5898 3186/B Ŕ REFERENCE

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332/48030 38. PROJEC

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STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY **HAYWOOD**

PROJECT DESCRIPTION US 23/US 74/US 19 (GREAT SMOKY MOUNTAIN HWY) FROM WEST OF NC 209 (CRABTREE RD.) TO EAST OF RUSS AVE. SITE DESCRIPTION BRIDGE NO. 430468 ON - L-(US 74/US 23) OVER RICHLAND CREEK BETWEEN **US 276 AND NC 209**



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 SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1991 707-6850. THE SUBSIFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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NOTES:

- TES: 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 WAVES ANY CLAIMS FOR INCRESSED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

C. SWAFFORD

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GEOTECHNOLOGY, INC

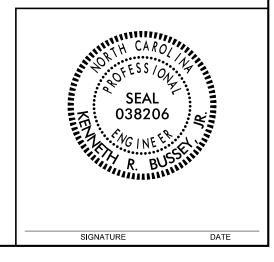
INVESTIGATED BY C. SWAFFORD

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CHECKED BY K. BUSSEY

SUBMITTED BY ______

DATE AUGUST 2021



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

	SOIL	DESCRIPTION		Τ	GRADATION		1	ROCK DE	SCRIPTION
			EARTH MATERIALS THAT CAN		TES A GOOD REPRESENTATION OF PARTIC			NON-COASTAL PLAIN MATERIAL THAT N CATES THE LEVEL AT WHICH NON-COA	
		UWER AUGER AND YIELD LES EST (AASHTO T 206,ASTM D	S THAN 100 BLOWS PER FOOT 1586). SOIL CLASSIFICATION		NDICATES THAT SOIL PARTICLES ARE ALL ES A MIXTURE OF UNIFORM PARTICLE SIZ		SPT REFUSAL IS	5 PENETRATION BY A SPLIT SPOON SA	AMPLER EQUAL TO OR LESS THAN 0.1
		DESCRIPTIONS GENERALLY I	NCLUDE THE FOLLOWING: ER PERTINENT FACTORS SUCH		ANGULARITY OF GRAIN			COASTAL PLAIN MATERIAL, THE TRA Y A ZONE OF WEATHERED ROCK.	INSITION BETWEEN SOIL AND ROCK
AS MINERALO	GICAL COMPOSITION, ANGULA	ARITY, STRUCTURE, PLASTICIT	Y,ETC. FOR EXAMPLE,		TY OR ROUNDNESS OF SOIL GRAINS IS DE			S ARE TYPICALLY DIVIDED AS FOLLOW	VS:
		TERBEDDED FINE SAND LAYERS			NGULAR, SUBROUNDED, OR ROUNDED.	STORATED BT THE TERMS:	WEATHERED		IN MATERIAL THAT WOULD YIELD SPT
		AASHTO CLASSIFI	CATION	_	MINERALOGICAL COMPOSI	TION	ROCK (WR)	100 BLOWS PER FO	
	GRANULAR MATERIALS ≤ 35% PASSING #200)	SILT-CLAY MATERIALS (> 35% PASSING #200)	ORGANIC MATERIALS	MINERAL NA	MES SUCH AS QUARTZ, FELDSPAR, MICA, T		CRYSTALLINE		GRAIN IGNEOUS AND METAMORPHIC RO REFUSAL IF TESTED. ROCK TYPE INC
GROUP A-1	A-3 A-2	A-4 A-5 A-6 A-7	A-1, A-2 A-4, A-5		N DESCRIPTIONS WHEN THEY ARE CONSID		ROCK (CR)	GNEISS, GABBRO, SC	CHIST, ETC.
CLASS. A-1-a A-1-b	A-2-4 A-2-5 A-2-6 A-2		A-3 A-6, A-7		COMPRESSIBILITY		NON-CRYSTALLIN		GRAIN METAMORPHIC AND NON-COASTA < THAT WOULD YEILD SPT REFUSAL 1
SYMBOL 000000000					HTLY COMPRESSIBLE	LL < 31	ROCK (NCR)	ROCK TYPE INCLUE	DES PHYLLITE, SLATE, SANDSTONE, ETC
000000000					ERATELY COMPRESSIBLE LY COMPRESSIBLE	LL = 31 - 50 LL > 50	COASTAL PLAIN SEDIMENTARY RO		EDIMENTS CEMENTED INTO ROCK,BUT CK TYPE INCLUDES LIMESTONE,SANDS
2 PASSING #10 50 MX			GRANULAR SILT- MUCK,		PERCENTAGE OF MATER		(CP)	SHELL BEDS, ETC.	
*40 30 MX 50 MX			SOILS CLAY PEAT				1	WEAT	HERING
	10 MX 35 MX 35 MX 35 MX 35	MX 36 MN 36 MN 36 MN 36 MN		ORGANIC MATERIAL	<u>SOILS</u>	OTHER MATERIAL TRACE 1 - 10%		OCK FRESH, CRYSTALS BRIGHT, FEW JOIN	TS MAY SHOW SLIGHT STAINING. ROCK
MATERIAL PASSING #40				TRACE OF ORGANIC M LITTLE ORGANIC MAT		TRACE 1 - 10% LITTLE 10 - 20%		AMMER IF CRYSTALLINE.	
LL –	- 40 MX 41 MN 40 MX 41	MN 40 MX 41 MN 40 MX 41 MN	SOILS WITH LITTLE OR	MODERATELY ORGANIC	5 - 10% 12 - 20%	SOME 20 - 35%		DCK GENERALLY FRESH, JOINTS STAINED, RYSTALS ON A BROKEN SPECIMEN FACE	
PI 6 MX	NP 10 MX 10 MX 11 MN 11	MN 10 MX 10 MX 11 MN 11 MN	MODERATE	HIGHLY ORGANIC	> 10% > 20%	HIGHLY 35% AND ABOVE		A CRYSTALLINE NATURE.	
GROUP INDEX Ø	Ø Ø 4 MX	8 MX 12 MX 16 MX NO MX	AMOUNTS OF SOILS		GROUND WATER			OCK GENERALLY FRESH, JOINTS STAINED	
USUAL TYPES STONE FRAGS.	FINE SILTY OR CLAYEY	SILTY CLAYEY	ORGANIC MATTER	∇	WATER LEVEL IN BORE HOLE IMMEDIA	TELY AFTER DRILLING		INCH. OPEN JOINTS MAY CONTAIN CLAY. RYSTALS ARE DULL AND DISCOLORED. CF	
OF MAJOR GRAVEL, AND MATERIALS SAND	SAND GRAVEL AND SAND	SOILS SOILS		▼	STATIC WATER LEVEL AFTER 24 H	IOURS		GNIFICANT PORTIONS OF ROCK SHOW DI	
GEN RATING			FAIR TO		PERCHED WATER, SATURATED ZONE, OR	WATER BEARING STRATA	(MOD.) GR	RANITOID ROCKS,MOST FELDSPARS ARE [DULL AND DISCOLORED, SOME SHOW CLA
AS SUBGRADE	EXCELLENT TO GOOD	FAIR TO POOR	POOR POOR UNSUITABL	E				JLL SOUND UNDER HAMMER BLOWS AND S ITH FRESH ROCK.	SHOWS SIGNIFICANT LOSS OF STRENGTH
	PI OF A-7-5 SUBGROUP IS ≤ LL	- 30 ; PI OF A-7-6 SUBGROUP IS	> LL - 30		SPRING OR SEEP			L ROCK EXCEPT QUARTZ DISCOLORED O	R STAINED IN GRANITOID ROCKS ALL F
	CONSISTEN	CY OR DENSENESS			MISCELLANEOUS SYMBO	ILS		ND DISCOLORED AND A MAJORITY SHOW	
	COMPACTNESS OR	RANGE OF STANDARD	RANGE OF UNCONFINED		30NKMENT (RE) 25/025 DIP & DIP DIR			ND CAN BE EXCAVATED WITH A GEOLOGIS TESTED, WOULD YIELD SPT REFUSAL	ST'S PICK. ROCK GIVES "CLUNK" SOUND W
PRIMARY SOIL TYPE	CONSISTENCY	PENETRATION RESISTENCE (N-VALUE)	COMPRESSIVE STRENGTH (TONS/FT ²)	L ROADWAY EMB				LL ROCK EXCEPT QUARTZ DISCOLORED O	
	VERY LOOSE	< 4		-1 54	- SPT			EDUCED IN STRENGTH TO STRONG SOIL.	
GENERALLY GRANULAR	LOOSE	4 TO 10		SOIL SYMBOL	OPT DAT TEST BOR	ING V INSTALLATION		D SOME EXTENT. SOME FRAGMENTS OF S	
MATERIAL	MEDIUM DENSE DENSE	10 TO 30 30 TO 50	N/A	ARTIFICIAL F	ILL (AF) OTHER AUGER BORING	CONE PENETROMETER		TESTED, WOULD YIELD SPT N VALUES	
(NON-COHESIVE)	VERY DENSE	> 50		HAN RUADWA		TEST		LL ROCK EXCEPT QUARTZ DISCOLORED O JT MASS IS EFFECTIVELY REDUCED TO S	
	VERY SOFT	< 2	< 0.25	INFERRED SOI	IL BOUNDARY - CORE BORING	 SOUNDING ROD 		MAINING. SAPROLITE IS AN EXAMPLE OF	
GENERALLY	SOFT	2 TO 4 4 TO 8	0.25 TO 0.5			TEST BORING		STIGES OF ORIGINAL ROCK FABRIC REM	
SILT-CLAY MATERIAL	MEDIUM STIFF STIFF	8 TO 15	0.5 TO 1.0 1 TO 2	INFERRED ROO	Ű,	WITH CORE	COMPLETE RO	OCK REDUCED TO SOIL. ROCK FABRIC NO CATTERED CONCENTRATIONS. QUARTZ MAN	I DISCERNIBLE, OR DISCERNIBLE UNLY I I BE PRESENT AS DIKES OR STRINGERS.
(COHESIVE)	VERY STIFF	15 TO 30	2 TO 4	★★★★★★ ALLUVIAL SOI	IL BOUNDARY A PIEZOMETER INSTALLATION	- SPT N-VALUE		SO AN EXAMPLE.	
	HARD		> 4				-	ROCK H	ARDNESS
	TEXTURE	OR GRAIN SIZE			RECOMMENDATION SYMB			NNOT BE SCRATCHED BY KNIFE OR SHA	
U.S. STD. SIEVE SIZE	4 10				UNCLASSIFIED EXCAVATION -	ACCEPTABLE, BUT NOT TO BE		EVERAL HARD BLOWS OF THE GEOLOGIST	
OPENING (MM)	4.76 2.00			SHALLOW	UNCLASSIFIED EXCAVATION -	USED IN THE TOP 3 FEET OF		AN BE SCRATCHED BY KNIFE OR PICK OM D DETACH HAND SPECIMEN.	NLY WITH DIFFICULTY. HARD HAMMER BL
	BBLE GRAVEL	COARSE FINE SAND SAND	SILI ULAY		ACCEPTABLE DEGRADABLE ROCK	EMBANKMENT OR BACKFILL		AN BE SCRATCHED BY KNIFE OR PICK. G	OUGES OR GROOVES TO 0 25 INCHES DE
(BLDR.) (C	COB.) (GR.)	(CSE.SD.) (F SE			ABBREVIATIONS			KCAVATED BY HARD BLOW OF A GEOLOGI	
GRAIN MM 305	75 2.0	0.25	0.05 0.005	AR - AUGER REFUSAL	MED MEDIUM	VST - VANE SHEAR TEST		MODERATE BLOWS.	
SIZE IN. 12	3			BT - BORING TERMINATED CL CLAY	D MICA MICACEOUS MOD MODERATELY	WEA WEATHERED γ - UNIT WEIGHT		AN BE GROOVED OR GOUGED 0.05 INCHES AN BE EXCAVATED IN SMALL CHIPS TO F	
S	SOIL MOISTURE -	CORRELATION OF	TERMS	CPT - CONE PENETRATIO		$\gamma_{\rm d}$ - DRY UNIT WEIGHT		DINT OF A GEOLOGIST'S PICK.	FEICES I INCH MAXIMUM SIZE BT HARD
SOIL MOISTURE		INTE GUIDE FOR	FIELD MOISTURE DESCRIPTION	CSE COARSE	ORG ORGANIC		SOFT CA	AN BE GROVED OR GOUGED READILY BY	KNIFE OR PICK. CAN BE EXCAVATED IN
(ATTERBERG LI	MITS) DESCR	RIPTION		DMT - DILATOMETER TES DPT - DYNAMIC PENETRA		ST <u>SAMPLE ABBREVIATIONS</u> S - BULK		ROM CHIPS TO SEVERAL INCHES IN SIZE	
	- SATUR		QUID; VERY WET, USUALLY	e - VOID RATIO	SD SAND, SANDY	SS - SPLIT SPOON		ECES CAN BE BROKEN BY FINGER PRESS AN BE CARVED WITH KNIFE. CAN BE EXC	
	(SAT	FROM BELOW	W THE GROUND WATER TABLE	F - FINE	SL SILT, SILTY	ST - SHELBY TUBE		R MORE IN THICKNESS CAN BE BROKEN E	
PLASTIC			REQUIRES DRYING TO	FOSS FOSSILIFEROUS FRAC FRACTURED. FRAC	SLI SLIGHTLY TURES TCR - TRICONE REFUSAL	RS – ROCK RT – RECOMPACTED TRIAXIAL	FI	NGERNAIL.	
RANGE <	- WET -		IMUM MOISTURE	FRAGS - FRAGMENTS	W - MOISTURE CONTENT	CBR - CALIFORNIA BEARING	FR	ACTURE SPACING	BEDDING
	C LIMIT			HI HIGHLY	V - VERY	RATIO	TERM	SPACING	TERM
	- MOIST	- (M) SOLID; AT O	R NEAR OPTIMUM MOISTURE	EQ	UIPMENT USED ON SUBJECT	PROJECT	VERY WIDE WIDE	MORE THAN 10 FEET 3 TO 10 FEET	VERY THICKLY BEDDED THICKLY BEDDED 1.
OM OPTIMU SL SHRINK				DRILL UNITS:	ADVANCING TOOLS:	HAMMER TYPE:	MODERATELY	CLOSE 1 TO 3 FEET	THINLY BEDDED 0.1
		REQUIRES A	DDITIONAL WATER TO	CME-45C	CLAY BITS	X AUTOMATIC MANUAL	CLOSE VERY CLOSE	0.16 TO 1 FOOT LESS THAN 0.16 FEET	VERY THINLY BEDDED 0.00 THICKLY LAMINATED 0.00
	- DRY -		IMUM MOISTURE	X CME-55	6' CONTINUOUS FLIGHT AUGER	CORE SIZE:		LESS THEY BID TEET	THINLY LAMINATED <
	PI	ASTICITY		X CME-55	X 8" HOLLOW AUGERS	-в			RATION
		TICITY INDEX (PI)	DRY STRENGTH	X CME-550	HARD FACED FINGER BITS		FOR SEDIMENTAF	RY ROCKS, INDURATION IS THE HARDEN	NING OF MATERIAL BY CEMENTING, HE
NON PLASTIC	<u>PLAS</u>	0-5	VERY LOW		TUNGCARBIDE INSERTS	X-N Q2	FRIABLE		FINGER FREES NUMEROUS GRAINS;
SLIGHTLY PLAS		6-15	SLIGHT	VANE SHEAR TEST		HAND TOOLS:		GENTLE BLOW	BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY P		16-25 26 OR MORE	MEDIUM HIGH			POST HOLE DIGGER	MODERATE		SEPARATED FROM SAMPLE WITH ST
				PORTABLE HOIST	TRICONE STEEL TEETH	HAND AUGER		BREAKS EASILY	Y WHEN HIT WITH HAMMER.
		COLOR		X CME-75	TRICONE TUNGCARB.	SOUNDING ROD	INDURATE		IFFICULT TO SEPARATE WITH STEEL BREAK WITH HAMMER.
			YELLOW-BROWN, BLUE-GRAY).		X CORE BIT	VANE SHEAR TEST	1		
MODIFIERS SL	JCH AS LIGHT, DARK, STRE	AKED, ETC. ARE USED TO D	ESCRIBE APPEARANCE.				EXTREMEL		BLOWS REQUIRED TO BREAK SAMPLE S ACROSS GRAINS.

