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REFERENCE

DESCRIPTION TITLE SHEET LEGEND (SOIL & ROCK) SITE PLAN PROFILES CROSS SECTIONS BORE & CORE LOGS CORE PHOTOGRAPHS

STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

MADISON COUNTY _

REPLACE BRDG #0067 ON PROJECT DESCRIPTION US-25/70 OVER THE FRENCH BROAD RIVER

48088 PROJEC

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5895		33

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 1919 TO7-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAIL

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 UNPELACED TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOLI MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOLI MOISTURE CONDITIONS MAY YARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

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PERSO	NNEL
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- <u>NCDOT-</u>
DC CHEEK
<u> </u>
<u>CD</u> JOHNSON
DC ELLIOTT
INVESTIGATED BY <u>NCDOT GEU /DCE</u>
DRAWN BY DC ELLIOTT
CHECKED BY JC KUHNE
SUBMITTED BY <u>JC KUHNE</u>
DATE
SEAL 2376
DocuSigned by:
Olastan Filiatt

D. Clayton Elliott -FD421F60CB0E40E.. 10/26/2020 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 D	ESCRIPT	ION				T		GF	RADATION						ROCK DE	SCRIPTION
BE PENETR ACCORDING IS BAS CONSISTEN	ATED WITH G TO THE S SED ON TH CY, COLOR,	UNCONSOLIDATE A CONTINUOUS STANDARD PENE E AASHTO SYST TEXTURE, MOIST	FLIGHT POW TRATION TES EM. BASIC D JRE, AASHTO	ER AUGER AN T (AASHTO 1 ESCRIPTIONS CLASSIFICAT	ID YIELD LES 206, ASTM GENERALLY ION, AND OTH	SS THAN 10 D1586). SOI INCLUDE TH HER PERTINE	Ø BLOWS PI L CLASSIFI HE FOLLOWI ENT FACTOP	ER FOOT CATION NG: RS SUCH	<u>WELL GRADED</u> - INDICAT <u>UNIFORMLY GRADED</u> - IN <u>GAP-GRADED</u> - INDICATE	NDICATE	S THAT SOIL	PARTICLES ARE AL	LL APPROXIM IZES OF TWO	ATELY THE SAME SIZE.	ROCK LINE I SPT REFUSA BLOWS IN N REPRESENTE	NDICATE L IS PE ON-COAS D BY A	ES THE LEVE INETRATION E STAL PLAIN ZONE OF WE	AIN MATERIAL THAT L AT WHICH NON-COA BY A SPLIT SPOON S MATERIAL, THE TRA ATHERED ROCK.	WOULD YIELD SPT REFUSAL IF TEST STAL PLAIN MATERIAL WOULD YIELD AMPLER EOUAL TO OR LESS THAN Ø. ANSITION BETWEEN SOIL AND ROCK
AS VE	MINERALOG	ICAL COMPOSIT	ON, ANGULAR	ITY, STRUCTL RBEDDED FIN	RE, PLASTICI E SAND LAYEF	TY,ETC. FO S. <i>HIGHLY PL</i>	R EXAMPLE ASTIC.A-7-6	•	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:					IALS AF	E TYPICALLY	Y DIVIDED AS FOLLON			
				ASHTO					ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.				WEATHERED ROCK (WR)			NON-COASTAL PLA	IN MATERIAL THAT WOULD YIELD SP' OOT IF TESTED.		
GENERAL CLASS.	(-	Granular Materiai ≤ 35% Passing ≢20	0)	(> 35% Pr	MATERIALS		GANIC MATER	IALS	MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.				CRYSTALLINE ROCK (CR)	:			GRAIN IGNEOUS AND METAMORPHIC R(REFUSAL IF TESTED. ROCK TYPE IN CHIST.ETC.		
GROUP CLASS. A-	A-1 1-a A-1-b		A-2 5 A-2-6 A-2-1	A-4 A-5	A-6 A-7 A-7-5.	A-1, A-2 A-3	A-4, A-5 A-6, A-7					RESSIBILITY			NON-CRYSTAL	LINE		FINE TO COARSE	GRAIN METAMORPHIC AND NON-COAST K THAT WOULD YEILD SPT REFUSAL
SYMBOL			222								OMPRESSIBLE COMPRESSIB	LE	LL < 31 LL = 31	- 50	ROCK (NCR)	AIN		ROCK TYPE INCLU	DES PHYLLITE, SLATE, SANDSTONE, ET EDIMENTS CEMENTED INTO ROCK, BUT
% PASSING	0000000						SILT-			LY COMP	PRESSIBLE		LL > 50		SEDIMENTARY (CP)				CK TYPE INCLUDES LIMESTONE, SAND
	MX MX 50 MX 5	51 MN				GRANULAR SOILS	CLAY	MUCK, PEAT		P	GRANULAR	GE OF MATER							HERING
	MX 25 MX 1	ØMX 35MX 35M	X 35 MX 35 M	x 36 MN 36 MI	1 36 MN 36 MN		50125		ORGANIC MATERIAL TRACE OF ORGANIC M		<u>SOILS</u> 2 - 3%	SILT - CLAY <u>SOILS</u> 3 - 5%	<u>OTHE</u> TRACE	<u>R MATERIAL</u> 1 - 10%	FRESH		FRESH, CRYST		TS MAY SHOW SLIGHT STAINING. ROCK
MATERIAL PASSING =40 LL P]	_ 6 MX			N 40 MX 41 MM		LITT	5 WITH LE OR	HIGHLY	LITTLE ORGANIC MATT MODERATELY ORGANIC HIGHLY ORGANIC	TER	3 - 5% 5 - 10% > 10%	5 - 12% 12 - 20% > 20%	LITTLE SOME HIGHLY	10 - 20% 20 - 35% 35% AND ABOVE	VERY SLIGHT (V SLI.)	ROCK CRYST	GENERALLY FI	RESH, JOINTS STAINED. OKEN SPECIMEN FACE	SOME JOINTS MAY SHOW THIN CLAY C SHINE BRIGHTLY. ROCK RINGS UNDER H
GROUP INDEX	0	0 0	4 MX		16 MX NO MX		ERATE NTS OF	ORGANIC SOILS			GRO	UND WATER			SLIGHT				AND DISCOLORATION EXTENDS INTO RO
	ONE FRAGS. RAVEL, AND SAND		DR CLAYEY AND SAND	SILTY SOILS	CLAYEY SOILS		GANIC TTER	50125				BORE HOLE IMMEDI		R DRILLING	(SLI.) MODERATE	CRYST	ALS ARE DULI	L AND DISCOLORED. CF	IN GRANITOID ROCKS SOME OCCASIONA RYSTALLINE ROCKS RING UNDER HAMME SCOLORATION AND WEATHERING EFFECT
GEN, RATING						FAIR TO						SATURATED ZONE, OF		RING STRATA	(MOD.)	GRANI	TOID ROCKS, M	10ST FELDSPARS ARE	DULL AND DISCOLORED, SOME SHOW CLA
AS SUBGRADE		XCELLENT TO GOO			TO POOR	POOR	POOR	UNSUITABLE		SPRI	NG OR SEEP						SOUND UNDER FRESH ROCK.	HAMMER BLOWS AND	SHOWS SIGNIFICANT LOSS OF STRENGTH
	P	I OF A-7-5 SUBGRO		30; PIOF A-7							MISCELLA	NEOUS SYMB			MODERATELY SEVERE				R STAINED. IN GRANITOID ROCKS.ALL KAOLINIZATION. ROCK SHOWS SEVERE L
					STANDARD		GE OF UNC	ONFINED					<u>JLJ</u>		(MOD. SEV.)	AND C	AN BE EXCAV	ATED WITH A GEOLOGI	ST'S PICK, ROCK GIVES "CLUNK" SOUND
PRIMARY SO	IL TYPE	CONSIST			N RESISTENCI 'ALUE)	E COMF	RESSIVE S (TONS/F)		L ROADWAY EMB			DIP & DIP DIF DIP & DIP DIF OF ROCK STRU	RECTION		SEVERE			<u>YIELD SPT REFUSAL</u> QUARIZ DISCOLORED O	R STAINED. ROCK FABRIC CLEAR AND E
GENERALL	Y	VERY LO			4						ſ	DPT DMT TEST BO		SLOPE INDICATOR	(SEV.)	REDUC	ED IN STRENC	GTH TO STRONG SOIL.	IN GRANITOID ROCKS ALL FELDSPARS
GRANULAR MATERIAL		LOOS MEDIUM (ENSE	10	TO 10 TO 30		N/A			ILL (AF		- 131 PMI		INSTALLATION CONE PENETROMETER				YIELD SPT N VALUES	
(NON-COHE	ESIVE)	DENS VERY DE			TO 50 50				THAN ROADWAY	Y EMBA		AUGER BORING		TEST	VERY SEVERE				R STAINED. ROCK FABRIC ELEMENTS AF SOIL STATUS, WITH ONLY FRAGMENTS O
051/50414		VERY S			2		< 0.25		INFERRED SOI	L BOUN		- CORE BORING	•	SOUNDING ROD	(V SEV.)				F ROCK WEATHERED TO A DEGREE THAT AIN. <u>IF TESTED, WOULD YIELD SPT N</u>
GENERALL SILT-CLA		SOF1 MEDIUM S	TIFF	4	TO 4 TO 8		0.25 TO 0.5 TO 1	.0	INFERRED ROC	CK LINE	. ^M) MONITORING W	ELL –	_ TEST BORING WITH CORE	COMPLETE	ROCK	REDUCED TO S	SOIL. ROCK FABRIC NO	T DISCERNIBLE. OR DISCERNIBLE ONLY
MATERIAL (COHESIVE)	STIFI VERY S			TO 15 TO 30		1 TO 2 2 TO 4		ALLUVIAL SOI	IL BOUN			Č	- SPT N-VALUE			ERED CONCEN AN EXAMPLE.	TRATIONS. QUARTZ MA	Y BE PRESENT AS DIKES OR STRINGER
					30		> 4											ROCK H	ARDNESS
				DR GRAII							ICLASSIFIED E	IDATION SYME		SSIFIED EXCAVATION -	VERY HARD				RP PICK. BREAKING OF HAND SPECIMEN
U.S. STD. SIEV OPENING (MM)		4.		40 0.42	60 20 0.25 0.07					🖾 uns	SUITABLE WAS	STE (ACCEP	TABLE, BUT NOT TO BE	HARD			WS OF THE GEOLOGIST BY KNIFE OR PICK O	'S PICK. NLY WITH DIFFICULTY. HARD HAMMER E
BOULDER	СОВ	BLE GRA	VEL	COARSE SAND	F IN SAN		SILT	CLAY	SHALLOW UNDERCUT		CLASSIFIED E	CAVATION - GRADABLE ROCK		MENT OR BACKFILL		TO DE	TACH HAND SI	PECIMEN.	
(BLDR.)	(CC	OB.) (G	R.)	(CSE. SD.)	(F S		(SL.)	(CL.)			ABB	REVIATIONS			MODERATELY HARD	EXCAV	ATED BY HAR	D BLOW OF A GEOLOG	OUGES OR GROOVES TO 0.25 INCHES D IST'S PICK. HAND SPECIMENS CAN BE D
GRAIN MM SIZE IN.	3Ø5 12	75 3	2.0		0.25	0.05	0.005	ō	AR - AUGER REFUSAL BT - BORING TERMINATED	D		MEDIUM - MICACEOUS		- VANE SHEAR TEST - WEATHERED	MEDIUM		DERATE BLOW		S DEEP BY FIRM PRESSURE OF KNIFE (
5122 14.		OIL MOIST				TERMS			CL CLAY		MOD	MODERATELY	γ-	UNIT WEIGHT	HARD	CAN B	E EXCAVATED	IN SMALL CHIPS TO	PEICES 1 INCH MAXIMUM SIZE BY HARD
	OISTURE S	CALE	FIELD MO	ISTURE	GUIDE FOR				CPT - CONE PENETRATION CSE COARSE		ORG	NON PLASTIC ORGANIC		DRY UNIT WEIGHT	SOFT		OF A GEOLOC E GROVED OR		KNIFE OR PICK. CAN BE EXCAVATED IN
(ATTER	RBERG LIM	ITS)	DESCRIF	PTION	BOIDE TON	1220 110	STORE DE		DMT - DILATOMETER TES DPT - DYNAMIC PENETRA			PRESSUREMETER T SAPROLITIC	EST <u>S4</u> S-1	AMPLE ABBREVIATIONS BULK				VERAL INCHES IN SIZE DKEN BY FINGER PRES	BY MODERATE BLOWS OF A PICK POIN
			- SATURA (SAT.)		USUALLY L FROM BELC				e – VOID RATIO F – FINE			SAND, SANDY SILT, SILTY		SPLIT SPOON SHELBY TUBE	VERY	CAN B	E CARVED WIT	TH KNIFE. CAN BE EXC	AVATED READILY WITH POINT OF PICK.
LL	_ LIQUID	LIMIT							FOSS FOSSILIFEROUS		SLI	SLIGHTLY	RS -	ROCK	SOFT	OR MO FINGEF		NESS CAN BE BROKEN	BY FINGER PRESSURE. CAN BE SCRATCH
RANGE <			- WET - 0	(W)	SEMISOLID; ATTAIN OP)	FRAC FRACTURED, FRAC FRAGS FRAGMENTS	TURES	<i>w</i> - M	TRICONE REFUSAL	CBR	RECOMPACTED TRIAXIAL - CALIFORNIA BEARING		FRAC	TURE SP	ACING	BEDDING
(PI) PL	_ PLASTIC	LIMIT							HI HIGHLY			ON SUBJEC		RATIO	TERM VERY WID	F	MOR	<u>SPACING</u> E THAN 10 FEET	TERM VERY THICKLY BEDDED
		1 MOISTURE	- MOIST	- (M)	SOLID; AT	OR NEAR O	PTIMUM MC	ISTURE	DRILL UNITS:		ANCING TOOLS:		HAMMER		WIDE MODERATE		3	TO 10 FEET	THICKLY BEDDED 1 THINLY BEDDED 0.
SL _	_ SHRINKA	GE LIMIT							CME-45C		CLAY BITS		X AU	TOMATIC MANUAL	CLOSE		0.	.16 TO 1 FOOT	VERY THINLY BEDDED 0.0
			- DRY - (D)	REQUIRES			J	CME-55		6" CONTINUOU	S FLIGHT AUGER	CORE SI	ZE:	VERY CLC	ISE	LESS	THAN 0.16 FEET	THICKLY LAMINATED 0.00 THINLY LAMINATED 4
			PLA	STICITY							8'HOLLOW AU		в_	П-н					RATION
			PLASTI	CITY INDEX	(PI)	D	RY STRENC		X CME-550		HARD FACED		<u>1</u> м-Х	NXWL			OCKS, INDUR		NING OF MATERIAL BY CEMENTING, HE FINGER FREES NUMEROUS GRAINS:
SLIGH	PLASTIC			0-5 6-15			VERY LOW SLIGHT	I	VANE SHEAR TEST		TUNGCARBIE		HAND TO	OLS:	FRIAB	LE			BY HAMMER DISINTEGRATES SAMPLE.
	RATELY PL Y PLASTIC		26	16-25 OR MORE			MEDIUM HIGH		PORTABLE HOIST			₩/ ADVANCER •STEEL TEETH		ST HOLE DIGGER	MODEF	RATELY	INDURATED		E SEPARATED FROM SAMPLE WITH ST Y WHEN HIT WITH HAMMER.
				OLOR								"TUNGCARB.		ND AUGER					IFFICULT TO SEPARATE WITH STEEL
DESCRIPTIO	INS MAY T				S (TAN. REF	. YELLOW-P	ROWN. BLU	E-GRAY).			CORE BIT			UNDING ROD NE SHEAR TEST	INDUR	ATED		DIFFICULT TO	BREAK WITH HAMMER.
	SCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.												EXTRE	MELY I	NDURATED		BLOWS REQUIRED TO BREAK SAMPLI		





