moderately close fracture spacing
2540	2,539.9	25.7	5.0	2:31 2:31 2:35 2:34 2:31	(5.0) 100%	(4.6) 92%					
2535	2,534.9	30.7	5.0	2:35 2:37 2:39 2:45 2:41	(5.0) 100%	(4.7) 94%					RS-8 RS-8 32.1' - 32.5' GSI= 70 - 80 Qu= 10,265 psi
2530	2,529.9	35.7									
Boring Terminated at Elevation 2,529.9 ft in Crystalline Rock (GNEISS)											

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi					
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)				
BORING NO. S1_B1-C (HDR)		STATION 23+64		OFFSET 13 ft RT		ALIGNMENT L_LT					
COLLAR ELEV. 2,575.5 ft		TOTAL DEPTH 44.0 ft		NORTHING 666,298		EASTING 818,886					
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic					
DRILLER L. Wanstrath		START DATE 03/10/21		COMP. DATE 03/10/21		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 20.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
2551.5	2,551.5	24.0	6.0	2:18 2:09 2:20 2:13 2:07 2:08	(4.5) 75%	(2.9) 48%				Begin Coring @ 24.0 ft CRYSTALLINE ROCK Gray, black, and white, Migmatitic Biotite GNEISS moderate to slight weathering, hard, close fracture spacing (continued) 1.5' core loss Close to moderately close fracture spacing; 0.2' core loss	
2550	2,551.5	24.0	6.0	2:19 2:13 2:17 1:58 2:09	(4.8) 96%	(3.5) 70%					Moderately hard, very close to close fracture spacing Close to moderately close fracture spacing, hard, moderate to slight weathering; 1.0' core loss
2545	2,545.5	30.0	5.0	1:46 1:48 1:53 1:50 1:59	(4.0) 80%	(1.9) 38%					
2540	2,540.5	35.0	5.0	2:11 1:49 2:21 2:13	(3.7) 93%	(2.4) 60%					RS-9 RS-9 39.4' - 40.0' GSI= 70 - 80 Qu= 13,205 psi
2535	2,535.5	40.0	4.0								
2531.5	2,531.5	44.0							44.0		
Boring Terminated at Elevation 2,531.5 ft in Crystalline Rock (GNEISS)											

NCDOT CORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST R. Dugger					
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)				
BORING NO. S1_B2-A (HDR)		STATION 25+17		OFFSET 30 ft LT		ALIGNMENT L_LT					
COLLAR ELEV. 2,565.2 ft		TOTAL DEPTH 36.3 ft		NORTHING 666,446		EASTING 818,943					
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic					
DRILLER L. Wanstrath		START DATE 03/01/21		COMP. DATE 03/01/21		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 28.5 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)	REC. (%)	RQD (%)			
2557.4	2,557.4	7.8	3.5	0:53/0.5 2:00/1.0 1:45/1.0 3:22/1.0	(2.6) 74%	(1.3) 37%	(23.7) 83%	(14.2) 50%		Begin Coring @ 7.8 ft	7.8
2555	2,553.9	11.3	5.0	1:18/1.0 3:02/1.0 0:47/1.0 0:55/1.0 1:25/1.0	(3.2) 64%	(0.0) 0%				CRYSTALLINE ROCK Light to medium gray with dark brown, Migmatitic Biotite GNEISS, moderate weathering, medium hard to hard, very close to close fracture spacing 0.9' core loss; very severely weathered, soft With trace epidote on fractures, moderate weathering, moderately hard Very severely weathered, soft 1.8' core loss Moderate to slight weathering, hard, close fracture spacing	
2550	2,548.9	16.3	5.0	1:50/1.0 1:33/1.0 1:37/1.0 1:54/1.0 2:13/1.0	(5.0) 100%	(4.0) 80%					
2545	2,543.9	21.3	5.0	1:18/1.0 1:39/1.0 1:31/1.0 1:29/1.0 2:09/1.0	(3.8) 76%	(1.9) 38%			RS-10	Severe weathering, soft, very close fracture spacing Moderate to slight weathering, hard, close fracture spacing RS-10 20.0' - 20.8' GSI= 75 - 85 Qu= 9,796 psi Very close fracture spacing 1.2' core loss With trace garnets, slight weathering, hard, close to wide fracture spacing	
2540	2,538.9	26.3	5.0	2:01/1.0 1:47/1.0 1:50/1.0 2:23/1.0 2:38/1.0	(5.0) 100%	(4.5) 90%					
2535	2,533.9	31.3	5.0	2:15/1.0 2:09/1.0 2:14/1.0 1:16/1.0 2:05/1.0	(5.0) 100%	(2.5) 50%					
2530	2,528.9	36.3								Boring Terminated at Elevation 2,528.9 ft in Crystalline Rock (GNEISS)	36.3

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi					
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)				
BORING NO. S1_B2-B (HDR)		STATION 24+67		OFFSET 16 ft RT		ALIGNMENT L_RT					
COLLAR ELEV. 2,565.5 ft		TOTAL DEPTH 32.6 ft		NORTHING 666,354		EASTING 818,982					
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic					
DRILLER K. Boone		START DATE 02/15/21		COMP. DATE 02/15/21		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 18.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)	REC. (%)	RQD (%)			
2550.9	2,550.9	14.6	3.0	(2.5) 83%	(0.5) 17%			(17.5) 97%	(14.9) 83%	Begin Coring @ 14.6 ft	14.6
2550	2,547.9	17.6	5.0	(5.0) 100%	(5.0) 100%					CRYSTALLINE ROCK Light to dark gray with brown, Migmatitic Biotite GNEISS moderately severe to moderate weathering, soft to moderately hard, very close to close fracture spacing 0.4' core loss Slight weathering, hard, moderately close to wide fracture spacing	
2545	2,542.9	22.6	5.0	(5.0) 100%	(4.7) 94%						
2540	2,537.9	27.6	5.0	(5.0) 100%	(4.7) 94%					Close to moderately close fracture spacing	
2535	2,532.9	32.6								Boring Terminated at Elevation 2,532.9 ft in Crystalline Rock (GNEISS)	32.6

NCDOT CORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)									
BORING NO. S1_B2-C (HDR)		STATION 24+82		OFFSET 15 ft RT		ALIGNMENT L_LT	0 HR. 4.0									
COLLAR ELEV. 2,567.3 ft		TOTAL DEPTH 48.5 ft		NORTHING 666,391		EASTING 818,957	24 HR. FIAD									
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 03/10/21		COMP. DATE 03/10/21		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
2570														2,567.3	0.0	GROUND SURFACE
2565	2,567.3	0.0	1	2	3	5						M		2,564.8	2.5	ROADWAY EMBANKMENT Very soft to medium stiff, red and brown, silty CLAY (A-7-6), micaceous
	2,562.3	5.0	3	3	7	10						W		2,560.3	7.0	
2560	2,559.8	7.5	18	14	26	40						W		2,557.8	9.5	ALLUVIAL Medium dense to very dense, gray, black, and white, SAND and GRAVEL (A-1-b)
2555	2,557.3	10.0	4	5	7	12						D				RESIDUAL Medium dense to dense, red, tan, and black, SILT (A-4), contains little rock fragments, micaceous, saprolitic
2550	2,552.3	15.0	3	4	6	10						D				
2545	2,547.3	20.0	8	16	30	46						D				
2540	2,542.3	25.0	100/0.5			100/0.5								2,542.3	25.0	WEATHERED ROCK Red, brown, and black, GNEISS
2535	2,538.8	28.5	60/0.0			60/0.0								2,538.8	28.5	CRYSTALLINE ROCK Light to dark gray with brown, f-c grained Biotite GNEISS, with trace garnets
2530												RS-11		2,531.9	35.4	Light to dark gray with brown, Migmatic Biotite GNEISS
2525																
2520														2,518.8	48.5	Boring Terminated at Elevation 2,518.8 ft in Crystalline Rock (GNEISS)

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

CORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi					
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)				
BORING NO. S1_B2-C (HDR)		STATION 24+82		OFFSET 15 ft RT		ALIGNMENT L_LT					
COLLAR ELEV. 2,567.3 ft		TOTAL DEPTH 48.5 ft		NORTHING 666,391		EASTING 818,957					
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic					
DRILLER L. Wanstrath		START DATE 03/10/21		COMP. DATE 03/10/21		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 20.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %			
2538.8	2538.8	28.5	1.5	1:49/0.5	(1.5)	(1.3)				Begin Coring @ 28.5 ft	28.5
	2537.3	30.0	5.0	2:09	100%	87%				WEATHERED ROCK (continued)	
				2:32	(4.8)	(2.4)				CRYSTALLINE ROCK	
2535				1:49	96%	48%				Light to dark gray with brown, f-c grained Biotite GNEISS, with trace garnets, moderately severe to slight weathering, moderately hard to hard, very close to close fracture spacing	
	2532.3	35.0	5.0	2:31						Severe weathering, medium to moderately hard, very close fracture spacing	35.4
				2:49						0.2' core loss	
2530				2:37	(5.0)	(4.3)				Moderate to slight weathering, moderately hard to hard, very close to close fracture spacing	
				3:02	100%	86%				RS-11 33.5' - 34.1'	
				2:42						GSI= 60 - 70	
	2527.3	40.0	5.0	2:18						Qu= 3,264 psi (sampled along healed joint)	
				1:59						Light to dark gray with brown, Migmatitic Biotite GNEISS, moderate to slight weathering, hard to moderately hard, very close to close fracture spacing	
2525				1:37	(5.0)	(1.0)				Core barrel blocked off	
				1:42	100%	20%				1.9' core loss	
	2522.3	45.0	3.5	1:57							
				1:53							
	2520			1:59							
				1:38	(1.6)	(0.4)					
				1:41	46%	11%					
2520				2:09							
	2518.8	48.5	1.08	1:08/0.5						Boring Terminated at Elevation 2,518.8 ft in Crystalline Rock (GNEISS)	48.5

NCDOT CORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Alex Lozada										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. S1_EB1_A		STATION 31+44		OFFSET 13 ft LT		ALIGNMENT L_LT										
COLLAR ELEV. 2,585.9 ft		TOTAL DEPTH 38.5 ft		NORTHING 666,931		EASTING 819,344										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Michael Moseley		START DATE 02/14/23		COMP. DATE 02/14/23		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2590																
2585	2,584.9	1.0	2	5	4									M	GROUND SURFACE	0.0
	2,582.4	3.5	3	5	4									M	ROADWAY EMBANKMENT Brown to gray, loose, silty sand (A-2-4), micaceous	5.0
2580	2,579.9	6.0	2	2	2									SS-003	ALLUVIAL Gray and white, soft, silty clay and peat, highly organic (A-7-6)	8.5
	2,577.4	8.5	4	4	4									M	Brown, soft, sandy silt (A-4)	12.0
2575														Sat.	Gray, soft, sandy clay (A-6)	12.0
2570	2,572.4	13.5	0	0	1									M		
2565	2,567.4	18.5	WOH	2	3									M		
	2,562.4	23.5	46	32	19									SS-007	RESIDUAL Orange to gray to brown, very dense, clayey sand (A-2-6), micaceous	22.0
2560														M		
2555	2,557.4	28.5	10	19	65									M		
	2,552.4	33.5	30	29	26									M	Brown to white, very dense, sandy silt (A-4), micaceous	31.1
2550														M		
	2,547.4	38.5	60/0.0												Boring Terminated by Auger Refusal at Elevation 2,547.4 ft on Rock.	38.5
															ST-001 had 100% recovery.	
															Other Samples: ST-001 (15.0 - 17.0)	

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Alex Lozada											
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)										
BORING NO. S1_EB1_B		STATION 32+24		OFFSET 31 ft RT		ALIGNMENT L_LT											
COLLAR ELEV. 2,587.7 ft		TOTAL DEPTH 42.7 ft		NORTHING 666,954		EASTING 819,431											
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Michael Moseley		START DATE 02/14/23		COMP. DATE 02/14/23		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
2590																	
	2,586.7	1.0	4	4	5										GROUND SURFACE	0.0	
2585	2,584.2	3.5	7	6	8									M	ROADWAY EMBANKMENT Brown, loose, sandy silt (A-4), micaceous, trace gravel	5.0	
	2,581.7	6.0	5	7	10									SS-012	40%	2,581.2	6.5
2580	2,579.2	8.5	3	3	3									M	ALLUVIAL Gray-brown, medium dense, sand (A-1-B), fine to medium grained sand	11.0	
	2,577.4	11.0												W	Dark gray, soft, sandy silt (A-4), fine grained sand, micaceous	11.0	
2575	2,574.2	13.5	0	2	2									W		17.0	
2570	2,569.2	18.5	0	2	2									W	Brown-gray, loose, sand (A-1-B), some silt	17.0	
2565	2,564.2	23.5	2	3	3									SS-017	206%	2,564.2	23.5
2560	2,559.2	28.5	6	13	36									W		29.3	
2555	2,554.2	33.5	22	24	35									W	RESIDUAL Gray and white, very dense, gravel (A-1-A), some coarse sand	37.5	
	2,550.2	37.5												W		37.5	
2550	2,549.2	38.5	100/0.7												WEATHERED ROCK White, migmatitic biotite gneiss	38.5	
	2,545.0	42.7	60/0.0												Boring Terminated by Auger Refusal at Elevation 2,545.0 ft on Rock.	42.7	

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

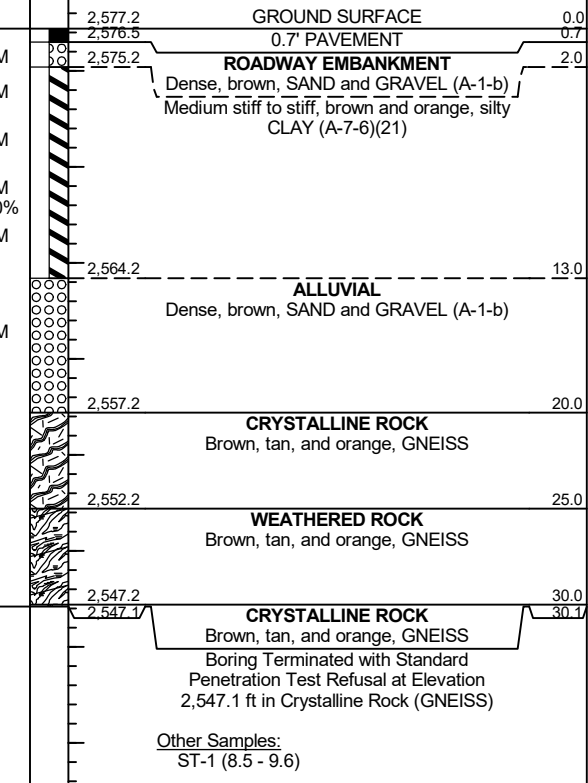
GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Alex Lozada										
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)									
BORING NO. S1_EB1_C		STATION 32+83		OFFSET 56 ft RT		ALIGNMENT L_LT										
COLLAR ELEV. 2,591.3 ft		TOTAL DEPTH 53.0 ft		NORTHING 666,974		EASTING 819,491										
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER Michael Moseley		START DATE 02/14/23		COMP. DATE 02/14/23		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						
2595																
2590	2,590.3	1.0	4	4	5											
	2,587.8	3.5	4	5	6											
2585	2,585.3	6.0	7	6	5											
	2,582.8	8.5	3	2	3											
2580																
	2,577.8	13.5	3	2	3											
2575																
	2,572.8	18.5	1	2	2											
2570																
	2,567.8	23.5	0	1	3											
2565																
	2,562.8	28.5	25	5	5											
2560																
	2,557.8	33.5	21	23	29											
2555																
	2,552.8	38.5	20	16	16											
2550																
	2,547.8	43.5	12	21	25											
2545																
	2,542.8	48.5	40	60												
2540																
	2,538.3	53.0	60/0.0													

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST R. Dugger										
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)									
BORING NO. S1_EB1-A (HDR)		STATION 23+78		OFFSET 30 ft LT		ALIGNMENT L_LT										
COLLAR ELEV. 2,577.2 ft		TOTAL DEPTH 30.1 ft		NORTHING 666,335		EASTING 818,860										
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 03/01/21		COMP. DATE 03/01/21		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						
2580																
	2,576.5	0.7	13	13	6											
2575																
	2,574.7	2.5	3	3	6											
	2,572.2	5.0	3	4	3											
2570																
	2,569.7	7.5	1	2	3											
	2,567.2	10.0	1	2	2											
2565																
	2,562.2	15.0	14	16	19											
2560																
	2,557.2	20.0	60/0.1													
2555																
	2,552.2	25.0	17	20	80/0.4											
2550																
	2,547.2	30.0	60/0.1													

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23



Other Samples:
ST-1 (8.5 - 9.6)

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST R. Dugger										
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)									
BORING NO. S1_EB1-B (HDR)		STATION 23+20		OFFSET 12 ft RT		ALIGNMENT L_RT										
COLLAR ELEV. 2,578.8 ft		TOTAL DEPTH 32.5 ft		NORTHING 666,239		EASTING 818,893										
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER L. Wanstrath		START DATE 01/29/21		COMP. DATE 01/21/21		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						
2580																
	2,578.2	0.6	15	18	10											
2575	2,576.3	2.5	2	3	4											
	2,573.8	5.0	11	11	7											
2570	2,571.3	7.5	1	2	3											
	2,568.8	10.0	2	2	4											
2565	2,563.8	15.0	2	7	14											
2560	2,558.8	20.0	2	2	2											
2555	2,553.8	25.0	2	5	6											
2550	2,548.8	30.0	100/0.5													
	2,546.3	32.5	60/0.0													

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)									
BORING NO. S1_EB1-C (HDR)		STATION 23+46		OFFSET 7 ft RT		ALIGNMENT L_LT										
COLLAR ELEV. 2,575.8 ft		TOTAL DEPTH 25.1 ft		NORTHING 666,287		EASTING 818,871										
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER L. Wanstrath		START DATE 03/09/21		COMP. DATE 03/09/21		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						
2580																
	2,575.8	0.0	2	3	3											
2575	2,573.3	2.5	4	2	3											
	2,570.8	5.0	2	3	4											
2570	2,568.3	7.5	2	2	2											
	2,565.8	10.0	1	1	4											
2565	2,560.8	15.0	6	11	20											
2560	2,555.8	20.0	14	13	21											
	2,551.1	24.7	100/0.3													
	2,550.7	25.1	60/0.0													

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Alex Lozada	
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)
BORING NO. S1_EB2_A		STATION 31+53		OFFSET 71 ft LT		ALIGNMENT L_LT	
COLLAR ELEV. 2,585.4 ft		TOTAL DEPTH 41.3 ft		NORTHING 666,978		EASTING 819,308	
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Michael Moseley		START DATE 02/15/23		COMP. DATE 02/15/23		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2590															
2585	2,584.4	1.0													
	2,581.9	3.5	4	3	4										
2580	2,579.4	6.0	3	2	3										
	2,576.9	8.5	0	0	2										
2575			0	0	3										
	2,571.9	13.5	4	4	5										
2570															
	2,566.9	18.5	3	3	4										
2565															
	2,561.9	23.5	4	8	13										
2560															
	2,556.9	28.5	28	100/0.9											
2555															
	2,551.9	33.5	100/0.3												
2550															
	2,546.9	38.5	100/0.3												
2545															
	2,544.1	41.3	60/0.0												

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST Alex Lozada	
SITE DESCRIPTION Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74							GROUND WTR (ft)
BORING NO. S1_EB2_B		STATION 34+10		OFFSET 16 ft RT		ALIGNMENT L_LT	
COLLAR ELEV. 2,607.3 ft		TOTAL DEPTH 45.7 ft		NORTHING 667,083		EASTING 819,563	
DRILL RIG/HAMMER EFF./DATE SUM3123 CME-550X 91% 11/19/2020				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER Michael Moseley		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.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2610															
	2,606.3	1.0													
2605			5	4	4										
	2,603.8	3.5	4	3	3										
2600			0	0	1										
	2,598.8	8.5	2	3	3										
2595															
	2,593.8	13.5	2	2	2										
2590															
	2,588.8	18.5	4	3	5										
2585															
	2,583.8	23.5	0	2	2										
2580															
	2,578.8	28.5	2	2	3										
2575															
	2,573.8	33.5	3	4	5										
2570															
	2,568.8	38.5	3	4	4										
2565															
	2,563.8	43.5	12	12	29										
	2,561.6	45.7	60/0.0												

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST C. Swafford									
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)								
BORING NO. S1_EB2-A (HDR)		STATION 26+08		OFFSET 30 ft LT		ALIGNMENT L_LT									
COLLAR ELEV. 2,580.0 ft		TOTAL DEPTH 27.0 ft		NORTHING 666,518		EASTING 818,995									
DRILL RIG/HAMMER EFF./DATE GTC3277 CME-75 83% (09/15/2020)			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER K. Boone		START DATE 02/28/21		COMP. DATE 02/28/21		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					
2580	2,579.1	0.9	14	19	9									2,580.0 GROUND SURFACE 0.0	
	2,579.1													2,579.1 0.9' PAVEMENT 0.9	
	2,576.5	3.5	6	3	4									ROADWAY EMBANKMENT Loose to medium dense, brown, SAND (A-3), with some gravel	5.5
2575	2,574.2	5.8	4	3	3									Soft to medium stiff, gray, SILT (A-4), contains trace root fragments, micaceous, organic odor	
	2,571.5	8.5	2	1	1										
2570	2,566.5	13.5	2	1	2									Soft, gray, CLAY (A-7-6), contains trace wood fragments, micaceous	12.0
	2,561.5	18.5	4	6	12									ALLUVIAL Very loose, gray, SAND and GRAVEL (A-1-b)	17.0
2565	2,556.5	23.5	13	21	33									RESIDUAL Very dense, brown, orange, and white, silty SAND (A-2-4), saprolitic	22.0
	2,553.0	27.0	60/0.0											Boring Terminated with Standard Penetration Test Refusal at Elevation 2,553.0 ft on Crystalline Rock (GNEISS)	27.0
NOTES Shelby tube obtained from 6.0'-8.0' Shelby tube obtained from 13.5'-15.5' Rig chatter and grinding at 27.0'															

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST R. Dugger									
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)								
BORING NO. S1_EB2-B (HDR)		STATION 25+59		OFFSET 20 ft RT		ALIGNMENT L_RT									
COLLAR ELEV. 2,577.5 ft		TOTAL DEPTH 45.4 ft		NORTHING 666,426		EASTING 819,039									
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 01/28/21		COMP. DATE 01/28/21		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					
2580	2,577.5													2,577.5 GROUND SURFACE 0.0	
	2,576.6	0.9	11	10	5									ROADWAY EMBANKMENT 0.9' PAVEMENT 0.9	
	2,575.0	2.5	4	2	4									ROADWAY EMBANKMENT Medium dense, brown and orange, SAND and GRAVEL (A-1-b) 4.5	2.5
2575	2,572.5	5.0	2	4	5									Loose, brown and orange, clayey SAND (A-2-6)	4.5
	2,570.0	7.5	4	2	3									Medium stiff to stiff, brown and orange, sandy SILT (A-4), micaceous	
2570	2,567.5	10.0	5	3	4										
	2,562.5	15.0	9	9	6									ALLUVIAL Medium dense, brown and gray, clayey SAND (A-2-6), with little gravel	13.0
2565	2,559.5	18.0	6	12	20									RESIDUAL Dense, brown and white, SAND (A-3), contains trace rock fragments, saprolitic	18.0
	2,554.5	23.0	4	7	11									Medium dense, brown, orange and white, clayey SAND (A-2-7), contains little rock fragments, micaceous	23.0
2560	2,549.5	28.0	52	40	45									Very dense, brown and orange with black, silty SAND (A-2-4)	28.0
	2,542.5	35.0	100/0.3											WEATHERED ROCK Brown and orange, GNEISS	35.0
2555	2,537.5	40.0	100/0.2												
	2,532.5	45.0	100/0.4											Boring Terminated at Elevation 2,532.1 ft in Weathered Rock (GNEISS)	45.4

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)								
BORING NO. S1_EB2-C (HDR)		STATION 25+66		OFFSET 19 ft RT		ALIGNMENT L_LT									
COLLAR ELEV. 2,577.1 ft		TOTAL DEPTH 27.5 ft		NORTHING 666,456		EASTING 819,011									
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 03/10/21		COMP. DATE 03/10/21		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					
2580	2,577.1	0.0	1	2	1									2,577.1	0.0
2575	2,574.6	2.5	3	4	3									2,572.6	4.5
2570	2,572.1	5.0	2	1	2									2,570.1	7.0
2565	2,569.6	7.5	1	1	2									2,564.1	13.0
2560	2,567.1	10.0	1	1	3									2,562.1	15.0
2555	2,562.1	15.0	5	10	8									2,557.1	20.0
2550	2,557.1	20.0	25	15	6									2,552.1	25.0
	2,552.1	25.0	100/0.5											2,549.6	27.5
	2,549.6	27.5	60/0.0												60/0.0

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST C. Swafford									
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)								
BORING NO. S2_B1-A (HDR)		STATION 31+78		OFFSET 5 ft RT		ALIGNMENT L_LT									
COLLAR ELEV. 2,586.8 ft		TOTAL DEPTH 65.0 ft		NORTHING 666,942		EASTING 819,380									
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)			DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 02/26/21		COMP. DATE 02/27/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
2590	2,586.8	0.0												2,586.8	0.0
2585	2,584.3	2.5	3	3	3									2,584.3	2.5
2580	2,581.8	5.0	5	10	10									2,579.3	7.5
2575	2,579.3	7.5	2	1	3									2,576.8	10.0
2570	2,576.8	10.0	1	2	3									2,571.8	15.0
2565	2,571.8	15.0	1	WOH	1									2,566.8	20.0
2560	2,566.8	20.0	1	1	2									2,561.8	25.0
2555	2,561.8	25.0	60/0.1											2,558.8	28.0
2550	2,556.8	30.0	11	13	16									2,551.8	35.0
2545	2,551.8	35.0	14	40	60/0.4									2,546.8	40.0
2540	2,546.8	40.0	100/0.4											2,541.8	45.0
2535	2,541.8	45.0	60/0.0												
2530															
2525															
														2,521.8	65.0

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

NOTES
0.5' topsoil

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST R. Dugger								
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)							
BORING NO. S2_B1-B (HDR)		STATION 31+70		OFFSET 45 ft RT		ALIGNMENT L_LT								
COLLAR ELEV. 2,584.7 ft		TOTAL DEPTH 62.8 ft		NORTHING 666,908		EASTING 819,403								
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)				DRILL METHOD SPT Core Boring		HAMMER TYPE Automatic								
DRILLER L. Wanstrath		START DATE 02/10/21		COMP. DATE 02/27/21		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2585	2,584.7	0.0	2	4	5							M	GROUND SURFACE	0.0
	2,582.2	2.5	7	12	11							D	ROADWAY EMBANKMENT Stiff, brown and orange, clayey SILT (A-5), micaceous	2.9
2580	2,579.7	5.0	18	18	16							D	Medium dense, brown, clayey SAND (A-2-6) with trace gravel	4.5
	2,577.2	7.5	4	4	4							D	Dense, brown and gray, silty SAND (A-2-4) with little gravel, micaceous	7.0
2575	2,574.7	10.0	2	2	3							M	ALLUVIAL Loose, brown and gray, silty SAND (A-2-4), micaceous	13.0
2570	2,569.7	15.0	1	1	1							SS-222	Very soft, gray, silty CLAY (A-7-5)(16) and SILT (A-5)(13), micaceous	18.0
2565	2,564.7	20.0	WOH	WOH	1							W	Very loose, brown and gray, silty SAND (A-2-4)	21.1
2560	2,559.7	25.0	7	5	2							Sat.	Very soft, brown and gray, CLAY (A-7-6)	23.0
2555	2,554.7	30.0	9	16	14							D	Loose, gray, SAND and GRAVEL (A-1-b)	28.0
2550	2,549.7	35.0	15	15	14							D	RESIDUAL Medium dense to dense, brown, white, and tan, silty SAND (A-2-4) with little rock fragments	33.0
2545	2,544.7	40.0	100/0.5									D	Very stiff, brown, orange, and tan, sandy SILT (A-4) with little rock fragments, micaceous, saprolitic	40.0
	2,542.2	42.5	60/0.0										WEATHERED ROCK Brown, gray, and white, GNEISS	42.0
2540													CRYSTALLINE ROCK No Recovery, begin rock coring at 42.0' Light to dark gray and white with trace pink, Migmatic Biotite GNEISS	
2535												RS-13		
2530														
2525													Grey and white, METAGRAYWACKE and QUARTZITE	58.1
													Boring Terminated at Elevation 2,521.9 ft in Crystalline Rock (METAGRAYWACKE and QUARTZITE)	62.8
<p>NOTES</p> <p>15.0- 17.0': ST-2 lab classified as (A-7-5)(16) in offset hole ~3' upstation</p> <p>15.0 - 16.5': SS-222 lab classified as (A-5)(13)</p> <p>Other Samples: ST-2 (15.0 - 17.0)</p>														