SHEET NO.

project reference no. B-3186/B-5898

DATE: 8-15-1-

TERMS AND DEFINITIONS D AN INFERRED ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. ED. AN INFERRED) SPT REFUSAL. 1 FOOT PER 60 IS OFTEN 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. N VALUES > 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. СК ТНАТ CLUDES GRANITE, 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. AL PLAIN IF TESTED. MAY NOT YIELD 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. STONE, CEMENTED DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. RINGS UNDER DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DATINGS IF OPEN. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. AMMER BLOWS IF FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE СК ИР ТО SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FELDSPAR FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. BLOWS. $\underline{\mathsf{FLOAT}}$ - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. IN ROCK HAS AS COMPARED 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. FELDSPARS DULL OSS OF STRENGTH WHEN STRUCK. 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 VIDENT BUT ITS LATERAL EXTENT. ARE KAOLINIZED 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. E DISCERNIBLE STRONG ROCK PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE ONLY MINOR OF AN INTERVENING IMPERVIOUS STRATUM. ALUES < 100 BPF RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE IN SMALL AND SAPROLITE IS RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. REQUIRES <u>SILL</u> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO LOWS REQUIRED THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. $\underline{\text{SLICKENSIDE}}$ - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. EEP CAN BE TACHED STANDARD PENETRATION TEST (PENETRATION RESISTANCE)(SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL B PICK POINT. WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL BLOWS OF THE TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. FRAGMENTS IT. SMALL, THIN 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. PIECES 1 INCH HED READILY BY TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. BENCH MARK: N/A THICKNESS 4 FEET 1.5 - 4 FEET FEET ELEVATION: 16 - 1.5 FEET NOTES: - 0.16 FEET BORING ELEVATIONS OBTAINED FROM TRIMBLE RI2 GNSS RECEIVER CERTIFIED WITH FCC PART 15 (CLASS B DEVICE), 24, 32; RCM; PTCRB; RT SIC 98 - Ø.Ø3 FEET 0.008 FEET FIAD - FILLED IMMEDIATELY AFTER DRILLING AT. PRESSURE. ETC. EEL PROBE: PROBE:

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

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

AASHTO LRFD Figure 10.4.6.4–1 — Determination of GSI for Jointed F	Rock Mass (Marı	inos and Hoek, 2000)			AASHTO LRFD Figure 10.4.6.4–2 $-$ Determination of GSI for T
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000) From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. Note that the table does not apply to structurally controlled failures. Where weak planar structural planes are present in an unfavorable orientation with respect to the excavation face, these will dominate the rock mass behaviour. The shear strength of surfaces in rocks that are prone to deterioration as a result of changes in moisture content will be reduced if water is present. When working with rocks in the fair to very poor categories, a shift to the right may be made for wet conditions. Water pressure is dealt with by effective stress analysis.	VERY GOOD Very rough, fresh unweathered surfaces	GOOD Rough, slightly weathered, iron stained surfaces FAIR Smooth, moderately weathered and altered surfaces	POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments	VERY POOR Slickensided, highly weathered surfaces with soft clay coatings or fillings	GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos. P and Hoek E., 2000) From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fail poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis.
STRUCTURE	DEC	CREASING SURFACE QU			COMPOSITION AND STRUCTURE
INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities	90		N/A	N/A	A. Thick bedded, very blocky sandstone The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass. In shallow tunnels or slopes these bedding planes may cause structurally controlled instability.
BLOCKY - well interlocked un- disturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets		70 60			B. Sand- stone with thin inter-
VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets		50			layers of siltstone amounts
BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity		40	30		C, D, E, and G - may be more or less folded than illustrated but this does not change the strength. Tectonic deformation, faulting and loss of continuity moves these categories to F and H.
discontinuity sets. Persistence of bedding planes or schistosity			20		G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers
LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes	N/A	N/A		10	Means deformation after tectonic disturbance

Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000)

PROJECT REFERENCE NO.

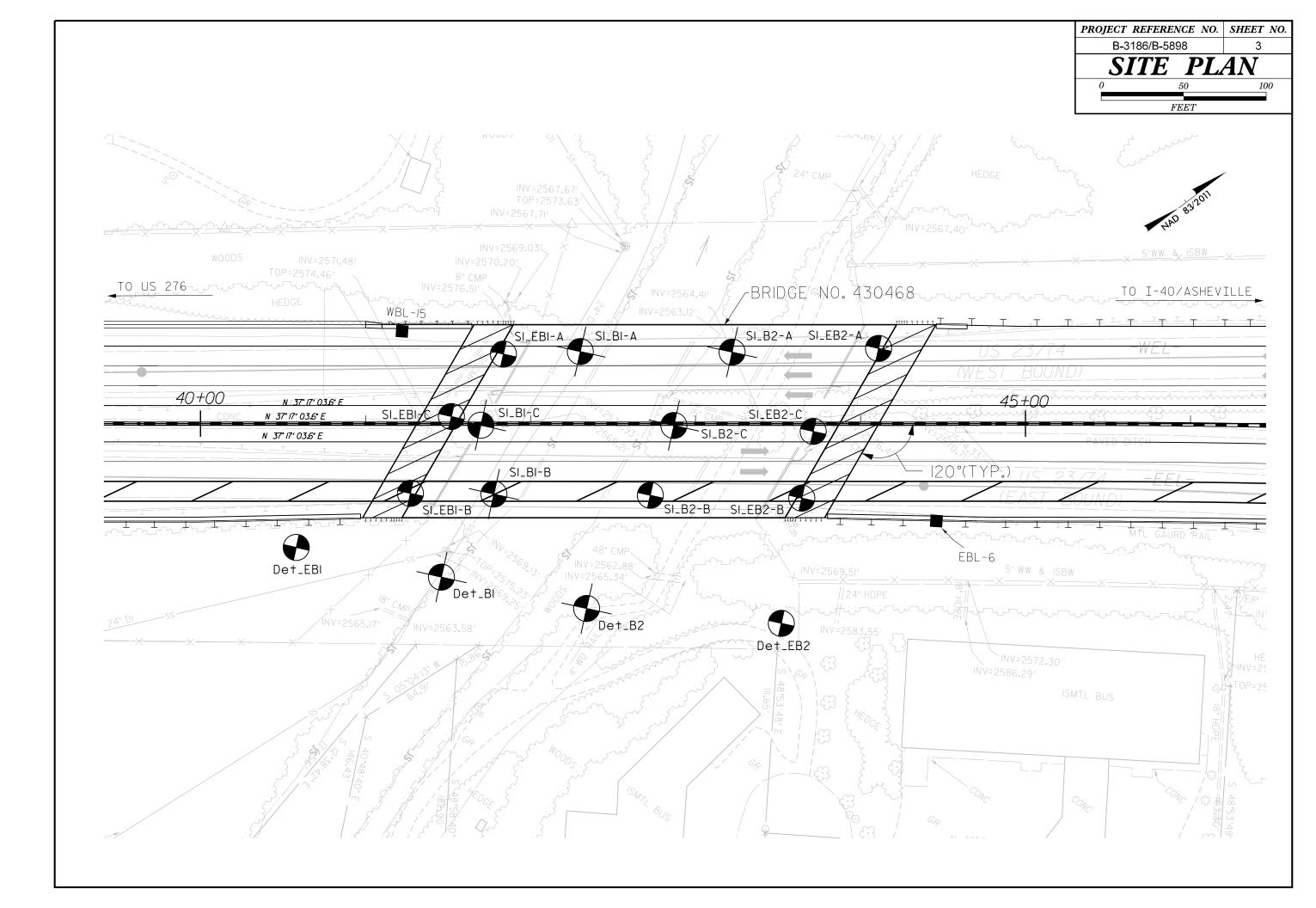
B-3186/B-5898

SHEET NO.

2A

SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)	VERY GOOD - Very Rough, fresh unweathered surfaces	600D - Rough, slightly weathered surfaces	FAIR - Smooth, moderately weathered and altered surfaces	POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments	VERY POOR - Very smooth, slicken- sided or highly weathered surfaces with soft clay coatings or fillings
	70 60	A			
E. Weak siltstone or clayey shale with sandstone layers		50 B 40	С	D E	
eformed, d/faulted, hale or siltstone deformed forming an tructure			30	F 20	
eformed silty forming a e with pockets vers of eansformed pieces.			¢	H	+ ¹⁰

DATE: 8-19-16

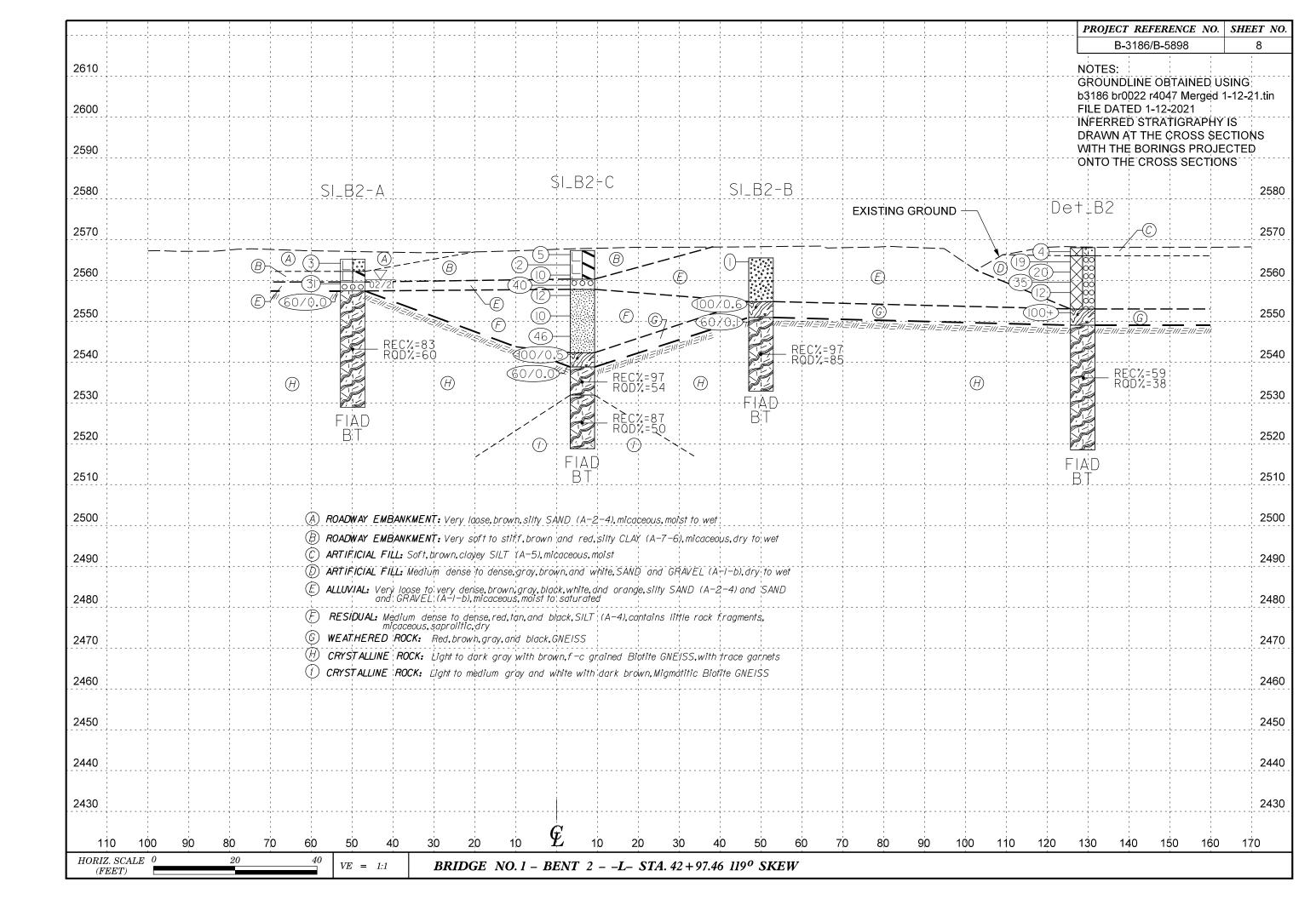


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2630	NO.		STATION	DEPTH INTERVAL	CI CI	ABB.				SILT	CLAY	10 4	G (SIEVES) 40 200	MOISTUR.	E ORGANIC			VE =	1:2.5				BRIDGE 60')	NO.1 PRO	FILE	
	ST- 1	<u>42' LT</u>	41+84	8.5′-9.6	<u>A-7-</u>	6 (21)	51 27	7.8	19.6	26.4	46.2	<u>98.9 96</u>	5.8 75.4	4 26	-	} -		1		· · · · · · · · · · · · · · · · · · ·						
2620					1		· · ·									1 1 1		1 1 1		1 1 1			1	1 I 1 I 1 I 1 I		262
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2590										SI	EBI-	А			: Surf	NORM Face el	AL WATER L.2564.00		EB2÷	Δ						2590
2000											ST-1	<u>-</u> 					1-14-2021)			u. !	· · · · · · · ·			· · · · · · · · · · · · · · · · · · ·		2000
2580			E	EXISTING	GROUN	D —			A	0	7' PAV	EMEN	7			_B2-A	Λ		<u>9' PA</u>	VEME	/\ /		_			2580
			— — — .							(19)						<u> </u>	+	(28)								2000
2570										$\frac{1}{3}$ (9)		SI	BI-A				(7)			·		÷				2570
2570							,		- B- ($(5)^{-1}$		ST-I				(A)	2			7	B					2570
2560								-						(2)	⊉ 3→		B			<u> </u>		<u> </u>	1	1 1 1 1 1 1		2560
2560							· · · · · · · · · · · · · · · · · · ·		<u>(C)</u>	.: <u>(35)</u> -		02/2		(46) +	- (31)-	000002	/	-(18)						· · · · · · · · · · · · · · · · · · ·		2560
2550								Ē—	<u></u>	6070.		<u>m=m=m=m</u>		<u>10/0.0</u>			enemenene fiemene	54			<u></u> <u></u> .	<u>iemememe</u>		1 1 1 1 1 1 1 1		0550
2550										0.0.0.0					0/0.0		\mathbb{O}	0.0;F	"AD"		\ \					2550
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2500		-	:Very loose								-'3),and :	S'AND and	d: GRAVEL	(A-I-D), 'n										· · · · · · · · · · · · · · · · · · ·		2500
	. ~		RED ROCK:					(A-2-4)	7, sapron																	
2490		· ·	LINE ROCK		1		1	iratiood - E	lintita CI	1/F155 WI	the trace of	inirinets								· · · · · · · · · · · · ·			; 	· 		2490
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2480				•									, , ,	· · · · · · · · · · · · · · · · · · ·	, , ,		· · ·			, , , ,		, , , ,	¦			2480
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2470		 		· · · · · · · · · · · · · · · · · · ·			· · · · ·							· · · · · · · · · · · · · · · · · · ·		1 1 1	· · · · · · · · · · · · · · · · · · ·	 		GR	ROUNE	DLINE OI				2470
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2450															1	1 1 1		1 1 1			ROFILE				-	2450
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			······	0 50 100	PROJECT REFERENCE NO.SIB-3816/B-5898	<u>енеет NO.</u> 5
	SAMPLE OFFICER STATION DEPTH AASHTO	L TEST RESULTS	% PASSING (SIEVES) % %	FEET	BRIDGE NO. 1 PROFILE	E
2630	NO. OFFSET STATION INTERVAL CLASS. ST-8 42' RT 41+27 7.5' - 9.1' A-6 (8)		MOISTURE ORGANIC 36.9 91.4 70.3 55.1 28 - -	VE = 1:2.5	57'RT OF -L-	
	SS-50 42' RT 41+30 7.5'-9.0' A-6 (16) SS-5 43' RT 43+63 10.0'-11.5' A-4 (1)		31.3 99.7 90.9 80.9 63 - 17.2 93.2 71.2 43.3 28 -			
2620	SS-8 43' RT 43+63 25.0'-26.5' A-2-7 (4)	52 30 47.3 29.7 18.3	4.7 91.9 58.9 28.6 18		· · · · · · · · · · · · · · · · · · ·	2620
2610		· · · · · · · · · · · · · · · · · · ·			·····	2610
2600		SI_EBI-B		SI_EB2-B		2600
	EXISTING GROUND —	ST–8 SS–50	NORMAL WATER SURFACE EL. 2564.00	SS-5		
2590		0.6' PAVEMENT	SURFACE EL. 2364.00	<u>SS-8</u>		2590
	\land			0.9' PAVEMENT		
2580 — —	<u> </u>	7	BI-B SI_B2-B	(15)		2580
2570						0570
2570		B 5 6 4				2570
2560	©					2560
2500	· ·	$\begin{array}{c} - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - $				2500
2550			\mathbb{C}			2550
2000	E-	00/0.5	·····			2000
2540						2540
2010		©, BT	ROD = 87	(100/0.2)		2010
2530		O	REC%=97 ⓒ ™ ROD%=85	100/0,1		2530
			TAD FIAD	FIAD		
2520		1 I I I	BT D	BT		2520
		<u></u>				
2510						2510
· · · · · · · · · · · · · · · · · · ·	A ROADWAY EMBANKMENT: Loose to medium dense	The second se		5		,
2500	B ROADWAY EMBANKMENT: Stiff to very stiff, brown C ALLUVIAL: Very loose to medium dense, gray, brown	and the second sec				2500
	D RESIDUAL: Medium stiff to hard, brown, orange a					
2490						2490
	E RESIDUAL: Medium dense to very dense brown or and SAND (A-3), contains trace rock	and the second				
2480	(F) WEATHERED ROCK: Brown, tan, and white, GNEIS					2480
	G CRYSTALLINE ROCK: Light to dark gray with bro	WIN, MIGMATITIC BIOTITE GNEISS		NOTES:		
2470				GROUNDL	INE OBTAINED USING	2470
				FILE DATE	22 r4047 Merged 1-12-21.tin D 1-12-2021	
2460		· · · · · · · · · · · · · · · · · · ·			STRATIGRAPHY IS DRAWN AT	Г <u>2</u> 460
				BORINGS	PROJECTED ONTO THE	
2450				PROFILE		2450
	9+00 40+00	41+00	42+00 43+00	44+00		