	TERMS AND DEFINITIONS
D. AN INFERRED	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
SPT REFUSAL. FOOT PER 60	AQUIFER - A WATER BEARING FORMATION OR STRATA.
IS OFTEN	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
N VALUES >	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
ICK THAT CLUDES GRANITE,	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.
AL PLAIN IF TESTED. C.	<u>COLLWVIDW</u> SOLES THAT CONTAIN AN THEORDEL HIGGING OF CHECKIN CHARGUNATE. <u>COLLWVIDW</u> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
MAY NOT YIELD TONE, CEMENTED	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.
	$\underline{\text{DIKE}}$ - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
RINGS UNDER	$\overline{\text{DIP}}$ - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
OATINGS IF OPEN, AMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
CK UP TO L FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
S. IN NY. ROCK HAS	<u>FLOAT</u> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
AS COMPARED	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
ELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
OSS OF STRENGTH	FIELD.
WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
VIDENT BUT	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO 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
RE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
F STRONG ROCK	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
ALUES < 100 BPF	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
IN SMALL AND S. SAPROLITE IS	<u>ROCK QUALITY DESIGNATION (ROD)</u> - 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.
0.050,0055	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
S REQUIRES	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
LOWS REQUIRED	THE ATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
EEP CAN BE ETACHED	<u>SLICKENSIDE</u> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
R PICK POINT. BLOWS OF THE	STANDARD PENETRATION TEST (PENETRATION RESISTANCE)(SPT) - NUMBER OF BLOWS (N OR BPF)OF A 140 LB.HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
FRAGMENTS T. SMALL, THIN	<u>STRATA CORE RECOVERY (SREC.)</u> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
PIECES 1 INCH	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
CO NEHDICI DI	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
	BENCH MARK: MULTIPLE : SEE BELOW IN NOTES
THICKNESS	
4 FEET .5 - 4 FEET	ELEVATION: *See below* FEET
6 - 1.5 FEET	NOTES:
3 - 0.16 FEET 08 - 0.03 FEET	
0.008 FEET	-BL-I- : N801995.4316, E867684.6623, ELEV=1333.17, -BL-STA II+63.14
AT, PRESSURE, ETC.	-BL-2- :N801969.6447,E868231.0760,ELEV=1343.52,-BL-STA 17+10.16
EEL PROBE:	-BY-5- :N801930.6311, E868178.8087, ELEV=1317.72, -BY-STA 6+85.50
PROBE;	

FIAD - FILLED IMMEDIATELY AFTER DRILLING

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

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

AASHTO LRFD Figure 10.4.6.4–1 — Determination of GSI for Jointed	Rock Mass (Marı	nos and Hoek,2	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 S	JRFACE QUA	ALITY 💳		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.
disturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets		70 60				B. Sand- stone with thin inter- layers of
VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets		5	50			siltstone
BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity DISINTEGRATED - poorly inter- locked, heavily broken rock mass			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.
DISINTEGRATED - poorly inter- locked, heavily broken rock mass with mixture of angular and rounded rock pieces				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