NCDOT BORE DOUBLE B-5898 AECOM + HDR RELEVANT LOGS.GPJ NC_DOT.GDT 8/31/23

WBS 48030.1.FS1		TIP B-5898/B-3186		COUNTY HAYWOOD		GEOLOGIST C. Swafford								
SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway)							GROUND WTR (ft)							
BORING NO. S2_EB1-A (HDR)		STATION 30+87		OFFSET 53 ft LT		ALIGNMENT L_LT								
COLLAR ELEV. 2,584.6 ft		TOTAL DEPTH 34.5 ft		NORTHING 666,917		EASTING 819,274								
DRILL RIG/HAMMER EFF./DATE GTC9083 CME-550X 80% (11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER L. Wanstrath		START DATE 02/25/21		COMP. DATE 02/25/21		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2585	2,584.6	0.0	5	7	4							M	GROUND SURFACE	0.0
	2,582.1	2.5	3	4	4							M	ROADWAY EMBANKMENT Medium dense, brown, f SAND (A-2-4), with trace gravel	1.0
2580	2,579.6	5.0	6	5	6							M	Soft, brown and orange, CLAY (A-7)	4.5
	2,577.1	7.5	3	3	3							Sat.	Loose to medium dense, gray, f-c SAND (A-2-4)	7.0
2575	2,574.6	10.0	3	2	2							SS-513	ALLUVIAL Soft, gray, SILT (A-5)(9), micaceous	10.0
2570	2,569.6	15.0	1	WOH	1							W	Very loose, gray, f silty SAND (A-2-4), micaceous	13.0
2565	2,564.6	20.0	1	1	2							W	Soft, gray, f sandy SILT (A-4), micaceous	18.0
2560	2,559.6	25.0	4	7	11							W	RESIDUAL Very stiff, brown and orange, f sandy SILT (A-4), micaceous, saprolitic	23.0
2555	2,554.6	30.0	90	10/0.1								W	WEATHERED ROCK Brown, orange, and white, GNEISS	30.0
	2,550.1	34.5	60/0.0										Boring Terminated with Standard Penetration Test Refusal at Elevation 2,550.1 ft on Crystalline Rock (GNEISS)	34.5
<p>Other Samples: ST-4 (15.0 - 17.0)</p>														

REFERENCE: B-5898/B-3186

PROJECT: 48030

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

SUBSURFACE INVESTIGATION

***APPENDIX B
SOIL TEST RESULTS***



SOIL TEST RESULTS

Soil Classification and Gradation


5438 Wade Park Blvd Suite 200, Raleigh, NC 27607

WBS No.: 48030.1.FS1
 Project Description: Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74
 Client Name: NCDOT

County: Haywood
 TIP No: B-5898/B-3186

BORING NO.	SAMPLE NO.	OFFSET	STATION	ALIGNMENT	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.L.	P.I.	% BY WEIGHT				% FINER (SIEVES)			% MOISTURE	% ORGANICS
										GRAVEL	C. SAND	F. SAND	FINES	10	40	200		
L_2700SPT (HDR)	SS-547	12' LT	9+16	L_LT	15.0-16.5	A-6 (10)	38	23	15	0.00	17.50	29.70	52.80	93.50	84.20	72.00	21.0	-
RW2_1	SS-120	19' LT	10+00	L_LT	8.5-10.0	A-4 (0)	0	0	0	1.72	16.88	27.84	53.57	98.28	81.41	53.57	24.4	-
RW2_2	SS-127	17' LT	10+51	L_LT	18.5-20.0	A-4 (0)	0	0	0	0.96	3.98	27.83	67.23	99.04	95.07	67.23	31.5	-
RW2_3	SS-132	18' LT	11+01	L_LT	8.5-10.0	A-4 (0)	0	0	0	0.60	19.99	41.89	37.53	99.40	79.41	37.53	20.7	-
RW2_4	SS-136	17' LT	11+49	L_LT	1.0-2.5	A-4 (0)	0	0	0	1.10	19.95	41.63	37.33	98.90	78.96	37.33	19.3	-
RW2_5	SS-141	18' LT	11+99	L_LT	3.5-5.0	A-4 (0)	0	0	0	0.26	10.70	39.23	49.81	99.74	89.04	49.81	21.3	-
RW2_6	SS-148	18' LT	12+50	L_LT	3.5-5.0	A-4 (1)	36	32	4	0.14	9.46	37.16	53.24	99.86	90.40	53.24	17.9	-
RW2_6	SS-152	18' LT	12+50	L_LT	18.5-20.0	A-4 (0)	0	0	0	0.01	4.09	26.98	68.91	99.99	95.89	68.91	30.2	-
RW2_7	SS-158	16' LT	13+00	L_LT	13.5-15.5	A-4 (0)	0	0	0	0.00	6.47	43.42	50.11	100.00	93.53	50.11	24.9	-
RW2_8	SS-163	17' LT	13+51	L_LT	6.0-7.5	A-4 (0)	0	0	0	1.07	9.64	41.75	47.54	98.93	89.29	47.54	14.1	-
RW2_9	SS-169	13' LT	14+00	L_LT	3.5-5.0	A-4 (0)	0	0	0	0.76	10.69	42.26	46.29	99.24	88.55	46.29	22.7	-
RW2_10	SS-176	14' LT	14+51	L_LT	6.0-7.5	A-4 (0)	39	37	2	0.27	19.31	40.07	40.35	99.73	80.43	40.35	18.9	-
RW2_11	SS-180	15' LT	14+98	L_LT	1.0-2.5	A-4 (0)	0	0	0	1.19	20.83	35.56	42.42	98.81	77.98	42.42	16.5	-
RW2_12	SS-187	17' LT	15+47	L_LT	3.5-5.0	A-4 (0)	0	0	0	0.29	5.59	37.59	56.52	99.71	94.11	56.52	21.5	-
RW2_13	SS-193	18' LT	16+05	L_LT	6.0-7.5	A-2-4 (0)	0	0	0	5.17	22.05	41.30	31.48	94.83	72.79	31.48	-	-
L_3500SPT (HDR)	ST-7	54' LT	16+95	L_LT	3.5-5.5	A-7-5 (16)	53	34	19	0.00	12.40	12.20	75.40	99.10	91.70	75.00	34.0	-
L_3700SPT (HDR)	SS-1011	20' LT	18+90	L_LT	5.0-6.5	A-7-5 (8)	49	32	17	0.00	23.90	20.60	55.50	90.60	76.40	54.60	28.0	-
L_LT_2007	SS-201	5 RT	20+07	L_LT	1.0-2.5	A-7-5 (5)	45	33	12	5.88	10.31	30.23	53.58	94.12	83.81	53.58	28.8	-
L_LT_2007	SS-203	5 RT	20+07	L_LT	6.0-7.5	A-7-5 (6)	44	32	12	1.22	9.94	29.90	58.94	98.78	88.84	58.94	25.1	-
L_LT_2206	SS-196	3' RT	22+06	L_LT	3.5-5.0	A-6 (4)	40	28	12	1.29	12.06	34.47	52.18	98.71	86.65	52.18	28.7	-
L_LT_2206	SS-199	3' RT	22+06	L_LT	13.5-15.0	A-1-A (1)	0	0	0	53.70	17.96	21.44	6.90	46.30	28.33	6.90	-	-
S1_EB1-A (HDR)	ST-1	30' LT	23+78	L_LT	8.5-9.6	A-7-6 (21)	24	27	0.00	7.80	19.60	72.60	98.90	86.80	75.40	26.0	-	-
RW5_1	SS-245	25' RT	26+29	L_LT	8.5-10.0	A-7-5 (25)	66	47	19	0.00	0.80	9.10	90.10	100.00	99.20	90.10	79.7	-
RW5_2	SS-235	28' RT	26+79	L_LT	3.5-5.0	A-2-4 (0)	0	0	0	2.18	18.88	51.90	27.03	97.82	78.93	27.03	-	-
RW5_3	SS-231	29' RT	27+29	L_LT	8.5-10.0	A-5 (7)	51	42	9	0.00	2.28	32.98	64.74	100.00	97.72	64.74	74.6	-
RW5_4	SS-224	31' RT	27+81	L_LT	8.5-10.0	A-7-5 (17)	63	49	14	0.00	0.84	17.18	81.98	100.00	99.16	81.98	68.6	-
RW5_5	SS-219	32' RT	28+29	L_LT	18.5-20.0	A-1-A (1)	0	0	0	64.18	14.39	14.32	7.12	35.82	21.43	7.12	-	-
RW5_6	SS-209	33' RT	28+80	L_LT	6.0-7.5	A-2-4 (0)	0	0	0	11.85	21.66	44.09	22.40	88.15	66.49	22.40	-	-
RW5_7	SS-110	36' RT	29+30	L_LT	3.5-5.0	A-4 (0)	0	0	0	4.56	17.19	39.16	39.09	95.44	78.25	39.09	22.4	-
RW5_8	SS-101	17' LT	13+51	L_LT	3.5-5.0	A-4 (0)	34	6	4.43	16.72	42.20	36.65	95.57	78.85	36.65	20.9	-	-
RW5_8	SS-103	43' RT	29+77	L_LT	8.5-10.0	A-2-4 (0)	0	0	0	3.73	14.24	58.88	23.15	96.27	82.03	23.15	-	-
RW5_9	SS-90	47' RT	30+29	L_LT	1.0-2.5	A-4 (0)	0	0	0	8.60	14.01	40.63	36.76	91.40	77.40	36.76	23.6	-
RW5_10	SS-81	50' RT	30+81	L_LT	8.5-10.0	A-2-4 (0)	0	0	0	5.15	13.59	63.88	17.38	94.85	81.26	17.38	-	-
S2_EB1-A (HDR)	SS-513	53' LT	30+87	L_LT	10.0-11.5	A-5 (9)	48	38	10	0.00	4.10	32.50	63.40	100.00	98.00	74.10	51.0	-
S2_EB1-A (HDR)	ST-4	53' LT	30+87	L_LT	15.0-17.0	A-2-4	27	21	6	0.00	41.20	30.80	28.00	94.40	66.30	31.20	-	-
RW5_11	SS-252	54' RT	31+31	L_LT	6.0-7.5	A-2-4 (0)	0	0	0	5.42	17.87	54.99	21.72	94.58	76.71	21.72	-	-
S1_EB1_A	SS-003	13' LT	31+44	L_LT	6.0-7.5	A-7-6 (12)	48	24	24	1.81	9.71	28.45	60.04	98.19	88.49	60.04	24.2	40.2
S1_EB1_A	SS-007	13' LT	31+44	L_LT	23.5-25.0	A-2-6 (1)	32	17	15	31.43	10.19	39.01	33.62	68.57	58.38	33.62	-	-
S1_EB1_A	ST-001	13' LT	31+44	L_LT	15.0-17.0	A-6 (8)	38	25	13	0.45	8.83	22.07	68.64	99.55	90.72	68.64	45.5	-
S1_EB2_A	SS-38	71' LT	31+53	L_LT	8.5-10.0	A-7-6 (13)	50	28	22	0.04	13.00	22.82	64.14	99.96	86.96	64.14	31.1	-
S1_EB2_A	SS-40	71' LT	31+53	L_LT	18.5-20.0	A-4 (0)	0	0	0	1.34	15.78	33.29	49.59	98.66	82.88	49.59	18.6	-
S1_EB1_B	SS-12	31' RT	32+24	L_LT	3.5-5.0	A-4 (0)	0	0	0	19.99	12.39	30.65	36.97	80.01	67.62	36.97	40.1	0.2
S1_EB1_B	SS-17	31' RT	32+24	L_LT	23.5-25.0	A-4 (0)	0	0	0	0.02	4.68	19.89	75.41	99.98	95.31	75.41	205.7	-
S2_B1-B (HDR)	SS-222	45' RT	31+70	L_LT	13.5-15.0	A-5 (13)	41	10	0.00	26.80	36.00	37.20	86.60	72.30	36.70	43.0	-	-
S2_B1-B (HDR)	ST-2	45' RT	31+70	L_LT	15.0-17.0	A-7-5 (16)	46	11	0.00	1.30	14.30	84.40	100.00	99.60	87.30	68.0	-	-

SOIL TEST RESULTS
Soil Classification and Gradation



5438 Wade Park Blvd Suite 200, Raleigh, NC 27607

WBS No.: 48030.1.FS1
Project Description: Bridges 430155 and 430158 over Richland Creek and Bridge 430168 over US 19/23 on US 23-74
Client Name: NCDOT

County: Haywood
TIP No: B-5898/B-3186

BORING NO.	SAMPLE NO.	OFFSET	STATION	ALIGNMENT	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.L.	P.I.	% BY WEIGHT				% FINER (SIEVES)			% MOISTURE	% ORGANICS
										GRAVEL	C. SAND	F. SAND	FINES	10	40	200		
S1_EB1_C	SS-25	56' RT	32+83	L_LT	8.5-10.0	A-6 (7)	40	22	18	1.29	11.72	33.46	53.54	98.71	87.00	53.54	29.1	-
S1_EB1_C	SS-26	56' RT	32+83	L_LT	13.5-15.0	A-2-4 (0)	0	0	0	0.10	5.32	68.58	25.99	99.90	94.58	25.99	-	-
S1_EB2_B	SS-68	16' RT	34+10	L_LT	6.0-7.5	A-4 (2)	36	26	10	5.60	17.19	32.70	44.50	94.40	77.20	44.50	25.8	-
S1_EB2_B	SS-74	16' RT	34+10	L_LT	33.5-35.0	A-4 (2)	27	18	9	2.73	15.00	33.51	48.76	97.27	82.27	48.76	18.0	1.2
RW-8_1	SS-56	56' RT	34+27	L_LT	1.0-2.5	A-7-5 (5)	49	30	19	9.87	12.18	32.15	45.80	90.13	77.95	45.80	22.8	-
RW-8_1	SS-60	56' RT	34+27	L_LT	13.5-15.0	A-4 (0)	0	0	0	1.61	13.97	35.05	49.37	98.39	84.42	49.37	36.5	-
RW-8_2	SS-54	65' RT	34+78	L_LT	33.5-35.0	A-6 (8)	37	19	18	4.29	11.04	24.70	59.97	95.71	84.66	59.97	29.6	-
RW8_2 (HDR)	SS-2	19' RT	11+74	L_RT	2.5-4.0	A-6 (2)	34	21	13	0.00	33.60	31.10	35.30	96.00	76.00	41.00	15.0	-
RW3_1	SS-266	142' RT	12+56	L_RT	18.5-20.0	A-5 (3)	53	44	9	0.03	7.14	46.72	46.11	99.97	92.83	46.11	23.3	-
RW3_1	SS-268	142' RT	12+56	L_RT	28.5-30.0	A-2-4 (0)	0	0	0	8.40	16.15	40.24	35.21	91.60	75.45	35.21	-	-
RW3_2	SS-282	235' RT	13+94	L_RT	18.5-20.0	A-4(0)	33	29	4	2.36	18.22	41.66	37.75	97.64	79.42	37.75	9.4	-
RW8_8 (HDR)	SS-4	20' RT	14+88	L_RT	7.5-9.0	A-2-4 (0)	28	22	6	0.00	54.40	23.40	22.20	87.70	50.70	24.30	10.0	-
RW8_10 (HDR)	SS-3	17' RT	15+90	L_RT	2.5-4.0	A-2-5 (1)	44	37	7	0.00	54.20	24.30	21.50	95.10	55.90	25.70	-	-
L_RT_1896	SS-274	168' RT	18+96	L_RT	3.5-5.0	A-6 (1)	40	26	14	27.30	12.79	24.04	35.87	72.70	59.91	35.87	20.3	-
S1_EB1-B (HDR)	ST-8	12' RT	23+20	L_RT	7.5-9.1	A-6 (8)	39	19	20	0.00	29.10	11.00	59.90	91.40	70.30	55.10	28.0	-
S1_EB1-B (HDR)	SS-50	12' RT	23+20	L_RT	7.5-7.0	A-6 (16)	40	20	20	0.00	14.00	10.30	75.70	99.70	90.90	80.90	63.0	-
S1_EB2-B (HDR)	SS-5	20' RT	25+59	L_RT	10.0-11.5	A-4 (1)	34	25	9	0.00	35.70	25.10	39.20	93.20	71.20	43.30	28.0	-
S1_EB2-B (HDR)	SS-8	20' RT	25+59	L_RT	25.0-26.5	A-2-7 (4)	52	22	30	0.00	47.30	29.70	23.00	91.90	58.90	28.60	18.0	-
RW6_5	SS-328	16' RT	31+50	L_RT	18.5-20.0	A-4 (0)	0	0	0	3.25	14.01	32.45	50.29	96.75	82.74	50.29	47.2	-
RW6_6	SS-335	18' RT	32+50	L_RT	13.5-15.0	A-4 (0)	0	0	0	7.61	10.86	29.30	52.23	92.39	81.53	52.23	26.7	-
RW6_6	SS-337	18' RT	32+50	L_RT	6.0-7.5	A-2-4 (0)	0	0	0	0.14	3.75	63.81	32.30	99.86	96.11	32.30	-	-

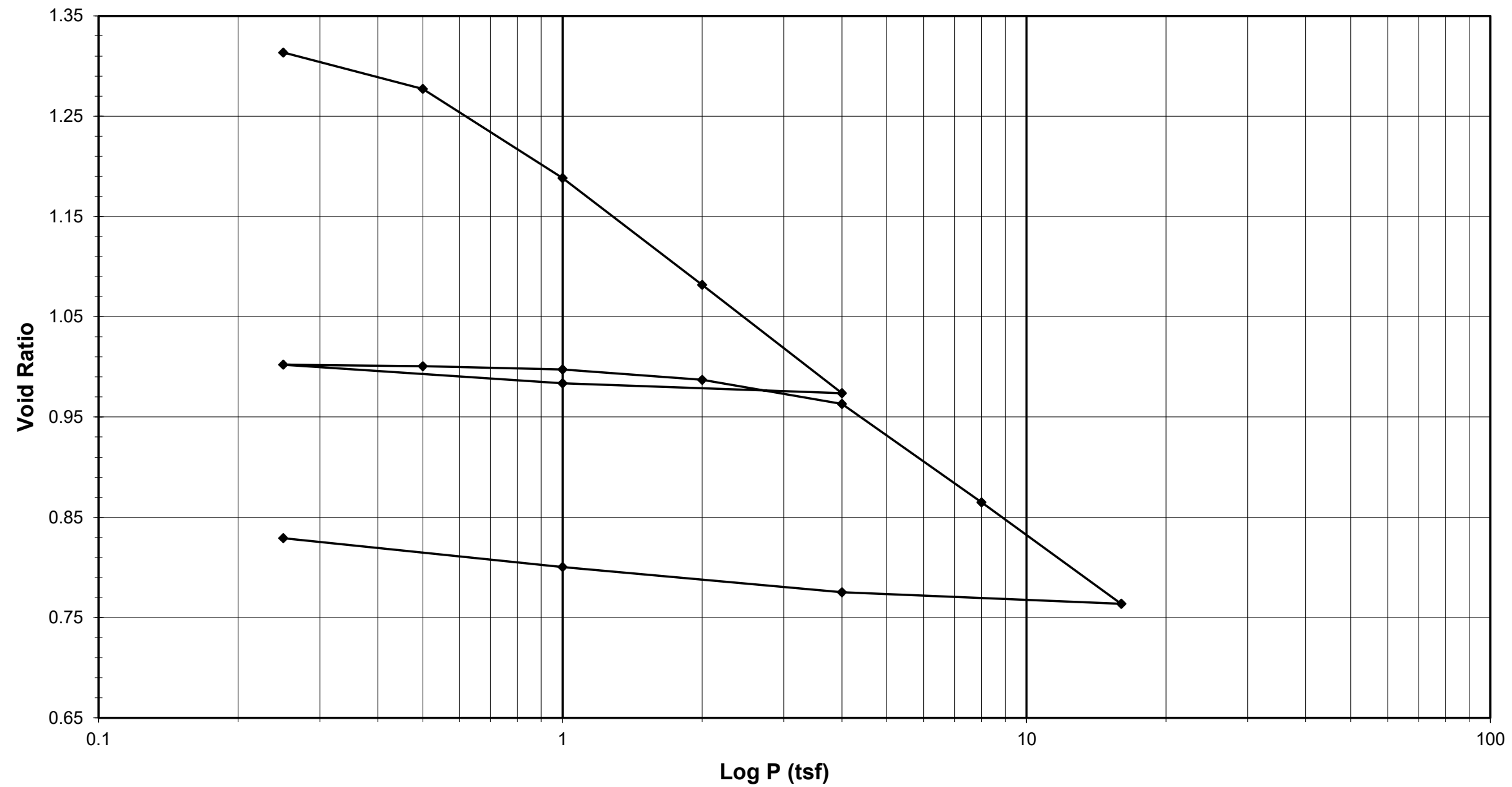
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM
 Client Project: B-5898 / B-3186
 Project No.: R-2023-090-001
 Lab ID: R-2023-090-001-048

Boring No.: S1_EB1_A
 Depth (ft): 15.0-17.0
 Sample No.: ST-1
 Visual Description: Brown Sandy Silt

Sample Conditions: Undisturbed, Inundated, Double Drained



Tested By MY Date 4/4/23 Approved By MPS Date 4/21/23



ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM
 Client Project: B-5898 / B-3186
 Project No.: R-2023-090-001
 Lab ID: R-2023-090-001-048

Boring No.: S1_EB1_A
 Depth (ft): 15.0-17.0
 Sample No.: ST-1
 Visual Description: Brown Sandy Silt

Sample Conditions: Undisturbed, Inundated, Double Drained

Consolidometer No. R470
1 Division = 0.0001 (in.)

<u>Sample Properties</u>	<u>Initial</u>	<u>Final</u>	<u>Test Data Summary</u>							
Water Content			Applied Pressure	Final Dial Reading	Machine Deflection	Corrected Reading	Height of Sample	Volume	Dry Density	Void Ratio
			(tsf)	(div)	(div)	(div)	(mm)	(cm ³)	(g/cm ³)	
Tare Number	490	720								
Wt. of Tare & WS (g)	256.44	209.25								
Wt. of Tare & DS (g)	207.21	181.94								
Wt. of Water (g)	49.23	27.31	Seating	0	0	0	25.400	80.440	1.13137	1.36881
Wt. of Tare (g)	99.05	89.89	0.25	242.8	8.9	233.9	24.806	78.559	1.15846	1.31341
Wt. of DS (g)	108.16	92.05	0.5	407.5	21.1	386.4	24.418	77.331	1.17685	1.27727
Water Content (%)	45.52	29.67	1	798.7	36.0	762.7	23.463	74.304	1.22479	1.18813
			2	1265.4	53.3	1212.1	22.321	70.689	1.28743	1.08167
			4	1743.6	76.0	1667.6	21.164	67.026	1.35779	0.97379
Sample Parameters			1	1670.3	43.7	1626.6	21.268	67.356	1.35115	0.98350
Sample Diameter (in)	2.5	2.5	0.25	1570.6	23.4	1547.2	21.470	67.994	1.33845	1.00231
Sample Height (in)	1.0000	0.7722	0.5	1581.7	27.8	1553.9	21.453	67.940	1.33952	1.00072
Sample Volume (cm ³)	80.44	62.12	1	1607.3	39.9	1567.4	21.419	67.831	1.34167	0.99751
Wt. of Wet Sample + Ring (g)	347.10	332.68	2	1666.1	55.0	1611.1	21.308	67.480	1.34866	0.98716
Wt. of Ring (g)	214.67	214.67	4	1789.6	76.4	1713.2	21.048	66.659	1.36527	0.96298
Wt. of Wet Sample (g)	132.43	118.01	8	2223.9	96.8	2127.2	19.997	63.329	1.43706	0.86492
Wet Density (pcf)	102.73	118.55	16	2689.8	135.5	2554.3	18.912	59.893	1.51950	0.76374
Wet Density (g/cm ³)	1.65	1.90	4	2590.4	84.2	2506.2	19.034	60.280	1.50974	0.77514
Water Content (%)	45.52	29.67	1	2451.4	52.3	2399.1	19.306	61.141	1.48848	0.80050
Wt. of Dry Sample (g)	91.01	91.01	0.25	2306.4	28.5	2277.9	19.614	62.116	1.46511	0.82921
Dry Density (pcf)	70.60	91.42								
Dry Density (g/cm ³)	1.13	1.47								
Void Ratio	1.3688	0.8292								
Saturation (%)	89.12	95.89								
Specific Gravity	2.68	<i>Measured</i>								
			<i>Tested By</i>	<i>MY</i>	<i>Date</i>	<i>4/4/23</i>	<i>Checked By</i>	<i>MPS</i>	<i>Date</i>	<i>4/21/23</i>



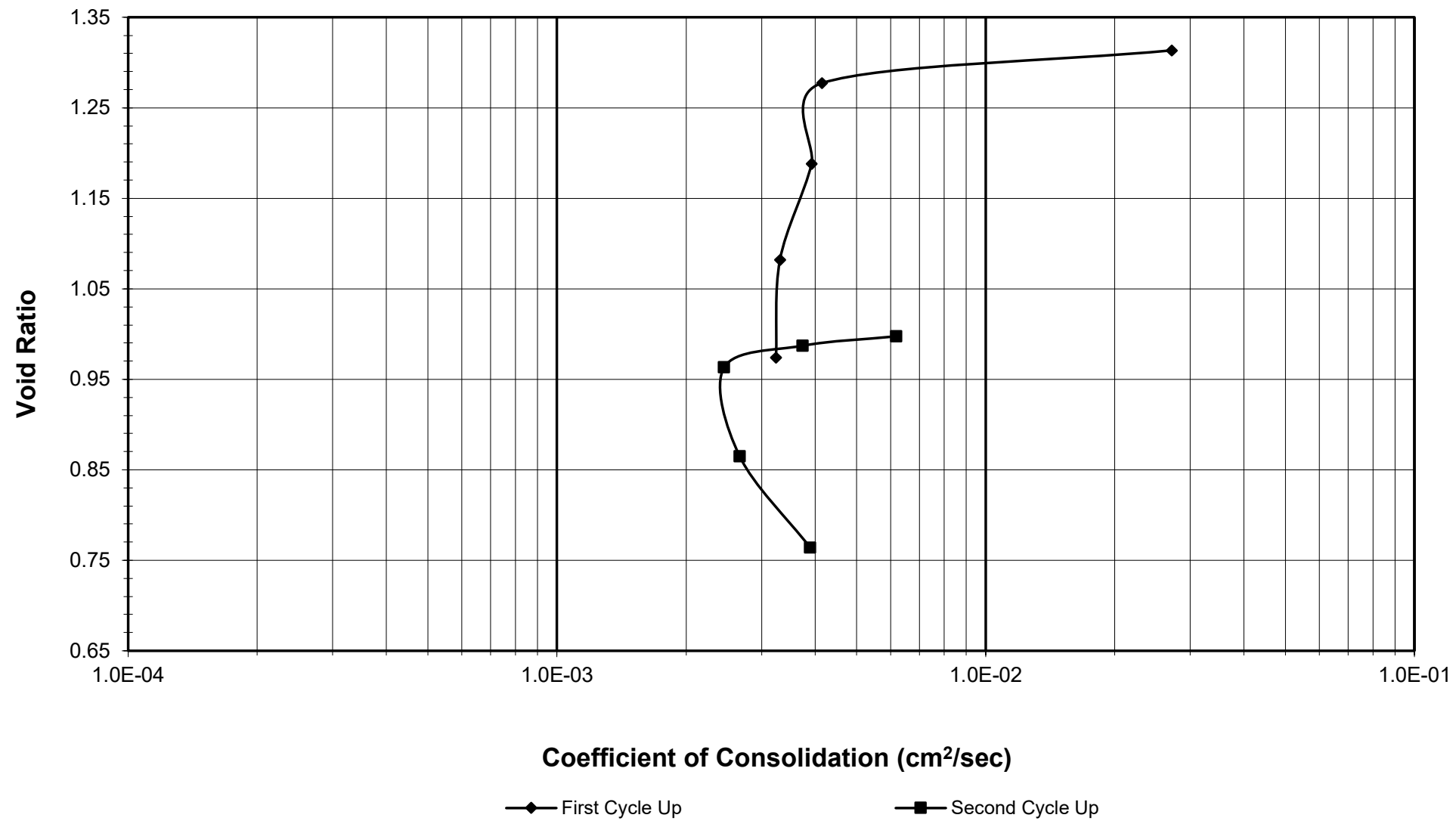
ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM
 Client Project: B-5898 / B-3186
 Project No.: R-2023-090-001
 Lab ID: R-2023-090-001-048

Boring No.: S1_EB1_A
 Depth (ft): 15.0-17.0
 Sample No.: ST-1
 Visual Description: Brown Sandy Silt

Sample Conditions: Undisturbed, Inundated, Double Drained



Tested By MY Date 4/4/23 Checked By MPS Date 4/21/23



ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM
 Client Project: B-5898 / B-3186
 Project No.: R-2023-090-001
 Lab ID: R-2023-090-001-048

Boring No.: S1_EB1_A
 Depth (ft): 15.0-17.0
 Sample No.: ST-1
 Visual Description: Brown Sandy Silt

Sample Conditions: Undisturbed, Inundated, Double Drained

Consolidometer No. R470
1 Division = 0.0001 (in.)