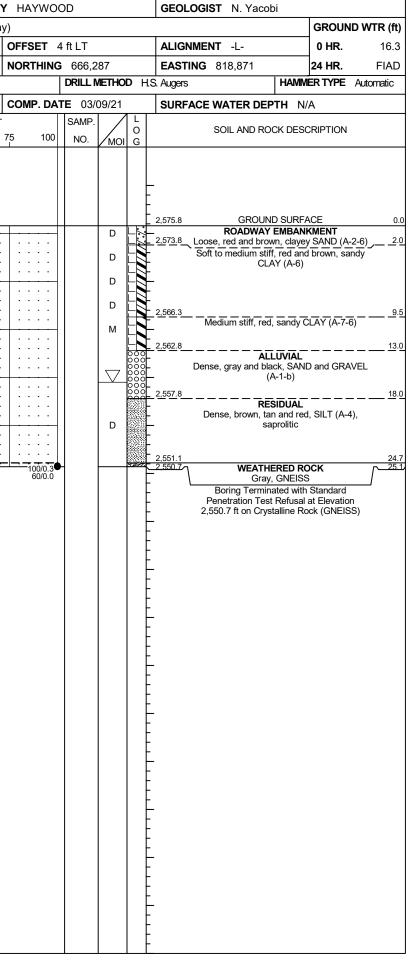
	[PROJECT REFERENCE NO.	SHEET NO
	SAMPLE OFFICER STA	SOIL TEST RESULTS NON DEPTH AASHTO LI DI % BY WEIGHT % PASSING (SIEVES) % %	B-3186/B-5898	6
	NO. OFFSEI STA ST-1 42' LT 41 ST-8 42' RT 41	IION INTERVAL CLASS. L.L. P.I. MOISTURE ORGANIC +84 8.5'-9.6' A-7-6(21) 51 27 7.8 19.6 26.4 46.2 98.9 96.8 75.4 26 - +27 7.5'-9.1' A-6(8) 39 20 29.1 11.0 23.0 36.9 91.4 70.3 55.1 28 - +30 7.5'-9.0' A-6(16) 40 20 14.0 10.3 44.4 31.3 99.7 90.9 80.9 63 -	NOTES: GROUNDLINE OBTAINED US b3186 br0022 r4047 Merged 1- FILE DATED 1-12-2021 INFERRED STRATIGRAPHY I DRAWN AT THE CROSS SEC WITH THE BORINGS PROJEC ONTO THE CROSS SECTION	12-21.tin S TIONS CTED
2610				
·				
2600				260
2590		SI_EBI-A SI_EBI-C ST-8 SS-50 OG' PAVEMENT Det_EBI		259
2580		$A \rightarrow (19)$		258
2570	B	(7) (7)		257
2560	— — <u> </u> — <u> </u> (Ē)	$-\underbrace{4}{5}$	/,	25
· · · · · · · · · · · · · · · · · · ·	(H)	$ \begin{array}{c} \hline \hline$	$\mathbf{\hat{\mathbf{C}}}$	
2550		(00/0.9)	<u> </u>	25
2540	<i>ŢII≡III.≡TII.</i> (H)		FIN=IN=IN=IN=IN= (H).	254
		BT		
2530				25
2520				252
2510		A) ROADWAY EMBANKMENT: Loose to dense, brown, tan, and orange, clayey SAND (A-2-6) and SAND and		25
		GRAVEL (A-I-b), micaceous, dry to moist		
2500		B) ROADWAY EMBANKMENT: Soft to very stiff, brown, red, and orange, clayey SILT (A-5), sandy CLAY (A-6), and CLAY (A-7), micaceous, dry to moist C) ARTIFICIAL FILL: Very soft to medium stiff, brown, fan, and orange, stifty CLAY (A-7-6), micaceous, moist		250
2490) ARTIFICIAL FILL: Loose to medium dense, brown and gray, SAND and GRAVEL (A-I-b), saturated		249
490		ALLUVIAL: Medium dense to dense, brown, black, and gray, SAND and GRAVEL (A–I–b), moist to wet		, 243
2480	(RESIDUAL: Medium stiff to hard brown orange, and white, SILT (A-4) with trace clay, contains liftle rock fragments, micaceous, saprolitic, dry to moist		248
		WEATHERED ROCK: Brown, gray, tan, and orange, GNEISS		
2470	(,	f) CRYSTALLINE ROCK: Brown,tan, and orange,GNEISS		24
2460				246
		ϵ		· · · · · · · · · · · · · · · · · · ·
	100 90 80 7	0 60 50 40 30 20 10 $ mu$ 10 20 30 40 50 60 70 80 90 100 110 120	130 140 150 160	170

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											· · · · · · · · · · · · · · · · · · ·			B-3186/B-5898	7
2610						, , ,								NOTES: GROUNDLINE OBTAINE b3186 br0022 r4047 Merg	erged 1-12-21 tin
2600			;			ć	SI_BI-C	C						FILE DATED 1-12-2021 INFERRED STRATIGRAF DRAWN AT THE CROSS WITH THE BORINGS PR	APHY IS SS SECTIONS PROJECTED
										· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		ONTO THE CROSS SEC	
2580		SI_BI	,.IA					,	SI_BI-	B		·	Det_BI		2580
2570			· · · · · · · · · · · · · · · · · · ·		(<u>B</u> <u>6</u> <u>8</u>		- T [®]	·						2570
2560		2		 		(5) (7) (7) (7) (7) (7) (7) (7) (7) (7) (7					Ø			<u>`</u>	— — — — 2560
2550	/// <i>=</i> ///=v ₆		REC%	1=100 <u> = =</u> 1=93 -				(26) ====================================				Ē (10)+			2550
2540	Ð			2%=95 2%=84	(<i>H</i>)			REC%=85 RQD%=54		REC%=97 ROD%=87	(2540
2530		FIAI BT					FIAD BT	(H)	FIAD	;)	Ĥ		REC%=10 ROD%=10	 100 <i>H</i>	2530
2520			;				Dı		BT				FIAD BT		2520
2510															2510
2500		(A) RO/	ADWAY EMI	BANKMENT: Very (A-	y soft to me 7-6),dry to	edium stiff,red,gray moist	ay, and bri	own,sandy CLAY (A-6) and '	CLAY					2500
2490		B ARTI	RTIFICIAL FIL RTIFICIAL FIL	FILL: Very loose to	to loose,browr ff,brown and	wn,clayey \$AND (A- nd gray,CLAY (A-7-6	4-2-6), mois 7-6), with litt	ist ittle gravel,moist to	to wet						2490
2480		È RES	SIDUAL: Mec	ledium stiff to sti	stiff,gray and	n, and orange, silty S. b), micaceous, wet to and white, sandy SILT			· · · · · · · · · · · · · · · · · · ·						248
2470		© CRYS	RYSTALLINE	1	o dark gray w	with brown,f-c gra		1 1 1		nets					247(
2460		(Н) СКГ:	STALLINE	ROCK: Light to i	mėdium grą	rạy with dạrk brown	ן , Mi gmatitı	c Biotite GNEISS	,						246
2450															245
2440						·;				:					244
2430						10 E 10				· · · · · · · · · · · · · · · · · · ·					243
100 9	90 80 70	70 60	50 40	40 30	20 10	،0 ک 1'	10 20	20 30 40	40 50	60 60	70 80	30 90 10	100 110 120	130 140 150 -	160 170



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									L TES	ST R	ESUL				~											B-3186/E	8-5898	ç	Э
2630	SAMP NO.	OF.		STATION	DEH INTE	RVAL	AASH CLA	SS.	L.L. P.I.		% BY W			% PASSING		MOIST	URE ORGA	% ANIC							NOTES			1	
2000	<u>SS-</u> SS-		′RT ′RT	43+63 43+63	10.0′- 25.0′-		A-4 (A-2-7	(1)	34 9 52 30	35.7	25. 1 29. 7	22.0 18.3	17.2	93.2 7 1 91.9 58	1.2 43. 3.9 28.				-,	+							OBTAINED	USING	
	55	; ;		+3,03	23.0	20.5	A 2 /	(7)	52 50	 	23.1	10.5		<u> </u>	20.	<u> 10</u>]	- - - -	1					b3186 b	r0022 r4	047 Mergeo		tin
2620										; 																TED 1-		N/10	
									1 1 1							1	1		1								ATIGRAPH E CROSS S		<u> </u>
2610																			-								INGS PRO		2
2010																											DSS SECTI		
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2600					-				1 1 1	-		-							1 1 1	-					1 1 1	1		1 1 1	2600
						EB2-	Λ			;							-,		·			;		e#_E[32	,	· · · · ·		
					91_1 '		A		1			SI	ĖB2-	Ċ	1	SI_E	В2-В		1						 ;				
2590					····	: ה־האוֹ <i>ו</i> רבּוּ	15 15					· · · · · · ·	. <u> </u>	÷		·													2590
					$\overline{}$	<u>PAVEN</u>	<u>1E N /</u>		EX	STING	ĠROUN	Þ				3	S–5 S–8		1						\overline{C}				
2580]		1							3–0 0.9 PAVE		1				~ (4)—						2580
2000				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	28-	0.0		<u>/</u>	÷	÷		· · · · · · · ·			;(-15)	<u> </u>	<u>U.9 PAVE</u> ;	<u>MENI</u>	· ;				$\frac{3}{7}$			<u> </u>			2000
				$\underline{(A)}$				(A)	1 1 1			(3)		A				A	$]$ $ \cdot$	÷	1		0		D	1		1	
2570					Θ_{i}		;		÷	+		<u>(</u>]				9 <u>-</u> -t			-;			~	4		_!		-: :		2570
				B			/21	B			(3			B	5	7	_[]	B			=	<	$\overline{3}$						
					$\underline{(3)}$				<u> </u>	<u> </u>	<u> </u>			<u> </u>	`	╧ー╞			<u></u>				$\sqrt{4}^{\mathbb{C}}$		\mathbb{C}	$\overline{\mathcal{D}}$			
2560				£(. 18)	000 000		(<i>E</i> -)		; 		.(<u>18)</u>		Ē	(15)	- OF/-2-	Ē	<u></u> . <u></u> .		· <u> </u>					/	<u> </u>		2560
				F (54)			· — _		1		(2)	000			325	000						00/0.8				-		
2550							(F)				-		000					Ē	1	1			(20)			-Ĥ			2550
2000				<u> </u>	F	TAD			-141=41=4	1=111=111=	niţi			`<	(F.) (<u>°'°'</u>						(31)			<u> </u>	$\frac{1}{2}\frac{1}{2}$		2000
				\bigcirc		AR		()	1 1 1	(H)	·/ (60,	0.0.		\mathcal{H}		85)-			+(H)			/				1		1	
2540					-				1 1 1			-	NR ·			/0.3			; •	-		G	(32)	بالتنظيم					2540
· · · · · · · · · · · · · · · · · · ·										;			- + + +			1/02			· · · · · · · · · · · · · · · · · · ·	/			5070.DH	FIAD	,	,	· · · · ·		
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2530															: < (00	1/0.4) ^E				1= = =	=///	\mathbb{C}		АП		, , , , , , , , , , , , , , , , , , , ,	· · · ·		2530
									1 1 1							; F	<u>I</u> AD	1	; <i> =</i> ///2						1 1 1			1	
2520																i t	ЗТ		1						1 1 1				2520
2520																													2520
2510										FMRAN	; KMENT. V	ary loos	to modi	, donco	; brown ro	daroon	ind aray	indaway S											2510
								. (4)."		 ¦	()	4-2-6), s	sility SAND	mdense, (A-2-4)), SAND (A-3), and	SAND	and GRA	VEL (A-I	- <i>b</i>),	· · · · · · · · · · · · · · · · · · ·		· -,- · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · ·	·	,	· · · · · · · · · · · · · · · · · · ·		
					-			_	1	1	; a	ry io we	/ :	1	1	1		1	1	1					1 1 1				
2500								B	ROADWAY	EMBAN	KMENT: S	Soft to st	iff,gray,t	or'own, orai and-wood	nge,and i	an, sandy nts-micae	SILT (A-	-4) and (mic-odor-	CLAY (A-7 moist to -v	'+6), Net					, , , , , , , , , , , , , , , , , , , ,		1 1 1 1		2500
					1																1		1			i i		1	
2400					1						micaceou	s, dry to	moist	\$ <i>ILT (A</i> -	;	,		+•••••••••••••••••••••••••••••••••••••					-		1	1			2400
2490								. (D). A	ART IF ICI	L FILL	Very loos	e to very	dense, re	d, brown, d RAVEL (A	ind_gray, 	silty SAN	D. (A-2-:	4), and . C.	L'AY.EY . SA	4Ņ <i>D</i>									2490
								(E)	ALLUVIAL:	¦ 'Medium	dense ar	dv red a	nd hrown	clayey SA	A = 2	2+6) and	άσι SAND απ	: A GRAVE	; -1. (Δ-1-h	¦)'wet					- - -				
2480								0		to satur	ated							: :		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,									2480
								· (F)· 7	RESIDUA	. Mediu	m dense		lense, brov	vh,orange ns trace t	and whit	e, silfy S	AND (A-2	2-4), claye	ey SAND										
			1						1 1	(A-2- wet	in, and S	<i>ң</i> м <i>ы</i> (А- ¦	J, coniali	is il uce t ¦	y nne ro ¦	, ¦ ¦	u¢⊓⊪S,miCC ¦	içeous, sa ¦	וווט וµו ¦	'y 10		- 		1	1				
2470								. (G). H	RESIDUA	Verv.	stiff. to h	ard white	arav_tan	and -brow	vo.SILT -	A-4). mic	aceous_sa	 		, , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					, , ,	, , 	1 1 1 1		2470
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1	100	90	80	70	60	50	40	3	0 2	20	10	Ł	10	20 3	30 4	40 5	50 6	60 7	70 8	30	90	100	110	120	130	140	150 16	0 170	J
HORIZ. SCAL	LE 0		20		40	VE =	1.1	T	זחמ			CDAG		TION	T	STA A	2 1 07 22	2 110.0	SVEW										
(FEET)						v 15 =	1.1	1	DKL	UUL I	XU.1 -	OVO	IJ JEC		L-	JI/1. 4.	ノT0/・ムム	4 117 V	JACW										