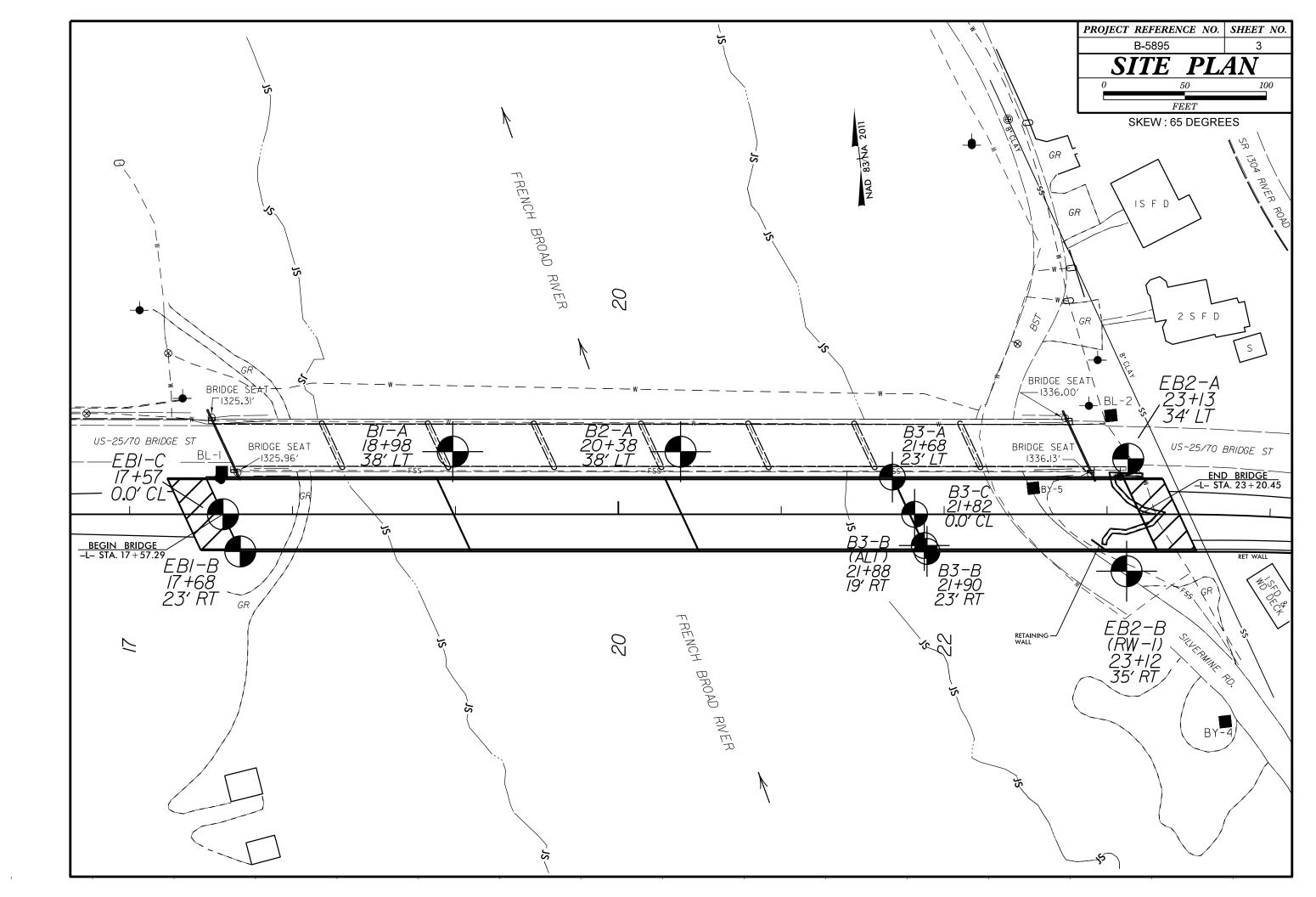
ectonically Defo	ormed Heteroc	geneous Rock	Masses (Marıı	nos and Hoek	, 2000)
ت ت اللہ اللہ اللہ اللہ اللہ اللہ اللہ ا	VERY GOOD - Very Rough, fresh unweathered surfaces	GOOD - Rough, slightly weathered surfaces	FAIR - Smooth, moderately weathered and altered surfaces	POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments	VERY POOR - Very smooth, slicken- sided or highly weathered surfaces with soft clay coatings or fillings
E. Weak siltstone	70 60	A 50			
formed, t/faulted, ale or siltstone forming an ructure		В 40	с с 30	р Е F 20	
formed silty orming a with pockets ers of ansformed leces.	/ /		\$	ŀ	+ ¹⁰

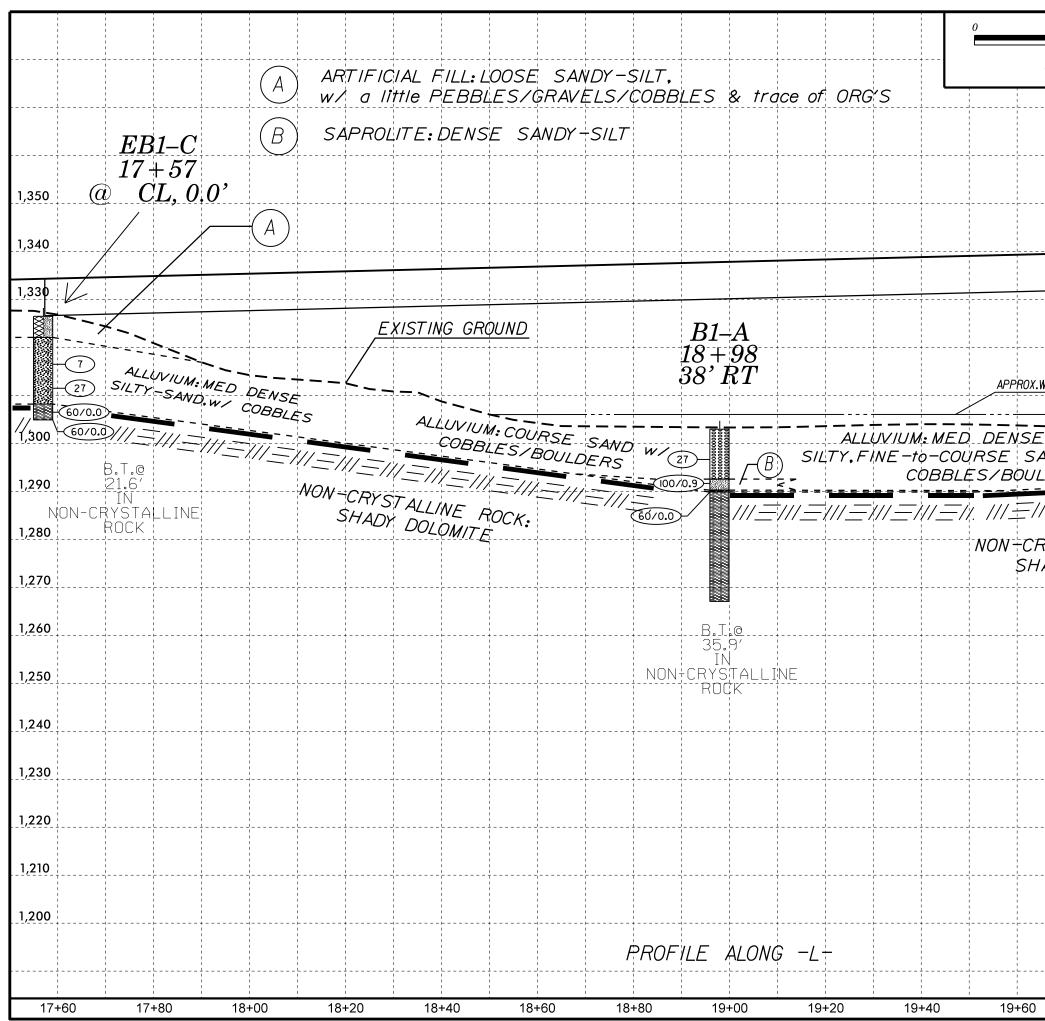
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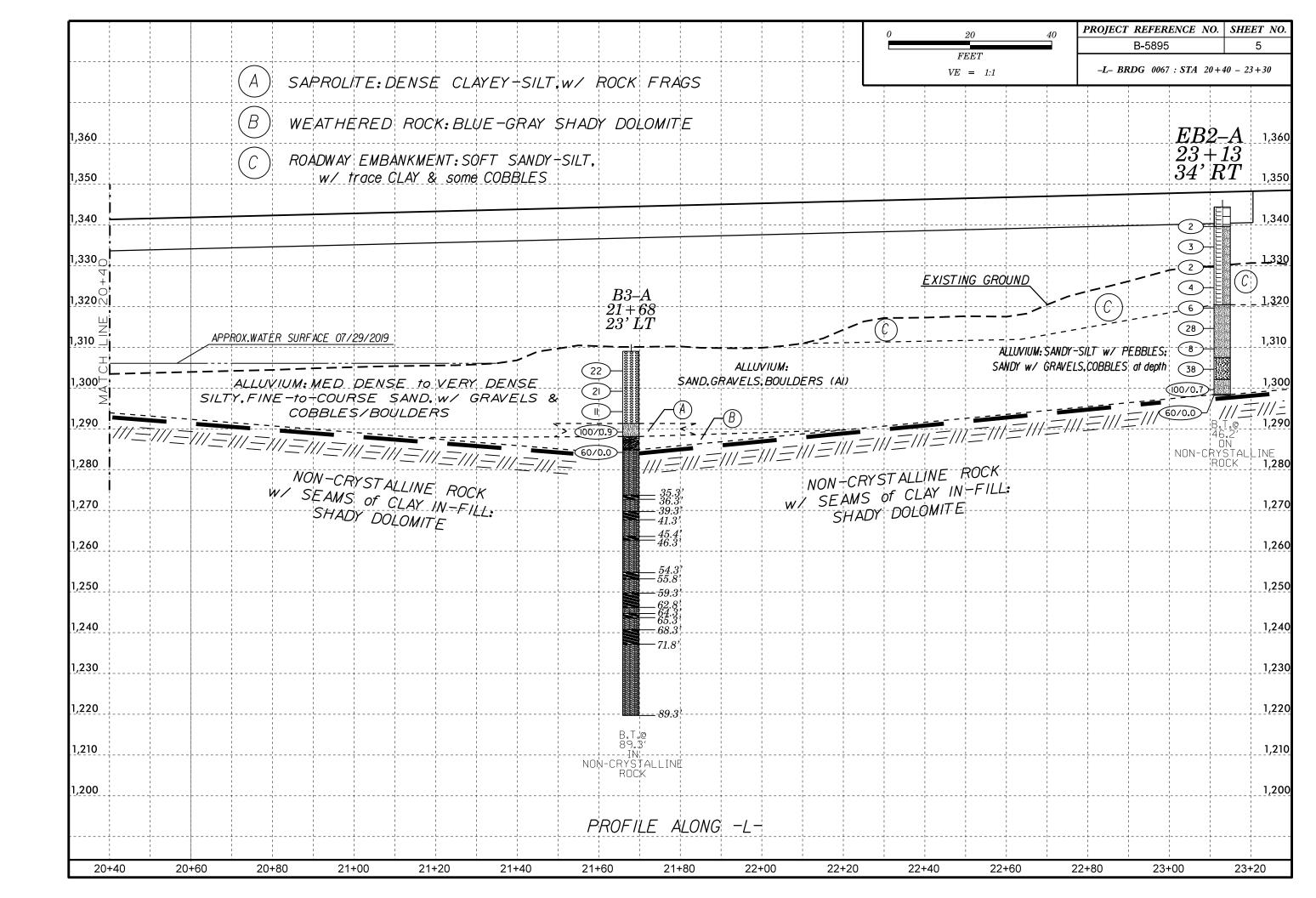
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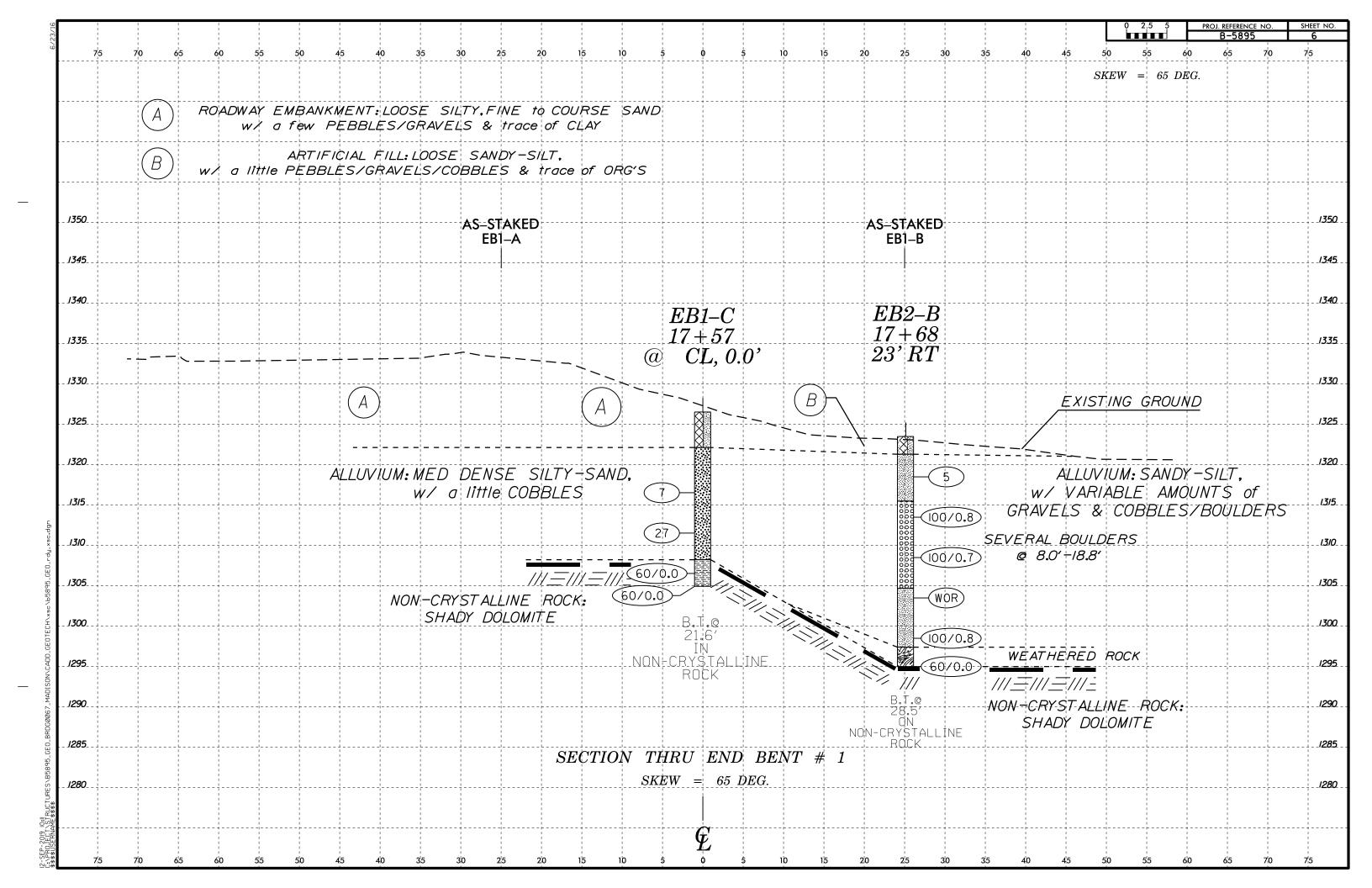
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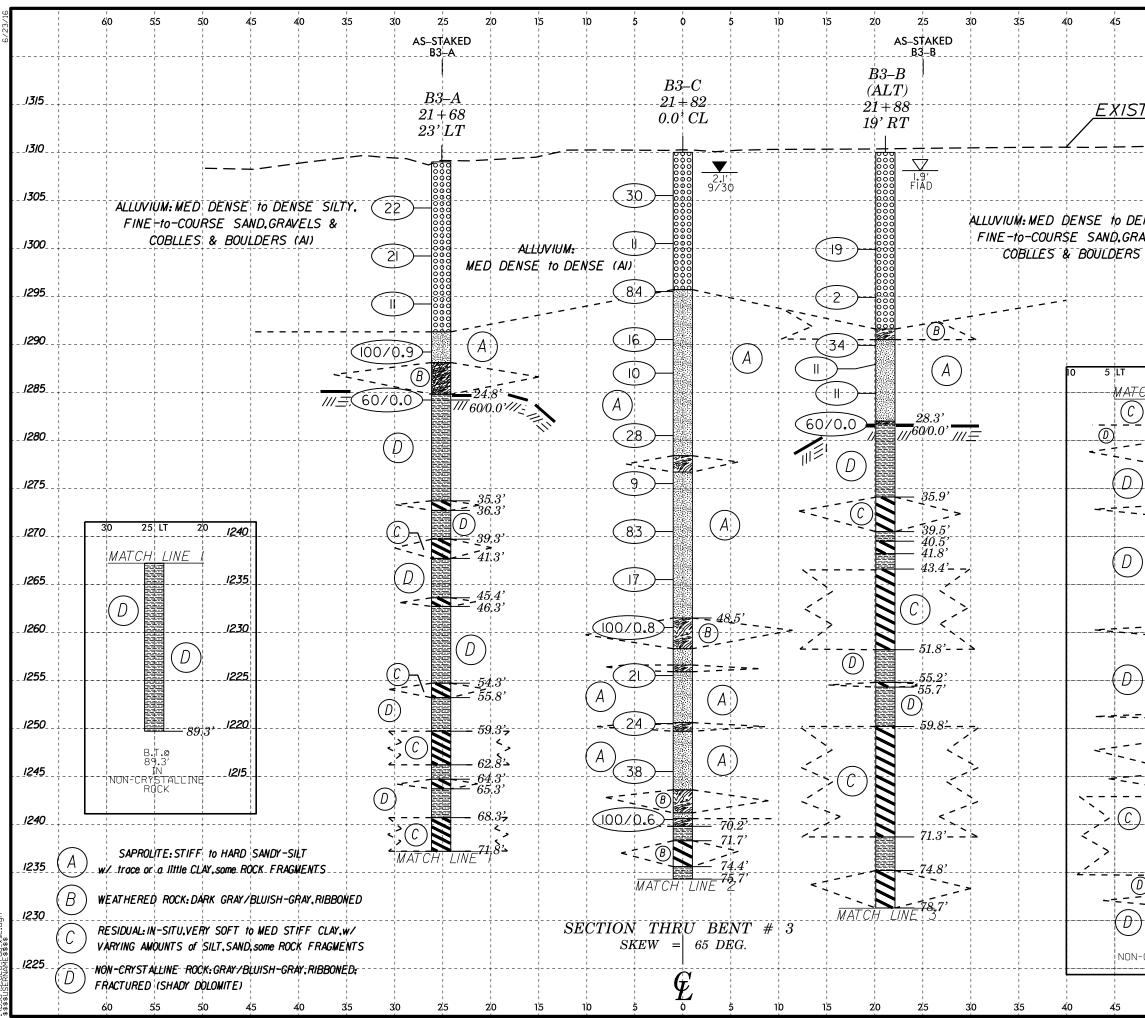