C_v Test Data Summary

<u>Sample Properties</u>	<u>Initial</u>	<u>Final</u>	<u>Load Increment</u>	<u>Dial Reading @ t₅₀</u>	<u>Machine Deflection</u>	<u>Corrected Dial Reading @ t₅₀</u>	<u>Sample Height @ t₅₀</u>	<u>Time t₅₀</u>	<u>C_v</u>
			(tsf)	(div)	(div)	(div)	(cm)	(min.)	(cm ² /sec)
Water Content									
Tare Number	490	720							
Wt. of Tare & WS (g)	256.44	209.25							
Wt. of Tare & DS (g)	207.21	181.94							
Wt. of Water (g)	49.23	27.31	0 - 0.25	141.5	8.9	132.6	2.506	0.19	0.0271
Wt. of Tare (g)	99.05	89.89	0.25 - 0.5	318.1	21.1	297.0	2.465	1.20	0.0042
Wt. of DS (g)	108.16	92.05	0.5 - 1	603.0	36.0	567.0	2.396	1.20	0.0039
Water Content (%)	45.52	29.67	1 - 2	1035.1	53.3	981.8	2.291	1.30	0.0033
			2 - 4	1506.8	76.0	1430.8	2.177	1.20	0.0032
			4 - 1	NA	NA	NA	NA	NA	NA
Sample Parameters									
Sample Diameter (in)	2.5	2.5	1 - 0.25	NA	NA	NA	NA	NA	NA
Sample Height (in)	1.0000	0.7722	0.25 - 0.5	NA	NA	NA	NA	NA	NA
Sample Volume (cm ³)	80.44	62.12	0.5 - 1	1598.2	39.9	1558.3	2.144	0.61	0.0062
Wt. of Wet Sample + Ring (g)	347.10	332.68	1 - 2	1651.0	55.0	1596.0	2.135	1.00	0.0037
Wt. of Ring (g)	214.67	214.67	2 - 4	1740.5	76.4	1664.1	2.117	1.50	0.0025
Wt. of Wet Sample (g)	132.43	118.01	4 - 8	2003.2	96.8	1906.4	2.056	1.30	0.0027
Wet Density (pcf)	102.73	118.55	8 - 16	2461.4	135.5	2325.9	1.949	0.80	0.0039
Wet Density (g/cm ³)	1.65	1.90	16 - 4	NA	NA	NA	NA	NA	NA
Water Content (%)	45.52	29.67	4 - 1	NA	NA	NA	NA	NA	NA
Wt. of Dry Sample (g)	91.01	91.01	1 - 0.25	NA	NA	NA	NA	NA	NA
Dry Density (pcf)	70.60	91.42							
Dry Density (g/cm ³)	1.13	1.47							
Void Ratio	1.3688	0.8292							
Saturation (%)	89.12	95.89							
Specific Gravity	2.68	<i>Measured</i>							

Tested By MY Date 4/4/23 Checked By MPS Date 4/21/23

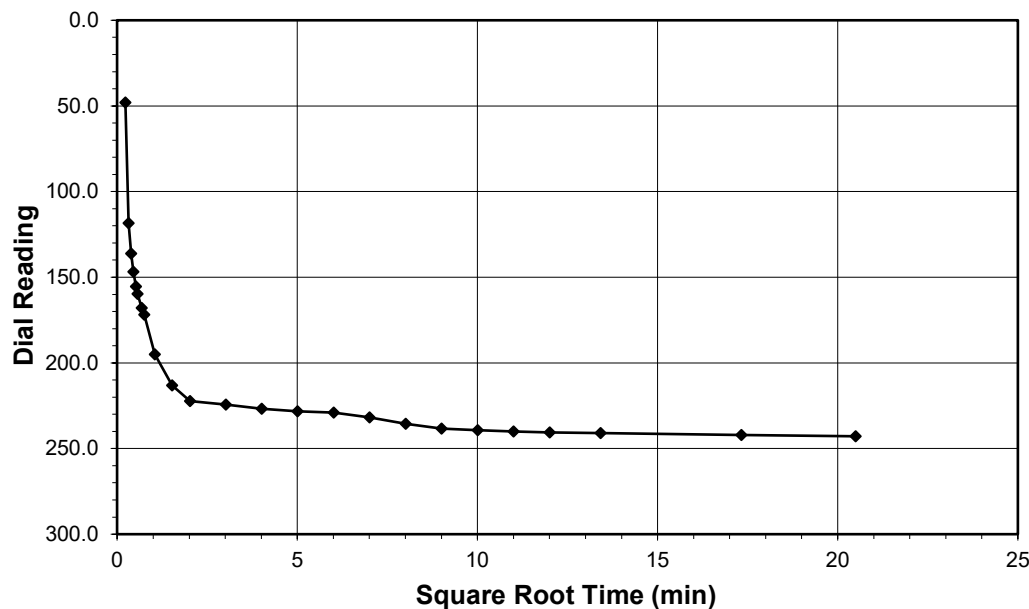


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

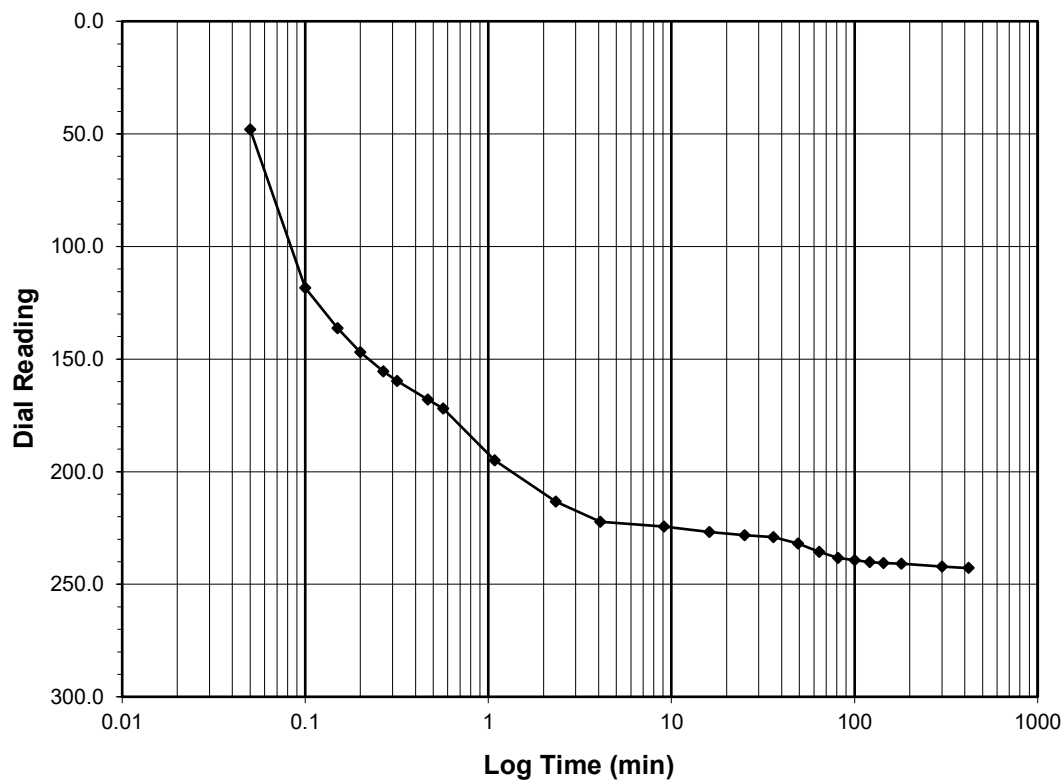
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) **0 - 0.25**
 Final Reading (div) **242.8**
 Consolidometer No. **R470**
 1 Division (in) 0.0001

Start Date 4/4/2023
 Start Time 16:39:25

Elapsed Time (min)	Dial Reading (div)
Initial	0.0
0.05	48.0
0.10	118.4
0.15	136.2
0.20	146.9
0.27	155.4
0.32	159.7
0.47	167.9
0.57	171.9
1.08	195.0
2.33	213.2
4.08	222.3
9.08	224.3
16.08	226.7
25.10	228.2
36.10	229.0
49.10	231.8
64.12	235.6
81.12	238.3
100.12	239.3
121.12	240.1
144.12	240.5
180.12	240.9
300.12	242.1
420.22	242.8



Tested By 129-07-0411 Date 4/4/23 Checked By MPS Date 4/21/23

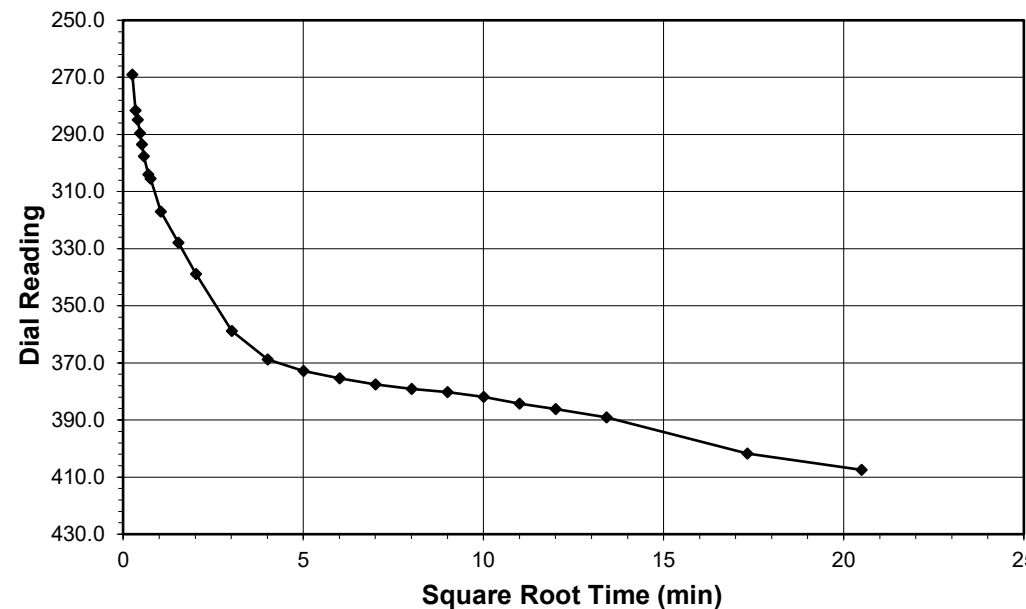


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

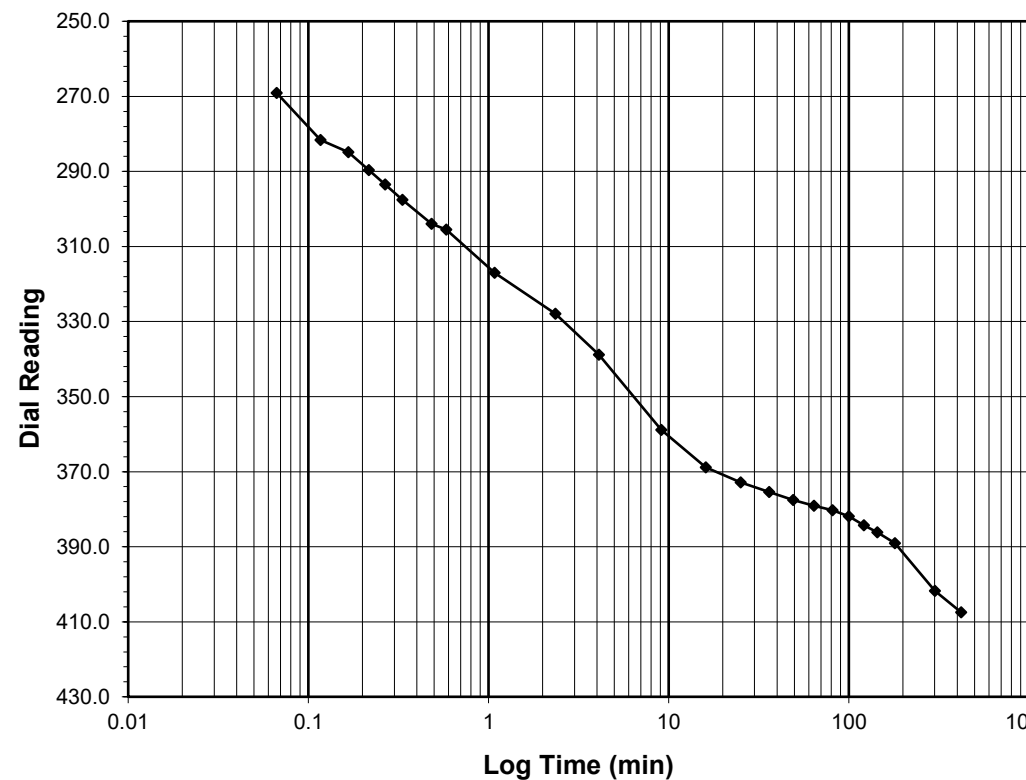
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) **0.25 - 0.5**
 Final Reading (div) **407.5**
 Consolidometer No. **R470**
 1 Division (in) 0.0001

Start Date 4/4/2023
 Start Time 23:39:39

Elapsed Time (min)	Dial Reading (div)
Initial	242.8
0.07	269.1
0.12	281.6
0.17	284.8
0.22	289.6
0.27	293.5
0.33	297.6
0.48	304.0
0.58	305.5
1.08	317.0
2.35	327.9
4.10	338.8
9.10	358.8
16.10	368.8
25.10	372.9
36.10	375.4
49.10	377.6
64.12	379.1
81.12	380.3
100.12	381.9
121.13	384.3
144.13	386.2
180.13	389.0
300.15	401.8
420.25	407.5



Tested By 129-07-0411 Date 4/4/23 Checked By MPS Date 4/21/23

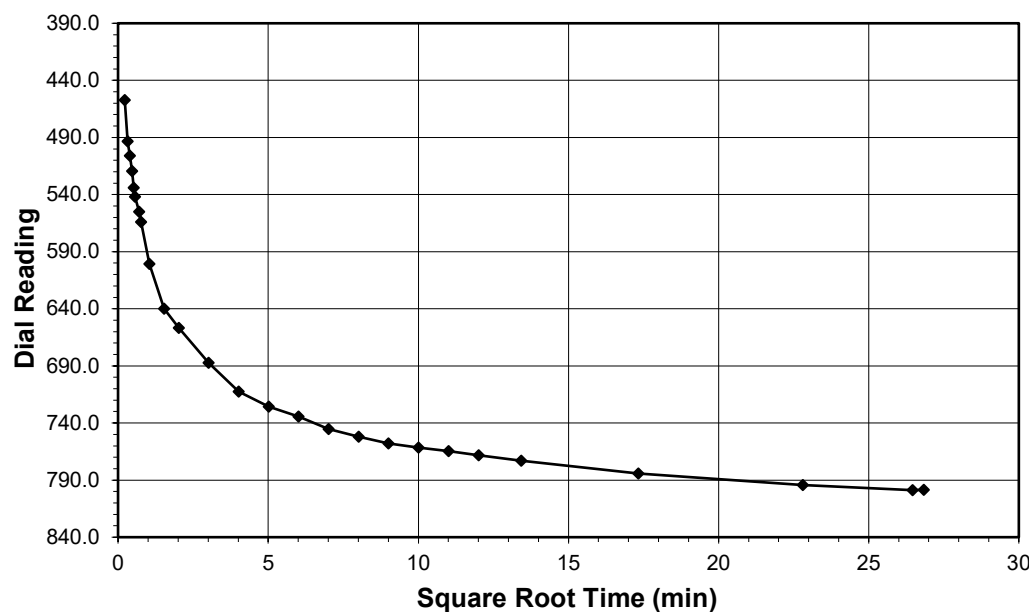


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

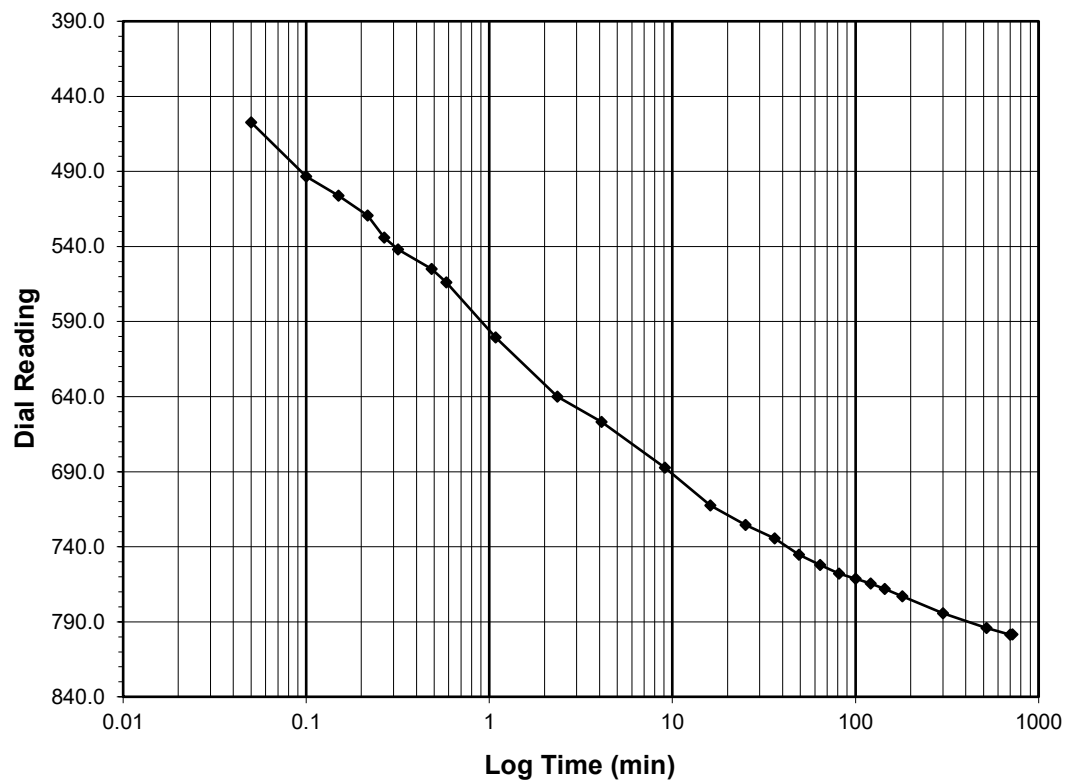
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) 0.5 - 1
 Final Reading (div) 798.7
 Consolidometer No. R470
 1 Division (in) 0.0001

Start Date 4/5/2023
 Start Time 6:39:53

Elapsed Time (min)	Dial Reading (div)
Initial	407.5
0.05	457.3
0.10	493.4
0.15	506.1
0.22	519.4
0.27	534.0
0.32	541.9
0.48	555.0
0.58	564.0
1.08	600.6
2.35	640.0
4.10	656.8
9.10	687.3
16.12	712.5
25.12	725.6
36.12	734.4
49.12	745.4
64.13	752.0
81.13	758.0
100.13	761.4
121.13	764.5
144.13	768.2
180.15	772.9
300.17	784.3
520.17	794.2
700.17	798.7
720.33	798.5



Tested By 129-07-0411 Date 4/5/23 Checked By MPS Date 4/21/23

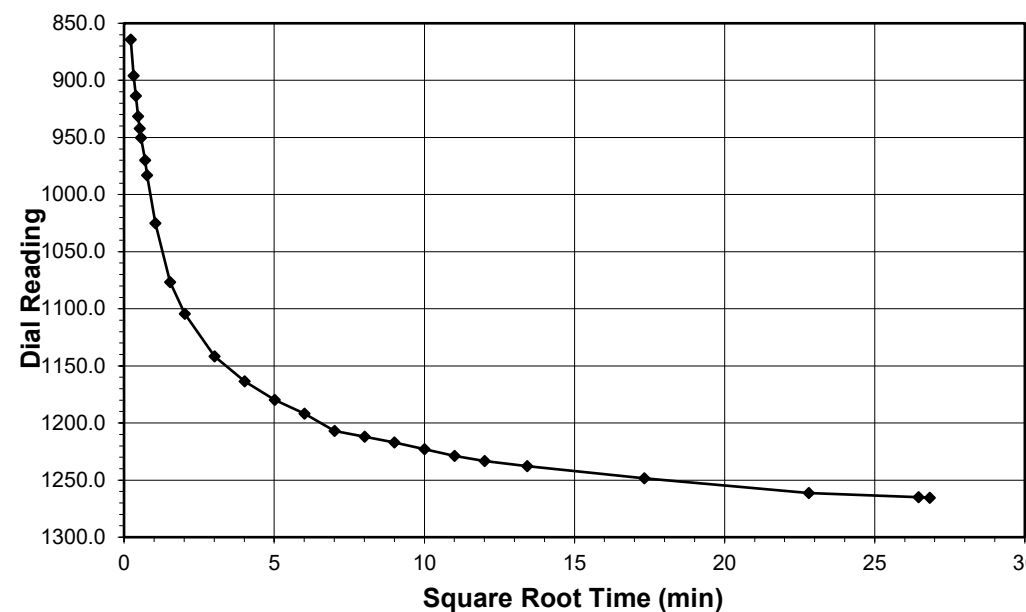


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

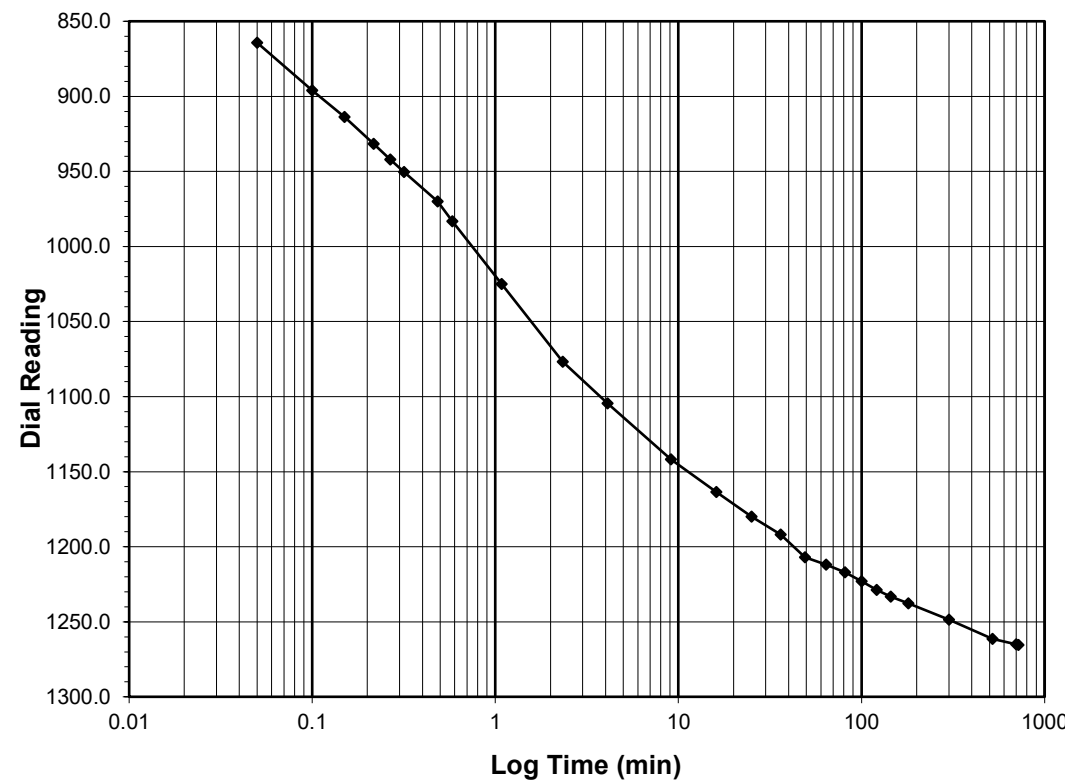
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) 1 - 2
 Final Reading (div) 1265.4
 Consolidometer No. R470
 1 Division (in) 0.0001

Start Date 4/5/2023
 Start Time 18:40:13

Elapsed Time (min)	Dial Reading (div)
Initial	798.7
0.05	864.3
0.10	896.0
0.15	913.6
0.22	931.6
0.27	942.1
0.32	950.4
0.48	970.0
0.58	983.1
1.08	1025.0
2.33	1076.7
4.10	1104.4
9.10	1141.7
16.10	1163.5
25.12	1179.8
36.12	1191.8
49.12	1207.0
64.13	1212.0
81.13	1217.0
100.13	1223.0
121.15	1228.7
144.15	1233.2
180.15	1237.8
300.15	1248.5
520.17	1261.3
700.17	1265.1
720.02	1265.4



Tested By 129-07-0411 Date 4/5/23 Checked By MPS Date 4/21/23

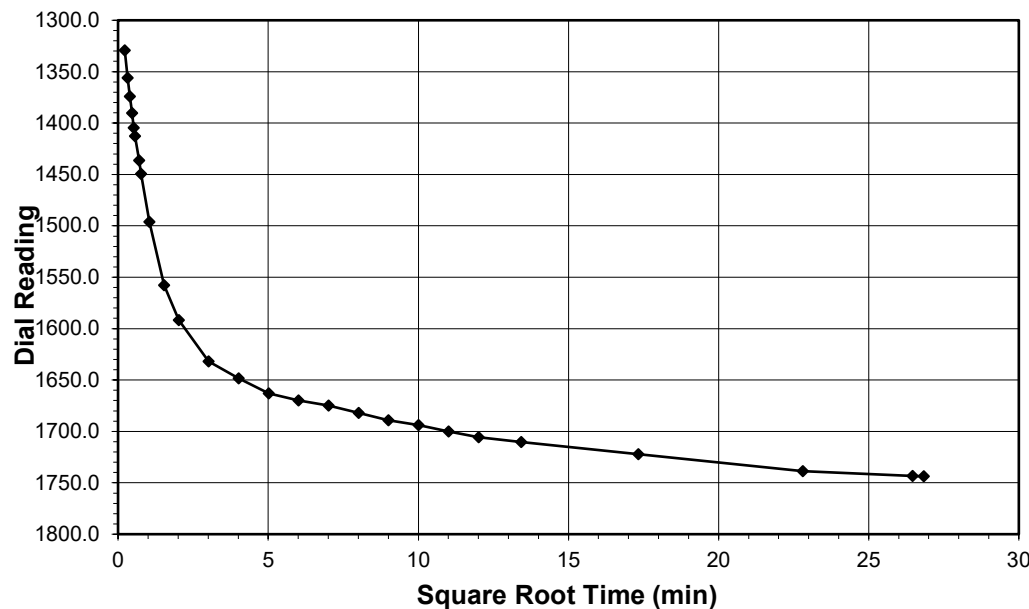


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

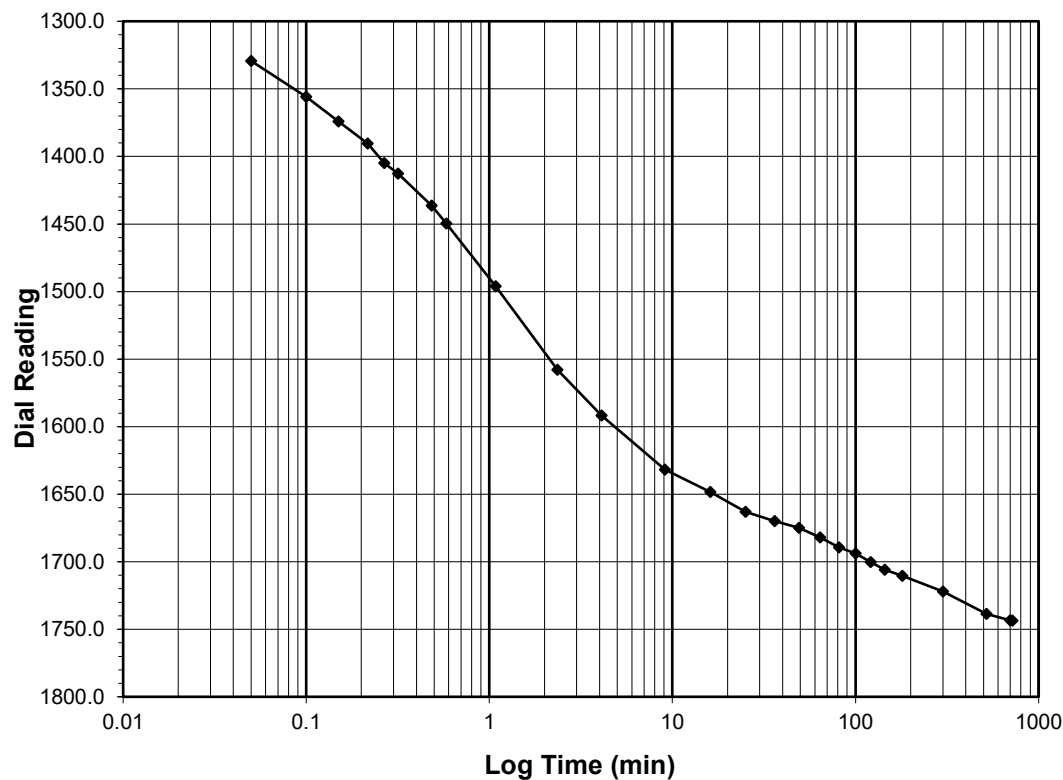
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) **2 - 4**
 Final Reading (div) **1743.6**
 Consolidometer No. **R470**
 1 Division (in) 0.0001

Start Date 4/6/2023
 Start Time 6:40:14

Elapsed Time (min)	Dial Reading (div)
Initial	1265.4
0.05	1329.4
0.10	1355.9
0.15	1374.0
0.22	1390.4
0.27	1404.8
0.32	1412.8
0.48	1436.3
0.58	1449.6
1.08	1496.1
2.35	1557.9
4.10	1591.8
9.10	1631.8
16.12	1648.3
25.12	1662.9
36.12	1669.9
49.13	1674.9
64.13	1681.9
81.13	1689.2
100.13	1693.8
121.13	1700.1
144.13	1705.8
180.13	1710.4
300.15	1722.0
520.15	1738.6
700.15	1743.3
720.23	1743.6