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	38332					P B-3186				OD			GEOLOGIST R. Dugger	1		3 8332						6 / B-5898	COUNTY
					`	Great Smok	-							GROUND WTR (ft)					23/ US			ky Mountai	
	ING NO					TATION 4			OFFSET				ALIGNMENT -L-	0 HR. N/A		RING NO.				_			
	LAR EL					OTAL DEP			NORTHIN					24 HR. FIAD		LAR ELI						TH 25.1 ft	
DRIL	L RIG/HA	MMER E	FF./DA	TE G		CME-550X 8				DRILL	METHO	DD H.	I.S. Augers HAMM	ER TYPE Automatic	DRIL	l rig/ha	MMERE	EFF./DA	TE GT			80% (11/24/20	
DRIL	LER L					TART DATE			COMP. DA			A . T	SURFACE WATER DEPTH N/	A	DRI	LER L	. Wans	-			ART DAT	E 03/09/2	
ELEV	DRIVE ELEV							PER FOOT		SAMP.			SOIL AND ROCK DESC	RIPTION	ELEV	DRIVE ELEV	DEPTH	· — — — — — — — — — — — — — — — — — — —	W COL				PER FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	25 5	50	75 100	NO.	/мо	I G	ELEV. (ft)	DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25 5	50 7
ł																							
2580		ł											-		2580		ł						
ł		ŧ						_					- 2,577.2 GROUND SURFA			-	Ŧ						
2575	2,576.5	+	13	13	6		9				м		2,576.5 0.7' PAVEMEN 2,575.2 ROADWAY EMBANI	·	2575	2,575.8	0.0	2	3	3	<u> </u>		
1	2,574.7	+ 2.5 +	3	3	6	· • • 9 · · ·					м		Dense, brown, SAND and G	RAVEL (A-1-b)		2,573.3	2.5				6		
ł	2,572.2	5.0	3	4	3	$ \cdot \cdot \cdot \cdot \cdot$					м		- Medium stiff to stiff, brown ar - CLAY (A-7-6)(2	nd orange, silty 1)			Į	4	2	3	• 5		
2570	2,569.7	7.5					· · · ·		· · · ·			FN	-		2570	2,570.8-	- <u>5.0</u>	2	3	4		· · · ·	
	2.567.2	‡ 10.0	1	2	3	• ⁵					M 30%		-			2,568.3	7.5	2	2	2			· · · · ·
2565	,	+ 10.0	1	2	2	4	· · · · ·	· · · · · · · · · · · · · · · · · · ·			M		-		2565	2,565.8-	10.0				4		· · · ·
2505	-	ŧ								1				<u> </u>	2000	-	ŧ	1	1	4	•5		
	2,562.2	15.0	14	16	19								Dense, brown, SAND and Gi	RAVEL (A-1-b)		-	ŧ						· · · · ·
2560		ŧ	14	10	19		• \$35				M	000	-		2560	2,560.8-	15.0	6	11	20			
		ŧ										000	-			-	ŧ						
	2,557.2	<u> 20.0</u>]	60/0.1				. 	+		•			CRYSTALLINE R			2,555.8-	20.0					.1	
2555	-	Ŧ					+	+		4			Brown, tan, and orange	, GNEISS	2555	-,	F	14	13	21	<u> </u>	•34	
	2,552.2	25.0			00/0 /								2,552.2	25.0		-	Ł						
2550		Ŧ	17	20	80/0.4				100/0.9	•			WEATHERED RC Brown, tan, and orange			2,551.1 2,550.7	24.7	100/0.3					
		Ŧ]			-			-	F	60/0.0					
	2,547.2	<u>T 30.0</u>	60/0.1						60/0.1	┢┤			2,547.2 2,547.1/ CRYSTALLINE RO			-	F						
	-	Ŧ										I F	Brown, tan, and orange Boring Terminated with			-	F						
1		ŧ										1 F	Penetration Test Refusal 2,547.1 ft in Crystalline Ro	at Elevation		-	ŧ						
		ŧ										1 F	-	CK (GINEISS)		-	ŧ						
	-	ŧ											- <u>Other Samples:</u> - ST-1 (8.5 - 9.6)			-	ŧ						
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WBS	38332.1.FS	1		T	IP B-3186 / B-5898	COUNT	Y HAYWOO	D			GEOLOGIST R. Dugger		
SITE	DESCRIPTIO	N US	23/ US	S 74 (0	Great Smoky Mounta	n Highwa	y)					GROUND W	TR (ft)
BOR	ING NO. S1_	EB1-B		S	TATION 41+27		OFFSET 4	2 ft RT			ALIGNMENT -L-	0 HR.	15.5
COL	LAR ELEV. 2	,578.8	ft	Т	OTAL DEPTH 32.51	t	NORTHING	666,2	39		EASTING 818,893	24 HR.	FIAD
				TC9083	3 CME-550X 80% (11/24/2	020)) Н.		J IER TYPE Autor	matic
DRII	LER L. Wan	strath		s	TART DATE 01/29/2	21	COMP. DAT	E 01/2	21/21		SURFACE WATER DEPTH N	/Δ	
			ow co			PER FOOT		SAMP.		L		<u></u>	
ELEV (ft)	DRIVE ELEV (ft) (ft)	0.5ft	-	-	4	50	75 100	NO.	моі	O G	SOIL AND ROCK DES		EPTH (ft
2580	2,578.2 0.6					1					2,578.8 GROUND SURF/		0.0
	2.576.3 2.5	15	18	10	▲				D	<u>-};</u>	-2,576.8 ROADWAY EMBAN	KMENT	<u>2.0</u>
2575		2	3	4			· · · ·		D	-	2,574.3 Medium dense, brown, tan SAND and GRAVEL		4.5
	2,573.8 5.0	11	11	7					D	-1	Loose, brown and orange,	clayey SAND	
	2,571.3 7.5			3					l		(A-2-6), micaced Stiff to medium stiff, brown		
2570	2,568.8 10.0		2	3	115	+	+	SS-50	63% 28%		_ sandy CLAY (A-6)(8)(16)	, micaceous	
	2,506.8 10.0	2	2	4					D				
0505	1				$\left \left \begin{array}{c} \cdot \mathbf{\lambda} \cdot \cdot \cdot \\ \cdot \mathbf{\lambda} \cdot \cdot \end{array} \right \left \begin{array}{c} \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \end{array} \right $				l		_2,565.8		<u>13</u> .0
2565	2.563.8 15.0					+	+ · · · · ·			- <u>`</u> -	Very stiff, brown, clayey	SILT (A-5)	
	+	2	7	14							2,562.6		16.2
2560	1 1										ALLUVIAL _2 <u>.560.8</u> Medium dense, brown and g	ray, SAND and	<u></u>
2000	2.558.8 20.0										GRAVEL (A-1 RESIDUAL	b)	
		2	2	2					D	Ŀ	Medium stiff to hard, brow		
2555	I I									× F	white, SILT (A-4), micaced	ous, saprolitic	
2000	2,553.8 25.0									81 -	-		
	l <u>t</u>	2	5	6					D	Ľ			
2550	I I									See F			
	2,548.8 30.0	1001									2,548.8		30.0
		100/0.5	b				· 100/0.5			<u>//</u>	2,546.3 Brown, tan and white,		32.5
	2,546.3 32.5	100/0.0	d				60+			in the second	Boring Terminated at Elevati	on 2,546.3 ft on	32.5
]									F	Crystalline Rock (GI	NEISS)	
	‡									Ę	Other Samples:		
	+									F	ST-8 (7.5 - 9.1)		
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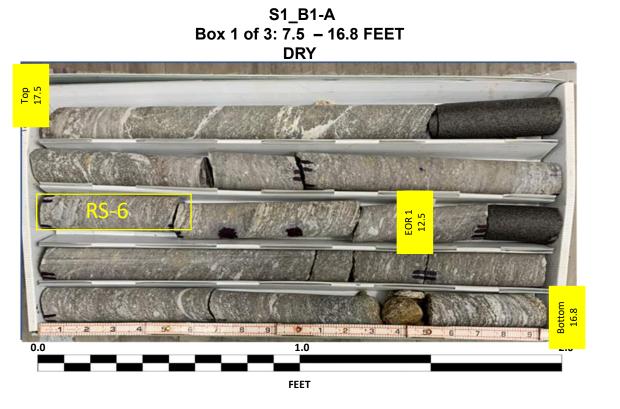
GEOTECHNICAL BORING REPORT DODEIOC

	E	BORE LOG						C	CORE LOG		
WBS 38332.1.FS1	TIP B-3186 / B-5898 COUN	TY HAYWOOD	GEOLOGIST R. Dugo	jer	WBS 38332.1.FS	1	TIP B-31	86 / B-5898 COUN	TY HAYWOOD	GEOLOGIST R. Dugo	ger
SITE DESCRIPTION US 23/ US	S 74 (Great Smoky Mountain Highw			GROUND WTR (ft)	SITE DESCRIPTIO	N US 23/ US	74 (Great Sm	oky Mountain Highv	vay)		GROUND WTR (ff
BORING NO. S1_B1-A	STATION 42+30	OFFSET 44 ft LT	ALIGNMENT -L-	0 HR. 5.0	BORING NO. S1	-	STATION	42+30	OFFSET 44 ft LT	ALIGNMENT -L-	0 HR. 5.0
COLLAR ELEV. 2,564.5 ft	TOTAL DEPTH 27.5 ft	NORTHING 666,373	EASTING 818,887	24 HR. FIAD	COLLAR ELEV. 2			PTH 27.5 ft	NORTHING 666,373	EASTING 818,887	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE G	GTC9083 CME-550X 80% (11/24/2020)	DRILL METHOD	SPT Core Boring	HAMMER TYPE Automatic	DRILL RIG/HAMMER	EFF./DATE GTO		. ,	DRILL METHOD	SPT Core Boring	HAMMER TYPE Automatic
DRILLER L. Wanstrath	START DATE 02/28/21	COMP. DATE 02/28/21	SURFACE WATER DE	PTH N/A	DRILLER L. Wan			TE 02/28/21	COMP. DATE 02/28/21	SURFACE WATER DE	PTH N/A
ELEV DRIVE ELEV (ft) DEPTH BLOW CO				OCK DESCRIPTION	CORE SIZE NQ2		TOTAL RU				
(ii) (ft) (ii) 0.5ft 0.5ft	0.5π 0 25 50	75 100 NO. MOI G	ELEV. (ft)	DEPTH (ft)	ELEV RUN (ft) ELEV DEPT (ft) (ft)	H RUN (ft) DRILL (ft) RATE (Min/ft)	RUN REC. RQD (ft) (ft) % %	SAMP. NO. (ft) (ft) (ft) (ft)	C C C C C C C C C C C C C C C C C C C	DESCRIPTION AND REMARK	KS DEPTH (
2565 2,564.5 0.0 WOR 1			2,564.5 GROUN	D SURFACE 0.0	2557 2,557.0 7.5					Begin Coring @ 7.5 ft CRYSTALLINE ROCK	
2560 2,559.5 5.0 2,559.5 5.0 67 25	46	· · · · · · · · · · · · · · · · · · ·	Very loose, brov <u>2,561.5</u> Dense, brown, SA	LUVIAL m, silty SAND (A-2-4), caceous	2555 2,552.0 12.5 2550	1:58 1:35 1:58	(5.0) (4.4) 100% 88% (5.0) (5.0) 100% 100%	RS-6	garnets, slig	ay with brown, m-c grained Bioti ht weathering, hard, close to wid weathering, moderately hard, v RS-6 11.0' - 11.5' GSI= 70 - 80 Qu= 18,520 psi	de fracture spacing
2,557.0 7.5 2555 60/0.0	····· ··· ··· ···			ALLINE ROCK with brown, m-c grained S, with trace garnets	2,547.0 17.5	2:15 2:10 5.0 1:45	(4.4) (3.9)	RS-7 (10.5) (9.3 95% 84%	Light to dark gray	eathering, hard, close to wide fr with brown, Migmatitic Biotite Gi hard, close to wide fracture sp RS-7 16.8' - 17.5'	NEISS, slight weathering,
2550					2,542.0 22.5	5.0 1:10 0:15 2:00 2:02 2:10 5.0 1:33	(5.0) (4.3)	-		GSI= 70 - 80 Qu= 10,027 psi 0.6' core loss	
2545				with brown, Migmatitic te GNEISS	2540	1:35 1:33 2:10	100% 86%		Very severe we Slight w	athering, moderately hard, very eathering, hard, close to wide fr	close fracture spacing acture spacing 27
		. . <td></td> <td></td> <td></td> <td>2.00</td> <td></td> <td></td> <td>Boring Terminat</td> <td>ed at Elevation 2,537.0 ft in Cry</td> <td></td>				2.00			Boring Terminat	ed at Elevation 2,537.0 ft in Cry	
2540			2.537.0	27.5							
			Boring Terminated	at Elevation 2,537.0 ft in Rock (GNEISS)							
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GEOTECHNICAL BORING REPORT

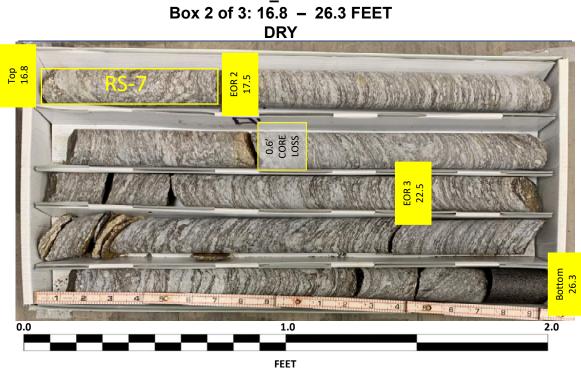
38330.1.FS1 (B-3186/B-5898)

US 23/ US 74 Great Smokey Mountain Highway



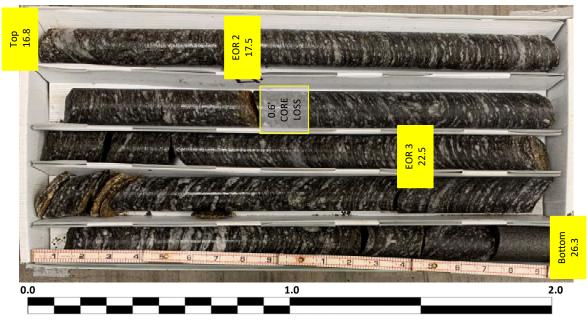






S1_B1-A

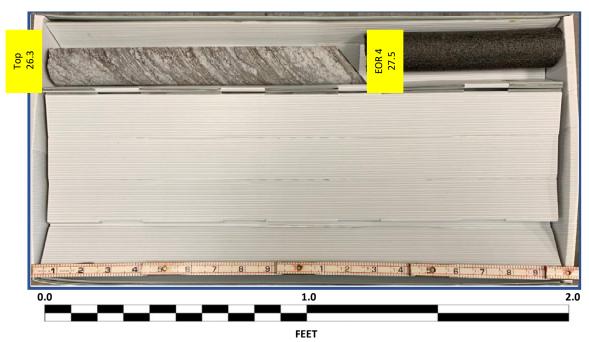
S1_B1-A Box 2 of 3: 16.8 – 26.3 FEET WET



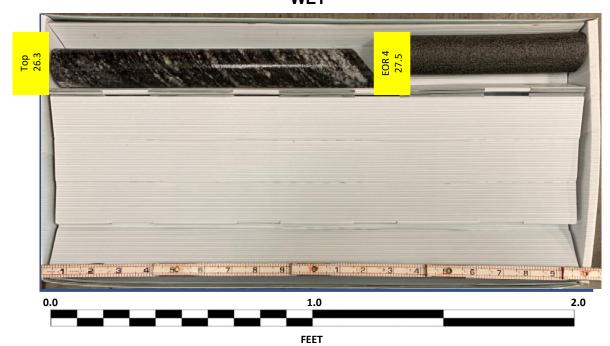
38330.1.FS1 (B-3186/B-5898)