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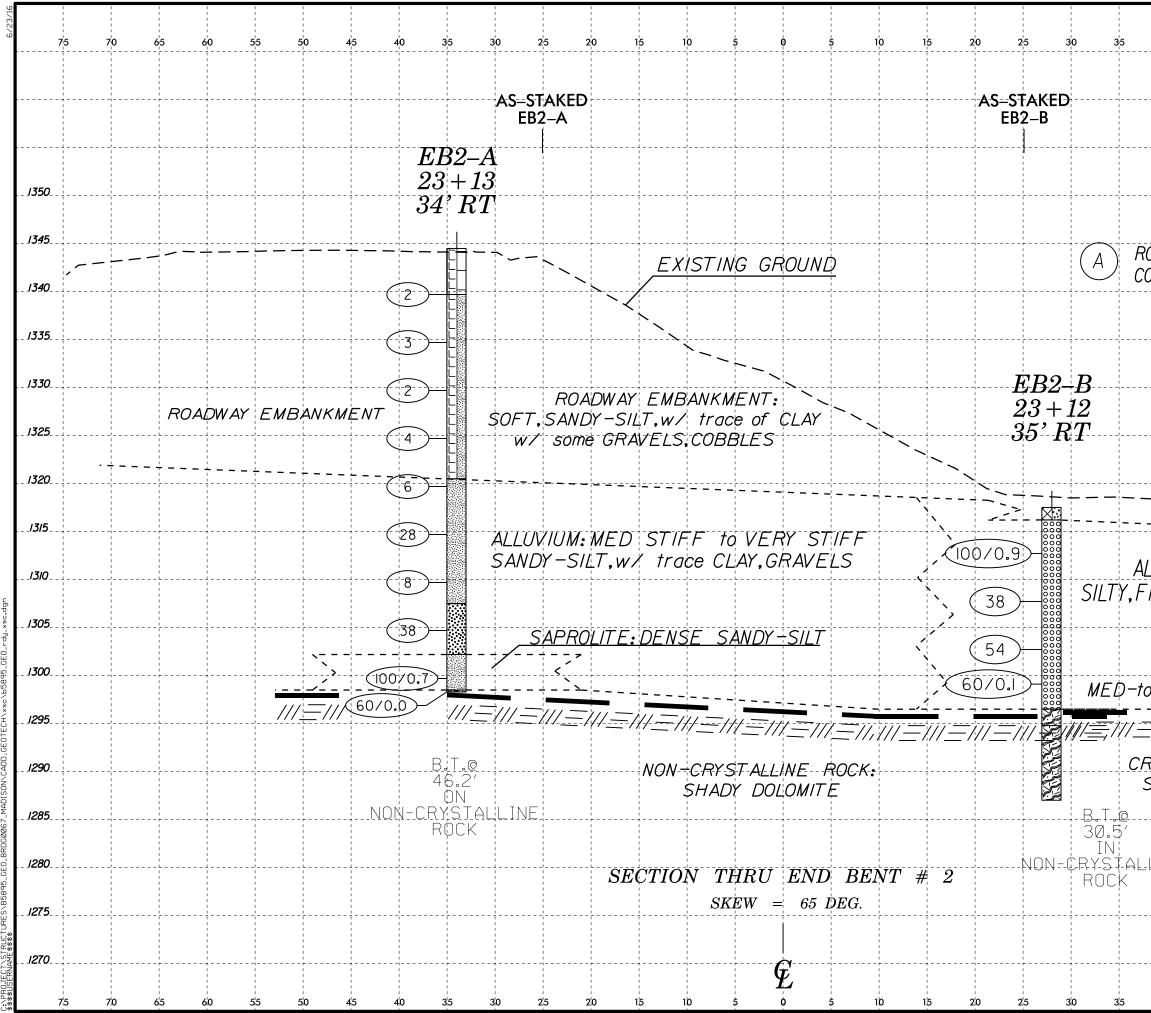
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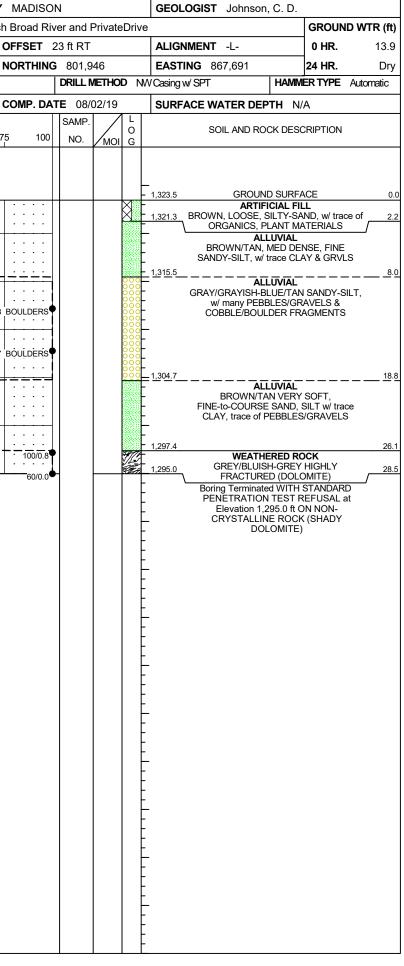
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GEOTECHNICAL BORING REPORT BORE LOG