Tested By 129-07-0411 Date 4/6/23 Checked By MPS Date 4/21/23

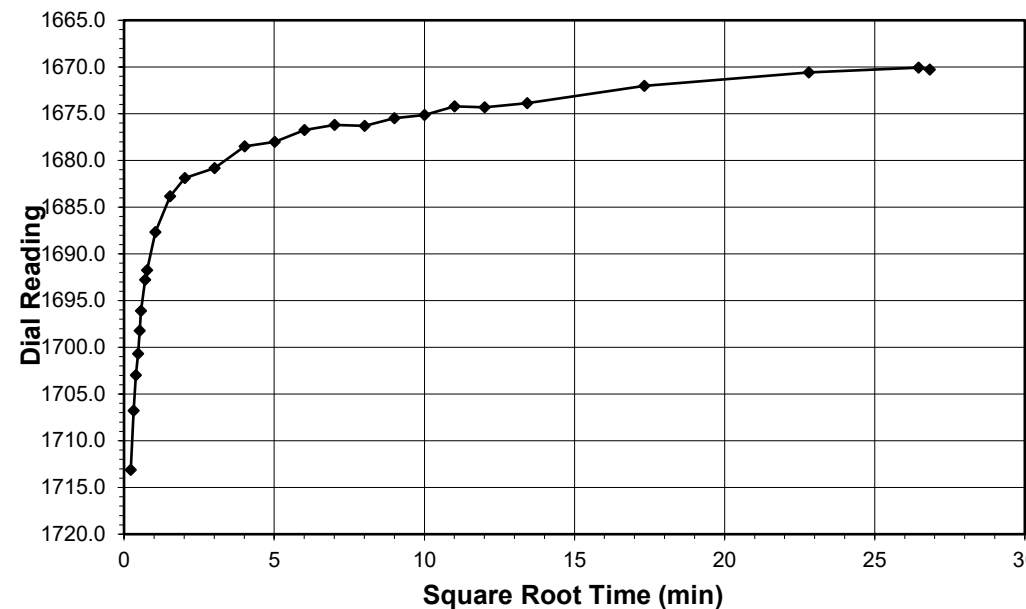


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

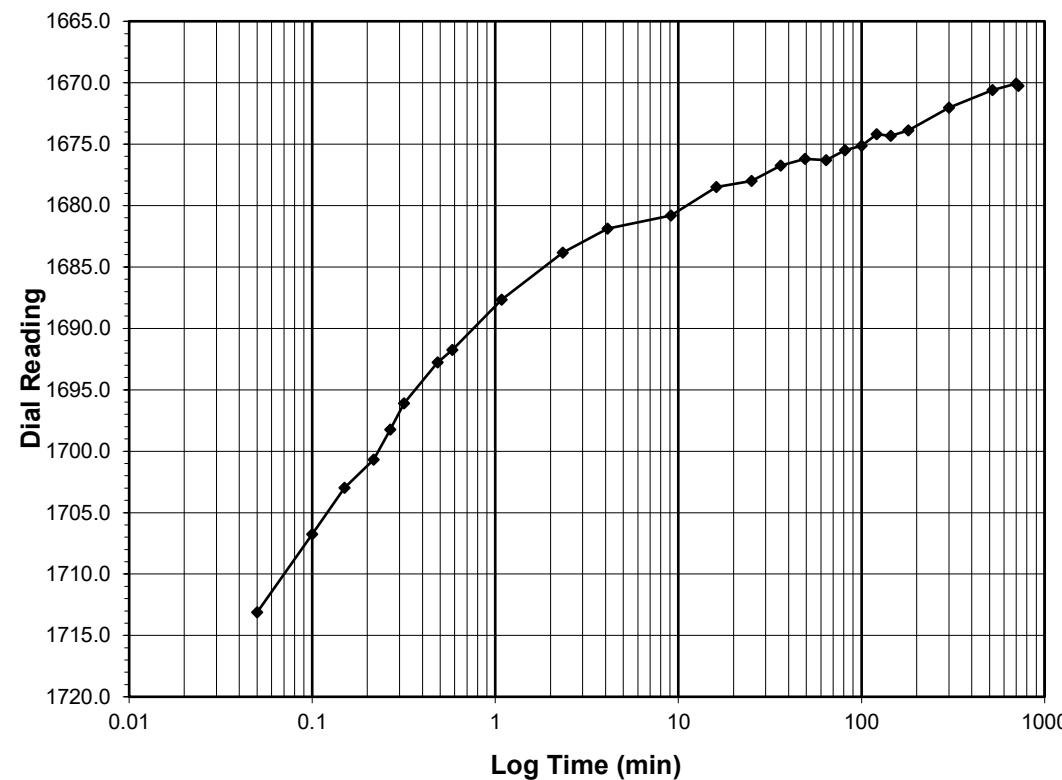
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) **4 - 1**
 Final Reading (div) **1670.3**
 Consolidometer No. **R470**
 1 Division (in) 0.0001

Start Date 4/6/2023
 Start Time 18:40:28

Elapsed Time (min)	Dial Reading (div)
Initial	1743.6
0.05	1713.1
0.10	1706.8
0.15	1703.0
0.22	1700.7
0.27	1698.2
0.32	1696.1
0.48	1692.8
0.58	1691.8
1.08	1687.7
2.33	1683.8
4.10	1681.9
9.10	1680.8
16.12	1678.5
25.12	1678.0
36.12	1676.7
49.13	1676.2
64.13	1676.3
81.13	1675.5
100.13	1675.1
121.13	1674.2
144.13	1674.3
180.13	1673.9
300.15	1672.0
520.15	1670.6
700.17	1670.1
720.15	1670.3



Tested By 129-07-0411 Date 4/6/23 Checked By MPS Date 4/21/23

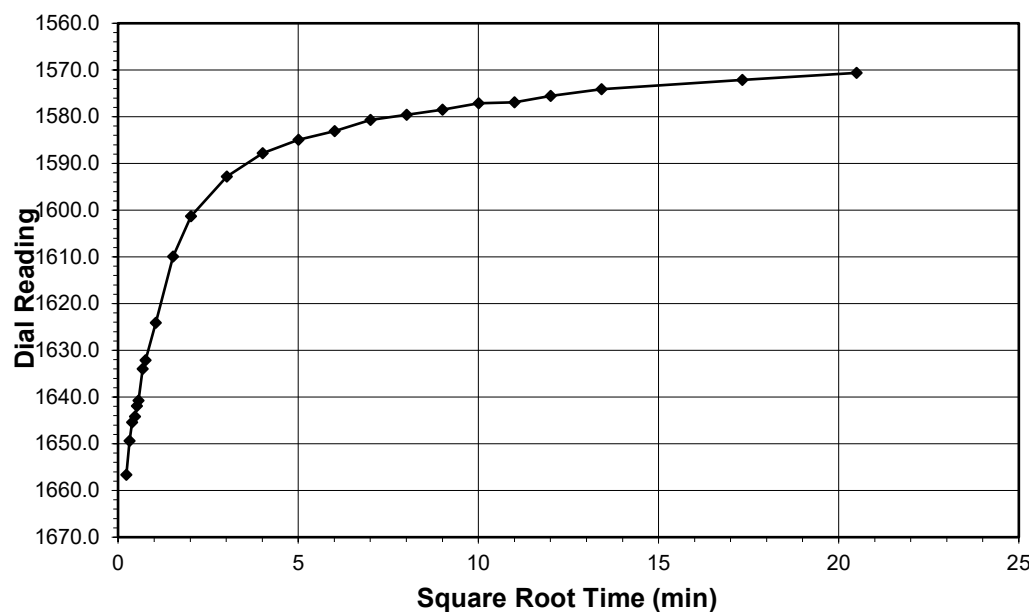


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

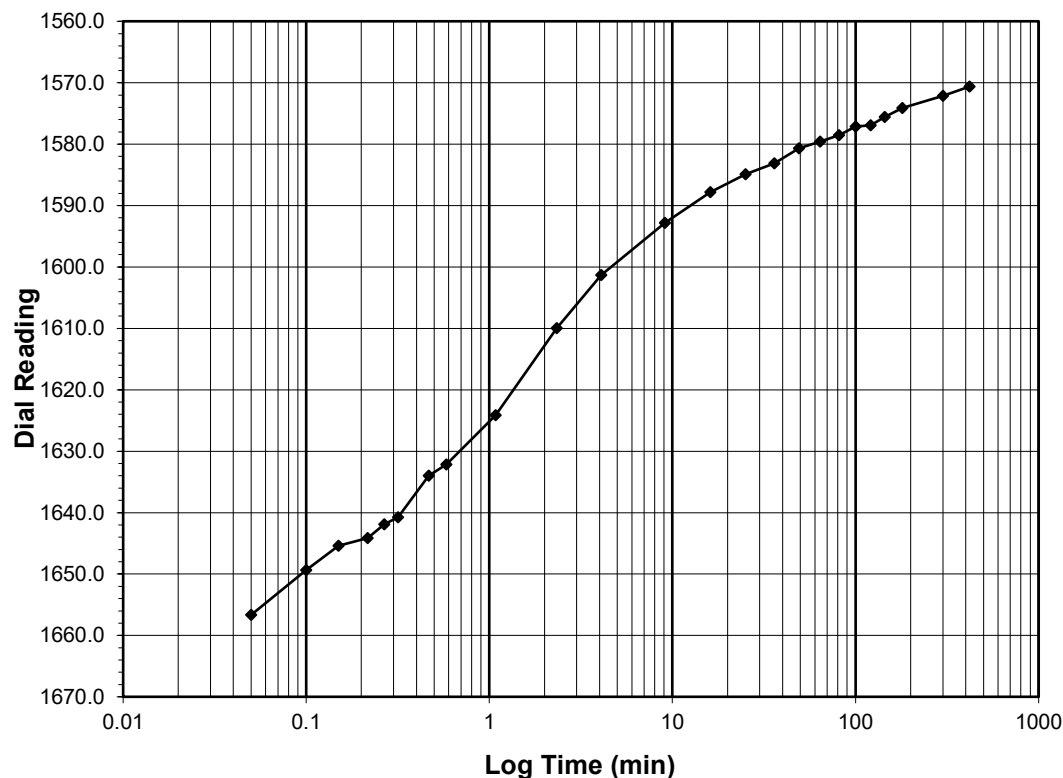
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) 1 - 0.25
 Final Reading (div) 1570.6
 Consolidometer No. R470
 1 Division (in) 0.0001

Start Date 4/7/2023
 Start Time 6:40:37

Elapsed Time (min)	Dial Reading (div)
Initial	1670.3
0.05	1656.6
0.10	1649.4
0.15	1645.4
0.22	1644.2
0.27	1641.9
0.32	1640.8
0.47	1634.0
0.58	1632.1
1.08	1624.1
2.33	1610.0
4.08	1601.3
9.08	1592.8
16.10	1587.8
25.10	1584.9
36.10	1583.1
49.12	1580.7
64.12	1579.6
81.12	1578.5
100.12	1577.1
121.12	1576.9
144.13	1575.6
180.13	1574.1
300.13	1572.1
420.22	1570.6



Tested By 129-07-0411 Date 4/7/23 Checked By MPS Date 4/21/23

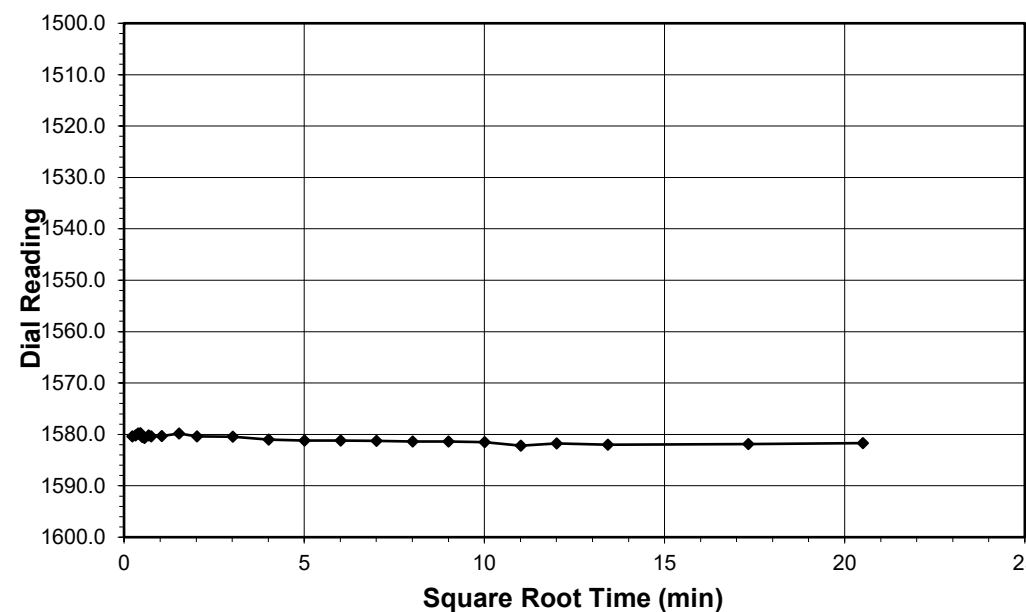


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

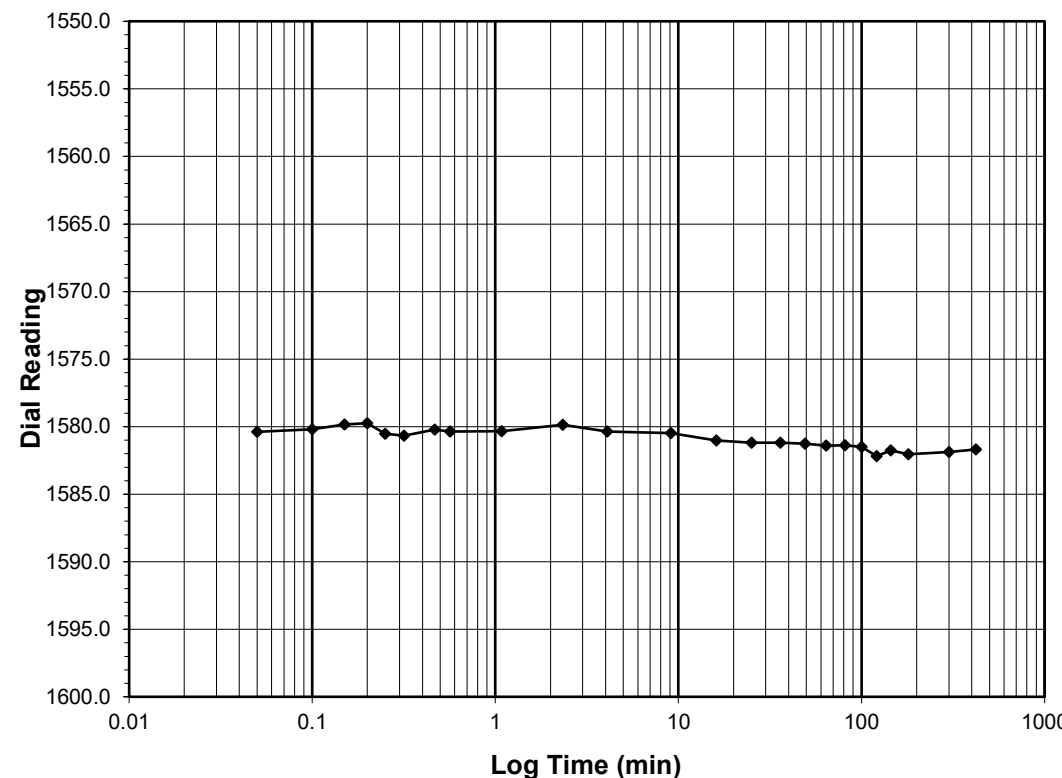
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) 0.25 - 0.5
 Final Reading (div) 1581.7
 Consolidometer No. R470
 1 Division (in) 0.0001

Start Date 4/7/2023
 Start Time 13:40:51

Elapsed Time (min)	Dial Reading (div)
Initial	1570.6
0.05	1580.4
0.10	1580.2
0.15	1579.8
0.20	1579.7
0.25	1580.5
0.32	1580.7
0.47	1580.2
0.57	1580.4
1.08	1580.3
2.33	1579.9
4.08	1580.4
9.08	1580.5
16.10	1581.0
25.10	1581.2
36.10	1581.2
49.12	1581.3
64.12	1581.4
81.13	1581.4
100.13	1581.5
121.15	1582.2
144.15	1581.7
180.17	1582.0
300.17	1581.9
420.42	1581.7



Tested By 129-07-0411 Date 4/7/23 Checked By MPS Date 4/21/23

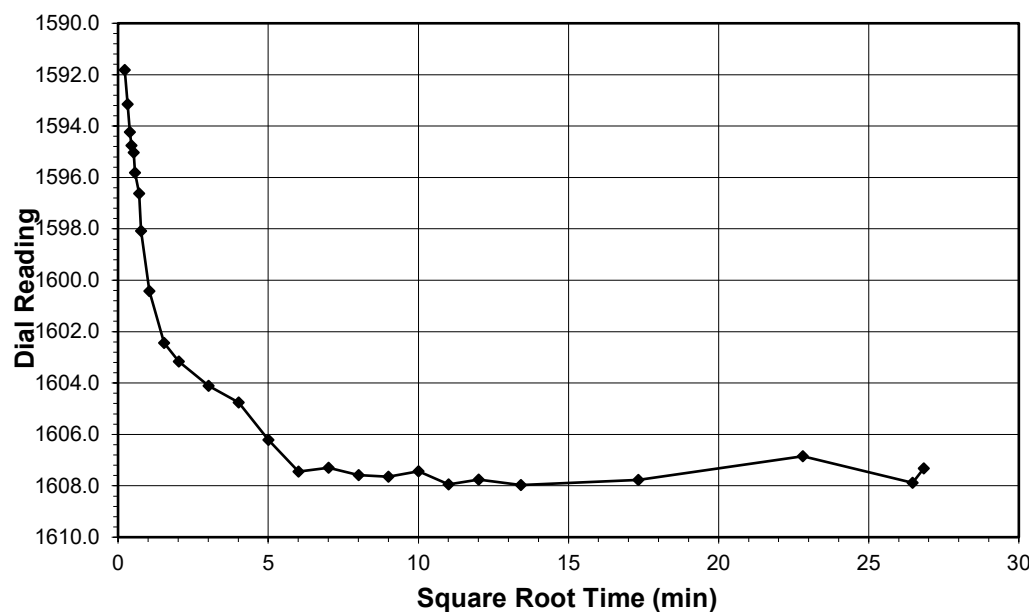


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

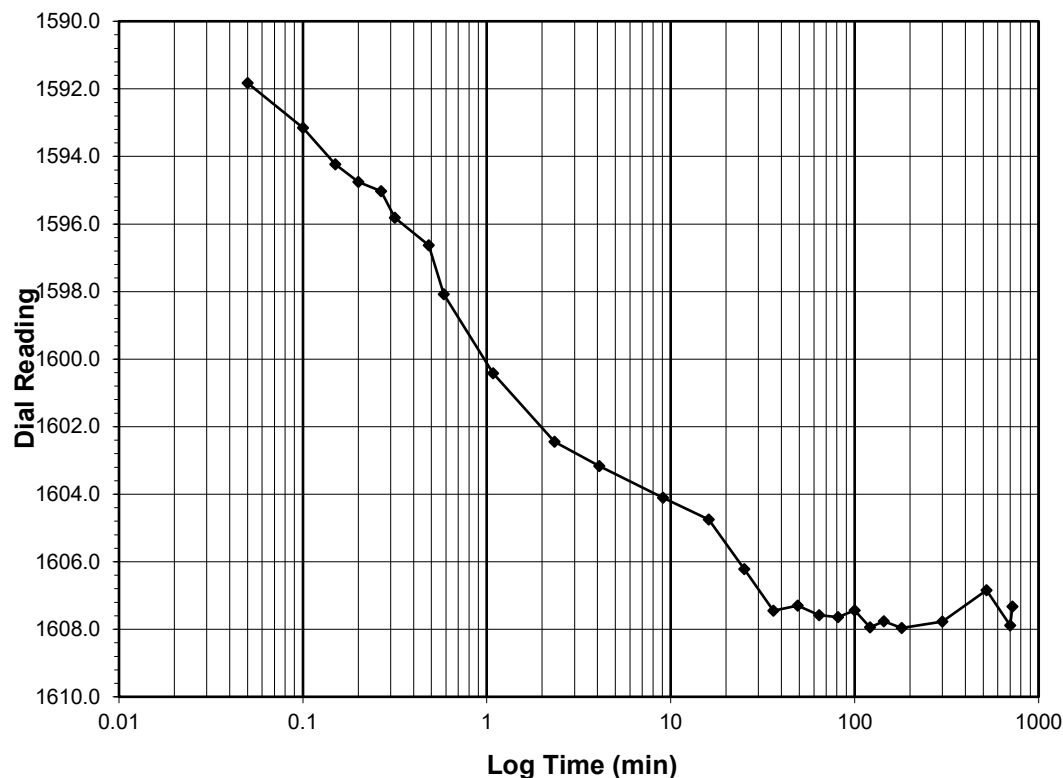
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) 0.5 - 1
 Final Reading (div) 1607.3
 Consolidometer No. R470
 1 Division (in) 0.0001

Start Date 4/7/2023
 Start Time 20:41:16

Elapsed Time (min)	Dial Reading (div)
Initial	1581.7
0.05	1591.8
0.10	1593.2
0.15	1594.2
0.20	1594.8
0.27	1595.0
0.32	1595.8
0.48	1596.6
0.58	1598.1
1.08	1600.4
2.33	1602.4
4.08	1603.2
9.08	1604.1
16.10	1604.8
25.10	1606.2
36.10	1607.5
49.10	1607.3
64.10	1607.6
81.10	1607.6
100.10	1607.4
121.10	1607.9
144.10	1607.8
180.12	1608.0
300.12	1607.8
520.12	1606.8
700.12	1607.9
720.05	1607.3



Tested By 129-07-0411 Date 4/7/23 Checked By MPS Date 4/21/23

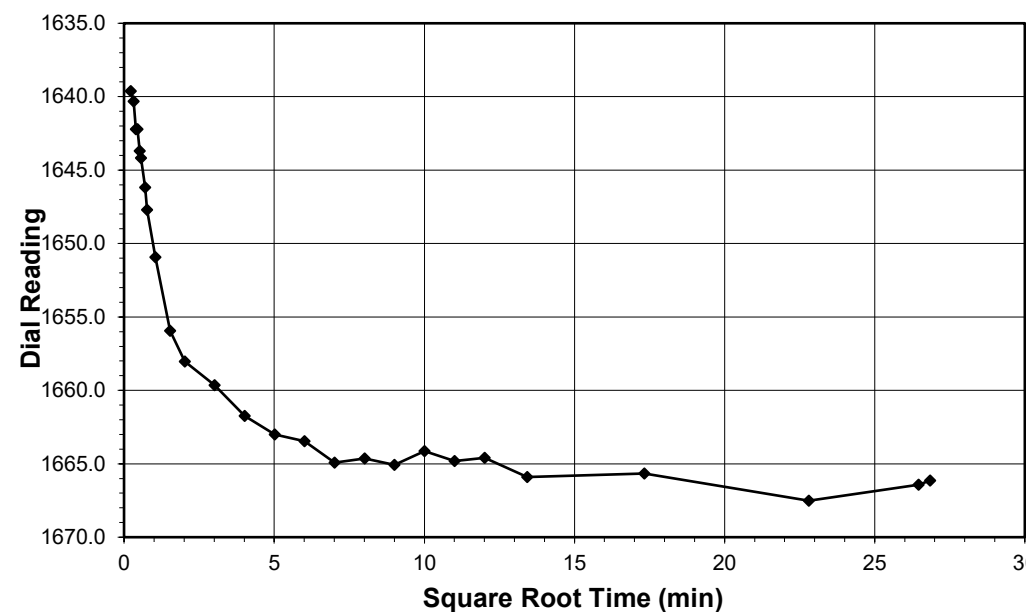


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

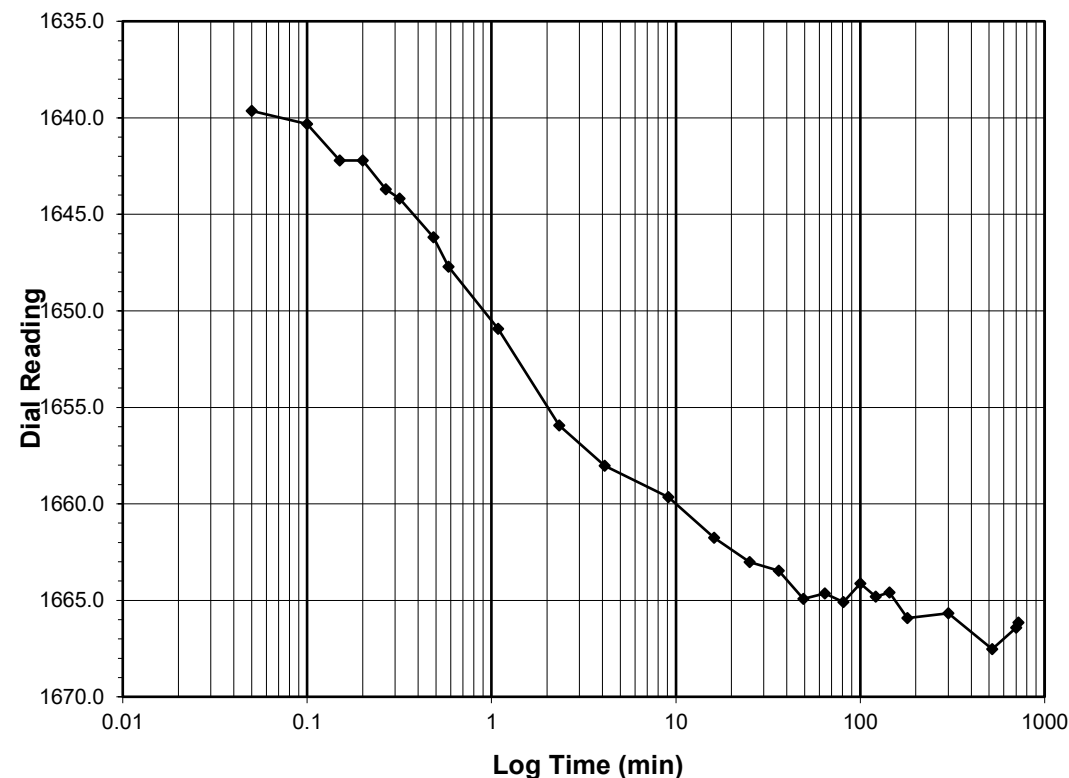
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) 1 - 2
 Final Reading (div) 1666.1
 Consolidometer No. R470
 1 Division (in) 0.0001

Start Date 4/8/2023
 Start Time 8:41:19

Elapsed Time (min)	Dial Reading (div)
Initial	1607.3
0.05	1639.6
0.10	1640.3
0.15	1642.2
0.20	1642.2
0.27	1643.7
0.32	1644.2
0.48	1646.2
0.58	1647.7
1.08	1650.9
2.33	1655.9
4.10	1658.0
9.10	1659.6
16.10	1661.7
25.12	1663.0
36.12	1663.5
49.12	1664.9
64.12	1664.6
81.12	1665.1
100.13	1664.1
121.13	1664.8
144.13	1664.6
180.13	1665.9
300.13	1665.7
520.13	1667.5
700.13	1666.4
720.48	1666.1



Tested By 129-07-0411 Date 4/8/23 Checked By MPS Date 4/21/23

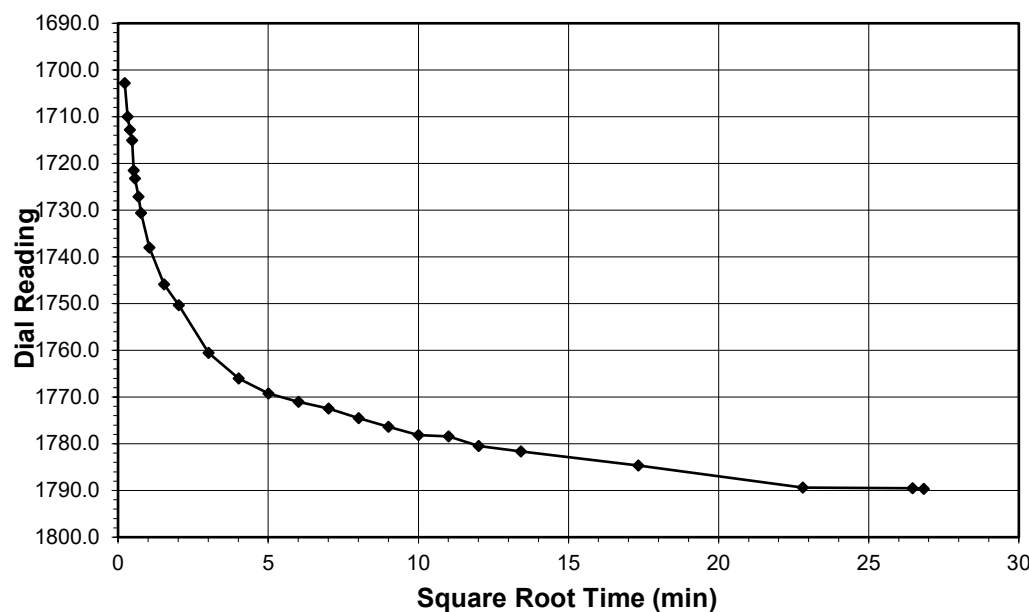


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

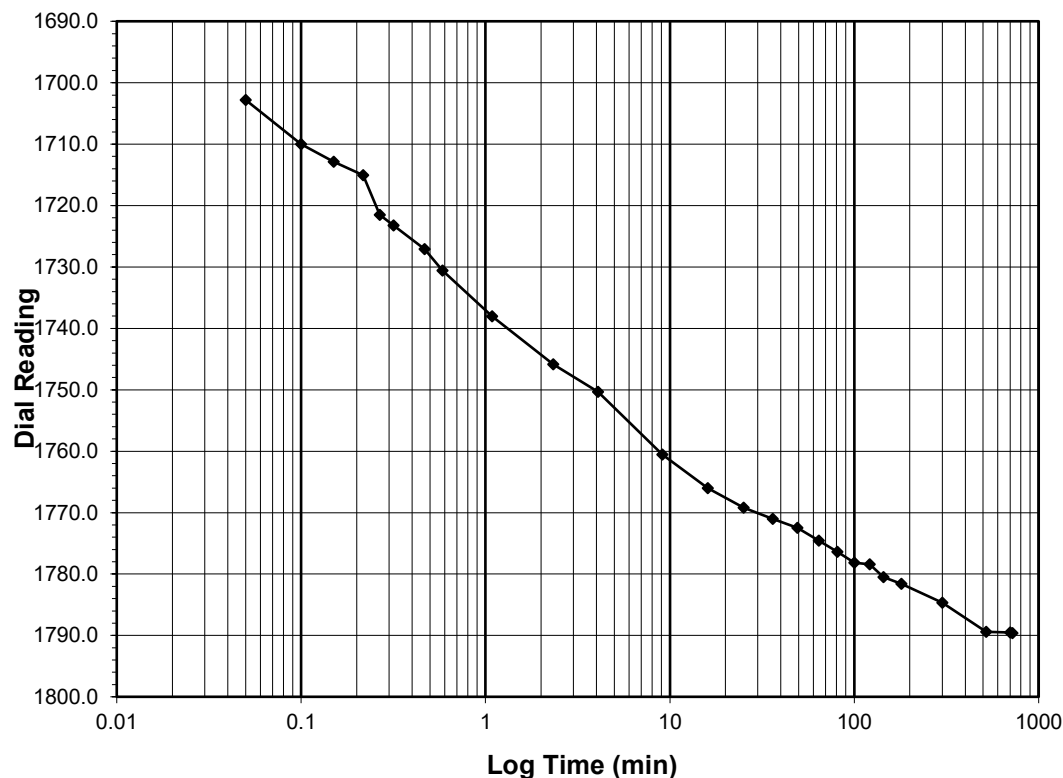
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) **2 - 4**
 Final Reading (div) **1789.6**
 Consolidometer No. **R470**
 1 Division (in) 0.0001