US 23/ US 74 Great Smokey Mountain Highway

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



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



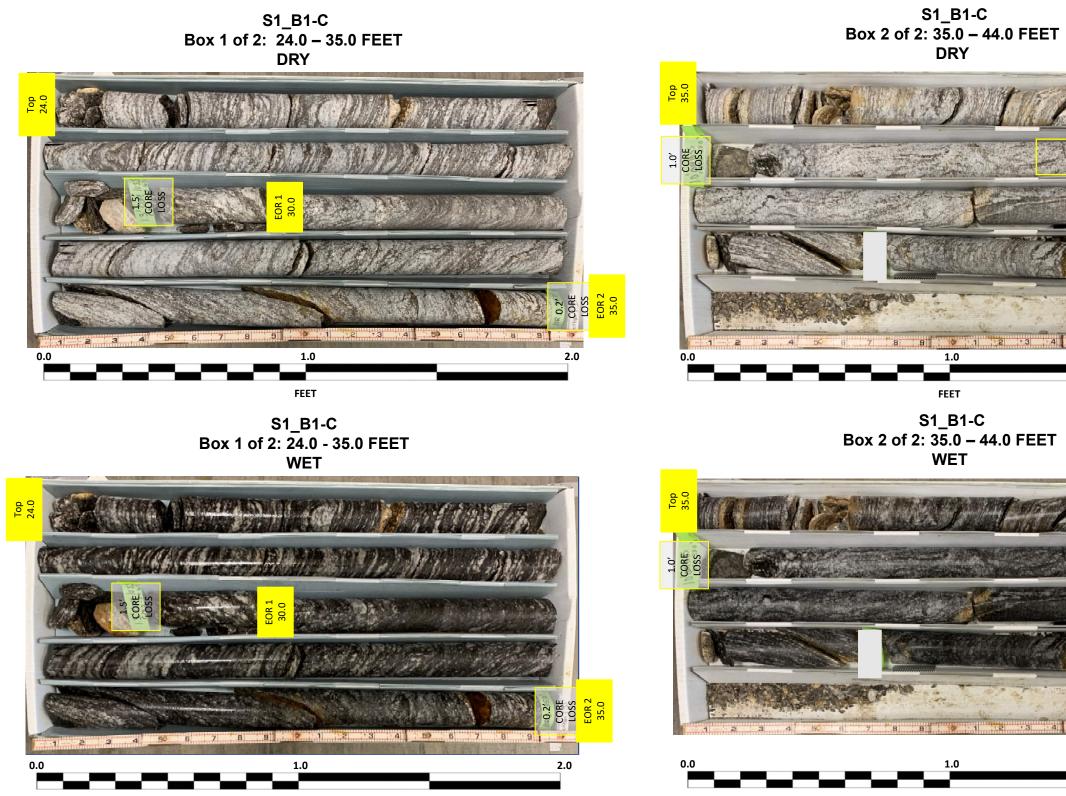
GEOTECHNICAL BORING REPORT

					GE	OTE	СН			L BC RE L	ORING I OG	REF	PORT	SF	IEET 15
8332	.1.FS1			TIP	B-318	6 / B-58	98 C			AYWO			GEOLOGIST N. Yacobi		
SCR	IPTION	US	23/ US 7	4 (Gre	at Smo	ky Mour	ntain H	lighwa	iy)				I	GROUN	D WTR (ft)
NO.	S1_E	31-C		STAT		41+70			OF	FSET [·]	l ft RT		ALIGNMENT -L-	0 HR.	13.0
ELE	EV. 2,8	575.5	ft	тот	AL DEF	PTH 44	.0 ft		NO	RTHING	666,298		EASTING 818,886	24 HR.	FIAD
G/HAI	VIMER E	FF./DA	TE GTC	1 3277 CIV	/E-75 83	% (09/15/2	2020)		1		DRILL METHO	D SP1	T Core Boring HAMIN	IER TYPE	Automatic
ર L.	Wanst	trath		STA	RT DAT	E 03/1	0/21		со	MP. DA	TE 03/10/21		SURFACE WATER DEPTH N	/A	
IZE	NQ2			тот	AL RUN	20.0 f	ft								
UN .EV	DEPTH	RUN	DRILL RATE	REC.	JN RQD	SAMP.	STR REC.	RQD	L O			D	ESCRIPTION AND REMARKS		
ft)	(ft)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	Ğ	ELEV. (1	t)				DEPTH (ft)
51 5	- 24.0		0.40		(0.0)								Begin Coring @ 24.0 ft		
	- 24.0	6.0	2:18 2:09	(4.5) 75%	(2.9) 48%					-	Gray, black	k, and w	CRYSTALLINE ROCK white, Migmatitic Biotite GNEISS mode	rate to sligh	t
-	-		2:20 2:13							-	we	athering	g, hard, close fracture spacing (contin	ued)	
- 45.5-	- 30.0		2:07 2:08				(17.0) 85%	(10.7) 54%		-			1.5' core loss		
-	-	5.0	2:19 2:13	(4.8) 96%	(3.5) 70%					-	Close	e to mod	derately close fracture spacing; 0.2' co	re loss	
-	-		2:17 1:58						Z	-					
40.5-	- 35.0 -	5.0	2:09 1:46	(4.0)	(1.9)				R	-	Мо	derately	y hard, very close to close fracture spa	ina	
-	_	0.0	1:48 1:53	80%	38%					-			ely close fracture spacing, hard, mode	•	
-	- - 40.0		1:50 1:59							-	01050 10 11		weathering; 1.0' core loss	ate to sign	
-	-	4.0	2:11 1:49	(3.7) 93%	(2.4) 60%	RS-9			2				RS-9 39.4' - 40.0' GSI= 70 - 80		
31 5-	- - 44.0		2:21 2:13	93%	00%				P	- - 2,531.5			Qu= 13,205 psi		44.0
-	-		2.13							- 2,001.0	Poring Torm	incted	0.3' core loss at Elevation 2,531.5 ft in Crystalline Re		
-	_									-	Boiling Term	inaleu a			5)
-	F									-					
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		ORE LOG				
WBS 38332.1.FS1	TIP B-3186 / B-5898 COUNT	Y HAYWOOD	GEOLOGIST N. Yacobi		WBS 38332.1.FS1	TIP B
SITE DESCRIPTION US 23/ US	74 (Great Smoky Mountain Highwa	ay)		GROUND WTR (ft)	SITE DESCRIPTION US 23/ US 74	4 (Great
BORING NO. S1_B1-C	STATION 41+70	OFFSET 1 ft RT	ALIGNMENT -L-	0 HR. 13.0	BORING NO. S1_B1-C	STATIC
COLLAR ELEV. 2,575.5 ft	TOTAL DEPTH 44.0 ft	NORTHING 666,298	EASTING 818,886	24 HR. FIAD	COLLAR ELEV. 2,575.5 ft	TOTAL
DRILL RIG/HAMMER EFF./DATE GTO		DRILL METHOD SP		IER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE GTC3	
DRILLER Wanstrath	START DATE 03/10/21	COMP. DATE 03/10/21		/A	DRILLER Wanstrath	START
			SOIL AND ROCK DES			RUN
DRILLER L. Wanstructure ELEV (ft) DRIVE ELEV (ft) DEPTH (ft) BLUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUUU		75 100 NO. MOI 0 G G D D D D M D D M M D D M M M C C C C C C	SURFACE WATER DEPTH N SOIL AND ROCK DES ELEV. (ft) 2,575.5 GROUND SURF ROADWAY EMBAN 2,573.5 Very soft, red and brown, sa Soft to medium stiff, red, gr CLAY (A-7-6 2,557.5 MEATHERED R Gray and black, G 2,557.5 CRYSTALLINE R Gray, black, and white, Mig GNEISS 2,551.5 CRYSTALLINE R Gray, black, and white, Mig GNEISS 2,531.5 Boring Terminated at Elevat Crystalline Rock (G	CRIPTION DEPTH (ft) ACE 0.0 IKMENT	DRILLER L. Wanstrath CORE SIZE NQ2 ELEV (ft) RUN ELEV (ft) DEPTH (ft) RUN (ft) DRILL RATE (Min/ft) 2551.5 2.551.5 24.0 6.0 2:18 2:09 2:20 2:20 2:203 2545 2.555.5 30.0 2:08 2:07 2:08 2546 5.0 2:19 2:535.5 2:17 1:58 2:535.5 2540 5.0 1:46 1:53 1:50 2:535.5 1:46 1:48 1:53 1:50 2:535.5 2531.5 44.0 2:11 1:49 2:21 2:13 2 5.31.5 44.0 2:13 1:49 2:21 2:13 2 5.31.5 44.0 2:13 1:49 2:21 2 4.0 2:13 4.0 2:11 1:49 2:21 1:49 2:21 4.0 2:13 1:49 2:13 4.0 2:13 1:49 2:13 4.0 4.0 2:13 4.0 4.0 2:13 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 <t< th=""><th>START TOTAL RUN REC. (4.5) (2 75% (4.8) 96% (4.0) (4.0) (4.0) (3.7) 93% 60</th></t<>	START TOTAL RUN REC. (4.5) (2 75% (4.8) 96% (4.0) (4.0) (4.0) (3.7) 93% 60

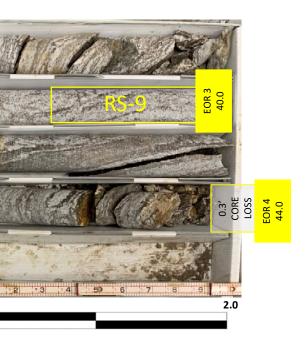
38330.1.FS1 (B-3186/B-5898)

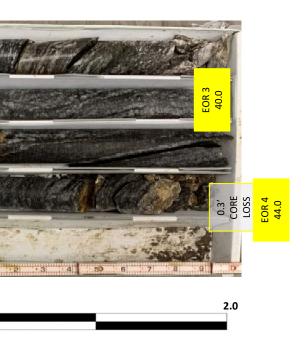
US 23/ US 74 Great Smokey Mountain Highway



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		BORE LOG	1			CORELOG	
WBS 38332.1.FS1	TIP B-3186 / B-5898 COU		GEOLOGIST R. Dugger	WBS 38332.1.FS1	TIP B-3186 / B-5898 COUN		1
	S 74 (Great Smoky Mountain High		GROUND WTR (ft)	SITE DESCRIPTION US 23/ US	, , , ,		GROUND WTR (ft
BORING NO. S1_B1-B	STATION 41+78	OFFSET 43 ft RT	ALIGNMENT -L- 0 HR. 0.0	BORING NO. S1_B1-B	STATION 41+78	OFFSET 43 ft RT ALIGNMENT -L-	0 HR. 0.0
COLLAR ELEV. 2,565.6 ft	TOTAL DEPTH 35.7 ft	NORTHING 666,279	EASTING 818,924 24 HR. FIAD	COLLAR ELEV. 2,565.6 ft	TOTAL DEPTH 35.7 ft	NORTHING 666,279 EASTING 818,924	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE G	, , ,	DRILL METHOD SF		DRILL RIG/HAMMER EFF./DATE GTO	1		HAMMER TYPE Automatic
DRILLER L. Wanstrath	START DATE 02/16/21	COMP. DATE 02/16/21	SURFACE WATER DEPTH N/A	DRILLER L. Wanstrath	START DATE 02/16/21	COMP. DATE 02/16/21 SURFACE WATER DEPTH	H N/A
ELEV DRIVE ELEV DEPTH BLOW CO (ft) (ft) 0.5ft 0.5ft			SOIL AND ROCK DESCRIPTION	CORE SIZE NQ2	TOTAL RUN 20.0 ft		
		75 100 NO. / MOI G	ELEV. (ft) DEPTH (ft)	ELEV RUN DEPTH RUN RATE (ft) (ft) (ft) (ft) (ft) (ft)	REC. RQD SAIVIF. REC. RQI	D D DESCRIPTION AND REMARKS	
2570				2549.9			DEPTH
			-	2,549.9 15.7 5.0 1:10	(4.8) (3.6) 96% 72% (19.4) (17. 97% 87%	3) CRYSTALLINE ROCK (continued)	
				1:24	96% 72% 97% 87%	Light to dark gray with brown, Migmatitic Biotite GNES weathering, hard, close to moderately close fra	cture spacing
2565 2,565.6 0.0 2 1	1 ₂	w	2,565.6 GROUND SURFACE 0.0 - ALLUVIAL	2545 2,544.9 20.7 1:40 5.0 2:10	(4.6) (3.5)	0.2' core loss	
		· · · · · · · · · · · · · · · · · · ·	Very loose, brown and orange, silty SAND, <u>2,562.6</u> micaceous <u>3.0</u>		(4.6) (3.5) 92% 70%		
2,560.6 5.0 15 20		· · · · · · 0000 • · · · · · 0000	Medium dense to dense, brown, SAND (A-3), with little gravel	2540 2.539.9 25.7 2.13		0.4' core loss; Moderately severe weathering, medium very close fracture spacing	-
	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	0 0 0 0	-	5.0 2:31	(5.0) (4.6) 100% 92%	Moderate to slight weathering, hard, close to modera spacing	ately close fracture
2555 2,555.6 10.0	$ \begin{bmatrix} & \cdot & \cdot & \cdot & \cdot & \cdot \\ & \cdot & \cdot & \cdot & \cdot &$			5.0 2:31 2:31 2:31 2:35 2:34 2535 2,534.9 30.7			
			-	2535 2,534.9 30.7 2:31 5.0 2:35	(5.0) (4.7) 100% 94% BS-8		
		· · · · · · · · · · · · · · · · · · ·		5.0 2:35 2:37 2:39 2:45	100% 94% <u>RS-8</u>	RS-8 32.1' - 32.5' GSI= 70 - 80	
2550 2,550.6 15.0 2,550.1 15.5 10 100/0.0			2,550.1 15.5 CRYSTALLINE ROCK	2530 2,529.9 35.7 2:45 2:41	(4.8) (3.6) (19.4) (17. 96% 72% 97% 879 (4.6) (3.5) 92% 70% (5.0) (4.6) 92% 100% (5.0) (4.7) 88-8 100% (5.0) (4.7) 88-8 100%	Qu= 10,265 psi _ 2,529.9 Qu= 10,265 psi Boring Terminated at Elevation 2,529.9 ft in Crystalli	3
- 60/0.0			Brown, GNEISS Light to dark gray with brown, Migmatitic				
2545			Biotite GNEISS			E E	
2540 -			-				
2535			-				
		· · · · · · RS-8					
2530			2,529.9 35.7			E E	
			Boring Terminated at Elevation 2,529.9 ft in Crystalline Rock (GNEISS)			I E	
			-				
			-				
						E E	
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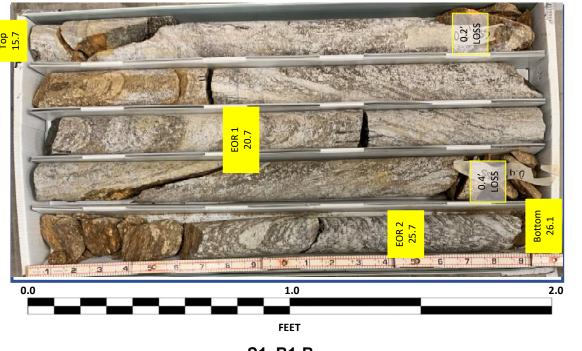
CAL BORING REPORT CORE LOG

SHEET	17	

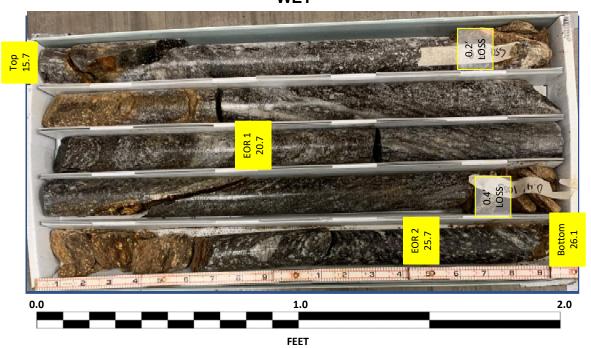
38330.1.FS1 (B-3186/B-5898)

US 23/ US 74 Great Smokey Mountain Highway

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



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



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



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



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		CAL BORING RE SORE LOG	PORT					CAL BORING RE	EPORT	SF	IEET 19
WBS 38332.1.FS1	TIP B-3186 / B-5898 COUN		GEOLOGIST R. Dugger		WBS 38332.1.FS1	TIP	B-3186 / B-5898 COUNT		GEOLOGIST R. Dugger		
SITE DESCRIPTION US 23/ US	74 (Great Smoky Mountain Highw	ay)		GROUND WTR (ft)	SITE DESCRIPTION US	3 23/ US 74 (Gr	ireat Smoky Mountain Highwa	ay)		GROUN	D WTR (ft)
BORING NO. S1_B2-A	STATION 43+22	OFFSET 43 ft LT	ALIGNMENT -L-	0 HR. 5.0	BORING NO. S1_B2-A	ST/	ATION 43+22	OFFSET 43 ft LT	ALIGNMENT -L-	0 HR.	5.0
COLLAR ELEV. 2,565.2 ft	TOTAL DEPTH 36.3 ft	NORTHING 666,446	EASTING 818,943	24 HR. FIAD	COLLAR ELEV. 2,565.2	? ft TO T	OTAL DEPTH 36.3 ft	NORTHING 666,446	EASTING 818,943	24 HR.	FIAD
DRILL RIG/HAMMER EFF/DATE GTO	C9083 CME-550X 80% (11/24/2020)	DRILL METHOD S	PT Core Boring HAM	MER TYPE Automatic	DRILL RIG/HAMMER EFF./D	ATE GTC9083 C	CME-550X 80% (11/24/2020)	DRILL METHOD	SPT Core Boring	IAMMER TYPE	Automatic
DRILLER L. Wanstrath	START DATE 03/01/21	COMP. DATE 03/01/21	SURFACE WATER DEPTH	N/A	DRILLER L. Wanstrath	STA	ART DATE 03/01/21	COMP. DATE 03/01/21	SURFACE WATER DEPT	H N/A	
ELEV DRIVE ELEV (ft) (ft) 0.5ft 0.5ft			SOIL AND ROCK DES		CORE SIZE NQ2		RUN 28.5 ft	L			
ELEV (ft) ELEV (ft) DEPTH (ft) DEPTH 0.5ft DEPTH 0.5ft 2570		75 100 NO. MOI G 	SOIL AND ROCK DES	DEPTH (t) FACE 0.0 NKMENT SAND (A-2-4), (A-7-6) 5.6 je, SAND and 7.8 -BOCK th dark brown, GNEISS 36.3 ation 2.528.9 ft in	Concentration RUN ELEV (ft) RUN (ft) DEPTH (ft) RUN (ft) 2557.4 7.8 3.5 2555 2,553.9 11.3 2550 2,548.9 16.3 2545 2,548.9 21.3 2545 2,538.9 26.3 2535 2,538.9 26.3 2535 2,538.9 31.3 2530 2,528.9 36.3 2530 31.3 5.0 2530 2,528.9 36.3 1 1 1 1 1 1 1 1 5.0 2530 2,528.9 36.3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1 1	DRILL RATE (Min/ft) REC. REC. (ft) (% 0:53/0.5 (2.6) 2:00/1.0 2:00/1.0 74% 3:22/1.0 1:18/1.0 (3.2) 3:02/1.0 1:18/1.0 (3.2) 3:22/1.0 1:18/1.0 (3.2) 3:33/1.0 1:25/1.0 (5.0) 1:33/1.0 1:37/1.0 1:37/1.0 1:38/1.0 76% 1:39/1.0 2:09/1.0 2:09/1.0 2:09/1.0 2:09/1.0 2:23/1.0 2:38/1.0 2:35/1.0 2:15/1.0	RUN C.) (ft) b SAMP. NO. STRATA REC. (ft) % 6) (1.3) % 37% (14.2) 83% 2) (0.0) (23.7)	G ELEV. (ft) 2,557.4 Light to medium graweathering, med 0.9 With trace epido Moderate f Severe Moderate f 2,528.9	DESCRIPTION AND REMARKS Begin Coring @ 7.8 ft CRYSTALLINE ROCK ay with dark brown, Migmatitic Bioti dium hard to hard, very close to clo ' core loss; very severely weathere te on fractures, moderate weatherin Very severely weathered, soft 1.8' core loss to slight weathering, hard, close fracture to slight weathering, hard, close fracture to slight weathering, hard, close fracture to slight weathering, hard, close fracture s (SI= 75 - 85 Qu= 9,796 psi Very close fracture spacing 1.2' core loss s, slight weathering, hard, close to v Very close to close fracture spacing ed at Elevation 2,528.9 ft in Crystall	e fracture spacing d, soft g, moderately har sture spacing e spacing sture spacing vide fracture spac	g rd ing 36.3
NCDOT BORE DOUBLE B3186_GEO_SPT.GPU											

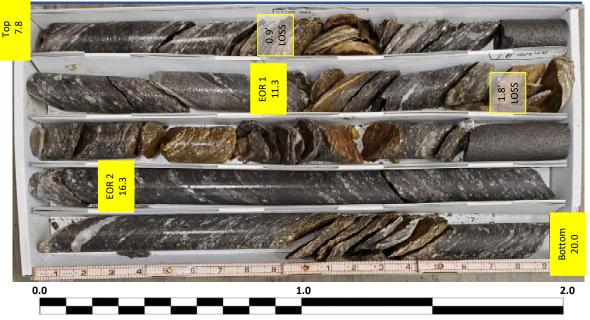
38330.1.FS1 (B-3186/B-5898)

US 23/ US 74 Great Smokey Mountain Highway

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



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



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

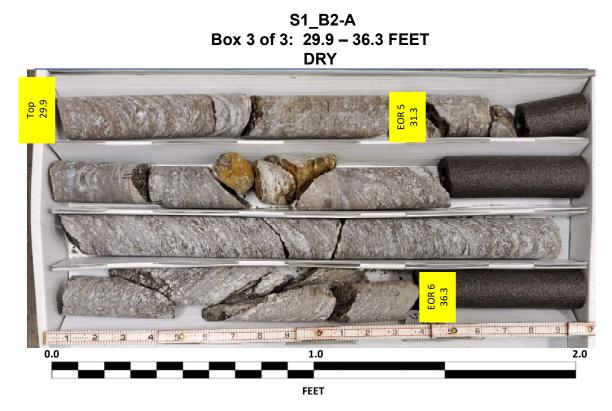


S1_B2-A Box 2 of 3: 20.0 – 29.9 FEET WET

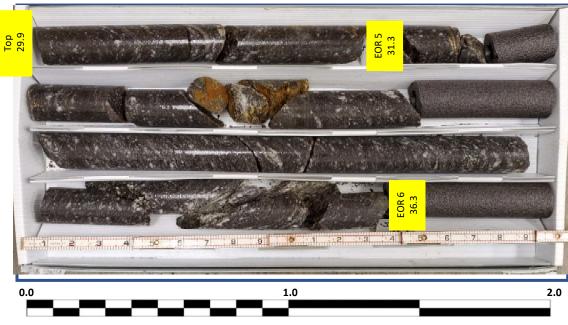


38330.1.FS1 (B-3186/B-5898)