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GEOTECHNICAL BORING REPORT POPEIOC

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SITE	DESCR	IPTIO	N Re	place	Bridge	No	o. 67 on US 25/70	over Frer	ich Broad Ri	/er and	Private	eDrive			-	GROUND W	/TR (ft)		SITE	DE
BORI	NG NO.	B1-A	۹.		s	ТА	TION 18+98		OFFSET	38 ft LT			ALIGNMENT -L-			0 HR.	N/A		BOR	ING
COLL	AR ELE	IV. 1	302.8	s ft	т	от	AL DEPTH 35.9	ft	NORTHING	3 801,9	992		EASTING 867,82	27		24 HR.	N/A	T.	COLI	LAR
							ME-550X 77% 07/3*					D NM	/ Casing W/SPT & Core		MME	RTYPE Auto			DRILL	RIG
DRILI	ER C	heek	סס		s	ТА	RT DATE 07/29	/19	COMP. DA						N/A	4			DRIL	LEF
ELEV	DRIVE	DEPTH	1	ow cc		Π		B PER FOO		SAMP.		1 - 1	1					t,	COR	E SI
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	10	0 25	50	75 100	NO.	мо	O G	SOIL AI	ND ROCK D	DESC		DEPTH (ft)	- F	ELEV	R
								1								-			(ft)	EL
1305																			289.65	
1000	-	-											1,302.8 G	ROUND SL		CE.	0.0	f		1,2
	-	-				+						800		ALLUVI	AL		0.0			1,2
1300	-	-					· · · · · · ·	· · · ·	· · · · ·				DEN	ISE to DEN	SE, S			-	1285	1
	-	t	1				· · · · · · · ·	: : : :	· · · · ·				FIN	E-to-COUR S/COBBLES	SE SA	AND,				1,2
4005	1,296.5	6.3	3	5	22	$\left \right $	$\begin{array}{c} \cdot \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \end{array} \begin{vmatrix} \cdot \cdot \cdot \\ \cdot \cdot \cdot \end{vmatrix} \begin{vmatrix} \cdot \cdot \cdot \\ \cdot \cdot \cdot \end{vmatrix}$		· · · · ·			0000	5. 5 EE						1280	.,20
1295	_	F					• • • • • • • • • • • • • • • • • • •					ŏŏŏ						F		
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1290	1,291.5 - 1,289.7	-	25	24	76/0.4	Ŧ						<u>F</u>			NDY-	SILT, w/ trace	12.7	-	1275	
	_,, <u>209</u> ./ _	- 13.1	60/0.0	0				100/0.	9 W.R. @ 12.7'	P		-	1,289.7	CLAY		ск				
	-	F	1				· · · · · · ·		· · · · · ·				GREY	BLUISH-GF	REY	HIGHLY			4070	1,2
1285	-	F							• • • • • •			1	NON	CRYSTALL	LINE	ROCK	ן נ	F	1270	
	-	-					· · · · · · ·						GREY, FRACTUREI	BLUISH-GF D (DOLOMI	REY ł TE), '	HIGHLY **with ZONES				1,2
1280	-						· · · · · · ·	· · · · ·	· · · · · ·			_		N-ÉILL, ROO JGH-OUT R		RAGMENTS, VERY **				
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1275	-	Ł										<u>-</u>								
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1270	-	-						· · · · ·				<u></u>						10/12/20		
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F	-	-				╀┸				-		-				tion 1,266.9 ft	35.9	DOT.GDT		
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8088.1.1 **TIP** B-5895 COUN SCRIPTION Replace Bridge No. 67 on US 25/70 over Fre **NO.** B1-A **STATION** 18+98 **R ELEV.** 1,302.8 ft TOTAL DEPTH 35.9 ft G/HAMMER EFF./DATE AFO8963 CME-550X 77% 07/31/2017 **START DATE** 07/29/19 R Cheek, D. O. IZE NXWL TOTAL RUN 22.8 ft RUN ELEV (ft) (ft) (ft) DRILL RATE (Min/ft) RUN EC. RQD t) (ft) % % REC. (ft) SAMP. REC. (ft) % (ft) 289.7 13.1 <u>286.9</u> 15.9 1:59/10 2:13/1.0 ERACTURE 1.5 5.0 2:13/1.0 30% 1:21/1.0 30% (0.8) 2:02/1.0 16% 0:51/1.0 16% 1:23/1.0 16% 2:02/1.0 16% 0:51/1.0 16% 1:23/1.0 16% 1:23/1.0 16% 0:51/1.0 16% 1:23/1.0 24% NA/1.0 206/1.0 1:02/1.0 1.6) 1:37/1.0 32% 1:37/1.0 2:31/1.0 5.0 1:29/1.0 2:31/1.0 0% 5.0 1:27/1.0 5.0 1:27/1.0 5.0 0.32/1.0 0 0% NA/1.0 30% NA/1.0 30% NA/1.0 0% NA/1.0 0% 281.9 20.9 276.9 25.9 271.9 30.9 <u>266.9 35.9 </u>

GEOTECHNICAL BORING REPORT CORE LOG

١T	ΥN	ADISO	N			GEOLOGI	ST Johi	nson, C. D.		
ene	ch B	road Riv	er a	and PrivateD	rive				GROUN	ID WTR (ft)
	OF	FSET 3	38 f	't LT		ALIGNME	NT -L-		0 HR.	N/A
	NO	RTHING	6	301,992		EASTING	867,827	7	24 HR.	N/A
			DF	RILL METHOD	NM	Casing W/SP	T & Core	HAMM	ER TYPE	Automatic
	со	MP. DA	ΓE	07/29/19		SURFACE	WATER	DEPTH N	'A	
1	L									
Ŭ Ū	O G	ELEV. (f	t)		D	ESCRIPTION	AND REM	IARKS		DEPTH (ft)
			,		Co	ntinued fror	n previou	is page		
		- 1,289.7				NON-CRYS	TALLINE I	ROCK		13.1
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		1,266.9	В	oring Terminat	ed at	Elevation 1,2	266.9 ft IN	NON-CRYST	ALLINE R	35.9 OCK
		-				(SHADY	DOLOMI	TE)		
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COUNTY **WBS** 48088.1.1 **TIP** B-5895 COUNTY MADISON GEOLOGIST Johnson, C. D. **WBS** 48088.1.1 **TIP** B-5895 SITE DESCRIPTION Replace Bridge No. 67 on US 25/70 over French Broad River and PrivateDrive **GROUND WTR (ft)** SITE DESCRIPTION Replace Bridge No. 67 on US 25/70 over Frenc BORING NO. B2-A **STATION** 20+38 OFFSET 38 ft LT ALIGNMENT -L-0 HR. N/A BORING NO. B2-A **STATION** 20+38 NORTHING 801,977 **COLLAR ELEV.** 1,303.0 ft TOTAL DEPTH 33.6 ft EASTING 867,966 COLLAR ELEV. 1,303.0 ft TOTAL DEPTH 33.6 ft 24 HR. N/A DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 77% 07/31/2017 DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automatic DRILL RIG/HAMMER EFF./DATE AF08963 CME-550X 77% 07/31/2017 DRILLER Cheek, D. O. **START DATE** 07/30/19 DRILLER Cheek, D. O. START DATE 07/30/19 **COMP. DATE** 07/30/19 SURFACE WATER DEPTH N/A ELEV DRIVE DEPTH BLOW COUNT SAMP. CORE SIZE NXWL TOTAL RUN 23.9 ft BLOWS PER FOOT ELEV SOIL AND ROCK DESCRIPTION 0 (ft) (ft) 0.5ft 0.5ft 0.5ft 25 50 75 100 NO. STRATA REC. RQD (ft) (ft) % % RUN RUN DRILL (ft) MOI G ELEV DEPTH RUN SAMP. REC. (ft) % RQD (ft) % ELEV RATE (ft) NO. (ft) (ft) (ft) (Min/ft) 1305 1293.27 1.293.3 + 9.7 2:22/0.9 (1.9) (1.2) 1:58/1.0 49% 31% 3.9 GROUND SURFACE 1.303.0 0.0 1290 1,289.4 13.6 1:24/1.0 1,301.7 ALLUVIAL 1.3
 3:26/1.0

 1:53/1.0
 (4.2)

 2:10/1.0
 84%
 _____ BROWN/TAN/GRAY, LOOSE, SILTY, FINE-to-COURSE SAND, w/ trace of BLDRS 1300 5.0 1,299.0 **GRAVELS & COBBLES** 4.0 _ _ . _ OUT BLDRS 1:44/1.0 ALLUVIAL
 1:43/1.0

 2:32/1.0

 1:08/1.0
 (2.7)

 1:06/1.0
 54%

 28%
 1285 1,284.4 18.6 -1 GRAY/BLUISH GRAY/BROWN, SILTY, FINE-to-COURSE SAND, w/ several -1 5.0 1295 BOULDERS 1,294.0 9.0 1,294.0 9.0 ___ 60/0.0 • 60/0.0 • 60/0.0 60/0.0 ALLUVIAL 2:29/1.0 1:26/1.0 BROWN/TAN/GRAY, LOOSE, SILTY, FINE-to-COURSE SAND, w/ trace of 1280 1,279.4 23.6
 2:49/1.0
 (3.0)
 (1.1)