Start Date 4/8/2023
 Start Time 20:41:48

Elapsed Time (min)	Dial Reading (div)
Initial	1666.1
0.05	1702.8
0.10	1710.0
0.15	1712.8
0.22	1715.1
0.27	1721.5
0.32	1723.2
0.47	1727.1
0.58	1730.6
1.08	1738.0
2.33	1745.9
4.08	1750.3
9.08	1760.5
16.08	1766.0
25.10	1769.2
36.10	1771.0
49.10	1772.5
64.12	1774.5
81.12	1776.4
100.12	1778.2
121.12	1778.4
144.12	1780.5
180.12	1781.6
300.13	1784.7
520.13	1789.4
700.15	1789.5
720.35	1789.6



Tested By 129-07-0411 Date 4/8/23 Checked By MPS Date 4/21/23

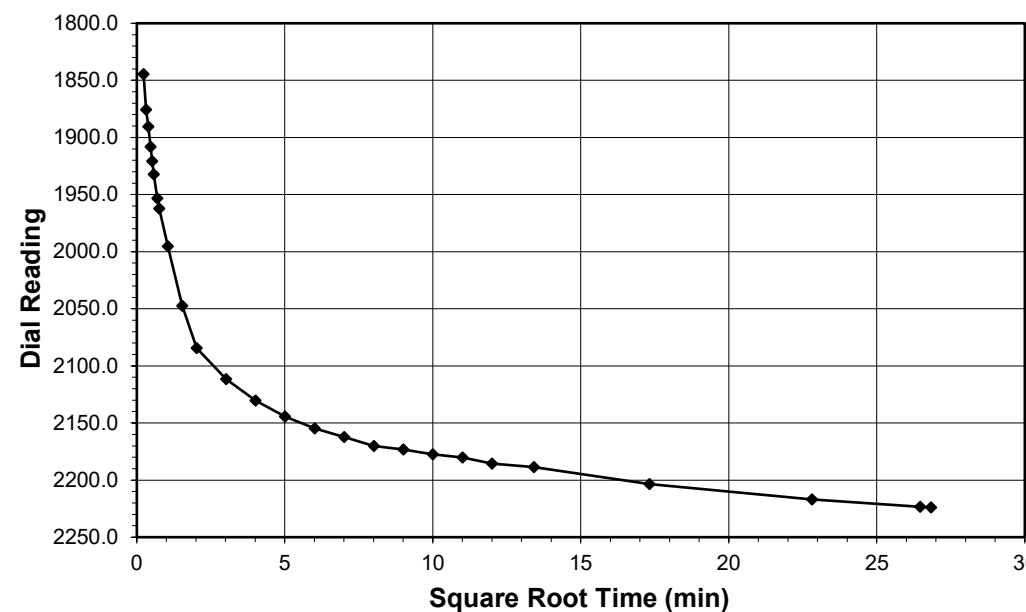


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

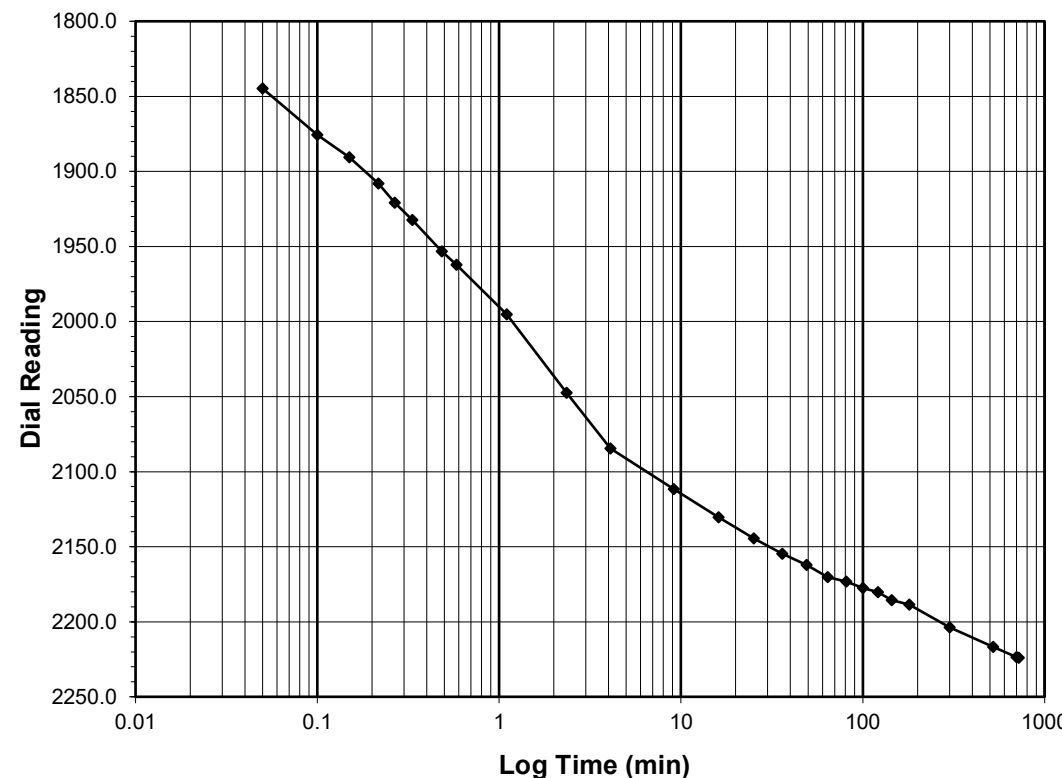
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) **4 - 8**
 Final Reading (div) **2223.9**
 Consolidometer No. **R470**
 1 Division (in) 0.0001

Start Date 4/9/2023
 Start Time 8:42:09

Elapsed Time (min)	Dial Reading (div)
Initial	1789.6
0.05	1844.6
0.10	1875.7
0.15	1890.5
0.22	1908.1
0.27	1920.8
0.33	1932.3
0.48	1953.3
0.58	1962.2
1.10	1995.3
2.35	2047.4
4.10	2084.5
9.12	2111.6
16.12	2130.4
25.12	2144.4
36.12	2154.6
49.13	2162.2
64.13	2170.2
81.13	2173.2
100.13	2177.5
121.15	2180.2
144.15	2185.7
180.15	2188.6
300.15	2203.6
520.15	2216.8
700.17	2223.5
720.23	2223.9



Tested By 129-07-0411 Date 4/9/23 Checked By MPS Date 4/21/23

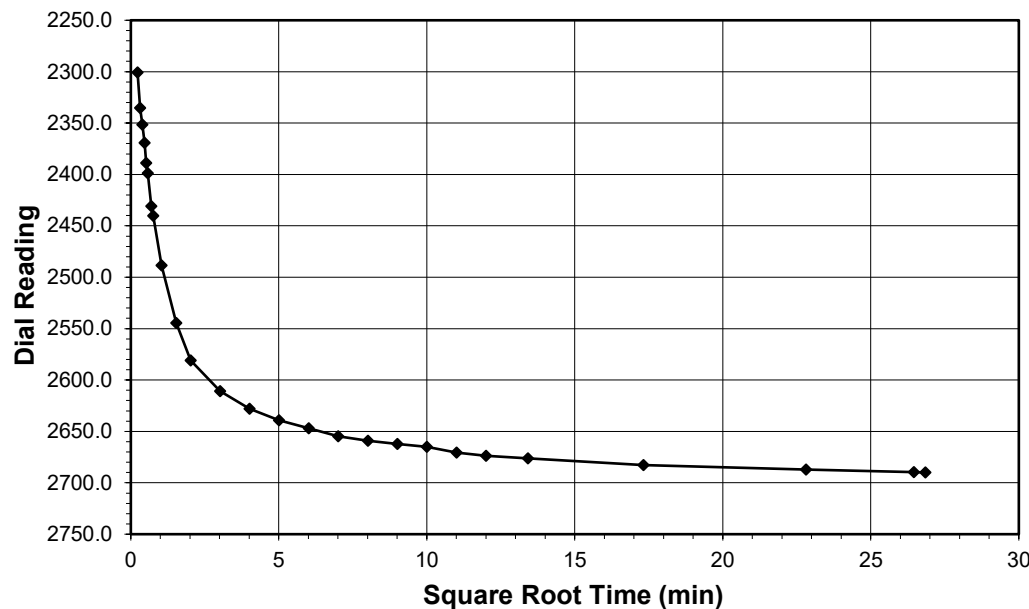


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

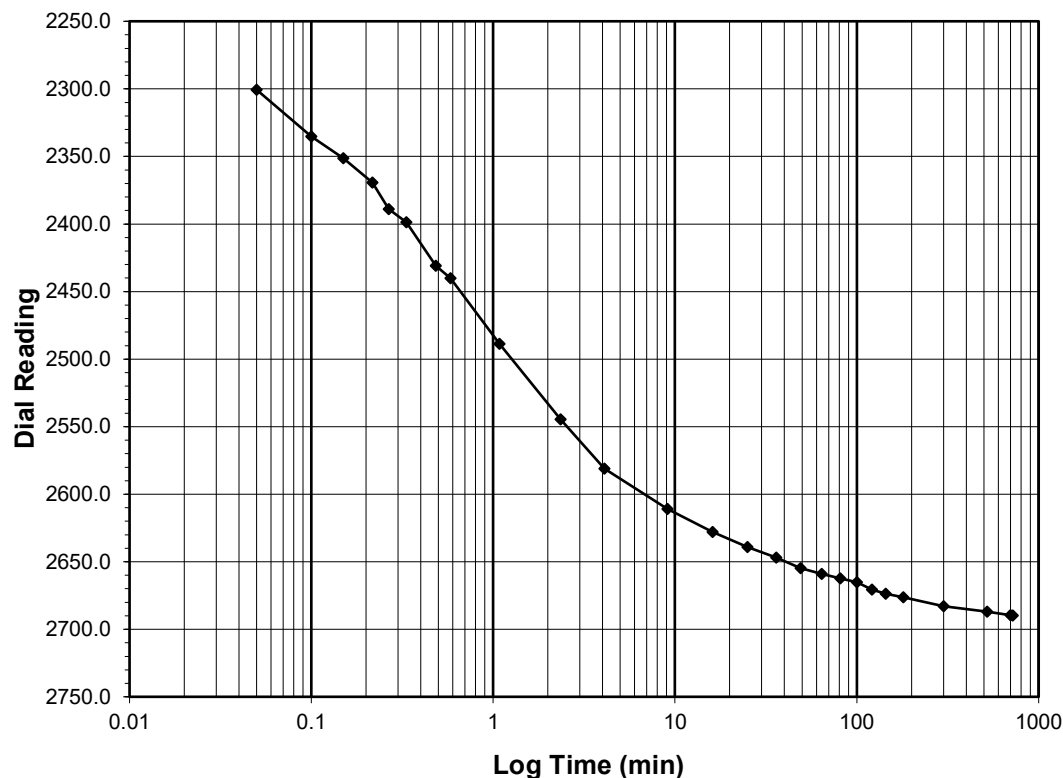
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) 8 - 16
 Final Reading (div) 2689.8
 Consolidometer No. R470
 1 Division (in) 0.0001

Start Date 4/9/2023
 Start Time 20:42:23

Elapsed Time (min)	Dial Reading (div)
Initial	2223.9
0.05	2300.7
0.10	2335.3
0.15	2351.4
0.22	2369.2
0.27	2389.0
0.33	2398.8
0.48	2430.9
0.58	2440.1
1.08	2488.6
2.35	2544.6
4.10	2581.0
9.10	2610.9
16.10	2628.0
25.10	2639.1
36.12	2646.8
49.12	2654.7
64.12	2659.0
81.13	2662.3
100.13	2665.1
121.13	2670.5
144.13	2673.6
180.13	2676.3
300.13	2682.8
520.15	2687.0
700.15	2689.6
720.40	2689.8



Tested By 129-07-0411 Date 4/9/23 Checked By MPS Date 4/21/23

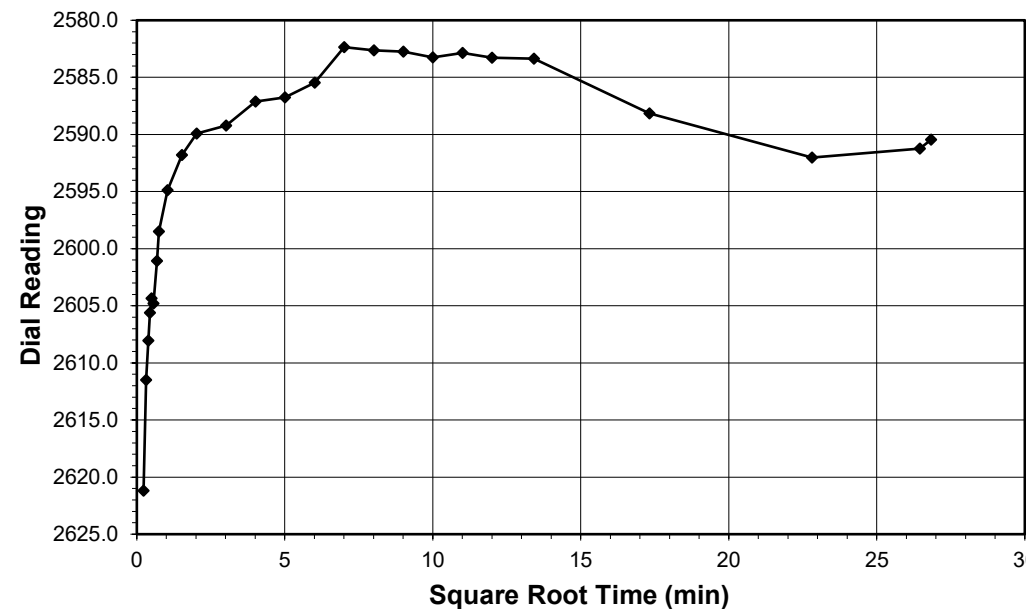


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

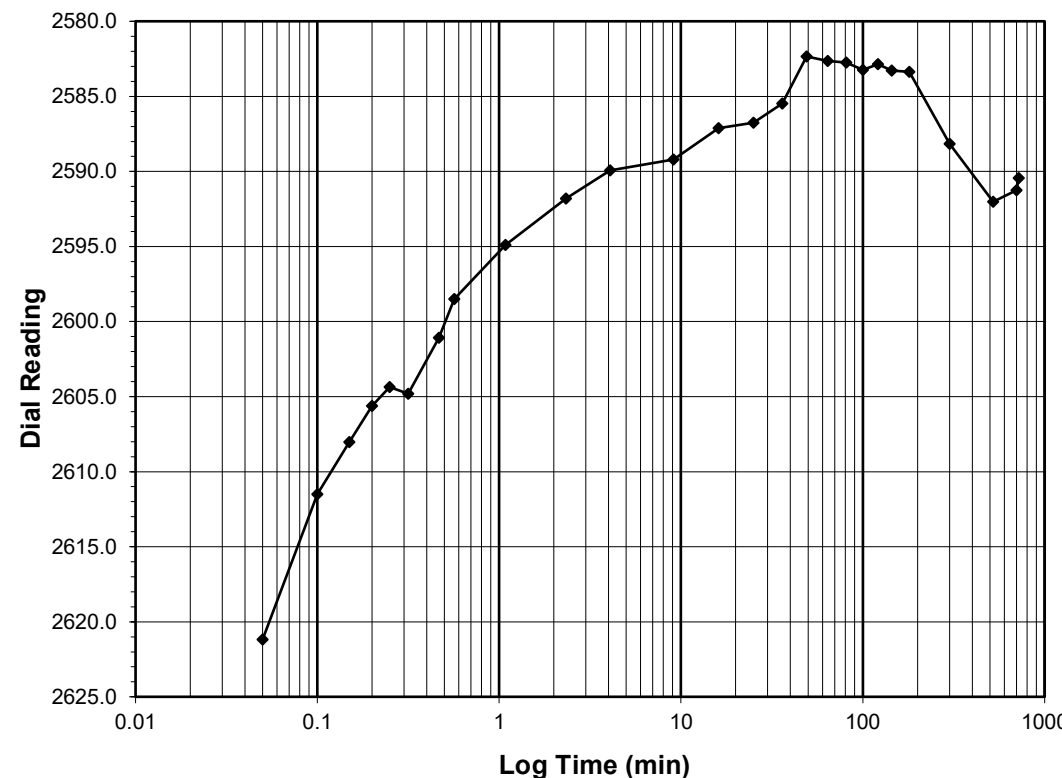
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) 16 - 4
 Final Reading (div) 2590.4
 Consolidometer No. R470
 1 Division (in) 0.0001

Start Date 4/10/2023
 Start Time 8:42:48

Elapsed Time (min)	Dial Reading (div)
Initial	2689.8
0.05	2621.2
0.10	2611.5
0.15	2608.0
0.20	2605.6
0.25	2604.4
0.32	2604.8
0.47	2601.1
0.57	2598.5
1.08	2594.9
2.33	2591.8
4.08	2589.9
9.10	2589.2
16.10	2587.1
25.10	2586.7
36.12	2585.5
49.12	2582.3
64.12	2582.6
81.13	2582.7
100.13	2583.2
121.13	2582.9
144.13	2583.3
180.13	2583.4
300.13	2588.2
520.15	2592.0
700.15	2591.2
720.23	2590.4



Tested By 129-07-0411 Date 4/10/23 Checked By MPS Date 4/21/23

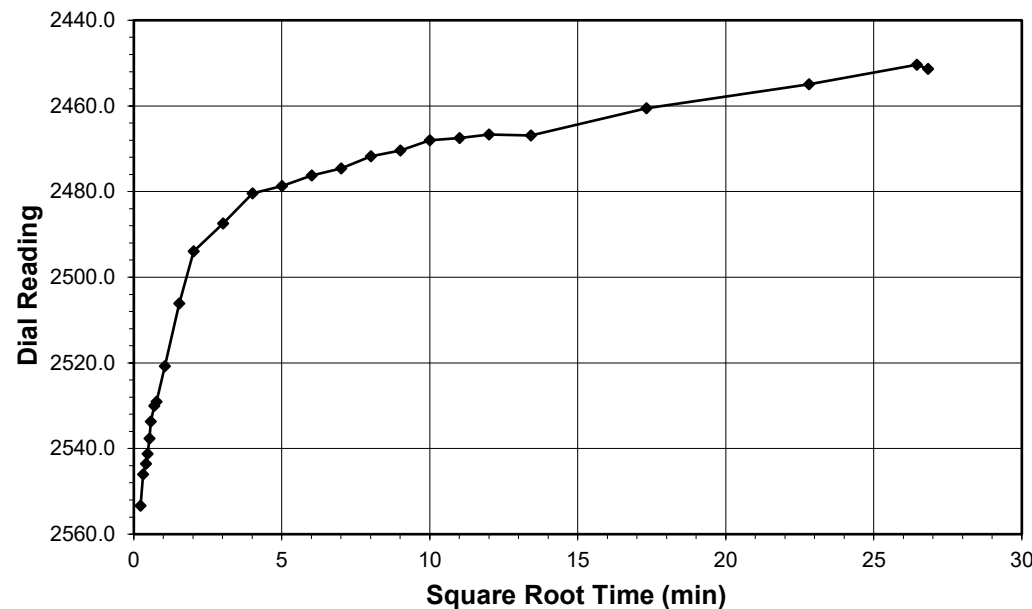


ONE DIMENSIONAL CONSOLIDATION

ASTM D 2435-96 (SOP-S24A)

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

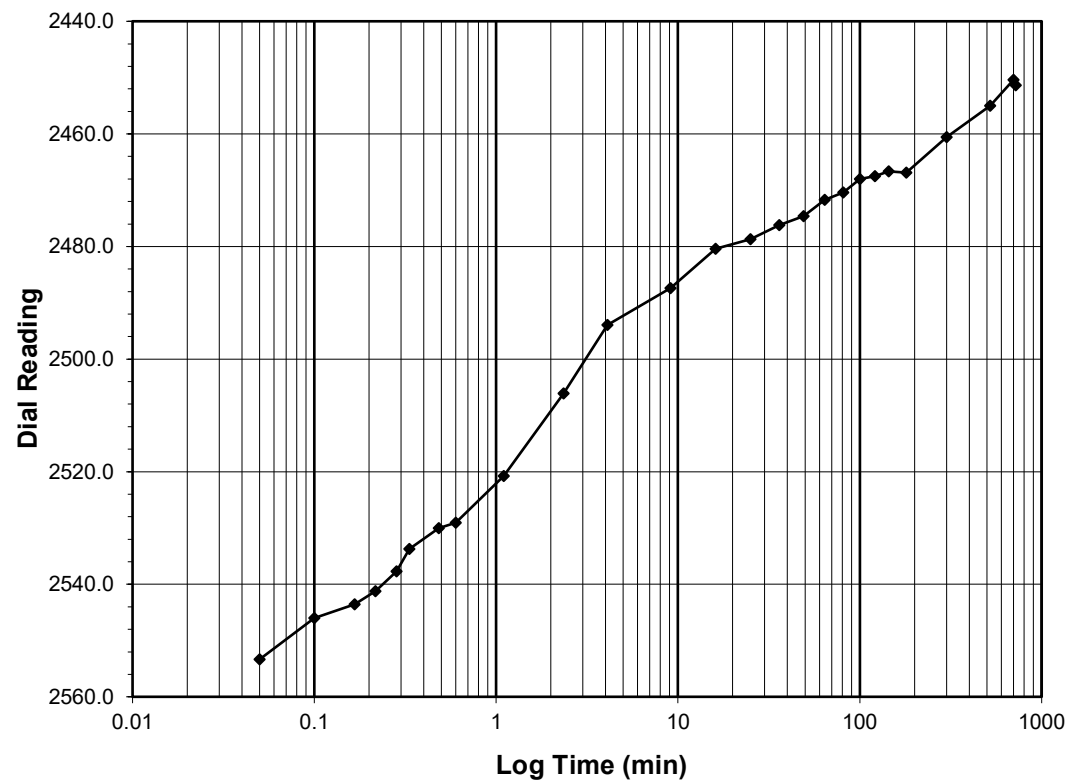
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) **4 - 1**
 Final Reading (div) **2451.4**
 Consolidometer No. **R470**
 1 Division (in) 0.0001

Start Date 4/10/2023
 Start Time 20:43:02

Elapsed Time (min)	Dial Reading (div)
Initial	2590.4
0.05	2553.3
0.10	2546.0
0.17	2543.6
0.22	2541.2
0.28	2537.7
0.33	2533.7
0.48	2530.0
0.60	2529.1
1.10	2520.8
2.35	2506.1
4.10	2493.9
9.10	2487.4
16.10	2480.4
25.10	2478.7
36.12	2476.2
49.12	2474.6
64.12	2471.7
81.12	2470.4
100.12	2468.0
121.13	2467.5
144.13	2466.6
180.15	2466.9
300.15	2460.6
520.15	2455.0
700.15	2450.4
720.12	2451.4



Tested By 129-07-0411 Date 4/10/23 Checked By MPS Date 4/21/23

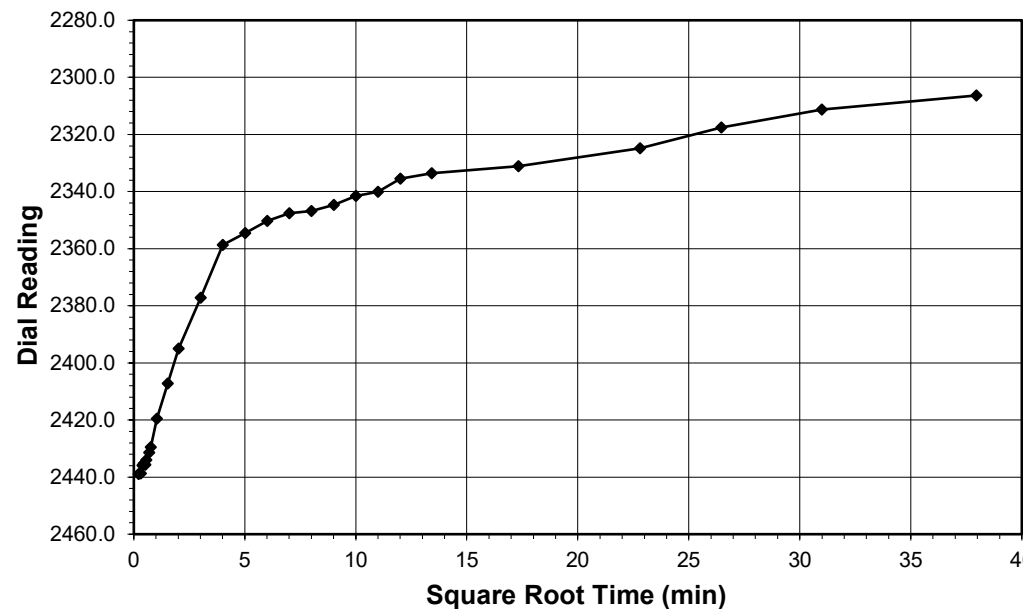


ONE DIMENSIONAL CONSOLIDATION

ASTM D2435 / D2435M-11

Client: AECOM Boring No.: S1_EB1_A
 Client Project: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Visual Description: Brown Sandy Silt

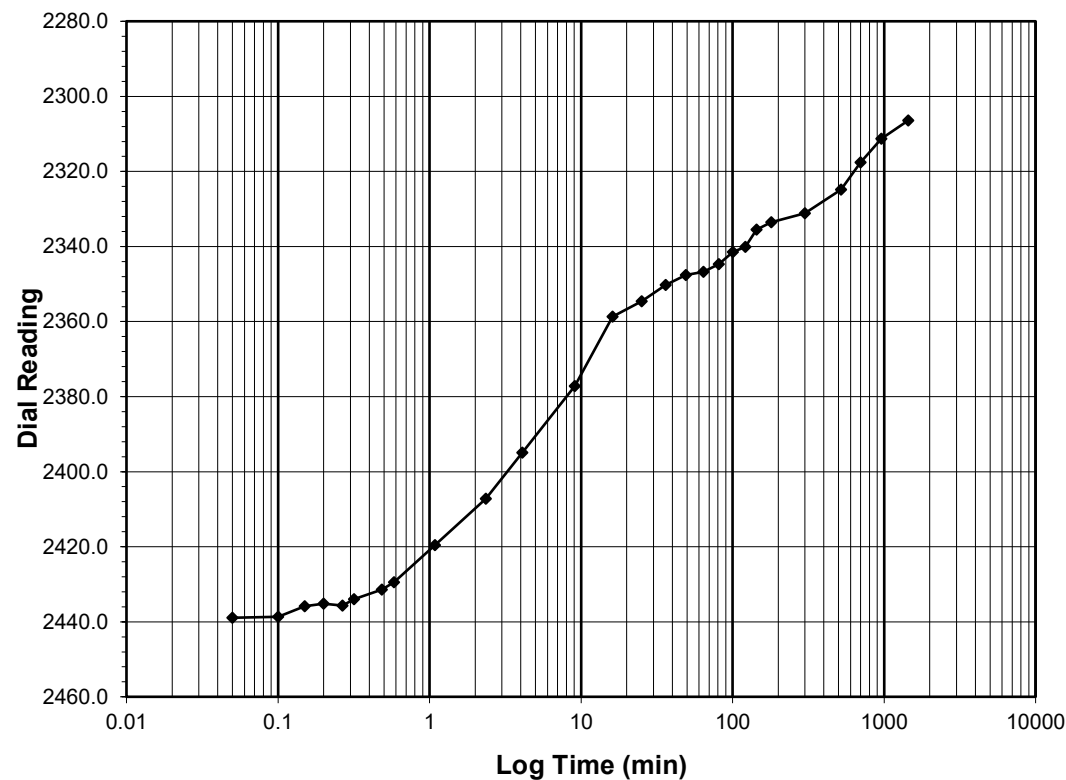
Sample Conditions: Undisturbed, Inundated, Double Drained



Test Load (tsf) **1 - 0.25**
 Final Reading (div) **2306.4**
 Consolidometer No. **R470**
 1 Division (in) 0.0001

Start Date 4/11/2023
 Start Time 8:43:09

Elapsed Time (min)	Dial Reading (div)
Initial	2451.4
0.05	2438.9
0.10	2438.7
0.15	2435.9
0.20	2435.2
0.27	2435.6
0.32	2434.0
0.48	2431.4
0.58	2429.5
1.08	2419.6
2.35	2407.2
4.10	2395.0
9.10	2377.2
16.10	2358.7
25.12	2354.6
36.12	2350.3
49.12	2347.6
64.13	2346.8
81.13	2344.7
100.13	2341.5
121.15	2340.1
144.15	2335.5
180.15	2333.5
300.17	2331.2
520.17	2324.9
700.17	2317.6
960.17	2311.3
1440.03	2306.4