US 23/ US 74 Great Smokey Mountain Highway



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

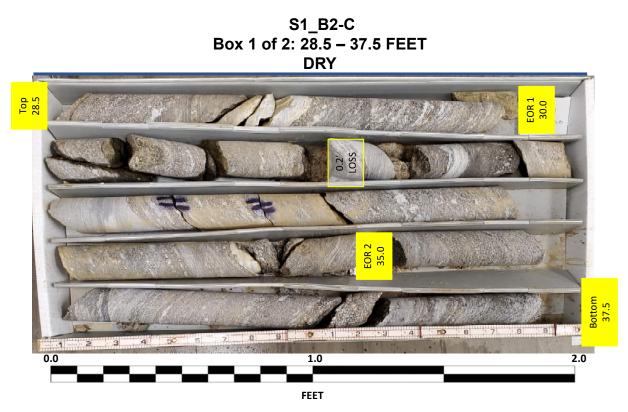


	E	BORE LOG			C	ORE LOG	
WBS 38332.1.FS1	TIP B-3186 / B-5898 COUN	TY HAYWOOD	GEOLOGIST N. Yacobi	WBS 38332.1.FS1	TIP B-3186 / B-5898 COUNT	ry haywood	GEOLOGIST N. Yacobi
SITE DESCRIPTION US 23/	US 74 (Great Smoky Mountain Highv	vay)	GROUND WTR (ft)	SITE DESCRIPTION US 23/ US	74 (Great Smoky Mountain Highwa	ay)	GROUND WTR
BORING NO. S1_B2-C	STATION 42+87	OFFSET 1 ft RT	ALIGNMENT -L- 0 HR. 4.0	BORING NO. S1_B2-C	STATION 42+87	OFFSET 1 ft RT	ALIGNMENT -L- 0 HR. 4
COLLAR ELEV. 2,567.3 ft	TOTAL DEPTH 48.5 ft	NORTHING 666,391	EASTING 818,957 24 HR. FIAD	COLLAR ELEV. 2,567.3 ft	TOTAL DEPTH 48.5 ft	NORTHING 666,391	EASTING 818,957 24 HR. FIA
DRILL RIG/HAMMER EFF./DATE	GTC9083 CME-550X 80% (11/24/2020)	DRILL METHOD S	PT Core Boring HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE GT	C9083 CME-550X 80% (11/24/2020)	DRILL METHOD	SPT Core Boring HAMMER TYPE Automati
DRILLER L. Wanstrath	START DATE 03/10/21	COMP. DATE 03/10/21	SURFACE WATER DEPTH N/A	DRILLER L. Wanstrath	START DATE 03/10/21	COMP. DATE 03/10/21	SURFACE WATER DEPTH N/A
ELEV DRIVE DEPTH BLOW C			SOIL AND ROCK DESCRIPTION	CORE SIZE NQ2	TOTAL RUN 20.0 ft		
(ft) (ft) (ft) 0.5ft 0.5ft	ift 0.5ft 0 25 50	75 100 NO. MOI G	ELEV. (ft) DEPTH (ft)	ELEV RUN ELEV DEPTH RUN RATE			DESCRIPTION AND REMARKS
				(ft) (ft) (ft) (Min/f	t) (ft) (ft) NO. (ft) (ft)	G ELEV. (ft)	DEPTI
2570			-	2538.8 2,538.8 28.5 2,537.3 30.0 1.5 N=60/0 1:49/0	<u>0.0</u> (1.5) (1.3) (6.7) (3.7)	2 538 8	Begin Coring @ 28.5 ft WEATHERED ROCK (continued)
2,567.3 0.0			- 2,567.3 GROUND SURFACE 0.0				CRYSTALLINE ROCK
<u>2565</u> <u>2,564.8</u> <u>2.5</u> <u>1</u> <u>2</u>	$\begin{array}{c c c c c c c c c c c c c c c c c c c $		ROADWAY EMBANKMENT Very soft to medium stiff, red and brown, silty	2535 <u>1</u> 2:32 1:49 2:31	(4.8) 96% (2.4) 48%	moderately severe	vith brown, f-c grained Biotite GNEISS, with trace garnets, to slight weathering, moderately hard to hard, very close
	1 42		CLAY (A-7-6), micaceous	2,532.3 35.0 2:49	RS-11	2,001.0	to close fracture spacing , medium to moderately hard, very close fracture spacing
2,562.3 5.0 3 3	7		-	2535 2,532.3 2	(5.0) (4.3) 100% 86% (11.4) (6.6) 87% 50%	Moderate to slight	0.2' core loss weathering, moderately hard to hard, very close to close
2560 2,559.8 7.5 18 14			<u></u>	2:42 2:18 2,527.3 40.0 1:59			fracture spacing RS-11 33.5' - 34.1'
2.557.3 10.0		· · · · · 000	Medium dense to very dense, gray, black,9.5 And white. SAND and GRAVEL (A-1-b)	† 50 1:37	(5.0) (1.0)	Qu	GSI= 60 - 70 u= 3,264 psi (sampled along healed joint)
	7	D	RESIDUAL Medium dense to dense, red, tan, and black.	2525 2,522.3 45.0 1:59	100% 20%	Light to dark gray v weathering, hard	with brown, Migmatitic Biotite GNEISS, moderate to slight to moderately hard, very close to close fracture spacing
			SILT (A-4), contains little rock fragments, micaceous, saprolitic	2,522.3 45.0 1:53 3.5 1:38	(1.6) (0.4)		Core barrel blocked off 1.9' core loss
2,552.3 15.0 3 4	6	· · · · · · · · · · · · · · · · · · ·		2520 1:41	46% 11%	Light to dark gray v weathering, hard	
2550			-	2,518.8 48.5 2:09 1:08/0	.5		ed at Elevation 2,518.8 ft in Crystalline Rock (GNEISS)
2,547.3 20.0 8 16							
2545	5 50 • 46	D	-				
			- 2.542.3 25.0				
2,542.3 25.0	<u> </u>		2,542.3 25.0				
2540			Red, brown, and black, GNEISS 28.5				
60/0.0			CRYSTALLINE ROCK Light to dark gray with brown, f-c grained				
2535		· · · · ·	Biotite GNEISS, with trace garnets				
		· · · · · RS-11					
2530 _		· · · · · · · · · · · · · · · · · · ·	Biotite GNEISS				
2525		· · · · ·	-				
			E				
2520							
			2,518.8 48.5				
			Boring Terminated at Elevation 2,518.8 ft in Crystalline Rock (GNEISS)			I E	
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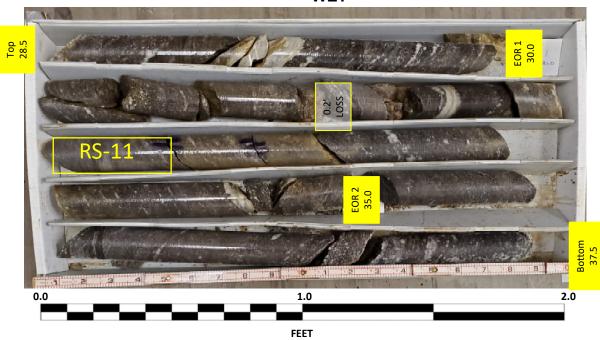
GEOTECHNICAL BORING REPORT CORFING

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

US 23/ US 74 Great Smokey Mountain Highway



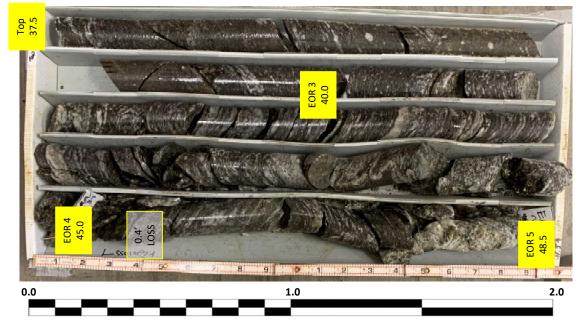
S1_B2-C Box 1 of 2: 28.5 – 37.5 FEET WET



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



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



FEET

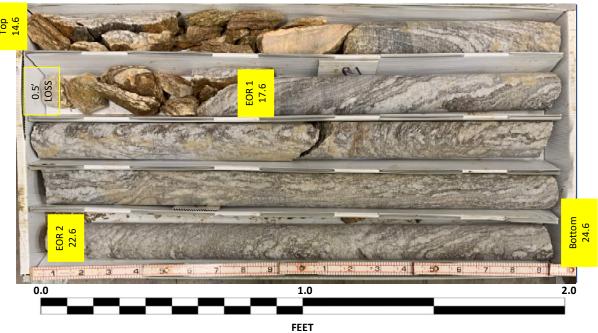
		BORE LOG				ORE LOG		
WBS 38332.1.FS1	TIP B-3186 / B-5898 COUN		GEOLOGIST N. Yacobi	WBS 38332.1.FS1	TIP B-3186 / B-5898 COUN		GEOLOGIST N. Yacobi	
SITE DESCRIPTION US 23/ US	74 (Great Smoky Mountain High	vay)	GROUND WTR (ft)	SITE DESCRIPTION US 23/ US	74 (Great Smoky Mountain Highw	ay)		GROUND WTR (ft)
BORING NO. S1_B2-B	STATION 42+73	OFFSET 43 ft RT	ALIGNMENT -L- 0 HR. N/A	BORING NO. S1_B2-B	STATION 42+73	OFFSET 43 ft RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 2,565.5 ft	TOTAL DEPTH 32.6 ft	NORTHING 666,354	EASTING 818,982 24 HR. FIAD	COLLAR ELEV. 2,565.5 ft	TOTAL DEPTH 32.6 ft	NORTHING 666,354	EASTING 818,982	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE GT	C3277 CME-75 83% (09/15/2020)	DRILL METHOD H.	S. Augers HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE GTO			H.S. Augers	AMMER TYPE Automatic
DRILLER K. Boone	START DATE 02/15/21	COMP. DATE 02/15/21	SURFACE WATER DEPTH N/A	DRILLER K. Boone	START DATE 02/15/21	COMP. DATE 02/15/21	SURFACE WATER DEPTH	N/A
ELEV DRIVE DEPTH BLOW COU	INT BLOWS PER FO		SOIL AND ROCK DESCRIPTION	CORE SIZE NQ2	TOTAL RUN 18.0 ft			
(ft) ELEV (ft) 0.5ft 0.5ft	0.5ft 0 25 50	75 100 NO. MOI G		ELEV RUN DEPTH RUN DRILL	RUN SAMP. STRATA REC. RQD SAMP. REC. RQD (ft) (ft) NO. (ft) (ft) (ft)		DESCRIPTION AND REMARKS	
				(ft) ELEV (ft) (ft) RATE (Min/ft)	RCI RQD SAMP. STRATA REC. RQD NO. (ft) (ft) (ft) % % % %	G ELEV. (ft)	DEOURIF HUN AND REMARKS	DEPTH (ft)
2570				2550.9 2550 2,550.9 14.6 3.0 1/ 0:0			Begin Coring @ 14.6 ft	
				/v=00/0.	1 (2.5) (0.5) (17.5) (14.9 83% 17% 97% 83%	Light to dark gray w	CRYSTALLINE ROCK ith brown, Migmatitic Biotite GNEISS ring, soft to mdoerately hard, very cl	14.6 S moderately severe
2565 2,565.5 0.0			2,565.5 GROUND SURFACE 0.0		(5.0) (5.0) 100% 100%	to moderate weathe	spacing	ose to close fracture
2565 2,565.5 0.0	0	— — — — — — — — — — — — — — — — — — —	- ALLUVIAL	2545 0:0	100%	Slight weatheri	0.4' core loss ing, hard, moderately close to wide fr	acture spacing
			Very loose, brown, silty SAND (A-2-4), micaceous	2,542.9 22.6 0:0			<i>S</i> , , <i>S</i>	1 5
2560				- 5.0 0:0	(5.0) (4.7) 100% 94%			
				2540 0:0 0:0 0:0) 2,550.9 Light to dark gray w to moderate weather Slight weather Clo	ose to moderately close fracture space	ing
				2,537.9 27.6 0:0	(5.0) (4.7) 100% 94%		,	
2555 2,554.8 10.7 100/0.5		100/0.5	_2,554.8 10.7 WEATHERED ROCK	2535 0:0	100% 94%			
			Brown, GNEISS	2,532.9 32.6 0:0 0:0		2,532.9		32.
2,550.9 14.6 60/0.1			2,550.9 14.6 CRYSTALLINE ROCK			Boring Terminate	ed at Elevation 2,532.9 ft in Crystallin	e Rock (GNEISS)
			Light to dark gray with brown, Migmatitic Biotite GNEISS				NOTES Rocking coring times not available	
							5 5	
2545			-					
2540								
2535			-					
			Crystalline Rock (GNEISS)					
			NOTES Rocking coring times not available					
			Resting coming times not available					
			-					
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GEOTECHNICAL BORING REPORT CORE LOG

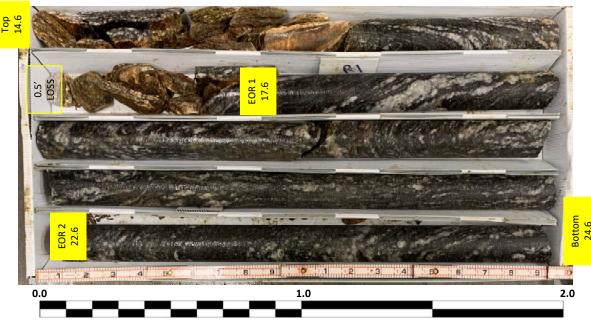
38330.1.FS1 (B-3186/B-5898)

US 23/ US 74 Great Smokey Mountain Highway

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



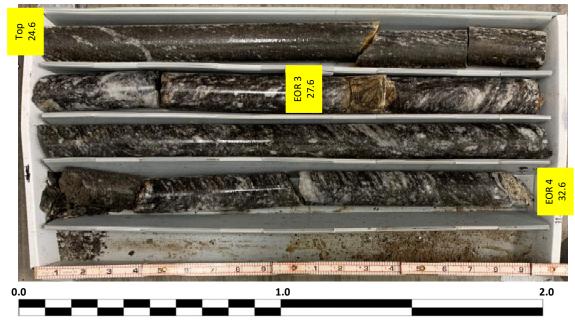
S1_B2-B Box 1 of 2: 14.6 – 24.6 FEET WET



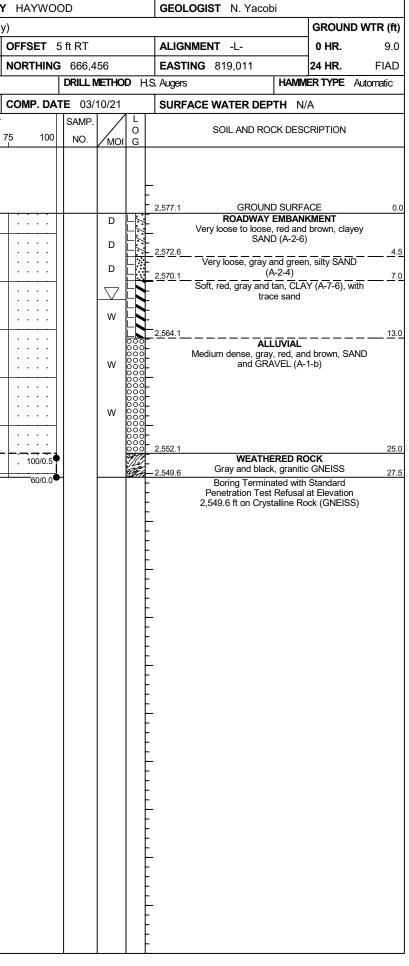
S1 B2-B Box 2 of 2: 24.6 – 32.6 FEET DRY