 1:45/1.0
 60%
 22%
 1290 **GRAVELS & COBBLES** 5.0 NON-CRYSTALLINE ROCK 1:32/1.0 GREY/BLUISH-GREY HIGHLY 1275 1,274.4 28.6 1:43/1.0 FRACTURED (DOLOMITE), **with ZONES 2:02/1.0 1:51/1.0 (4.0) (2.6) OF CLAY IN-FILL, ROCK FRAGMENTS, 1285 5.0 THROUGH-OUT RECOVERY 1:49/1.0 80% 52% 1:32/1.0 1270 1,269.4 33.6 1:44/1.0. 2:10/1.0 1280 • • • 1275 . 1270 -1.269.433.6 Boring Terminated at Elevation 1,269.4 ft IN NON-CRYSTALLINE ROCK (SHADY DOLOMITE)

GEOTECHNICAL BORING REPORT CORE LOG

MDISON GEOLOGIST Johnson, C. D. COFFSET 38 ft.LT LI LT LI GROUND WTR (#) OFFSET 38 ft.LT LIGNMENT -L- O HR N/A DRILLMETHOD NW/Casing WSPT & Core HAMMER TYPE Automatic Zeore HAMMER TYPE Automatic COMP.DATE 07/30/19 SURFACE WATER DEPTH N/A DESCRIPTION AND REMARKS Continued from previous page Continued from previous page Sase Continued from previous page Continued from previous page Sase Continued from previous page Sase Sase Continued from previous page Sase Sase Continued from previous from previous from previous from previous from Sase Sase			0	1		
OFFSET 38 ft LT ALIGNMENT -L- 0 HR. N/A NORTHING 801,977 EASTING 867,966 24 HR. N/A DRILL METHOD NVCasing WSPT & Core HAMMER TYPE Automatic COMP. DATE 07/30/19 SURFACE WATER DEPTH N/A L 0 DESCRIPTION AND REMARKS 0 G Continued from previous page NON-CRYSTALLINE ROCK (continued) 0 L 0 23.6' - 33.6' : 15 - 25 *w/ CLAY IN-FILL ZONES 33.6 L 1.289.4 33.6 33.6	ΥN	/ADISON		GEOLOGIST	Johnson, C. D.	
OFFSET 38 ft LT ALIGNMENT -L- 0 HR. N/A NORTHING 801,977 EASTING 867,966 24 HR. N/A DRILL METHOD NVCasing WSPT & Core HAMMER TYPE Automatic COMP. DATE 07/30/19 SURFACE WATER DEPTH N/A L 0 DESCRIPTION AND REMARKS 0 G Continued from previous page NON-CRYSTALLINE ROCK (continued) 0 L 0 23.6' - 33.6' : 15 - 25 *w/ CLAY IN-FILL ZONES 33.6 L 1.289.4 33.6 33.6	ch B	road River	and PrivateDriv	e		GROUND WTR (ft)
NORTHING 801,977 EASTING 867,966 24 HR. N/A DRILL METHOD NWCasing WSPT & Core HAMMER TYPE Automatic COMP. DATE 07/30/19 SURFACE WATER DEPTH N/A L 0 DESCRIPTION AND REMARKS E G Continued from previous page NON-CRYSTALLINE ROCK (continued) I GSI : 9.7' - 23.6' : 20 - 30 23.6' - 33.6' : 15 - 25 *w/ CLAY IN-FILL ZONES I 1.269.4 Boring Terminated at Elevation 1,269.4 ft IN NON-CRYSTALLINE ROCK 33.6				1	1	
DRILL METHOD NW/Casing WSPT & Core HAMMER TYPE Automatic COMP. DATE 07/30/19 SURFACE WATER DEPTH N/A L 0 DESCRIPTION AND REMARKS G Continued from previous page NON-CRYSTALLINE ROCK (continued) G SI : 9.7' - 23.6' : 20 - 30 23.6' - 33.6' : 15 - 25 *w/ CLAY IN-FILL ZONES Hamma Elevation 1,269.4 ft IN NON-CRYSTALLINE ROCK	<u> </u>			_		-
COMP. DATE 07/30/19 SURFACE WATER DEPTH N/A L O G Continued from previous page NON-CRYSTALLINE ROCK (continued) GSI : 9.7' - 23.6' : 20 - 30 23.6' - 33.6' : 15 - 25 *w/ CLAY IN-FILL ZONES	NO	RTHING	301,977	EASTING 86	57,966	24 HR. N/A
L DESCRIPTION AND REMARKS Continued from previous page NON-CRYSTALLINE ROCK (continued) G G G G Solid Soli		Di	RILL METHOD N	W Casing W/SPT & O	Core HAMM	ER TYPE Automatic
L DESCRIPTION AND REMARKS Continued from previous page NON-CRYSTALLINE ROCK (continued) G G G G Solid Soli	<u></u>					/ A
O G DESCRIPTION AND REMARKS Continued from previous page NON-CRYSTALLINE ROCK (continued) GSI : 9.7' - 23.6' : 20 - 30 23.6' - 33.6' : 15 - 25 *w/ CLAY IN-FILL ZONES 1,269.4 Boring Terminated at Elevation 1,269.4 ft IN NON-CRYSTALLINE ROCK		INP. DATE	07/30/19	SURFACE WA	AIER DEPIH N/	A
O G DESCRIPTION AND REMARKS Continued from previous page NON-CRYSTALLINE ROCK (continued) GSI : 9.7' - 23.6' : 20 - 30 23.6' - 33.6' : 15 - 25 *w/ CLAY IN-FILL ZONES 1,269.4 Boring Terminated at Elevation 1,269.4 ft IN NON-CRYSTALLINE ROCK						
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GSI : 9.7' - 23.6' : 20 - 30 23.6' - 33.6' : 15 - 25 *w/ CLAY IN-FILL ZONES				Continued from pr	revious page	
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23.6' - 33.6' : 15 - 25 *w/ CLAY IN-FILL ZONES		-	(CCI · 0	7' - 23 6' · 20 - 3	0	
- - - - 1,269.4 Boring Terminated at Elevation 1,269.4 ft IN NON-CRYSTALLINE ROCK		-				ILL ZONES
 Boring Terminated at Elevation 1,269.4 ft IN NON-CRYSTALLINE ROCK 	薑	-				-
 Boring Terminated at Elevation 1,269.4 ft IN NON-CRYSTALLINE ROCK 	薑	_				
 Boring Terminated at Elevation 1,269.4 ft IN NON-CRYSTALLINE ROCK 		-				
 Boring Terminated at Elevation 1,269.4 ft IN NON-CRYSTALLINE ROCK 	薑	-				33.6
(SHADY DOLOMITE)		- E	Boring Terminated	at Elevation 1,269.4	4 ft IN NON-CRYST	ALLINE ROCK
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WBS	48088	.1.1			Т	IP B-5895		COUNT	Y MADIS	ON			GEOLOGIST Johnso	n, C. D.		WBS	48088	.1.1				P B-5895		COUNT	Υ
SITE	DESCR	IPTION	N Rep	lace E	Bridge	No. 67 on	US 25/70	over Fren	nch Broad F	River an	d Priva	teDriv	e		GROUND WTR (ft)	SITE	DESCRI	PTION	Rep	lace B	ridge I	No. 67 on l	JS 25/70 o	ver Fren	ch
BOR	NG NO.	B3-A	4		s	TATION 2	1+68		OFFSET	23 ft L	.т		ALIGNMENT -L-		0 HR. N/A	BOR	ING NO.	B3-A	<u>۱</u>		ST	TATION 2	1+68		C
COLI	AR ELE	V 1	309.0	ft		OTAL DEP	TH 89.3	ft	NORTHIN	NG 801	1 947		EASTING 868,094		24 HR. N/A	COL	LAR ELE	V 1	309.0	ft		OTAL DEPI	FH 89.3 ft		N
						3 CME-550X					-		W Casing W/SPT & Core		ER TYPE Automatic			-				CME-550X 7			
									1				-												T_
DRIL	LER C	heek, [-			TART DAT			COMP. D				SURFACE WATER DE	. PTH N//	A	DRIL	LER Ch	neek, I	-						C
ELEV	DRIVE ELEV	DEPTH	' 	W CO				PER FOO			IP. 🔻		SOIL AND R	OCK DESC	RIPTION	ELEV	DRIVE ELEV	DEPTH	·	W COL				PER FOOT	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25 I	50	75 10	0 NO	. /мс) G	ELEV. (ft)		DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	25 5	50	75
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1310																1230							Matc	h Line	
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1290	1.289.2	19.8				」 ├ ¦	+ · · ·					N V	BROWN/ORANG				+	-			ı				
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1285	1,284.2	24.8					+					5//_		RED (DOLO STALLINE			+	-			1				
		-	60/0.0					.		2 1			- GREY/BLU	SH-GREY	HIGHLY		7	-			1				
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1200	4	-					1			-			- THROUGH-	OUT RECC	VERY **		+	-			ı				
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	1	-												ESIDUAL STALLINE				-			ı				
1270		-							.				GREY/BLUISI	-GREY FR			+	-			ı				
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5	1	-						· · · ·	· · · · · ·	1			- NON-CRY	STALLINE			‡	-			ı				
1265	1	_											- GREY/BLUISI	I-GREY FR OLOMITE)	ACTURED			-			ı				
L 202		Ł	1										- 1,263.6		45.4		7	-							
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	4	-	1				· · · ·						- 1,253.2 BROWN SOF	ESIDUAL	TIFF CLAY / 55.8		‡	-							
		È	1										- NON-CRY	STALLINE	ROCK		1	-							
1250	-	F	1					· · · · ·	· · · · ·	-11				OLOMITE)	ACTURED 59.3		-	-							
	1	-	1										R	ESIDUAL			‡	-							
	1	È i	1				· · · ·						1,246.2 NON CPV	CTALLING	62.8		1	-							
1245	-	F	1						· · · · ·	-11				STALLINE	64.3 65.3			-							
	-	-	1					.					- NON-CRY	STALLINE	ROCK		7	-							
1240	4	F	1										GREY/BLUISI	I-GREY FR OLOMITE)	ACTURED68.3		‡	-							
	4	-					1			-11			R	ESIDUAL			4	-							
1005	-	L	1					.					BROWN SOF		71.8			-							
1235	1	-								i			- NON-CRY GREY/BLUISI	STALLINE			‡	-							
1235	4	F	1				1			-11				OLOMITE)			‡	-							
;	-	L	1															-							
1230	1	F	1							11			_				7	-				l			
1200			1	I	I		<u> </u>				1					· •	<u> </u>	_	1	ı					