Tested By 129-07-0411 Date 4/11/23 Checked By MPS Date 4/21/23



SIEVE AND HYDROMETER ANALYSIS
NCDOT MOD. AASHTO T-88,

WASH SIEVE ANALYSIS
NCDOT MOD. AASHTO T-88,

Client: AECOM Boring No.: S1_EB1_A
 Client Reference: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Soil Color: **Brown**

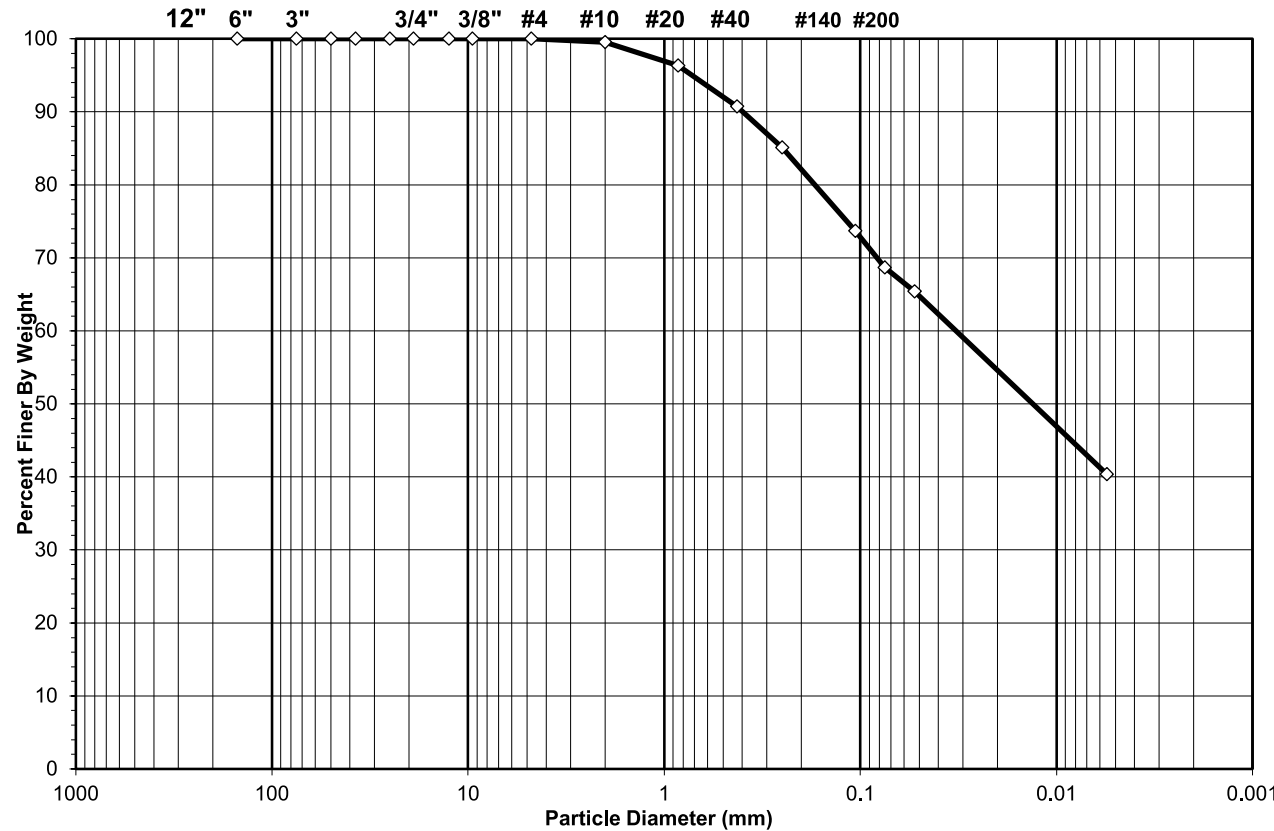
Client: AECOM Boring No.: S1_EB1_A
 Client Reference: B-5898 / B-3186 Depth (ft): 15.0-17.0
 Project No.: R-2023-090-001 Sample No.: ST-1
 Lab ID: R-2023-090-001-048 Soil Color: **Brown**

USCS AASHTO	SIEVE ANALYSIS			HYDROMETER
	cobbles	gravel	sand	silt and clay fraction

Minus #10 for Hygroscopic (10-15gm)		Hydrometer Specimen 50 or 100gms	
Tare No.	AN	Air Dried Hydrometer Material (gm)	70.75
Wgt. Tare + Wet Specimen (gm)	46.84	Corrected Dry Wt. of Hydro Mtrl. (gm)	67.65
Wgt. Tare + Dry Specimen (gm)	45.46		
Weight of Tare (gm)	15.38	Weight of -#270 Material	44.43
Weight of Water (gm)	1.38	Weight of -#10; +#270 Material	23.22
Weight of Dry Soil (gm)	30.08		
Moisture Content (%)	4.6		

Tare No.	425	Dry Weight of Material Ret. #10 (gm)	0.96
Wgt. Tare + Air Dry Soil (gm)	320.13	Corrected Dry Sample Wt - #10 (gm)	210.34
Weight of Tare (gm)	99.18		
Air Dried Wgt. Total Sample (gm)	220.95		
Total Dry Weight Sample (gm)	211.3	J - Factor (Percent Finer than #10)	0.9955

Sieve Size	Sieve Opening (mm)	Wgt. of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated Percent Finer (%)
12"	300	0.00	0.00	0.00	100.00	100.00
6"	150	0.00	0.00	0.00	100.00	100.00
3"	75	0.00	0.00	0.00	100.00	100.00
2"	50	0.00	0.00	0.00	100.00	100.00
1 1/2"	37.5	0.00	0.00	0.00	100.00	100.00
1"	25.0	0.00	0.00	0.00	100.00	100.00
3/4"	19.0	0.00	0.00	0.00	100.00	100.00
1/2"	12.5	0.00	0.00	0.00	100.00	100.00
3/8"	9.5	0.00	0.00	0.00	100.00	100.00
#4	4.75	0.00	0.00	0.00	100.00	100.00
#10	2.00	0.96	0.45	0.45	99.55	99.55
#20	0.85	2.20	3.25	3.25	96.75	96.31
#40	0.425	3.80	5.62	8.87	91.13	90.72
#60	0.25	3.80	5.62	14.49	85.51	85.12
#140	0.106	7.78	11.50	25.99	74.01	73.68
#200	0.075	3.42	5.06	31.04	68.96	68.64
#270	0.053	2.22	3.28	34.33	65.67	65.38
Pan	-	44.43	65.67	100.00	-	-



Sieve Size (mm)	Percent Finer	USCS %	AASHTO %	NCDOT SOIL MORTAR %
100	100.00	Gravel 0.00	Gravel 0.45	Coarse Sand Ret. #60 14.49
2	99.55	Sand 31.36	Coarse Sand 8.83	Fine Sand Ret. #270 19.84
0.075	68.64	Silt & Clay 68.64	Fine Sand 22.07	Silt 0.05-0.005mm 25.12
			Silt & Clay 68.64	Clay <0.005mm 40.55

AASHTO (GI) A-6 (8)

Tested By 129-07-0411 Date 4/17/23 Checked By AES Date 4/19/23



HYDROMETER ANALYSIS
NCDOT MOD. AASHTO T-88,

Client	AECOM	Boring No.	S1_EB1_A
Client Reference	B-5898 / B-3186	Depth (ft)	15.0-17.0
Project No.	R-2023-090-001	Sample No.	ST-1
Lab ID	R-2023-090-001-048	Soil Color	Brown

Elapsed Time (min)	R Measured	Temp. (°C)	Composite Correction	R Corrected	N (%)	K Factor	Diameter (mm)	N' (%)	
14:55:00	0	NA	NA	NA	NA	NA	NA	NA	
14:55:30	0.50	48.0	24.7	-2.60	44.6	65.5	0.01279	0.0525	65.2
15:55:00	60.00	31.0	24.7	-2.60	27.6	40.6	0.01279	0.0055	40.4

Corrections	
a - Factor	0.994
Percent Finer than # 10	99.55
Specific Gravity	2.68 Measured

Note: Hydrometer test is performed on - #10 sieve material.

LL = 38
PL = 25
PI = 13

ATTERBERG LIMITS

AASHTO T-89, T-90 (DOT Modified)

Client	AECOM	Boring No.	S1_EB1_A
Client Reference	B-5898 / B-3186	Depth (ft)	15.0-17.0
Project No.	R-2023-090-001	Sample No.	ST-1
Lab ID	R-2023-090-001-048	Soil Description	BROWN SILT (Minus No. 40 sieve material, Airdried)

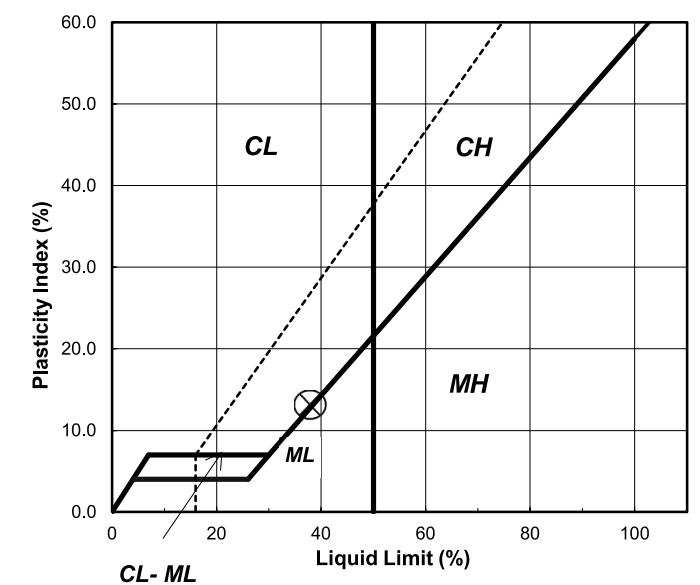
Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

Liquid Limit Test	1
Tare Number	17
Wt. of Tare & WS (gm)	17.68
Wt. of Tare & DS (gm)	14.72
Wt. of Tare (gm)	6.99
Wt. of Water (gm)	3.0
Wt. of DS (gm)	7.7
Moisture Content (%)	38.3
Number of Blows	25

Plastic Limit Test	1	2	Range	Test Results
Tare Number	21	23		Liquid Limit (%) 38
Wt. of Tare & WS (gm)	16.14	14.59		Plastic Limit (%) 25
Wt. of Tare & DS (gm)	14.33	13.11		Plasticity Index (%) 13
Wt. of Tare (gm)	7.06	7.10		USCS Symbol ML
Wt. of Water (gm)	1.8	1.5		
Wt. of DS (gm)	7.3	6.0		
Moisture Content (%)	24.9	24.6	0.3	

Note: The acceptable range of the two Moisture contents is ± 2.6

Plasticity Chart



Tested By 129-09-0411 Date 4/14/23 Checked By AES Date 4/19/23

Tested By 129-07-0411 Date 4/14/23 Checked By AES Date 4/17/23
page 1 of 1 DCN: CT-S4B DATE: 10/8/01 REVISION: 2

**SPECIFIC GRAVITY**

AASHTO T-100-15

Client:	AECOM	Boring No.:	S1_EB1_A
Client Reference:	B-5898 / B-3186	Depth (ft):	15.0-17.0
Project No.:	R-2023-090-001	Sample No.:	ST-1
Lab ID:	R-2023-090-001-048	Visual Description:	Brown Clay

(Minus No.4 sieve material, oven dried)

Replicate Number	1	2
Pycnometer ID:	R 716	R 717
Weight of Pycnometer & Soil & Water (g):	684.99	683.77
Temperature (°C):	24.8	24.6
Weight of Pycnometer & Water (g):	651.99	650.62
Tare Number:	716	717
Weight of Tare & Dry Soil (g):	206.98	205.62
Weight of Tare (g):	154.21	152.77
Weight of Dry Soil (g):	52.77	52.85
Specific Gravity of Soil @ Measured Temperature:	2.669	2.683
Specific Gravity of Water @ Measured Temperature:	0.99710	0.99715
Conversion Factor for Measured Temperature:	0.99889	0.99895
Specific Gravity @ 20° Celsius:	2.672	2.686

Average Specific Gravity @ 20° Celsius	2.68
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Tested By RFF Date 4/5/23 Checked By AES Date 4/7/23

page 1 of 1 DCN: CT-S5 DATE: 3/26/18 REVISION: 21

REFERENCE: B-5898/B-3186

PROJECT: 48030

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

SUBSURFACE INVESTIGATION

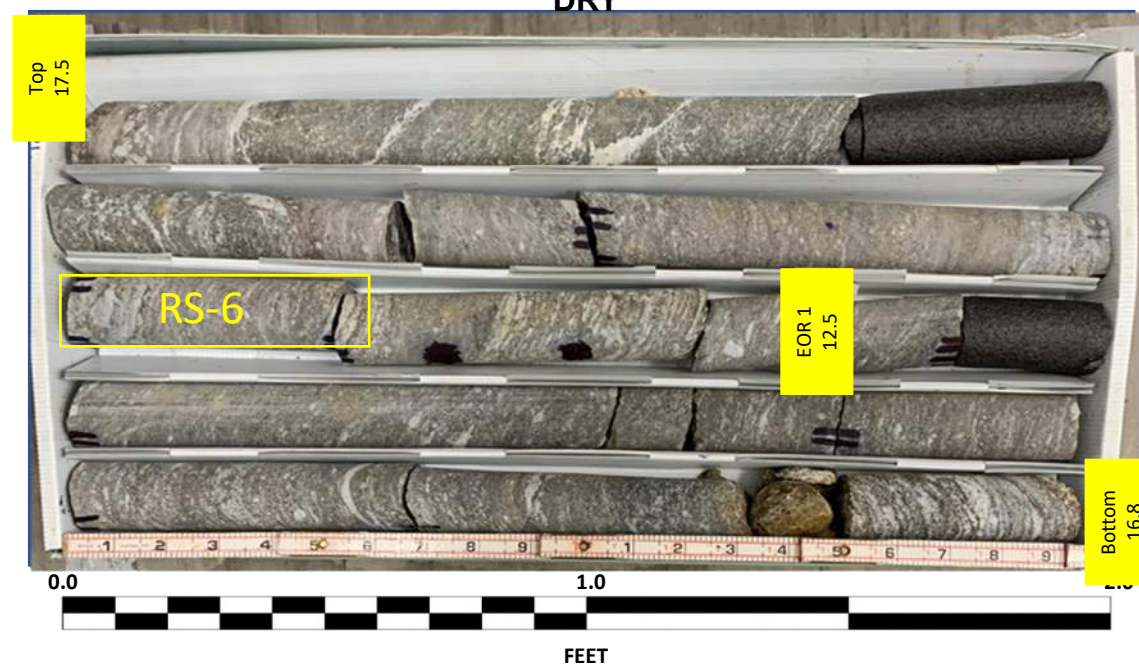
*APPENDIX C
HDR ROCK CORE PHOTOGRAPHS*



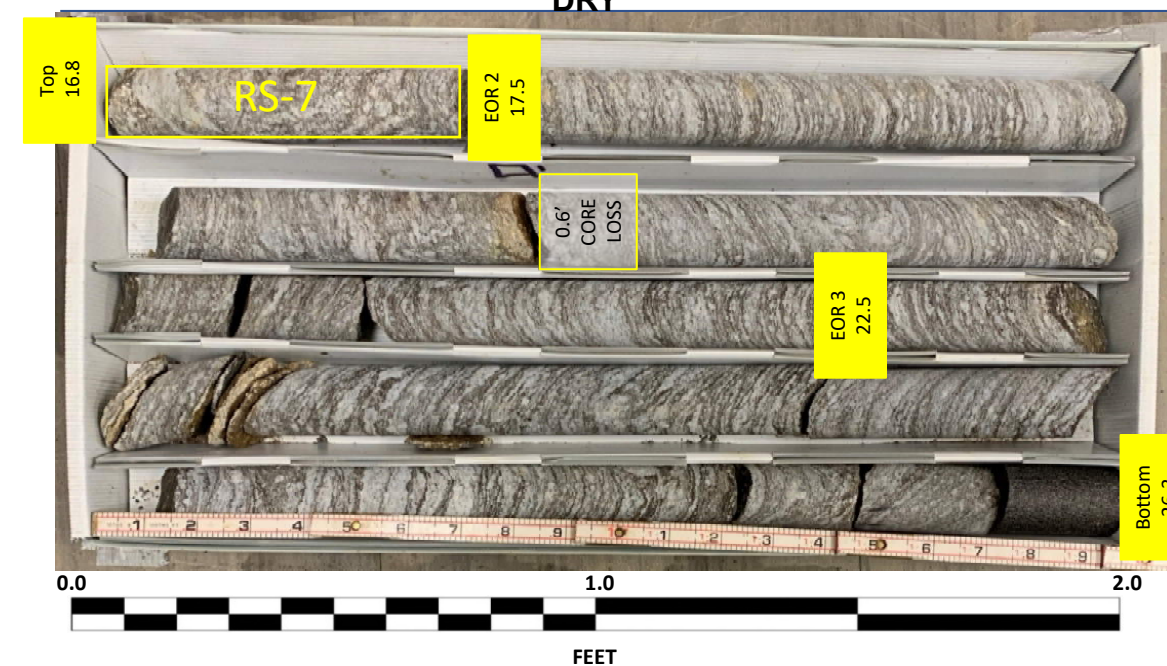
CORE PHOTOGRAPHIC RECORD

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

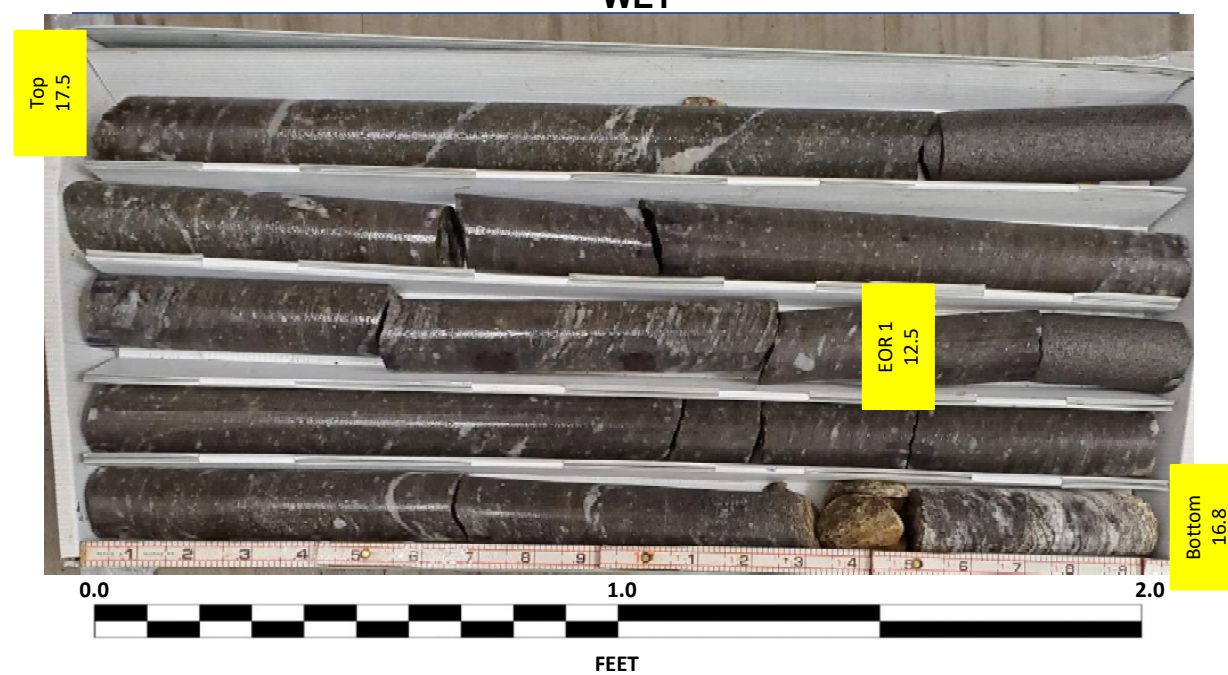
S1_B1-A (HDR)
Box 1 of 3: 7.5 – 16.8 FEET
DRY



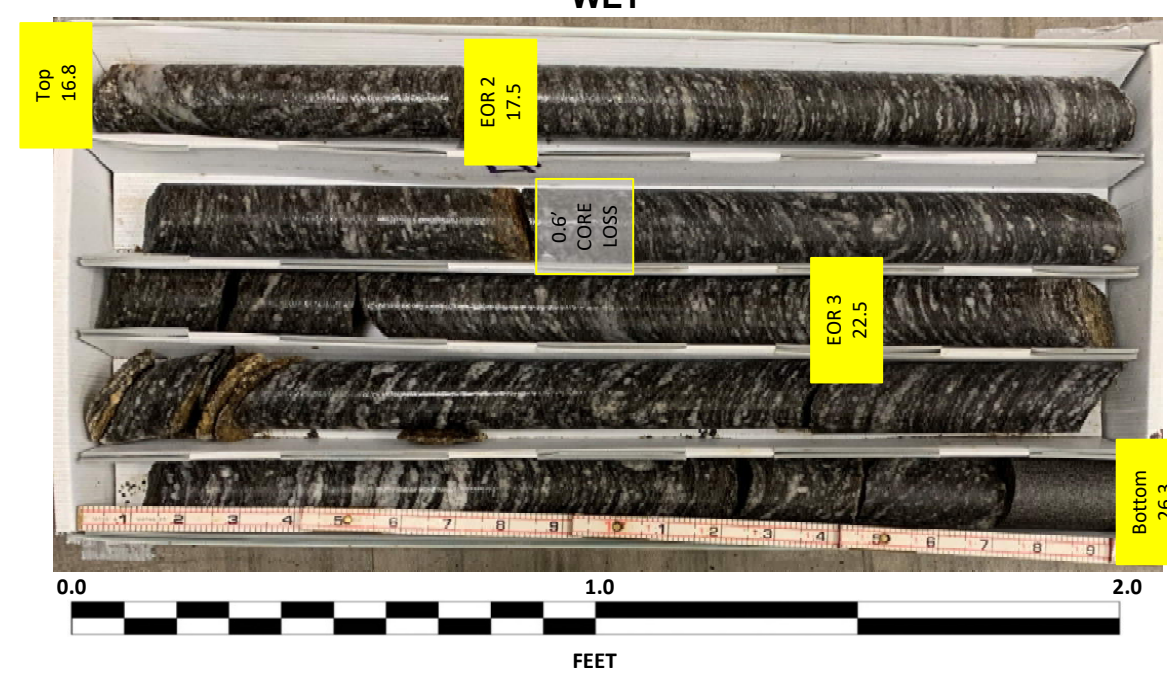
S1_B1-A (HDR)
Box 2 of 3: 16.8 – 26.3 FEET
DRY



S1_B1-A (HDR)
Box 1 of 3: 7.5 – 16.8 FEET
WET

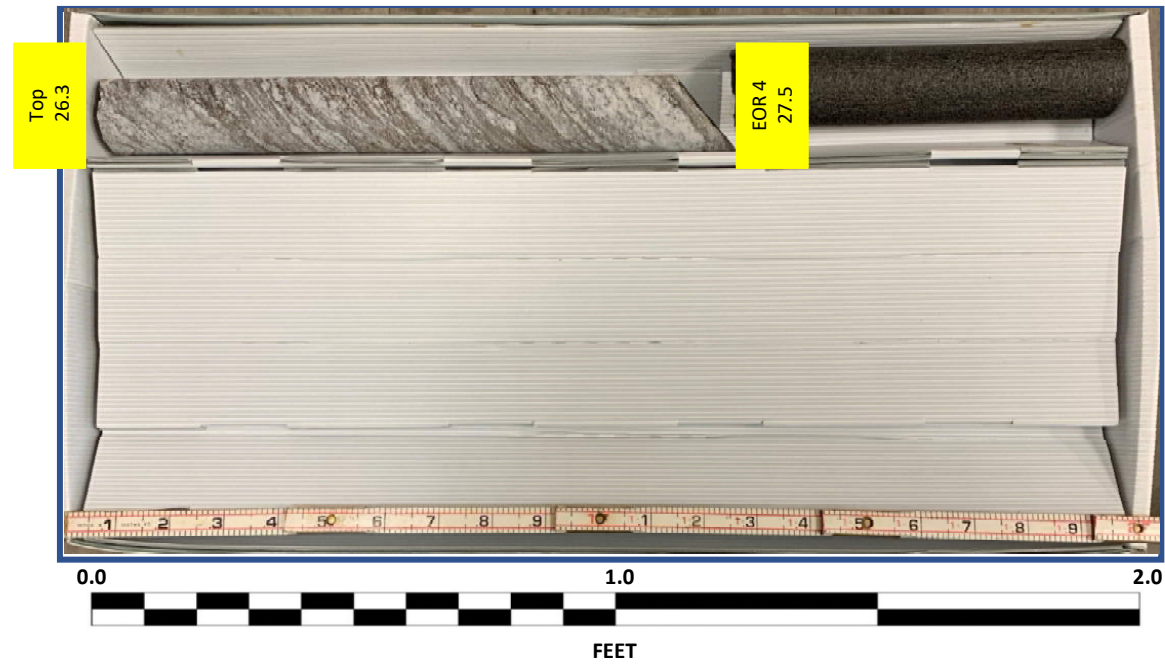


S1_B1-A (HDR)
Box 2 of 3: 16.8 – 26.3 FEET
WET

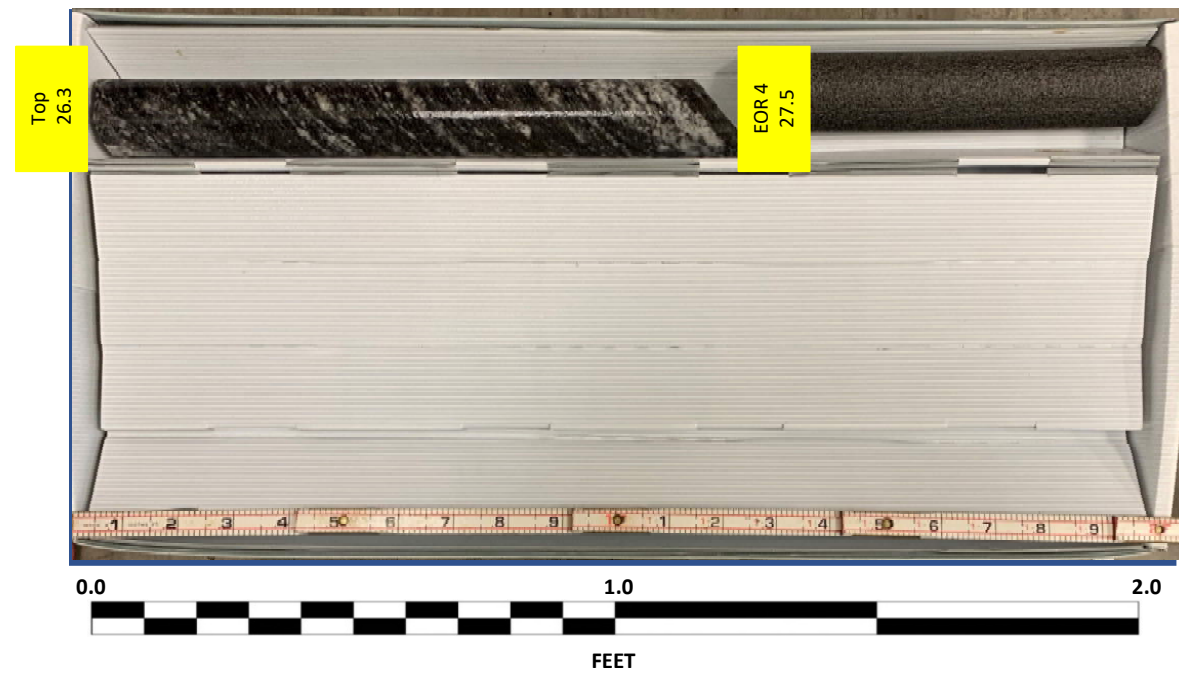


CORE PHOTOGRAPHIC RECORD
38330.1.FS1 (B-3186/B-5898)
US 23/ US 74 Great Smokey Mountain Highway

S1_B1-A (HDR)
Box 3 of 3: 26.3 – 27.5 FEET
DRY



S1_B1-A (HDR)
Box 3 of 3: 26.3 – 27.5 FEET
WET

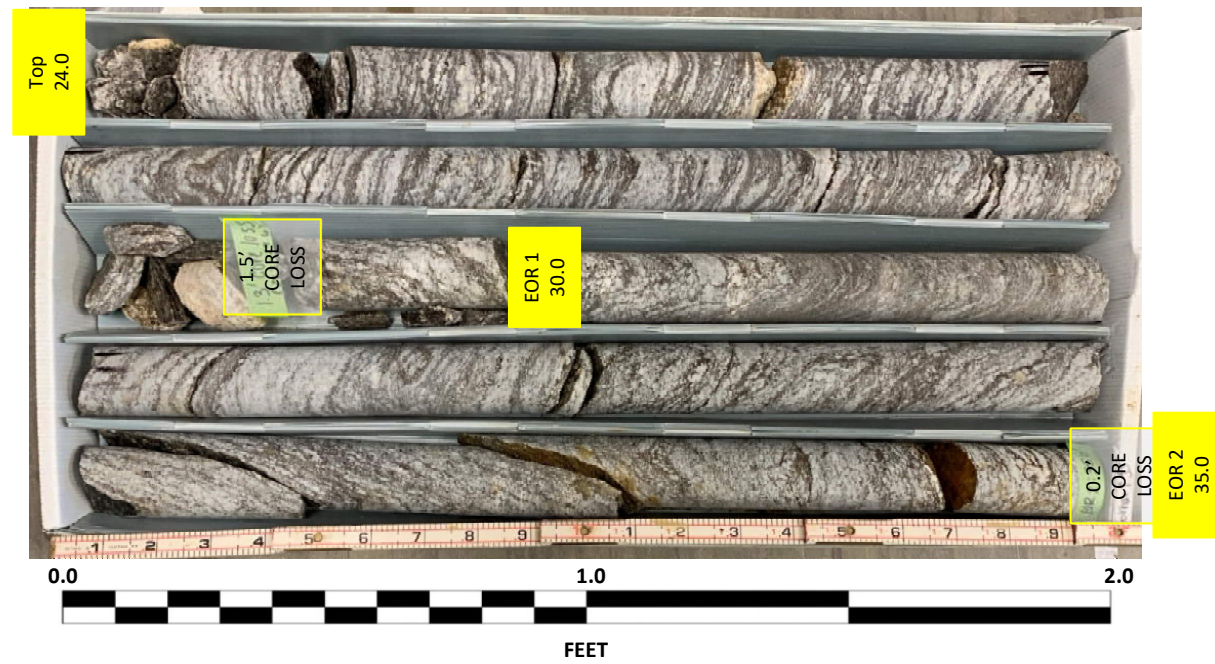


CORE PHOTOGRAPHIC RECORD

38330.1.FS1 (B-3186/B-5898)