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



								-								·								
	38332								Y HAYWO	OD			GEOI	OGIST C. Swafford			3 8332					IP B-3186		
						Great Smol	-	n Highwa	-						GROUND WTR (ft)							Great Smol	-	n Highway
BOR	ING NO	. S1_l	EB2-A		S	TATION 4	4+11		OFFSET	46 ft LT			ALIG	NMENT -L-	0 HR. 11.5	BOR	ING NO.	S1_	EB2-C		S	TATION 4	3+71	
COL	LAR ELI	EV. 2,	580.0	ft	Т	OTAL DEP	TH 27.0 f	t	NORTHING					ING 818,995	24 HR. FIAD	COL	LAR ELE	EV. 2,	577.1	ft	т	OTAL DEP	TH 27.5 ft	t I
DRIL	RIG/HA	MMER E	EFF./DA	G	TC3277	'CME-75 83%	% (09/15/2020	0)		DRILL	METHC	DD H.	I.S. Augers	HAMI	MER TYPE Automatic	DRIL	L RIG/HAI	MMER E	FF./DA	TE G	STC908	3 CME-550X 8	0% (11/24/20)20)
DRIL	LER K	. Boon	е		S	TART DAT	E 02/28/2	21	COMP. DA	TE 02/	28/21		SURF	ACE WATER DEPTH	J/A	DRIL	LER L.	Wans	trath		S	TART DAT	E 03/10/2	1
ELEV	DRIVE ELEV	DEPTH	BLC	ow co	JNT		BLOWS	PER FOOT		SAMP.	▼⁄			SOIL AND ROCK DES	SCRIPTION	ELEV	DRIVE ELEV	DEPTH	BLC	ow co	DUNT		BLOWS F	PER FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75 100	NO.	мо		ELEV. (f		DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25 5	50 7
ł																								
2580	0.570.4												2,580.0	GROUND SURF		2580		_						
	2,579.1	0.9	14	19	9		28				м		2,579.1	0.9' PAVEME ROADWAY EMBAN	NKMENT		-							
	2,576.5	3.5	6	3	4								-	Loose to medium dense, browith some gra	own, SAND (A-3),		2,577.1	0.0	1	2	1			
2575	2,574.2	5.8				↓● ⁷	<u> </u>	+	<u> </u>		M		2,574.5		5.5	2575	2,574.6	2.5	3	4	3		+	+
		-	4	3	3	6					M		-	Soft to medium stiff, gra contains trace root fragme	nts, micaceous,		2,572.1	5.0		-		P 7		
2570	2,571.5	<u>- 8.5</u>	2	1	1	\mathbf{J}_2^{\prime}					м		-	organic odo	r	2570		F	2	1	2	ϕ_3 · · ·		
	-	F				1					\Box		2,568.0		12.0		2,569.6	- 7.5	1	1	2	-		
i.	2,566.5 [.]	13.5			-								-	Soft, gray, CLAY (A-7-6), wood fragments, mi	contains trace		2,567.1	10.0	1	1	3			· · · · ·
2565	-	ŧ	2	1	2	<u><u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u></u>			· · · ·		W		-	wood hagments, m	leaceous	2565	-	È.						
	-	ŧ				ix : :							2,563.0		17.0		2.562.1	45.0						
0500	2,561.5	18.5	4	6	12						w	000	-	Very loose, gray, SAND		0500	,	- 15.0	5	10	8	┤ : : . ` ,	8	
2560	-	F					×		1			000	-	(A-1-b)		2560		-						
	2.556.5 [.]	- 23 5											2,558.0	RESIDUAL			2,557.1	20.0	05	45				
2555	-2,000.0	20.0	13	21	33		· · · · ·	9 54 · · ·			w		-	Very dense, brown, orange SAND (A-2-4), sa	, and white, silty prolitic	2555	-	_	25	15	6	•	21 • • • •	
	2.553.0	27.0											2,553.0		27.0		-							
		Ł	60/0.0						60/0.0				-	Boring Terminated wit Penetration Test Refuse	h Standard al at Elevation		2,552.1	25.0	100/0.5	3		.	-	
1	-	F											_	2,553.0 ft on Crystalline F		2550	2,549.6	- 27.5	60/0.0					
1		Ŧ											-	<u>NOTES</u> Shelby tube obtained fr			-	F	00/0.0					
i		ŧ											-	Shelby tube obtained fro	om 13.5'-15.5'		-	F						
i	-	ŧ											-	Rig chatter and grindi	ing at 27.0'			-						
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WBS	38332	2.1.FS1			TI	P B-3186	/ B-5898	COUNT	Y HAYWC	OD			GEOL	DGIST R. Dugger			38332					P B-3186		COUN	
SITE	DESCR	RIPTION	US	23/ U	S 74 (0	Great Smok	ky Mounta	in Highwa	1						GROUND WTR (ft)					23/ US	S 74 (C	Great Smol	ky Mountaii	n Highw	ay)
BOR	ING NO	. S1_E	EB2-B		S	TATION 4	3+64		OFFSET	45 ft RT			ALIGN	MENT -L-	0 HR. 16.0	BOR	ing no	. Det_	EB1		S	TATION 4	0+58		OFF
COLI	LAR EL	EV. 2,	577.5	ft	т	OTAL DEP	TH 45.4	ft	NORTHIN	G 666,4	26		EASTI	NG 819,039	24 HR. FIAD	COLL	LAR EL	EV. 2,	570.8 f	ft	т	OTAL DEP	TH 24.0 ft	t	NO
DRILL	L RIG/HA	MMER E	FF./D/	TE (STC9083	CME-550X 8	0% (11/24/2	2020)	1	DRILL	VIETHO	DD H	I.S. Augers	HAMM	IER TYPE Automatic	DRILL	RIG/HA	MMER E	FF./DA	TE G	TC8255	CME-55 93%	% (11/24/2020))	
DRIL	LER L	. Wans	trath		S		E 01/28/2	21	COMP. DA	TE 01/	28/21		SURF		/A	DRIL	LER L	. Wans	rath		S	FART DAT	E 03/22/2	1	со
ELEV	DRIVE	DEPTH	-	ow co				PER FOOT		SAMP.		1 L	1			ELEV	DRIVE	DEPTH	1	w co			BLOWS F		
(ft)	ELEV (ft)	(ft)			0.5ft	0		50	75 100	NO.	Имо		ELEV. (ft)	SOIL AND ROCK DES	CRIPTION DEPTH (ft)	(ft)	ELEV (ft)	(ft)		0.5ft		0		50	75
	()														DEFITI(II)		()							1	
0500																0575									
2580		ŧ											F			2575		ŧ							
	2,576.6	<u> </u>											- 2,577.5 - 2,576.6	GROUND SURF/ ROADWAY EMBAN				ł							
2575		1	11	10	5	1 5					D		2,575.0	0.9' PAVEMEN	IT 2.5	2570	2,570.8	<u> </u>	1	1	1				
		Ŧ	4	2	4	• <u>6</u> · ·					м		2,573.0	ROADWAY EMBAN Medium dense, brown and	KMENT		2.568.3	2.5				•2			
	2,572.5	<u>+ 5.0</u>	2	4	5			•••	· · · · · ·		м			and GRAVEL (A-	-1-b)		,	‡	10	11	7		8		: :
2570	2,570.0	7.5												Loose, brown and orange, (A-2-6)	clayey SAND	2565	2,565.8	5.0	10	3	2		· · · ·		· ·
	0 507 5	1	4	2	3	6 5				SS-5	28%		L	Medium stiff to stiff, brown	and orange,		2,563.3	7.5				₽ ⁰			
	2,567.5	T 10.0	5	3	4				.		м		F	sandy SILT (A-4)(1), m	licaceous		2 560 9	10.0	3	3	4				
2565		Ŧ				<u>7</u>	+ • • • •						- 2,564.5		<u>13.0</u>	2560	2,560.8	+ 10.0	2	3	8		+		· ·
	2,562.5	+ 15.0				::::			· · · · · ·					Medium dense, brown and	d grav. clavev			‡							: :
		1	9	9	6				. .		$\mid \nabla$	///		SAND (A-2-6), with litt		0555	2.555.8	+ 15.0				::'::			· · ·
2560	-	ŧ							+ • • • •				2,559.5	RESIDUAL	<u>18.0</u>	2555	-	t	6	8	7	15	+	<u></u>	
	2,557.5	20.0		10								0000		Dense, brown and white,	SAND (A-3),			Ŧ							
2555		ŧ	6	12	20		32		 		Sat.	0000		contains trace rock fragme		2550	2,550.8	20.0	22	15	85/0.3				
2000	-	ŧ					1						2,554.5	Medium dense, brown, orar	nge and white 23.0	2000	-	ŧ	22	15	00/0.0		<u> </u>		
	2,552.5	25.0	4	7	11	· · · / · · · .	' 			SS-8	18%			clayey SAND (A-2-7)(4), cor fragments, micace	ntains little rock		2,546.8	24.0						· · · ·	· ·
2550		t				● <u>1</u> 8	⁸			33-0	10%		2,549.5	iragments, micad				t	60/0.0						
		Ŧ						×					<u></u>	Very dense, brown and oran	nge with black,28.0			Ŧ							
	2,547.5	+ <u>30.0</u> +	52	40	45				· · · · · · · · · · · · · · · · · · ·		D		- -	silty SAND (A-2	-4)			Ŧ							
2545		‡							· · · · · ·								-	‡							
	2.542.5	+ 35.0											- 2,542.5		35.0			‡							
	2,042.0	1 33.0	100/0.	3					100/0.3			۶Ľ		WEATHERED RO	DCK			t							
2540	-	Ŧ						· · · ·				1	-	Brown and orange, C	JNEISS		-	Ŧ							
	2,537.5	40.0										Ħ						Ŧ							
2535		‡	100/0.	2					· · 100/0.2	Ĩ I		H	4					‡							
2000	-	ŧ										-	<u> </u>				-	ŧ							
	2,532.5	45.0	100/0	1				• • • •					2,532.1		45.4			t							
		+	100/0.						100/0.4				F	Boring Terminated at Elevati Weathered Rock (G	ion 2,532.1 ft in NEISS)			+							
	-	Ŧ											F	Υ.	,		-	Ŧ							
1		‡											F					‡							
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75 100 NO. MOI G SOIL AND ROCK DESCRIPTION 75 100 NO. MOI G SOIL AND ROCK DESCRIPTION 75 100 NO. MOI G SOIL AND ROCK DESCRIPTION 75 100 NO. MOI 2.570.8 GROUND SURFACE 0.0 7 7.0 ARTIFICIAL FILL 2.0 ARTIFICIAL FILL 2.0 7 7.0 Sat.	JNT	r r	1A	/WC		טי			GEO	LOGIST	R. Dugg	jer		
OFFSET 75 ft RT ALIGNMENT -L- 0 HR. N/A NORTHING 666,164 EASTING 818,877 24 HR. FIAD DRILL METHOD H.S. Augers HAMMER TYPE Automatic COMP. DATE 03/22/21 SURFACE WATER DEPTH N/A OOT SAMP. L SOIL AND ROCK DESCRIPTION 75 100 NO. MOI C.570.8 GROUND SURFACE 0.0 ARTIFICIAL FILL 2.570.8 GROUND SURFACE 0.0 ARTIFICIAL FILL 2.2 2.0 . . . Sat. 2.588.8 Very soft, brown and orange, sitty CLAY _2.0 <t< th=""><th>hwa</th><th>V)</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>GROUN</th><th>D WTR (ft)</th></t<>	hwa	V)											GROUN	D WTR (ft)
NORTHING 666,164 EASTING 818,877 24 HR. FIAD DRILL METHOD HS. Augers HAMMER TYPE Automatic COMP. DATE 03/22/21 SURFACE WATER DEPTH N/A OOT SAMP. L SOIL AND ROCK DESCRIPTION 75 100 NO. MOI G SOIL AND ROCK DESCRIPTION 75 100 NO. MOI G SOIL AND ROCK DESCRIPTION 75 100 NO. MOI G SOIL AND ROCK DESCRIPTION 75 100 NO. MOI G SOIL AND ROCK DESCRIPTION 75 100 NO. MOI G SOIL AND ROCK DESCRIPTION 75 100 NO. MOI G SOIL AND ROCK DESCRIPTION 75 100 NO. MI 2,568.8 Very soft, brown and orange, silty CLAY 2.0 70 Satt Satt Satt (A-7.6) 9.5 70 M 2,561.3 (A-7.6) 9.5 70 M Stiff, brown and orange, SILT (A-4), with trace clay, contains little rock fragments 2.550.3 20.5 70 M			E 0	CT	-				A. 10		• •		•	
DRILL METHOD H.S. Augers HAMMER TYPE Automatic COMP. DATE 03/22/21 SURFACE WATER DEPTH N/A OOT SAMP. 0 G SOIL AND ROCK DESCRIPTION 75 100 NO. MOI G SOIL AND ROCK DESCRIPTION 0 SOIL AND ROCK DESCRIPTION Artificial fill 2.570.8 GROUND SURFACE 0.0 1 M 2.570.8 GROUND SURFACE 0.0 M 2.568.8 Very soft, brown and orange, silty CLAY 2.0 Sat. Loose to medium dense, brown and gray, SAND and GRAVEL (A-1-b) M 2.561.3 RESIDUAL													URK.	
COMP. DATE 03/22/21 SURFACE WATER DEPTH N/A OOT SAMP. 0 SOIL AND ROCK DESCRIPTION 75 100 NO. MOI G SOIL AND ROCK DESCRIPTION 75 100 NO. MOI G ARTIFICIAL FILL 0.0 75 100 NO. MOI G ARTIFICIAL FILL 0.0 75 100 NO. M 2,570.8 GROUND SURFACE 0.0 70 M 2,568.8 Very soft, brown and orange, sitty CLAY 2.0 2.0 70 Sat. Sat. Sat. Sat. Sat. Sat. Sat. 7.0 70 NA 2,561.3 Medium stiff, brown, and tan, sitty CLAY 2.0 7.0 70 NA 2,561.3 RESIDUAL Stiff, brown and orange, SILT (A-4), with trace clay, contains little rock fragments 71 NA 2,550.3 20.5 Sat. 2,560.8 24.0 70 NA 2,550.3 20.5 Sat. Sa		NC	RT	HIN		-			EAS	FING 8	18,877		24 HR.	FIAD
OOT SAMP. L Solit Solit					Γ	DRILL	/IETHO	D H.	S. Auger	s		HAMM	ER TYPE	Automatic
OOT SAMP. L Solit Solit		co	MF	P. DA	т,	E 03/3	22/21		SLIR	FACF W		PTH N/	A	
75 100 NO. MOI G SOIL AND ROCK DESCRIPTION 75 100 NO. MOI G ARTIFICIAL FILL 0.0 ARTIFICIAL FILL 0.0 ARTIFICIAL FILL 2.0 <th>007</th> <th></th> <th></th> <th></th> <th> </th> <th>-</th> <th>, <u>_</u> /</th> <th>LI</th> <th></th> <th></th> <th></th> <th>· · · · · · //</th> <th></th> <th></th>	007				 	-	, <u>_</u> /	LI				· · · · · · //		
Moni G 2,570.8 GROUND SURFACE 0.0	001			100			/	0		S	OIL AND RC	OCK DESC	RIPTION	
M 2.568.8 Very soft, brown and orange, silty CLAY _2.0		13		100	\parallel	NU.		G						
			•	· · · · · · · · · · · · · · · · · · ·			M Sat. Sat. M		2,568.8	Very Loose	GROUN ARTIF soft, brown (A-7-6) to medium SAND and um stiff, brown and c e clay, contai WEATH Brow oring Termin etration Tes	ID SURFA FICIAL FIL and orange, dense, bro GRAVEL WIN, and ta A-7-6) SIDUAL orange, SII ns little ro IERED RC n, GNEIS: mated with t Refusal	ACE L e, silty CL/ own and gr (A-1-b) n, silty CL/ LT (A-4), w ck fragmen DCK S Standard at Elevatio	/ ay,7_0 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5 9.5

GEOTECHNIC

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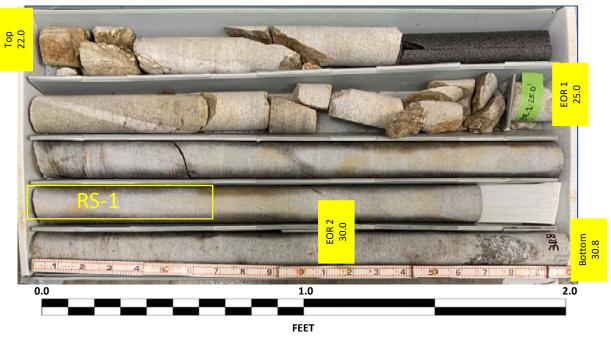
	_	SORE LOG						
WBS 38332.1.FS1	TIP B-3186 / B-5898 COUN	TY HAYWOOD	GEOLOGIST N. Yacobi	WBS 38332.1.FS1 TIP B-3186 / B-5898 COUNTY HAYWOOD GEOLOGIST N. Yacobi				
SITE DESCRIPTION US 23/ US	74 (Great Smoky Mountain Highw	ay)	GROUND WTR (ft)	SITE DESCRIPTION US 23/ US 74 (Great Smoky Mountain Highway) GROUND WTR (ft)				
BORING NO. Det_B1	STATION 41+46	OFFSET 93 ft RT	ALIGNMENT -L- 0 HR. N/A	BORING NO. Det_B1 STATION 41+46 OFFSET 93 ft RT ALIGNMENT -L- 0 HR. N/A				
COLLAR ELEV. 2,567.0 ft	TOTAL DEPTH 42.0 ft	NORTHING 666,223	EASTING 818,945 24 HR. FIAD	COLLAR ELEV. 2,567.0 ft TOTAL DEPTH 43.0 ft NORTHING 666,223 EASTING 818,945 24 HR. FIAD				
DRILL RIG/HAMMER EFF./DATE GTO		DRILL METHOD S		DRILL RIG/HAMMER EFF./DATE GTC8255 CWE-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	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 ELEV (ft) (ft) (ft) 0.5ft 0.5ft		75 100 100 10	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)					
				(ff) (ff)				
2570			-	2545 Begin Coring @ 22.0 ft 2,545.0 22.0 3.0 1:17 (3.0) (14) (13.0) (11.2) 2,545.0 CRYSTALLINE ROCK 22				
2.567.0 0.0			2.567.0 GROUND SURFACE 0.0	2,542.0 25.0 1:08 100% 47% 100% 86% Light to medium gray and white with tan, m-c grained GRANITE with trace Bitoite Gneiss zenoliths, slight to very slight weathering, moderately hard to				
	1	· · · · · M	ARTIFICIAL FILL	5.0 1:38 (5.0) (4.8)				
2.504.5 7 2.5	3	· · · · ·	Very loose to loose, brown, clayey SAND (A-2-6)	2540 1:59 100% 96% Slight ot fresh, hard, moderately close to wide fracture spacing 2:08 8 RS-1 RS-1 27.0' - 27.7'				
2.562.0 5.0	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		2,537.0 30.0 2:04 GSI= 85 - 95 Qu= 22,108 psi				
2560 2.559.5 7.5 2 1	$5 \qquad \bullet_6 \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot \cdot $	· · · · · · W		2535 5.0 (5.0) (5.				
2,559.5 7.5 2 3	3	I VI 5/2/31		GSI= 85 - 95 Qu= 20,364 psi				
2,557.0 10.0 2 2	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		Medium stiff to stiff, gray and white, sandy SILT (A-4)	2,532.0 35.0 2:25 (5.0) (5.0) (7.0) 7.0 2.532.0 35 35 35 35 35 35 35 35 35 35 35 35 35				
2555	•	· · · · · · M	_	2530 2:01 100% 100% 100% 100% 100%				
		NY4334		2525 2,524.0 43.0 2:36 2,524.0 43.0 2:36 2,524.0 43.0 2:36				
	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	· · · · · · M		2,527.0 40.0 1:56 3.0 1:36 (3.0) (3.0) RS-3				
2550 -			-	2525 1:49 100% 100% 100% GSI = 85 - 95 2,524.0 43.0 2:36 GSI = 2,524.0 Qu= 16,519 psi 43				
2,547.0 20.0			2,547.0 20.0	Boring Terminated at Elevation 2,524.0 ft in Crystalline Rock (GNEISS)				
2545 57 100/0.3		· · · 100+	WEATHERED ROCK 2,545.0 Brown and black, GNEISS 22.0	Image: Notes				
	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		Run times for core at 30.0' were not recorded				
			Light to medium gray and white with tan, m-c grained GRANITE with trace Bitoite Gneiss					
2540			zenoliths					
		RS-1						
2535		· · · · · · RS-2	-					
			2.532.0 35.0					
			Light to dark gray with brown, Migmatitic					
			_ Biotite GNEISS					
		RS-3	2,525.0 42.0					
			Boring Terminated at Elevation 2,525.0 ft in Crystalline Rock (GNEISS)					
			G ystailine Rock (GIVEISS)					
			-					
			-					
			-					
			-					
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			_					