M	IADISC	١	1			GEOLOGIST Johnson,	C. D.		
h Br	oad Ri	Ve	er and F	Private	Driv	e		GROUN	D WTR (ft)
OFF	SET	2	3 ft LT			ALIGNMENT -L-		0 HR.	N/A
NO	RTHIN	G	801,9	47		EASTING 868,094		24 HR.	N/A
			DRILL	/IETHO	DN	W Casing W/SPT & Core	HAMME	RTYPE	Automatic
col	MP. DA	T	E 07/2	26/19		SURFACE WATER DEPT	'H N//	4	
			SAMP.		L O	SOIL AND ROCI	K DESC	RIPTION	
75 I	100		NO.	моі			_	_	
		+ -						ROCK	
.					臺	GREY/BLUISH-GI (DOLOMITE	REY FR	ACTURED)
	· · ·				E	-	.) (contin	lucu)	
					±	-			
	· · · ·					-			
·	· · ·	L				- 1,219.7 	votion	1 210 7 #	89.3
						- Boring Terminated at Ele - CRYSTALLINE ROCK	vationK (SHAE)	DY DOLO	MITE)
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WBS	48088	.1.1			TIP	B-589	95	С	OUNT	ΥN	IADISON	GEOLOGI	ST Johnso	on, C. D.		
SITE	DESCR	IPTION	l Rep	lace Brid	ge No	. 67 or	า US 25/7	'0 ove	r Fren	ch B	road River and PrivateDrive				GROUN	D WTR (ft)
BOR	ING NO.	B3-A			STA	ΓΙΟΝ	21+68			OF	SET 23 ft LT	ALIGNMEN	NT -L-		0 HR.	N/A
	LAR ELE				_		PTH 89.			NO	RTHING 801,947	EASTING	-	1	24 HR.	N/A
DRILL	RIG/HAN	/IMER E	FF./DA	TE AFO8	963 CIV	1E-550×	(77% 07/3	31/2017			DRILL METHOD NM	/Casing W/SP	T & Core	HAMME	RTYPE	Automatic
DRIL	LER C	heek, [0. 0.		STA	RT DA	TE 07/2	5/19		со	MP. DATE 07/26/19	SURFACE	WATER DE	PTH N/A	۸	
COR	E SIZE	NXWL			-	-	N 62.9 f									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	ATA RQD (ft) %	L O G	ELEV. (ft)	ESCRIPTION	AND REMAR	KS		DEPTH (ft
282.61	1,282.6	- 26.4	2.9	0:30/0.9	(1.5)	(1.1)						ntinued fron				
1280	1,279.7	- - 29.3		2:37/1.0 2:40/1.0	52%	38%				Ē	-					
1275	-		5.0	1:35/1.0 2:54/1.0 2:04/1.0 1:14/1.0	(4.3) 86%	(3.8) 76%										
1270	1,274.7	<u>- 34.3</u> -	5.0	2:04/1.0 0:45/1.0	(2.9)	(2.0)				霻	- 1,273.7					35.3
	-	-		1:22/1.0 NA/1.0	58%	40%					1,272.7		SIDUAL	ск		36.3
1270	1,269.7	- 39.3		1:36/1.0 1:49/1.0						臺						39.3
	-	-	5.0	0:30/1.0 0:28/1.0	(2.0) 40%	(1.1) 22%					- 1,267.7		SIDUAL			41.3
1005	-	-		4:32/1.0 2:11/1.0						薑	-	NON-CRYS	FALLINE ROO	CK		
1265	1,264.7	<u> 44.3 </u>	5.0	2:17/1.0 1:57/1.0	(3.8)	(2.7)				臺	- 1,263.6					45.4
	-	-		0:21/1.0 1:00/1.0	76%	54%					1,262.7		SIDUAL	2K		46.3
1260	1,259.7	- - 49.3		1:32/1.0 1:58/1.0						臺		NUN-CRTS	ALLINE ROO	51		
		-	5.0	1:40/1.0	(4.1) 82%	(2.5) 50%										
	-	-		1:39/1.0	02/0	0070				齹	•					
1255	1,254.7	54.3	5.0	2:06/1.0	(2.2)	(1.4)					1,254.7	DEC	SIDUAL			54.
	-	-	5.0	NA/1.0 NA/1.0	(2.3) 46%	(1.4) 28%					1,253.2		TALLINE ROO	ск		55.
1250	4 0 4 0 7	-		NA/1.0 NA/1.0						薑						
1200	1,249.7_	- 59.3 -	5.0	NA/1.0 NA/1.0	(1.4)	(0.9)						RES	SIDUAL			59.3
	-	-		NA/1.0 NA/1.0	28%	18%					- 1,246.2					62.6
1245	1,244.7	- - 64.3		NA/1.0 NA/1.0						薑	1,244.7		TALLINE ROO	СК		64.
	-	-	5.0	4:02/1.0 1:47/1.0	(2.7) 54%	(1.8) 36%					1,243.7		SIDUAL	ск		65.3
1240	-	-		1:41/1.0 0:25/1.0						薹	- 1,240.7					68.3
1240	1,239.7	<u>- 69.3</u> -	5.0	0:49/1.0 1:11/1.0	(3.4)	(0.8)					_ ·	RES	SIDUAL			
	-	-		1:14/1.0 2:03/1.0	68%	16%					1,237.2			~ K		71.8
1235	1,234.7_	- 74.3		1:15/1.0 1:25/1.0						臺	-	NUN-CRTS	ALLINE ROO	51		
	-	-	5.0	1:35/1.0 3:45/1.0	(3.5) 70%	(2.7) 54%				臺						
	-	-		1:56/1.0 1:34/1.0		-				臺						
1230	1,229.7	- 79.3 -	5.0	2:14/1.0 1:54/1.0	(4.4)	(3.9)				霻	_					
	-	-		2:49/1.0 2:24/1.0	88%	78%				臺						
1225	1,224.7	_ _ 84.3		1:46/1.0 2:56/1.0						臺	-					
		-	5.0	2:43/1.0 3:09/1.0	(5.0) 100%	(4.7) 94%					-					
	-	-		1:23/1.0	100%	9470				臺	• •					
1220	1,219.7	89.3		1:49/1.0 1:35/1.0						÷	- 1,219.7					89.3
	-	-									- Boring Terminated a		DOLOMITE)	IN-CRISIA		UCK
	-	-									•					
	-	-									GSI : 26.4' - 39.3					
	-	-									- 39.3' - 47.4 - 47.4' - 52.9	4':15-25 *C 5':30-40	LAY IN-FIL	.L 46.3' - 4	7.3'	
	-	-									52.5' - 54.3					
	-	-									- 54.3' - 75.0 - 75.0' - 89.3	0' : 10-15 *N 3' : 40-50	.C.R. w/ SE	VRL CLA	Y IN-FIL	L ZONES
	-	-										5.40-30				
		-									-					
	-	-														