US 23/ US 74 Great Smokey Mountain Highway

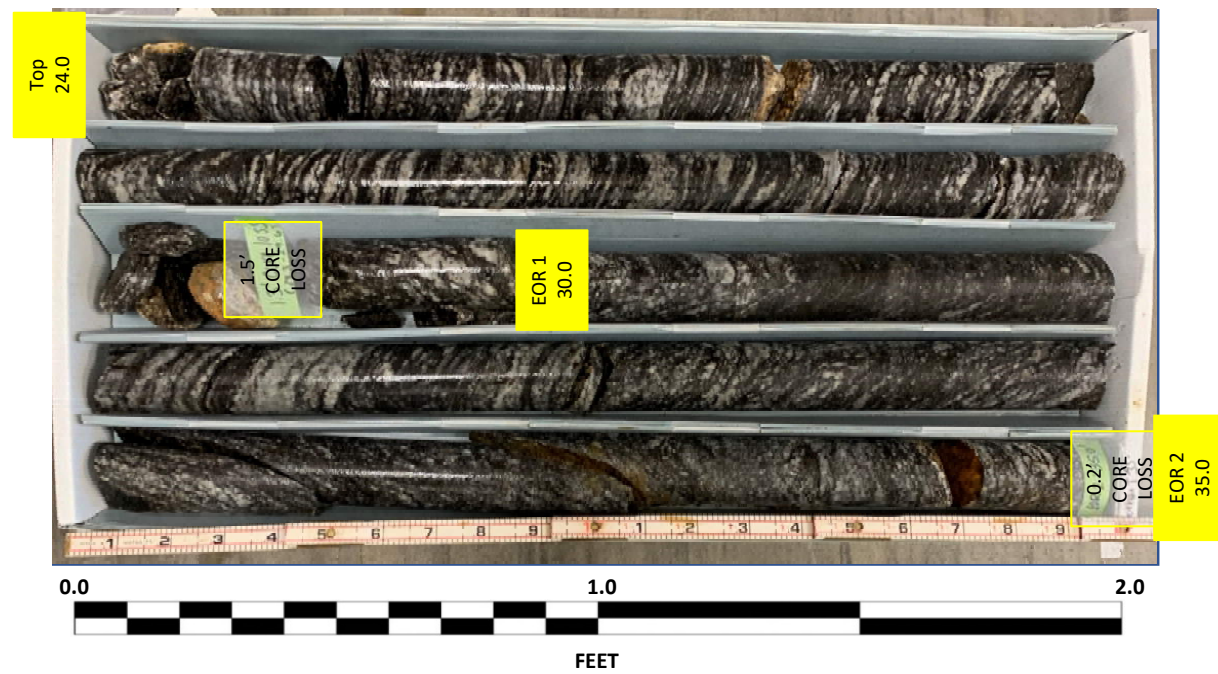
S1_B1-C (HDR)
Box 1 of 2: 24.0 – 35.0 FEET
DRY



S1_B1-C (HDR)
Box 2 of 2: 35.0 – 44.0 FEET
DRY



S1_B1-C (HDR)
Box 1 of 2: 24.0 - 35.0 FEET
WET



S1_B1-C (HDR)
Box 2 of 2: 35.0 – 44.0 FEET
WET



CORE PHOTOGRAPHIC RECORD

38330.1.FS1 (B-3186/B-5898)

US 23/ US 74 Great Smokey Mountain Highway

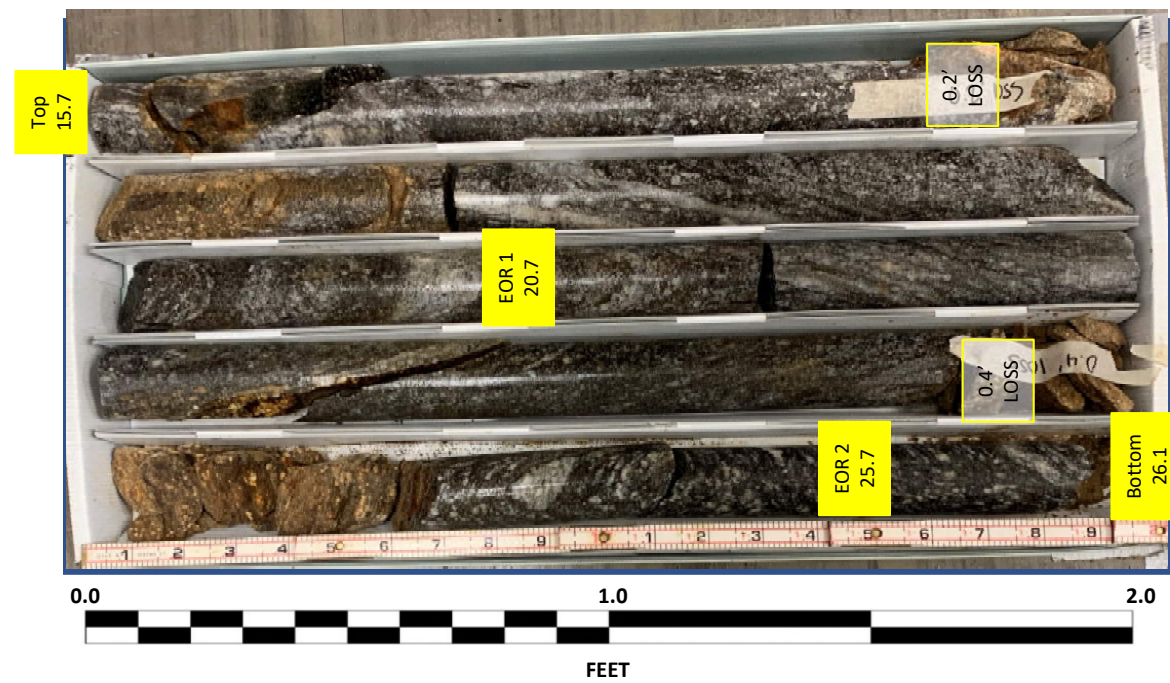
S1_B1-B (HDR)
Box 1 of 2: 15.7 – 26.1 FEET
DRY



S1_B1-B (HDR)
Box 2 of 2: 26.1 – 35.7 FEET
DRY



S1_B1-B (HDR)
Box 1 of 2: 15.7 – 26.1 FEET
WET

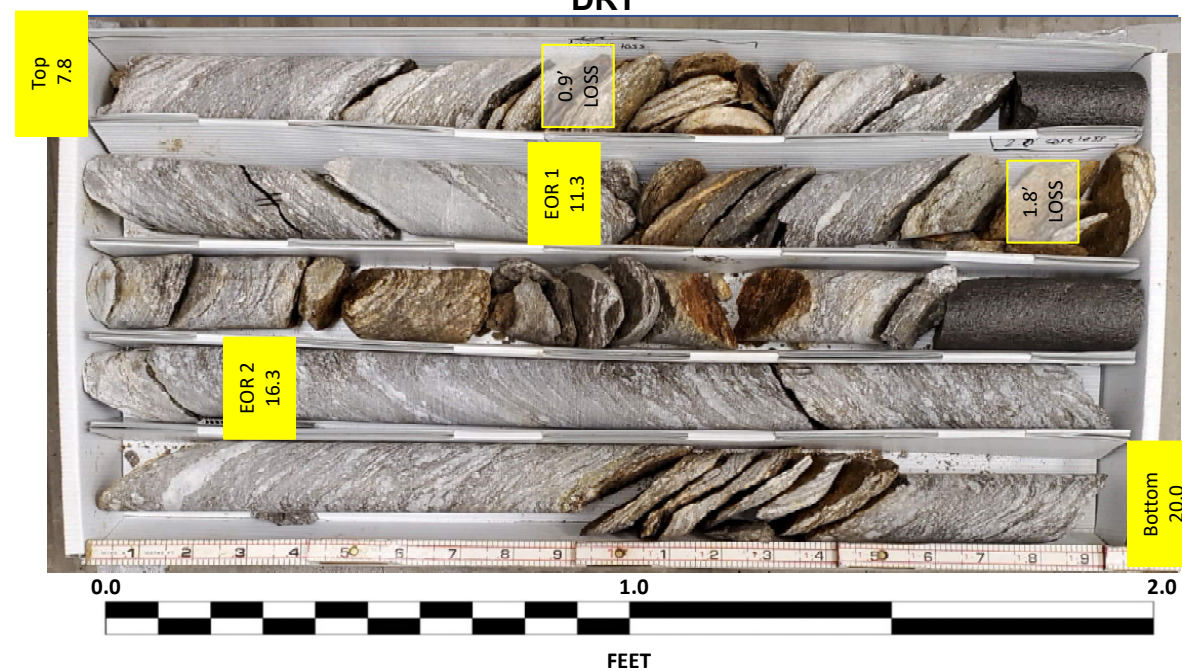


S1_B1-B (HDR)
Box 2 of 2: 26.1 – 35.7 FEET
WET

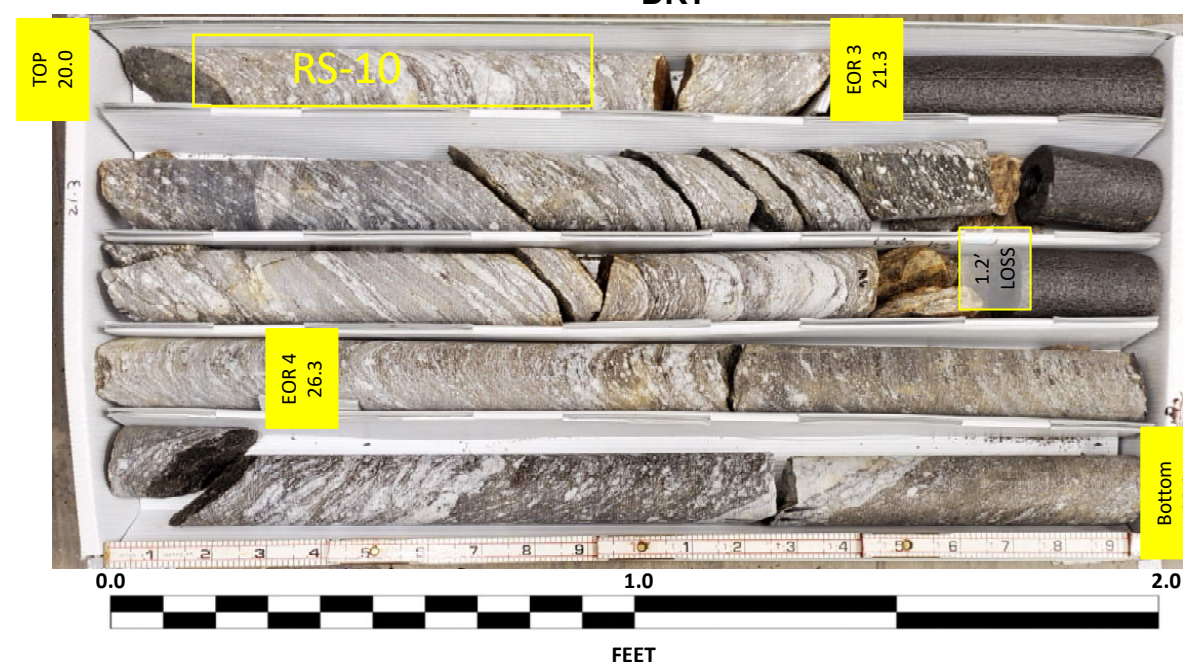


CORE PHOTOGRAPHIC RECORD
38330.1.FS1 (B-3186/B-5898)
US 23/ US 74 Great Smokey Mountain Highway

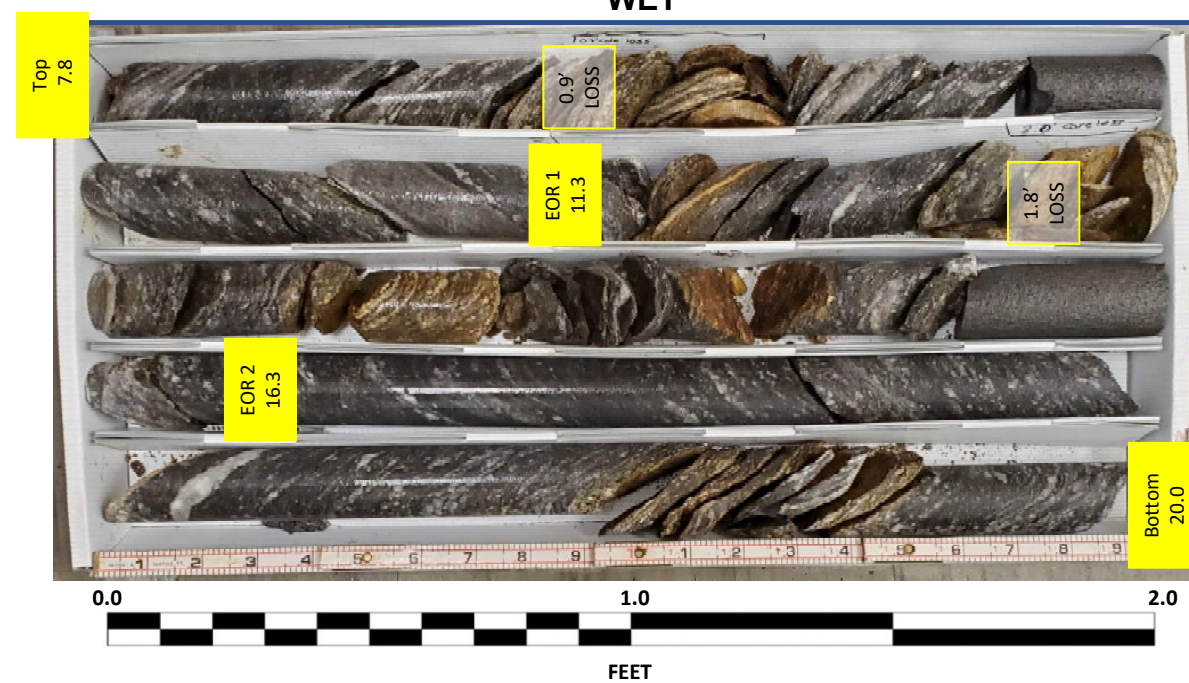
S1_B2-A (HDR)
Box 1 of 3: 7.8 – 20.0 FEET
DRY



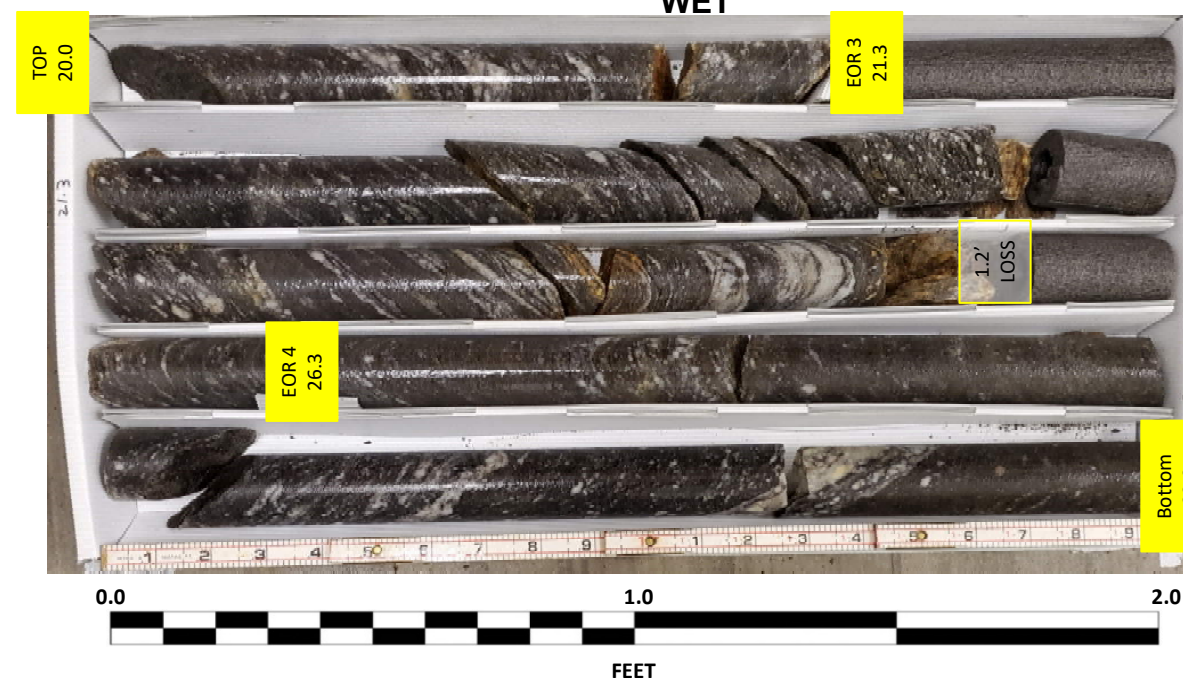
S1_B2-A (HDR)
Box 2 of 3: 20.0-29.9 FEET
DRY



S1_B2-A (HDR)
Box 1 of 3: 7.8 – 20.0 FEET
WET



S1_B2-A (HDR)
Box 2 of 3: 20.0 – 29.9 FEET
WET

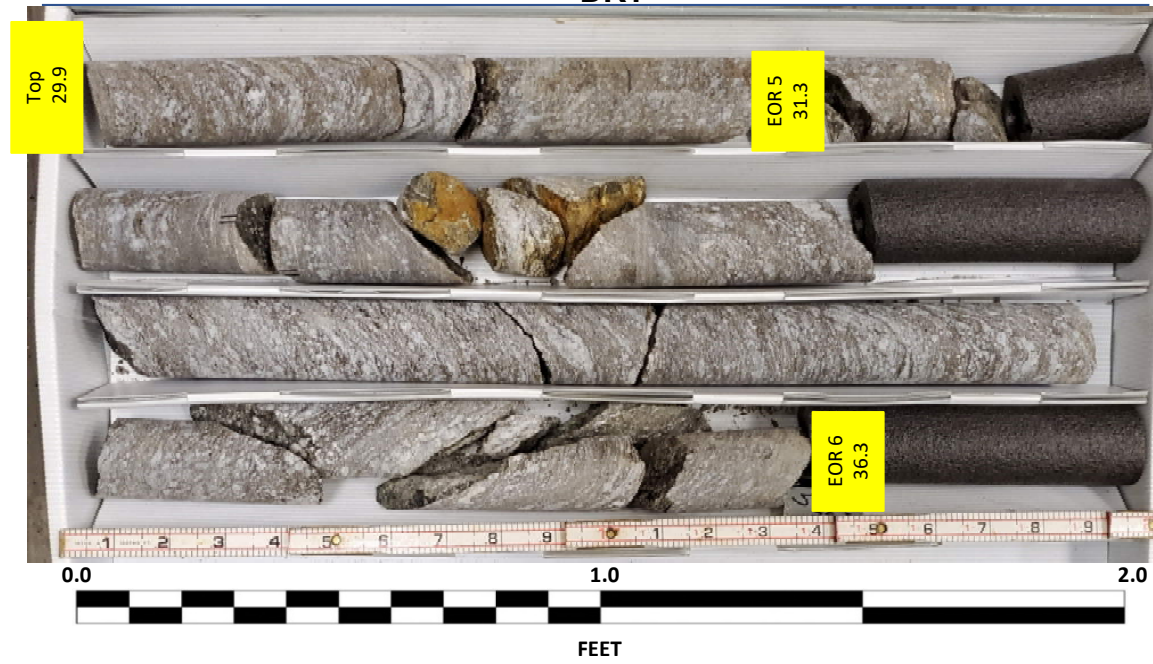


CORE PHOTOGRAPHIC RECORD

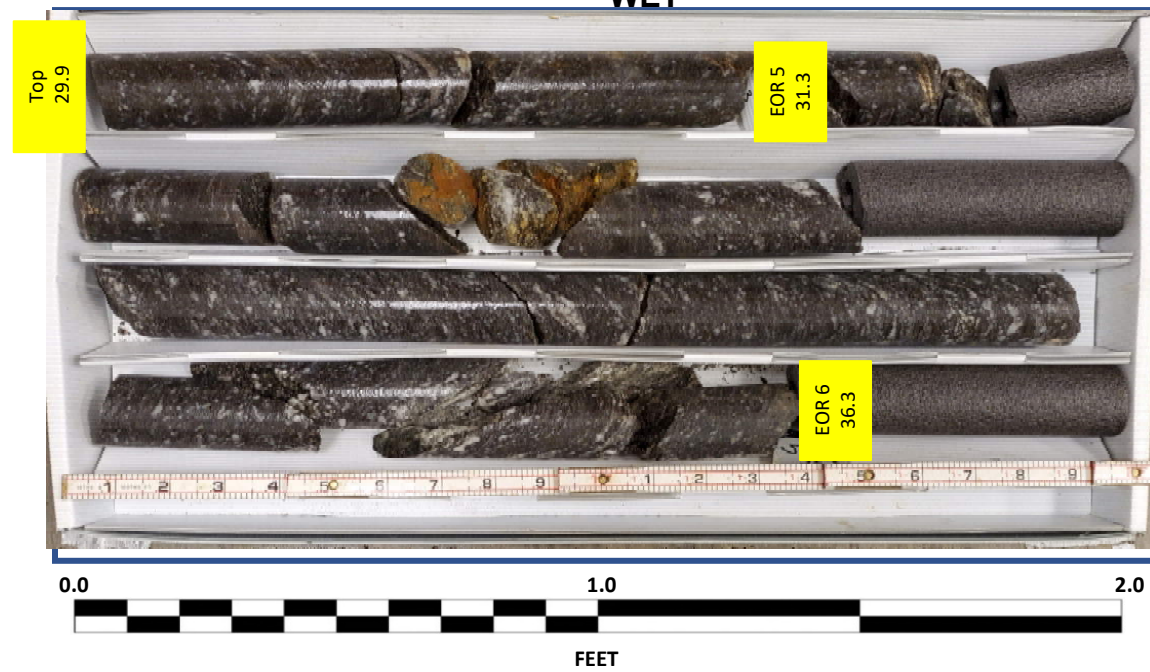
38330.1.FS1 (B-3186/B-5898)

US 23/ US 74 Great Smokey Mountain Highway

S1_B2-A (HDR)
Box 3 of 3: 29.9 – 36.3 FEET
DRY



S1_B2-A (HDR)
Box 3 of 3: 29.9 – 36.3 FEET
WET

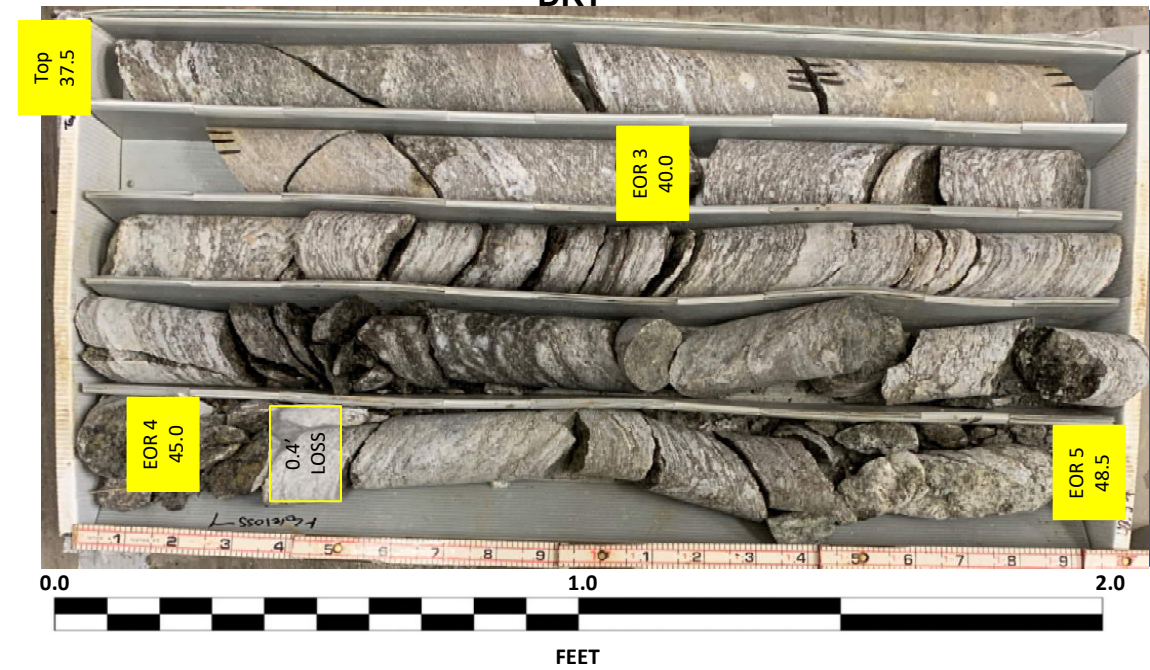


CORE PHOTOGRAPHIC RECORD
38330.1.FS1 (B-3186/B-5898)
US 23/ US 74 Great Smokey Mountain Highway

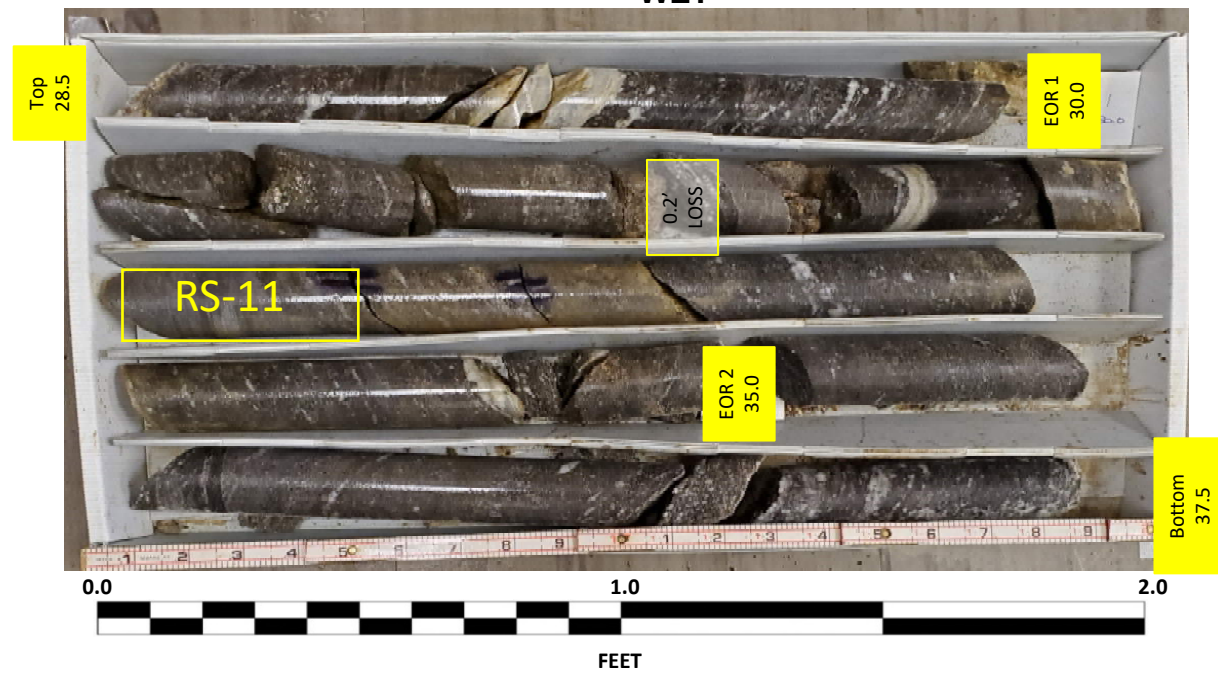
S1_B2-C (HDR)
Box 1 of 2: 28.5 – 37.5 FEET
DRY