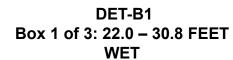
7	AL BORING REPORT									
C	DRE LOG									
Υ	HAYWOOD	GEOLOGIST	N. Yacobi							

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

US 23/ US 74 Great Smokey Mountain Highway

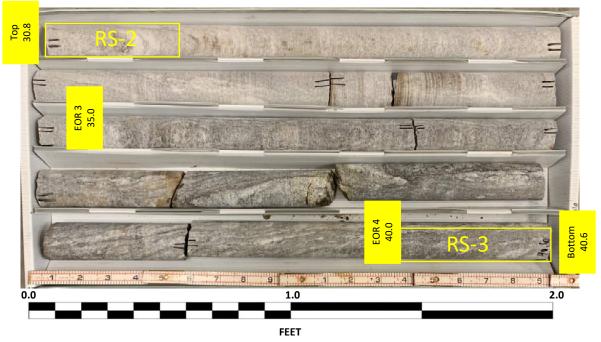
DET-B1 Box 1 of 3: 22.0 – 30.8 FEET DRY











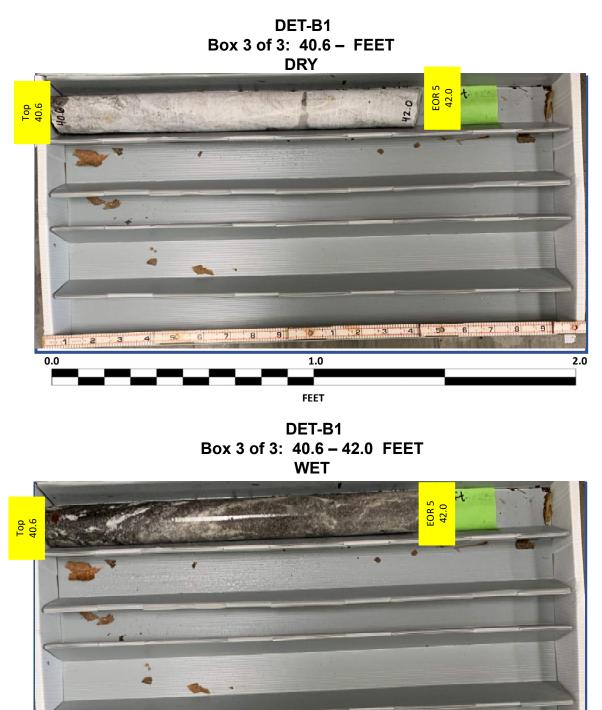




FEET

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

US 23/ US 74 Great Smokey Mountain Highway



7 8 9 9

FEET

2 3 4

.50

4

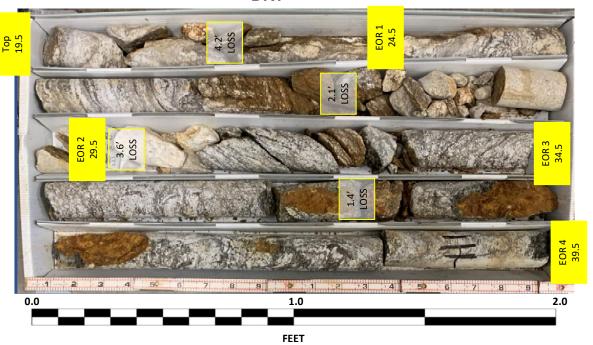
M/DO 00000 4 F04						
WBS 38332.1.FS1	TIP B-3186 / B-5898 COUNT		GEOLOGIST N. Yacobi		TIP B-3186 / B-5898 COUNTY HAYWOO	
SITE DESCRIPTION US 23/ US		1	GROUND WTR (ft)	SITE DESCRIPTION US 23/ US 74		GROUND WTR (ft)
BORING NO. Det_B2	STATION 42+34	OFFSET 113 ft RT	ALIGNMENT -L- 0 HR. N/A		STATION 42+34 OFFSET 1	
COLLAR ELEV. 2,568.0 ft	TOTAL DEPTH 49.5 ft	NORTHING 666,281	EASTING 819,014 24 HR. FIAD	· ·	TOTAL DEPTH 49.5 ft NORTHING	
DRILL RIG/HAMMER EFF./DATE GTC				DRILL RIG/HAMMER EFF./DATE GTC8		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			TE 03/11/21 SURFACE WATER DEPTH N/A
ELEV DRIVE DEPTH BLOW COUNT (ft) (ft) (ft) 0.5ft 0.5ft 0			SOIL AND ROCK DESCRIPTION		TOTAL RUN 30.5 ft	
(ft) (ft) (ft) 0.5ft 0.5ft (0.5ft 0 25 50	75 100 NO. MOI G	ELEV. (ft) DEPTH (ft)	ELEV RUN (ft) (ft) (ft) DEPTH RUN (ft) (ft) (ft) (Min/ft)	RUN SAMP. STRATA L REC. RQD NO. (ft) (ft) 0 (ft) (ft) NO. % % G ELEV. (ft)	DESCRIPTION AND REMARKS
					(ft) (ft) NO. (ft) (ft) G ELEV. (ft	•
2570			-	2549 2,549.0 19.0 5.5 -/0.5	(1.3) (0.6) (17.9) (11.5) (2.549.0	Begin Coring @ 19.0 ft CRYSTALLINE ROCK 19.0
2,568.0 0.0 2 2	2 4	М 🖄	2,568.0 GROUND SURFACE 0.0 ARTIFICIAL FILL	- 1:38 1:18	(1.3) (0.6) (17.9) (11.5) 2,549.0 24% 11% 59% 38% 11	Light to dark gray, white, and brown, Migmatitic Biotite GNEISS interlayered with weathered rock seams and high concentrations of felsic dikes, with
2565 2,565.5 2.5 5 10	9			2545 1:01 2,543.5 24.5 1:00		trace fault breccia moderately severe to moderate weathering, moderately hard to hard, very close to close fracture spacing
2.563.0 5.0	$\begin{array}{c c c c c c c c c c c c c c c c c c c $		white, SAND and GRAVEL (A-1-b)	2,543.5 + 24.5 1:00 + 5.0 0:38 + 0:12	(2.9) (0.5) 58% 10%	4.2' core loss
6 8		. w 🏹 🕯		<u>2540</u> <u>2540</u> <u>-</u> 0:20 0:12		2.1' core loss
	20		-	2,538.5 29.5 0:31 5.0 0:57		3.6' core loss
2,558.0 10.0 4 6		· · · · · 🕅		+ 0:48		0.0 00101055
2555			·	2535 0:49 0:53 2,533.5 34.5 1:00		Moderate to slight weathering, hard, very close to moderately close fracture
2,553.0 15.0			2,553.0 15.0	- 5.0 1:11 - 1:15	(3.6) (2.8) 72% 56%	spacing, with few healed fractures
	00/0.5		Gray, GNEISS		(1.3) (0.6) 24% 11% (2.9) (0.5) 58% 10% (1.4) (0.4) 28% 8% (3.6) (2.8) 72% 56% 88% 58% RS-4 100 (4.3) (4.3) 86% 86%	1.4' core loss
2550			2,549.0 19.0	2,528.5 - 39.5 - 1:23 2,528.5 - 39.5 - 1:27 - 5.0 1:29		<1cm normal-sense displacement on healed subvertical fracture 0.6' core loss
			CRYSTALLINE ROCK Light to dark gray, white, and brown,	+ 1:25	(4.4) (2.9) 88% 58% RS-4	RS-4 40.2' - 41.0" GSI= 65 - 75
2545			Migmatitic Biotite GNEISS interlayered with weathered rock seams and high	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		Qu= 8,866 psi
			concentrations of felsic dikes, with trace fault breccia	- 5.0 1:49 - 1:47	(4.3) (4.3) 86% 86%	
						0.7' core loss
2540			-	2,518.5 49.5 1:26	RS-5 2,518.5	RS-5 48.5' - 49.0' 49.5 GSI= 65 - 75
						Qu= 8,369 Boring Terminated at Elevation 2,518.5 ft in Crystalline Rock (GNEISS)
2535			-			, , , , , , , , , , , , , , , , , , ,
						NOTES Split spoon at 10.0' resulted in low recovery
2530			-			
2525	· · · · · · · · · · · · · · · · · · ·		-			
2520						
			- 2,518.5 49.5			
			- Boring Terminated at Elevation 2,518.5 ft in Crystalline Rock (GNEISS)			
			. , , ,			
			NOTES Split spoon at 10.0' resulted in low recovery			
			-			
			-			
			-			
			_			

GEOTECHNICAL BORING REPORT CORE LOG

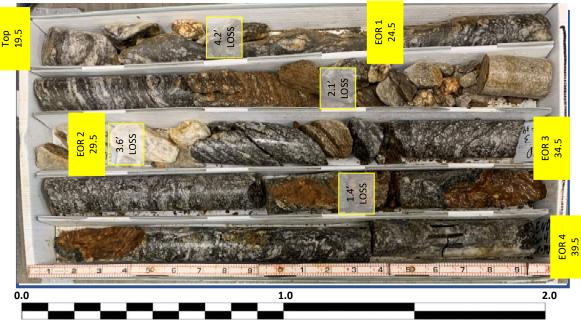
38330.1.FS1 (B-3186/B-5898)

US 23/ US 74 Great Smokey Mountain Highway

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



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



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



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



								<u>SORE L</u>	.06			
WBS	38332	.1.FS1	1		Т	IP B-3186 /	B-5898 COUN	TY HAYWO	OD		GEOLOGIST N. Yacobi	
SITE	DESCR	IPTION	US	23/ U	S 74 (0	Great Smoky	Mountain Highv	/ay)				GROUND WTR (ft)
	ING NO.					TATION 43+		OFFSET	121 ft R	Т	ALIGNMENT -L-	0 HR. N/A
COL	AR ELE	IV. 2.	- .584.5	ft	т	OTAL DEPTH	43.3 ft	NORTHING	G 666.3	370	EASTING 819,092	24 HR. FIAD
			-			5 CME-55 93% (*						MMER TYPE Automatic
	LER L.							COMP. DA				Ν//Δ
	DRIVE			OW CO			BLOWS PER FO		SAMP.		SURFACE WATER DEPTH	N/A
ELEV (ft)	ELEV (ft)	DEPTH (ft)	0.5ft		1	0 25		75 100	NO.	MOI G	SOIL AND ROCK D	ESCRIPTION DEPTH (ft
2585	2,584.5	- 0.0	3	2	2	 					-2,584.5 GROUND SU	
	2.582.0	2.5				 • ⁴ · · ·					<u>2,582.5</u> Soft, red and brown, sa	andy CLAY (A-6),2.0
580	-	_	1	1	2	$\left \begin{array}{c} \cdot \cdot \cdot \cdot \\ \bullet \\ 3 \cdot \cdot \cdot \end{array} \right $					Very loose to loose, red	
	2,579.5	- 5.0	2	3	4						clayey SAND (A-2-6	b), micaceous
	2,577.0	7.5				.¶′	· · · · · · · · ·	· · · · ·			2,577.5 Loose, red, brown, and	7.
575	- 2.574.5		4	3	3	∳ 6 [,] · ·					(A-2-4), mica	
	2,574.5	- 10.0 -	2	2	2					м		
	-	F		1		• • • •	· · · · · · · · ·				<u></u> 2,57 <u>1.5 </u>	<u>13</u> .
570	- 2.569.5	- 15.0									Soft, gray, clayey SILT	(A-5), micaceous
			1	1	2					м 🕅	41- 19-	
	-	F									<u> </u>	18.
565	- 2.564.5	- 20.0					· · · · · · · · ·	· · · · ·			Soft, gray, lean C	LAY (A-7-6)
			1	1	3	4	· · · · · · ·	· · · · ·		м 🕅		
	-	-									- 2,561.5	23.
560	- 2.559.5	- 25.0						· · · · · ·			Very dense, gray, white a	1 1 6)
	-		14	86	24/0.5			· · · 100+			WEATHEREI	ROCK
	-	-									2,556.5 Gray, white, and t	
555	- 2,554.5	- 30.0									RESIDU	
	-		15	9	11		· · · · · · ·	· · · · · ·			SILT (A-4), micace	ous, saprolitic
	-	Ł		1							81 82	
50	- 2,549.5	- 35.0		l		`	\			🛛 🕅	<u> </u>	
	-	È	8	15	16		9 31	· · · · · ·			-	
	-	F		1			· · · · · · · · · · · · · · · · · · ·					
545	2,544.5	40.0		<u> </u>	-	+	+ +					
	-	F	6	7	25					🛛 🎆	-	
	2.541.3	43.2	60/0.4	<u> </u>				<u> </u>			2,541.3 2.541.2/1 CRYSTALLIN	43. F ROCK / 43.
		F	60/0.1	4				ou/u.1			CRYSTALLIN Gray, white, and br	
	-	F		1							Boring Terminated	with Standard
	-	t		1							Penetration Test Refu 2,541.2 ft in Crystalline	
	-	F									- NOTES	
	-	F		1							 Offset and augered dowr 	to 18.0' for shelby
	-	È.		1							- tube sam	ple
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FSS REPORT ON SAMPLES OF: Rock For Quality

DET_B1

DET_B2

DET_B2

RS-3

RS-4

RS-5

40.1-40.6

40.2-41.0

48.5-49.0

Migmatitic Biotite Gneiss

Migmatitic Biotite Gneiss

Migmatitic Biotite Gneiss

PROJECT: DATE SAMPLED:		B-3186 / B-	5898			COUNTY:	Haywood 5/11/2021		
		05/11/2021				RECEIVED:			
	SAMPLED FROM:	Test Boring	S			REPORTED:	5/12/2021 Kevin E. Walker		
	SUBMITTED BY:	HDR			_	BY / CERT NO:			
-									
	BORING NO	SAMPLE	DEPTH (FT)	ROCK TYPE	LENGTH (IN)	DIAMETER (IN)	UNIT WEIGHT (PCF)	UNCONFINED COMPRESSIVE S	
	S1_B1-A	RS-6	11.0-11.5	Biotite Gneiss	4.16	1.86	175.8	18,520	
	S1_B1-A	RS-7	16.8-17.5	Migmatitic Biotite Gneiss	3.49	1.86	173.40	10,027	
	S1_B1-B	RS-8	32.1-32.5	Migmatitic Biotite Gneiss	4.17	1.87	172.90	10,268	
	S1_B1-C	RS-9	39.4-40.0	Migmatitic Biotite Gneiss	4.14	1.87	171.40	13,205	
	S1_B2-A	RS-10	20.0-20.8	Migmatitic Biotite Gneiss	4.15	1.87	171.50	9,796	
	S1_B2-C	RS-11	33.5-34.1	Biotite Gneiss	4.16	1.86	173.10	3,264	
	DET_B1	RS-1	27.0-27.7	Granite	4.17	1.86	165.5	22,108	
	DET_B1	RS-2	30.8-31.3	Granite	4.19	1.86	165.1	20,364	

4.11

4.25

4.24

1.86

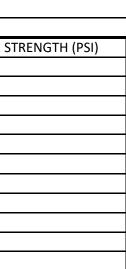
1.87

1.87

170.4

170.3

169.5



16,519

8,866

8,389