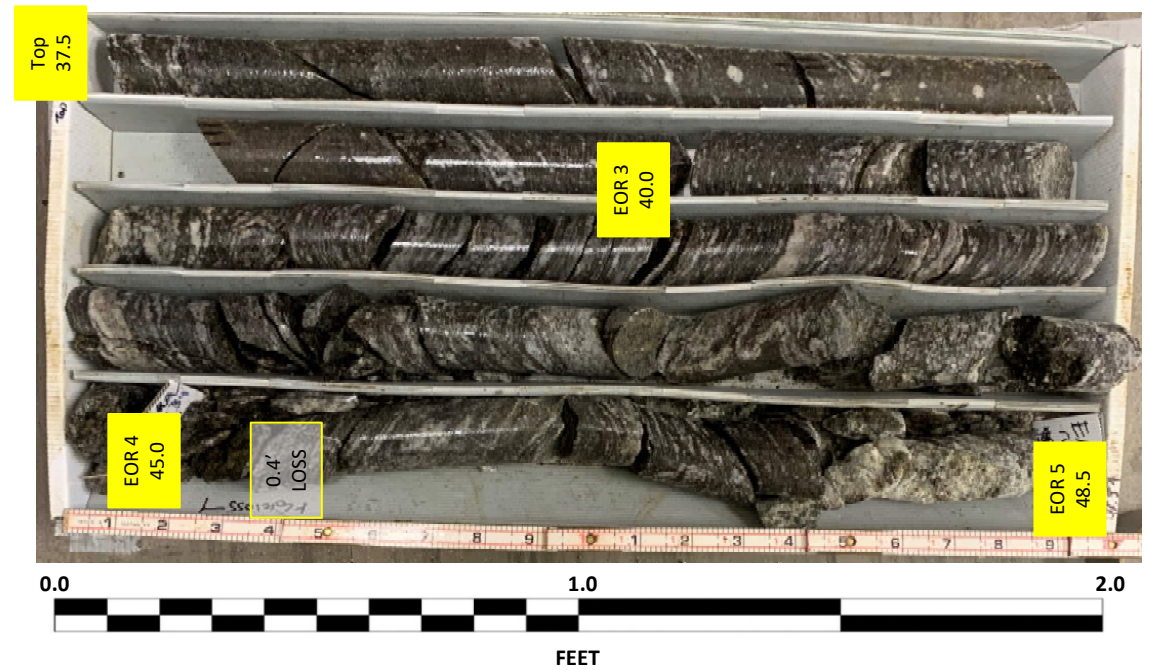
S1_B2-C (HDR)
Box 2 of 2: 37.5 – 48.5 FEET
DRY



S1_B2-C (HDR)
Box 1 of 2: 28.5 – 37.5 FEET
WET

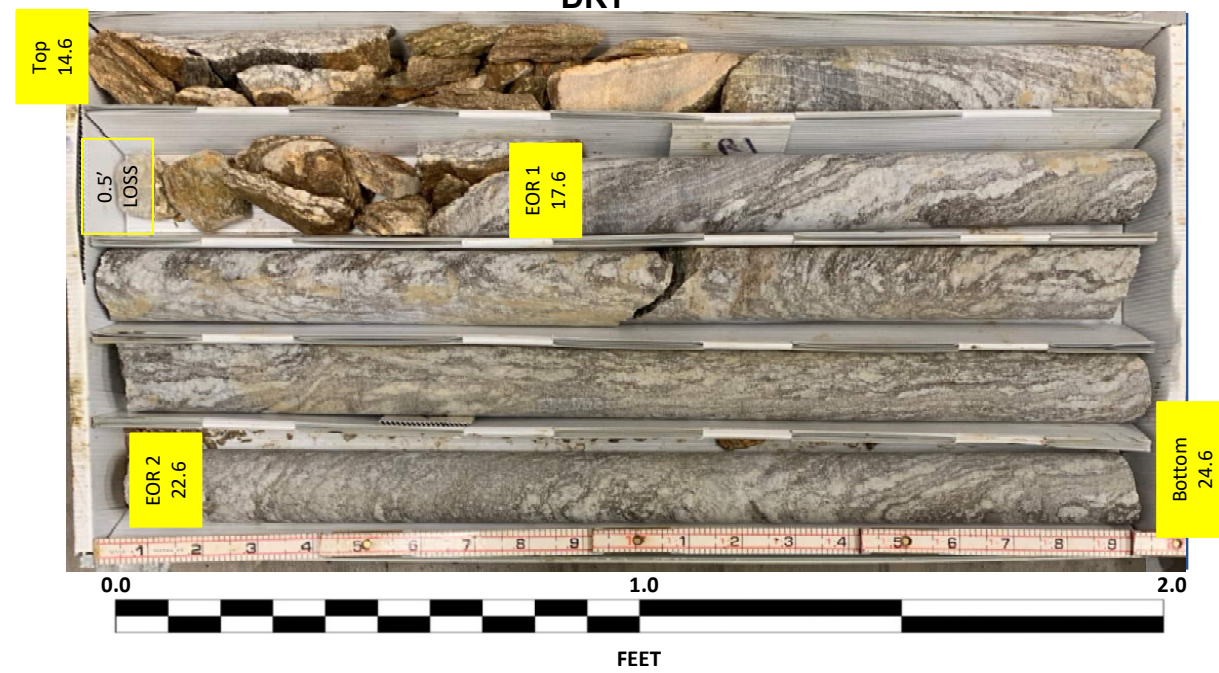


S1_B2-C (HDR)
Box 2 of 2: 37.5 – 48.5 FEET
WET



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

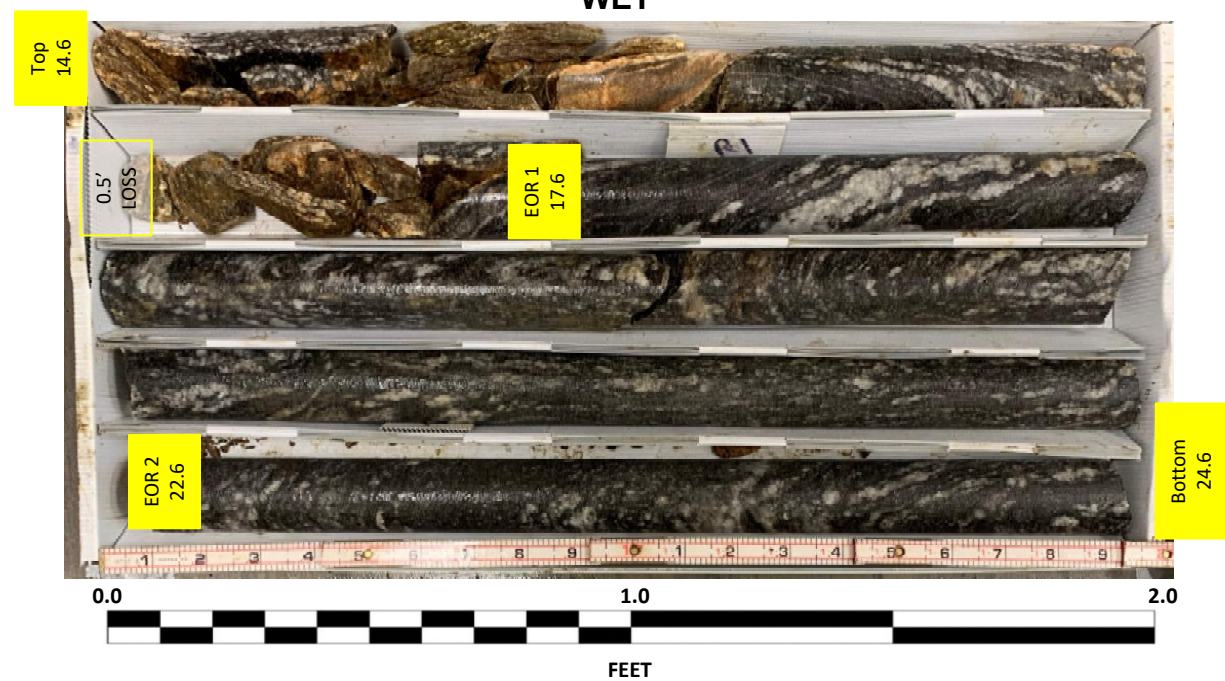
S1_B2-B (HDR)
Box 1 of 2: 14.6 – 24.6 FEET
DRY



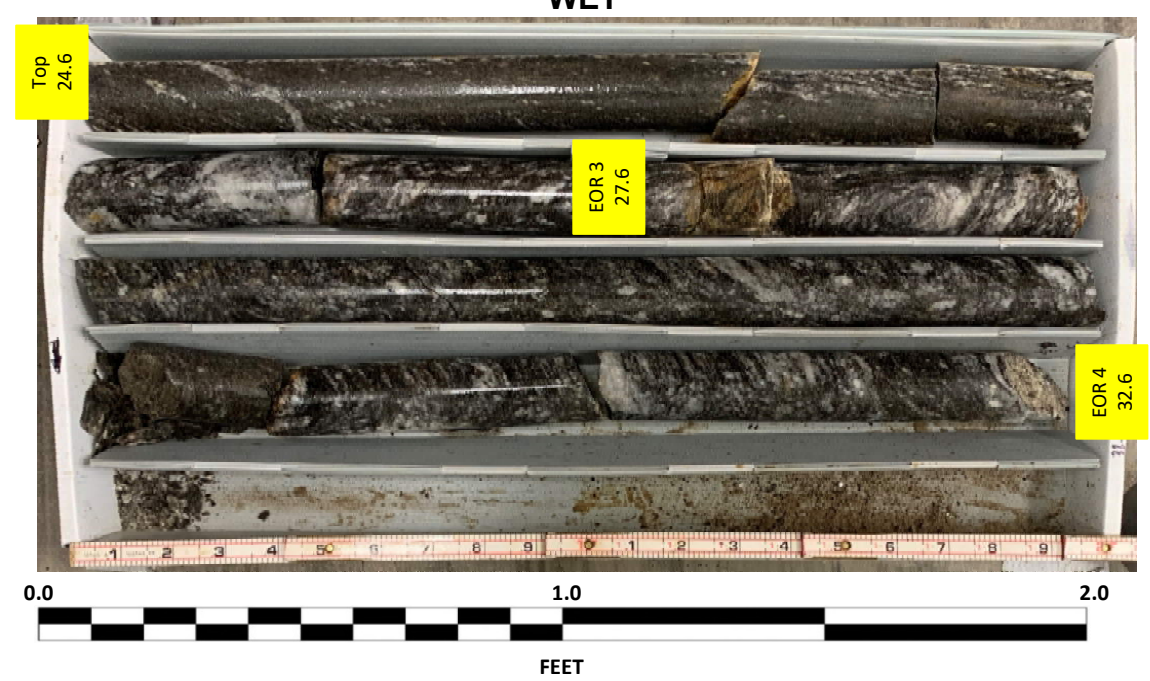
S1_B2-B (HDR)
Box 2 of 2: 24.6 – 32.6 FEET
DRY



S1_B2-B (HDR)
Box 1 of 2: 14.6 – 24.6 FEET
WET

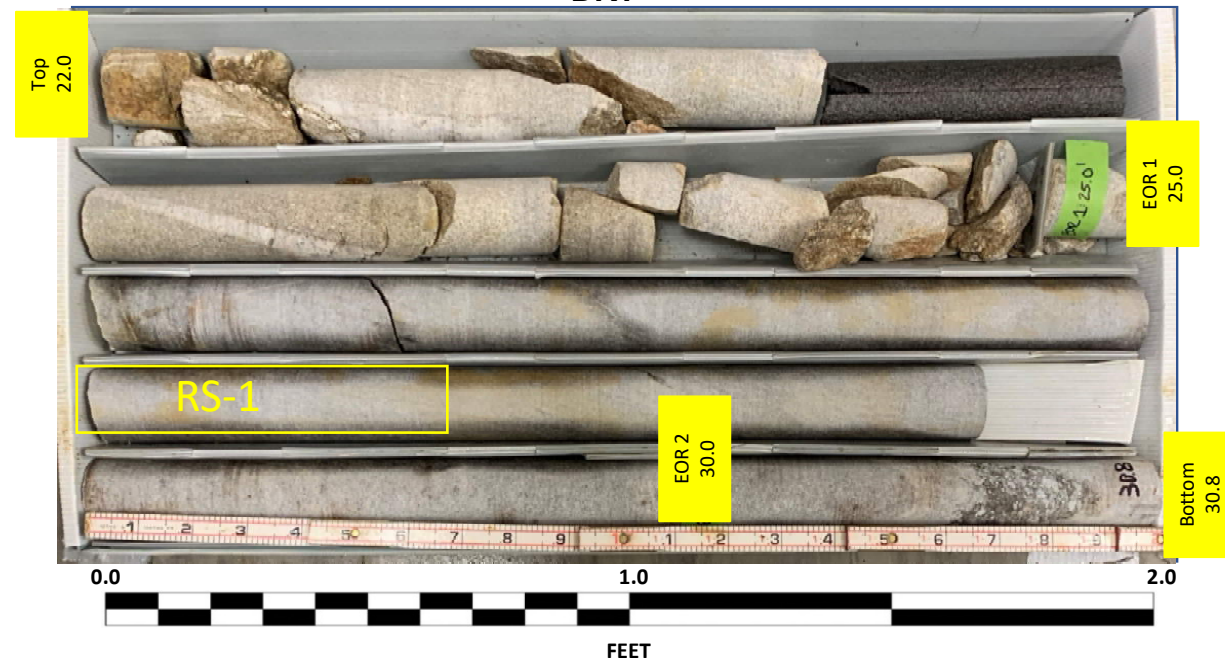


S1_B2-B (HDR)
Box 2 of 2: 24.6 – 32.6 FEET
WET

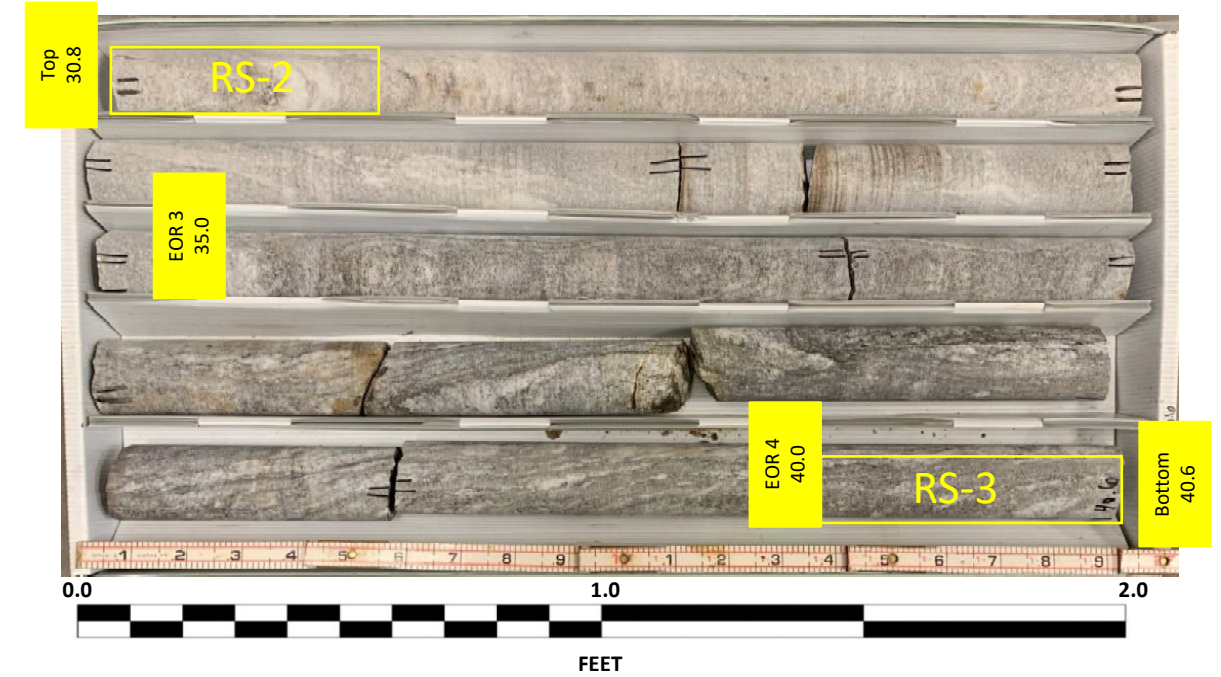


CORE PHOTOGRAPHIC RECORD
38330.1.FS1 (B-3186/B-5898)
US 23/ US 74 Great Smokey Mountain Highway

DET-B1 (HDR)
Box 1 of 3: 22.0 – 30.8 FEET
DRY



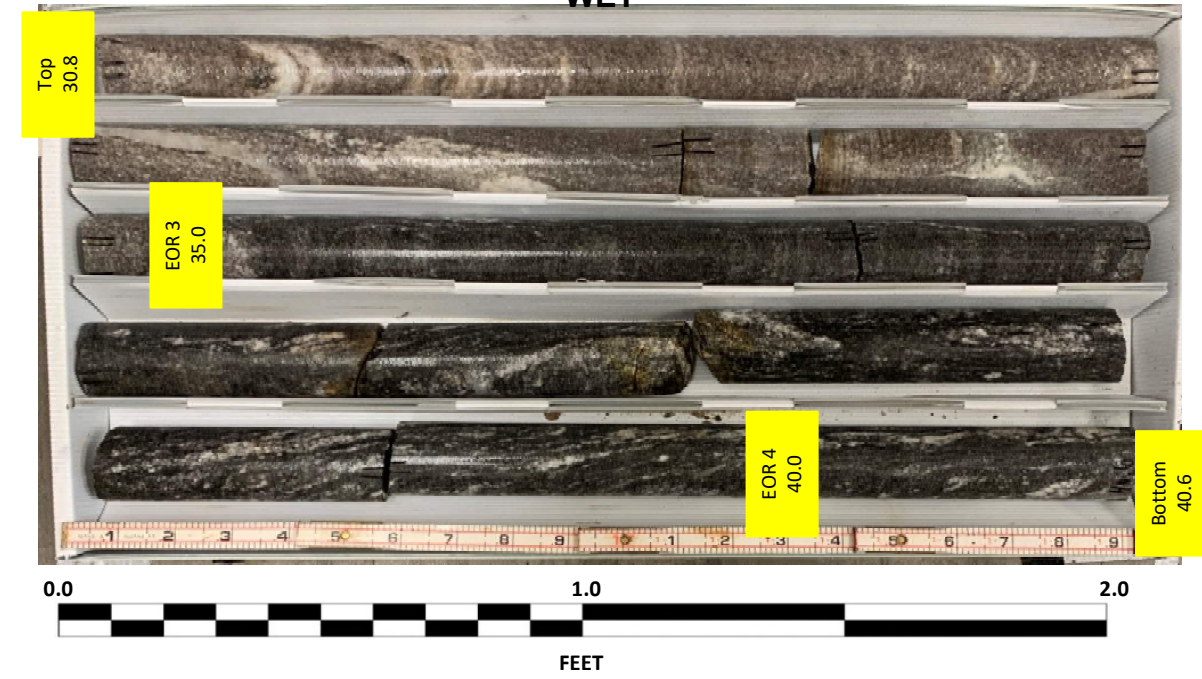
DET-B1 (HDR)
Box 2 of 3: 30.8 – 40.6 FEET
DRY



DET-B1 (HDR)
Box 1 of 3: 22.0 – 30.8 FEET
WET



DET-B1 (HDR)
Box 2 of 3: 30.8 – 40.6 FEET
WET

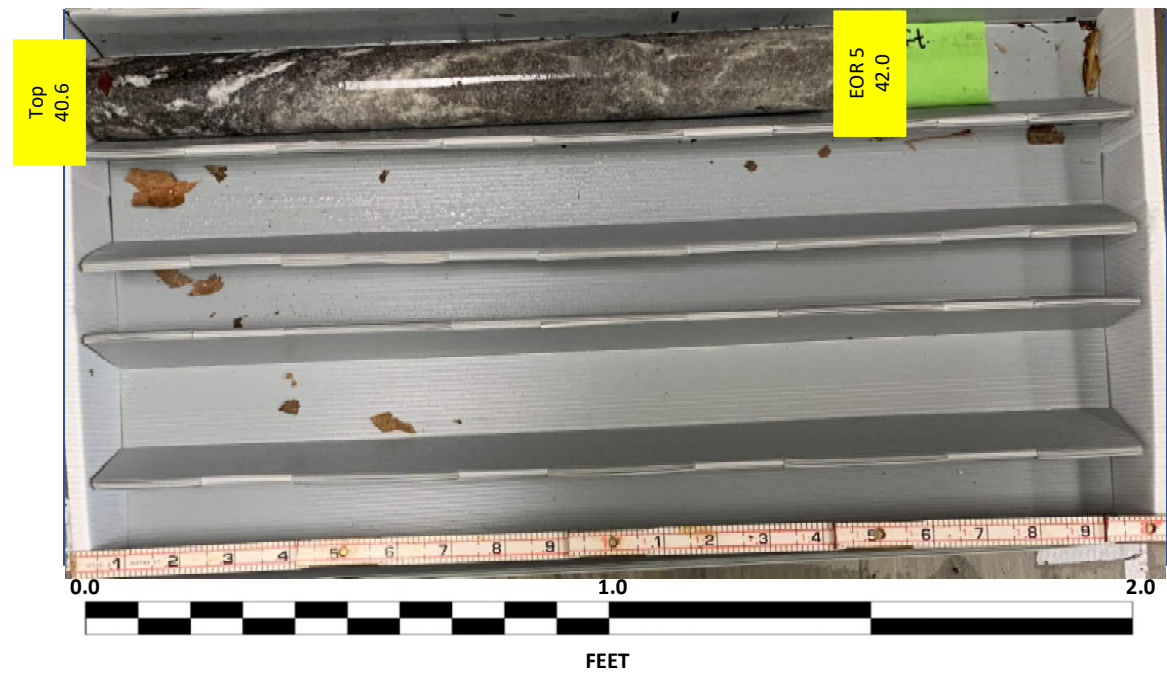


CORE PHOTOGRAPHIC RECORD
38330.1.FS1 (B-3186/B-5898)
US 23/ US 74 Great Smokey Mountain Highway

DET-B1 (HDR)
Box 3 of 3: 40.6 – FEET
DRY



DET-B1 (HDR)
Box 3 of 3: 40.6 – 42.0 FEET
WET

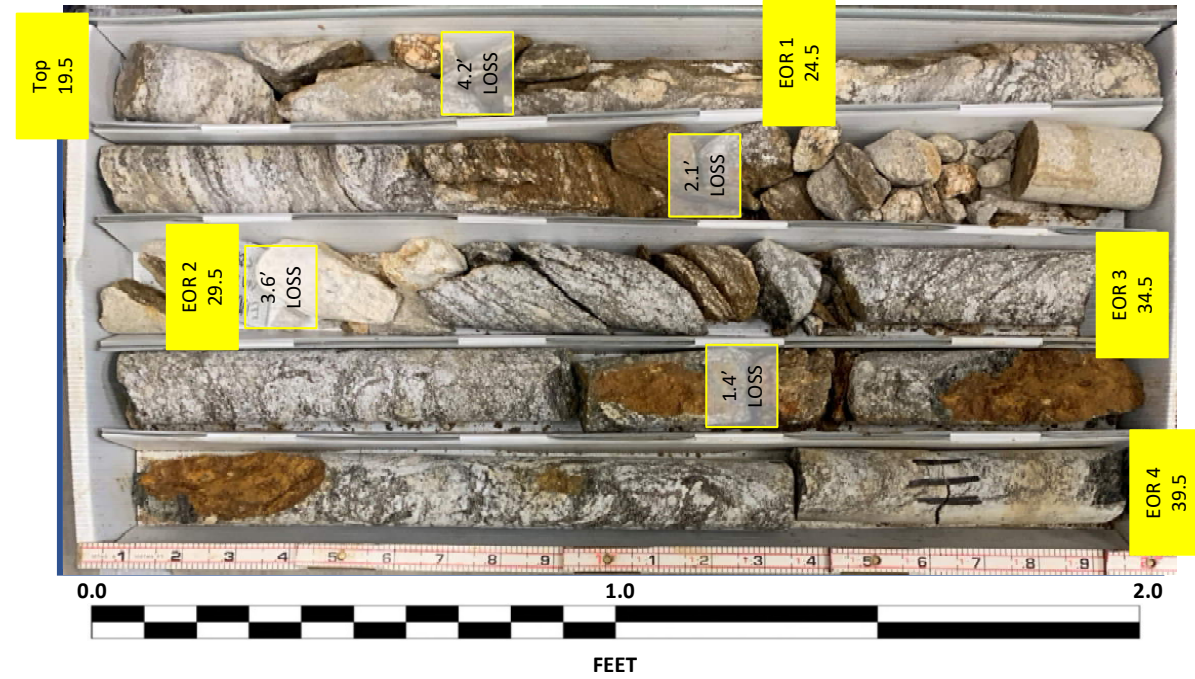


CORE PHOTOGRAPHIC RECORD

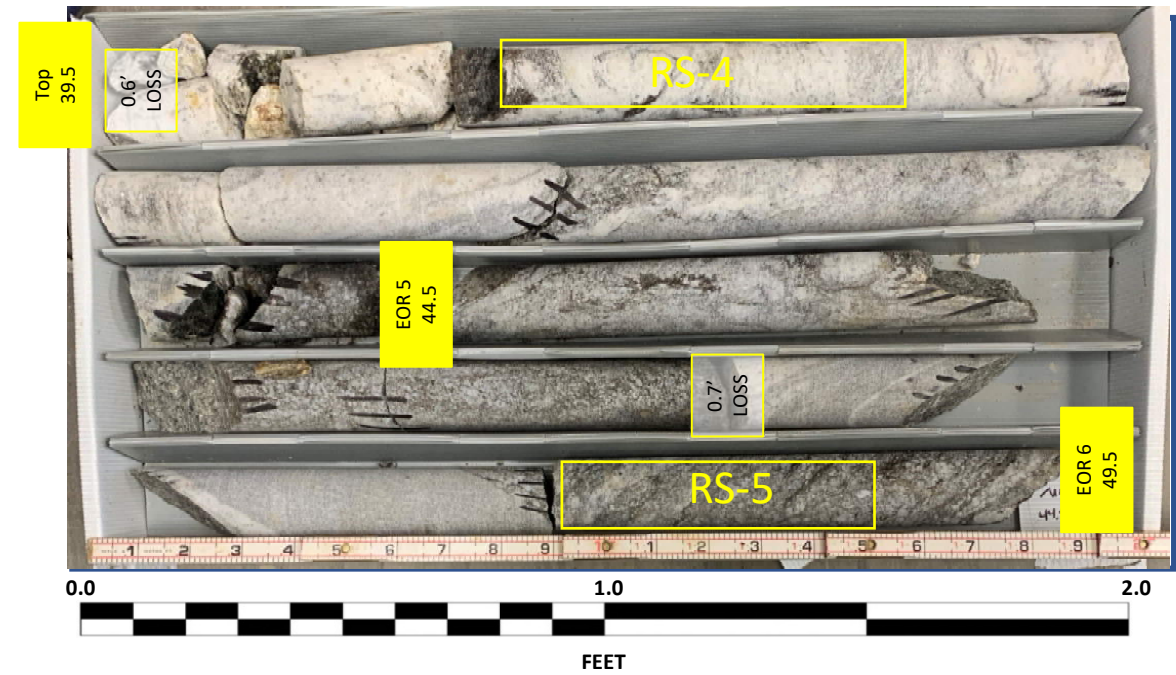
38330.1.FS1 (B-3186/B-5898)

US 23/ US 74 Great Smokey Mountain Highway

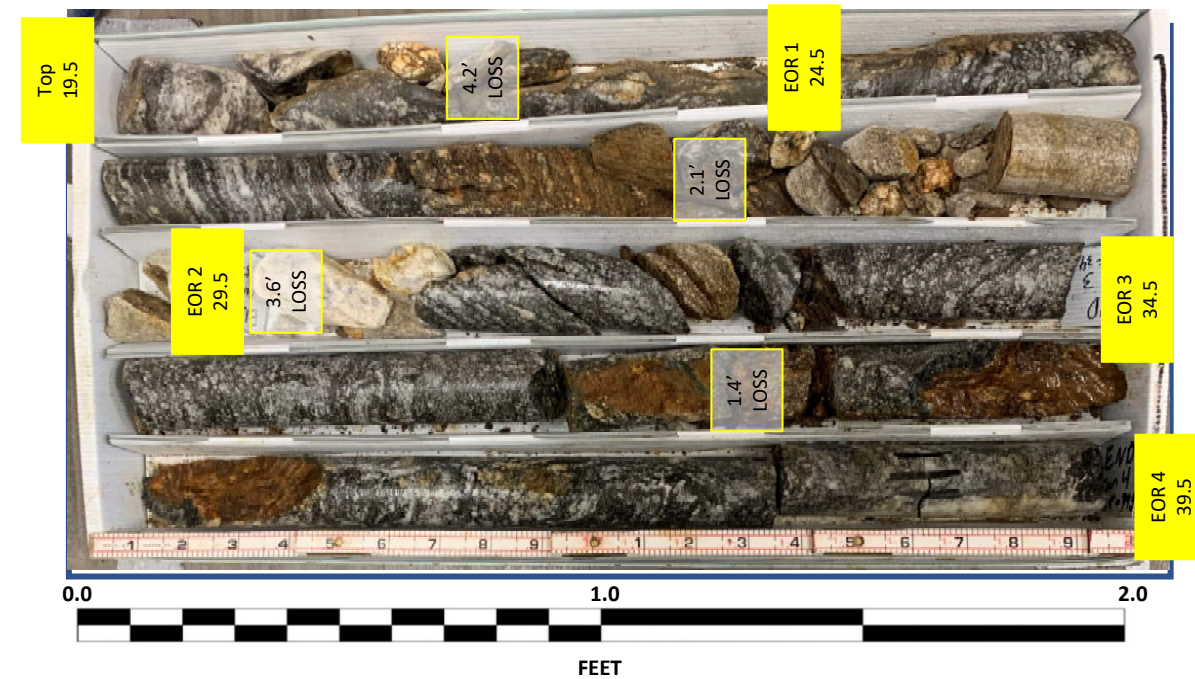
DET-B2 (HDR)
Box 1 of 2: 19.5 – 39.5 FEET
DRY



DET-B2 (HDR)
Box 2 of 2: 39.5 – 49.5 FEET
DRY



DET-B2 (HDR)
Box 1 of 2: 19.5 – 39.5 FEET
WET



DET-B2 (HDR)
Box 2 of 2: 39.5 – 49.5 FEET
WET