SITE DESCRIPTION Replace Bridge No. 67 on US 25/70 over French Broad River and PrivateDrive GROUND WTR (ft) SITE DESCRIPTION Replace Bridge No. 67 on US 25/70 over French II BORING NO. B3-C STATION 21+82 OFFSET CL ALIGNMENT -L- 0 HR. N/A BORING NO. B3-C STATION 21+82 Off COLLAR ELEV. 1,310.0 ft TOTAL DEPTH 129.8 ft NORTHING 801,923 EASTING 868,105 24 HR. 2.1 COLLAR ELEV. 1,310.0 ft TOTAL DEPTH 129.8 ft TOTAL DEPTH 129.8 ft DRILL METHOD N/Casing WSPT & Core HAMMER TYPE Automatic DRILL RIG/HAMMER EFF/DATE AF08963 CME-550X 94% 04/08/2019 DRILL RIG/HAMMER EFF/DATE AF0.50X 94% 04/08/2019 DRILLER Cheek, D. O. START DATE 09/25/20 COMP. DATE 09/28/20 SURFACE WATER DEPTH N/A DRILLER Cheek, D. O. START DATE 09/25/20 CMP. DATE 09/25/20 CMP. DATE 09/25/20 DRILL														1										
Deres No. STATION 21-02 OFFER T L AUDMENT L OPER NM NM SCALE (L) AUDMENT L OPER NM DERUS OWER DUID TOTAL DEPTH 12:0.01 NORTHON D. 1570.01 NORTH										-				GEOLOGIST Johnson, C. D.										
ColLub ELEV 13/0 TOTAL DEFTH 13/0<	SITE	DESCR	RIPTION	l Rep	place E	ridge	No. 67 on	US 25/70	over Fren	1		Private	eDriv		ND WTR (ft)	SITE	DESCRIPTI	ON Re	place B	ridge N	lo. 67 on l	JS 25/70 c	over Frer	ich E
Dotal. Importanti - Activiti Dest. Importanti - Activiti - Activi - Activiti - Activiti - Activiti - Activi - Activ	BOR	ING NO	. B3-C	;		S	TATION	21+82		OFFSET	CL			ALIGNMENT -L- 0 HR.	N/A	BOR	NG NO. B3	-C		ST	ATION 2	1+82		OF
DBILLER COMPARISE COMPARISE <thcomparise< th=""> <thcomparise< th=""> <thcom< th=""><th>_</th><th></th><th>,</th><th></th><th></th><th></th><th></th><th></th><th></th><th>NORTHIN</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>NC</th></thcom<></thcomparise<></thcomparise<>	_		,							NORTHIN														NC
NY R_CWCCARF R_CWC	DRILI	L RIG/HA	MMER E	FF./DA	TE AF	-08963	CME-550X	94% 04/08/2	2019		DRILL	METHO	DN	W Casing W/SPT & Core HAMMER TYPE	Automatic	DRILL	. RIG/HAMMER	R EFF./DA	ATE AF	08963 (ME-550X 9	34% 04/08/2 	019	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	DRIL	LER C	Cheek, D	D. O.		S		E 09/25/2	20	COMP. DA	TE 09/	28/20		SURFACE WATER DEPTH N/A		DRIL	LER Cheek	, D. O.		ST	ART DATE	E 09/25/2	.0	CC
10 0.	ELEV											▼∕		SOIL AND ROCK DESCRIPTION	J		FLEV DEP	····						
1310 1310	(π)	(ft)	(π)	0.5ft	0.5ft	0.5ft	0	25	50	75 100	NO.	Имо	I G	ELEV. (ft)	DEPTH (ft)	(π)	(ft) (ft	0.5ft	0.5ft	0.5ft		25 !	50	75
1310 1310																								
1300 1302 1302 1302 1302 1202 1202 1301 1302 1302 1302 1302 1202 1202 1302 1302 1302 1302 1302 1202 1202 1302 1302 1302 1302 1302 1202 1202 1303 1304 120 1202 1202 1202 1202 1304 1202 1202 1202 1202 1202 1202 1305 1202 1202 1202 1202 1202 1202 1305 1202 1202 1202 1202 1202 1202 1306 1202 1202 1202 1202 1202 1202 1306 1202 1202 1202 1202 1202 1202 1202 1202 </td <td>1315</td> <td></td> <td>+</td> <td></td> <td>_</td> <td></td> <td>1235</td> <td></td> <td></td> <td>+</td> <td>+</td> <td></td> <td>Matc</td> <td>h Line</td> <td></td>	1315		+											_		1235			+	+		Matc	h Line	
330 1.005 4.5 1 1.015 GAUG SURVEY 202 338 1.005 4.5 1 1.5			ŧ														÷							: :
James	1310	· ·	‡											1 310 0 GROUND SURFACE	0.0	1230	‡				· · · · ·			· ·
303 1.3014 4.5 14 18 15 125 303 1.3014 0.6 7 4 125 125 303 1.3014 0.6 7 4 125 125 303 1.3014 0.6 7 4 125 125 303 1.3014 0.6 7 4 125 125 303 1.3014 0.6 7 4 125 125 303 1.3014 0.6 7 4 125 125 303 1.3014 0.6 7 4 125 125 303 1.3014 0.6 0.0 100 126 126 126 303 1.3014 0.6 0.0 0.0 126 126 126 126 126 303 1.3014 0.0 0.0 0.0 0.0 126 126 126 126 126 126 126 126 126 126 126 126 126 126 126 126 <td< td=""><td>1310</td><td>-</td><td>ŧ</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>000</td><td>ALLUVIAL</td><td></td><td>1230</td><td>+</td><td></td><td></td><td></td><td></td><td><u> </u></td><td></td><td>. – .</td></td<>	1310	-	ŧ										000	ALLUVIAL		1230	+					<u> </u>		. – .
333			ŧ					. I . I					000	SILTY, FINE-to-COURSE SAND, w	w/		‡				· · · ·		· · · ·	· · ·
1300 1301	1305	1,305.5	4.5	14	15	15							000	_ GRAVELS, & COBBLES, BOULDERS (_ & 5.7' : becomes A-4 dominant with de	@ 3.1' lepth	1225	1				· · · ·	· · · ·		· ·
1300 1305			ŧ					A					000	-			‡							· ·
1302 1205 1215 1215 1215 1205 1205 124.5 1215 1215 1206 1205.1 120.5 121.5 121.5 1207 1202.5 120.5 121.5 121.5 1208 120.5 121.5 121.5 121.5 1209 1201.5 120.5 121.5 121.5 1200 1202.5 121.5 121.5 121.5 1200 120.5 121.5 121.5 121.5 1200 120.5 121.5 121.5 121.5 1200 120.5 121.5 121.5 121.5 1200 120.5 121.5 121.5 121.5 1201 120.5 121.5 121.5 121.5 1201 120.5 121.5 121.5 121.5 1202 121.5 121.5 121.5 121.5 1203 122.5 121.5 121.5 121.5 1204 122.5 121.5 121.5 121.5 1205 122.5 121.5 <td></td> <td>1 300 5</td> <td>+ 0.5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>000</td> <td></td> <td></td> <td></td> <td>+</td> <td></td> <td></td> <td></td> <td>· · · ·</td> <td></td> <td></td> <td>· · ·</td>		1 300 5	+ 0.5										000				+				· · · ·			· · ·
1285 1285 1284 2 30 54 - <t< td=""><td>1300</td><td>1,000.0</td><td>1 2.9</td><td>6</td><td>7</td><td>4</td><td>•11</td><td></td><td></td><td></td><td></td><td>w</td><td>000</td><td>-</td><td></td><td>1220</td><td>+</td><td></td><td></td><td></td><td></td><td>+</td><td> · · · ·</td><td><u> </u></td></t<>	1300	1,000.0	1 2.9	6	7	4	•11					w	000	-		1220	+					+	· · · ·	<u> </u>
1285 1.433 1.43 2 3 54 1280 1.284 1.5 6 6 10 1281 1.284 4 5 5 1.284 1			ŧ										000				ŧ				· · · ·			· · ·
1200 1200 <td< td=""><td>1295</td><td>1,295.5</td><td>14.5</td><td>2</td><td>30</td><td>54</td><td></td><td></td><td>+</td><td></td><td></td><td> </td><td>000</td><td></td><td>14.3</td><td>1215</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	1295	1,295.5	14.5	2	30	54			+				000		14.3	1215	1							
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1275 1275.5 34.5 2 4 5 1270 1270.5 34.5 2 4 5 1270 1270.5 34.5 17 20 63 1275 1275.5 34.5 17 20 63 1270 1270.5 39.5 17 20 63 1286 1285.5 44.5 - - - 1286 1285.5 44.5 - - - - 1286 1285.5 44.5 - - - - - 1286 1285.5 54.6 - - - - - - 1285 1285.5 54.6 -	1280	1,280.5	+ 29.5 +	1	11	17		• •••••				м		-		1200	–					+		· ·
1275 1.275.5 34.5			ŧ						$-\frac{1}{2}$	W.R. SEAMS			17 -	WEATHERED ROCK			Ŧ							
1270 1270	1275	1,275.5	- 34.5			-	· · · · ·		+	· -+				DARK GRAT/DLUISH-GRAT, W/ LIACE		1195	Ŧ							
1270 1270 1270 53 17 20 63 1265 1265 44.5	1210	-	ŧ	2	4	5	. • 9					M			CLAY		+							
1270 1200 330 17 20 63 Image: service of the servi			ŧ					.									ļ ļ							
1265 1265.5 44.5 25 7 10 1115 1260 1260.5 44.5 25 7 10 1115 1116 1260 1260.5 44.5 37 630.3 1116 1116 1116 1260 1265.5 54.5 28 10 11 1121 11226 1283.3 IN-FILL & some POCK FRAGMENTS 51.7 1250 1250.5 54.5 28 10 11 11 1120 1288.8 Resonance CLAY 34 1250 1250.5 54.5 28 10 11 11 1288.8 Resonance CLAY 34 1250 1250.5 54.5 35 96 10 14 1288.8 Resonance CLAY 34 1245 1245.5 54.4 10 16 22 1288.8 Resonance CLAY 34 1240 1240.5 68.4 10 16 22 1288.8 Resonance CLAY 34 1241 1241.5 548.5 10 16 128.6 128.6 10.0	1270	1,270.5	+ 39.5 +	17	20	63		SAPROLIT	E w/ W.R. S			М		-		1190	-				· · · ·	+	· · ·	· ·
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1260 1260 37 63/0.3			ŧ					· · · · · ·							48.5		‡							. .
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1255 1.255.5 54.5			ŧ					┇┿╧╧╧	+	$\frac{1}{2}$	I I		5775	SAPROLITE			ļ ļ							
1250 28 10 11 1250 1250.5 59.5	1255	1.255.5	+ 54.5					! <u></u>		. DGE 53.4'-54.1'			\$777	BROWN/GRAY SANDY-SILT, w/ trace	CLAY 53.4		‡							
1250 1.250.5 59.5 96 10 14 1245 96 10 14 1.245.5 64.5 10 16 22 1240 1.240.5 69.5 53 47/.01 47/.01 1.243.6 66.4 1240 1.240.5 69.5 53 47/.01 10 16 22 1240 1.240.5 69.5 53 47/.01 10 16 22 1240 1.240.5 69.5 53 47/.01 10 16 22 1240 1.240.5 69.5 53 47/.01 1000.6 1.243.6 66.4 1.240.5 69.5 53 47/.01 1.243.6 66.4 66.4 1.240.5 69.5 53 47/.01 1.243.6 SAPROLITE 68.8 1.240.6 SAPROLOCK 70.2 70.2 70.2 70.2 1.243.6 NON-CRYSTALLINE ROCK 71.7 71.7 71.7 1.228.6 GREY/BLUISH-GREY FRACTURED 74.4 74.4 74.4			ŧ	28	10	11	9	21				м		WEATHERED ROCK			+							
1250 1.250.5 59.5			ŧ					i									‡							
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1245 1,245.5 64.5 10 16 22 1.245.5 64.5 10 16 22 1,240 1,240.5 69.5 1.245.5 69.5 1.241.2 68.8 1240 1,240.5 69.5 1.241.2 68.8 66.4 1.240.5 69.5 1.241.2 68.8 69.4 1.240.6 SAPROLITE 69.4 1.240.8 VEATHERED ROCK 70.2 1.240.8 VEATHERED ROCK 71.7 0.00.0 1.000.6 1.238.8 VEATHERED ROCK 71.7 0.00.0 0.00.0 0.00.0 0.00.0 1.238.8 VEATHERED ROCK 71.7 0.00.0 0.00.0 0.00.0 0.00.0 0.00.0 1.238.8 VEATHERED ROCK 71.7 0.00.0 0.00.0 0.00.0 0.00.0 0.00.0 0.00.0 71.4			ŧ					4 24						DARK GRAY/BLUISH-GRAY			‡							
1240 10 16 22		1 2/5 5	+ 64 5							.					_AY		±							
1240 1,240.5 69.5 53 47/.01 53 47/.01 1240 1,240.5 53 47/.01 1240 1,240.5 53 47/.01 1240 1,240.5 53 47/.01 1240 1,240.5 SAPROLITE 69.5 1,240.6 1220 69.4 1240 1,240.6 1240 1,240.6 1240 1,241.2 68.8 69.4 1,240.5 1,240.6 1,240.6 1,240.6 1,240.6 1,240.6 1,240.6 1,240.6 1,240.6 1,238.8 WEATHERED ROCK 71.7 1,238.8 NON-CRYSTALLINE ROCK 1,238.8 1,238.6 1,238.7 1,238.8 1,238.6 1,238.7 1,238.8 1,238.6 1,238.6 1,238.6 1,238.6 1,238.7 1,238.6 1,238.7 1,238.7 1,238.8 1,238.8 1,238.6	1245		+	10	16	22		3 8	<u> </u>			м		_ - 1,243.6	66.4		\pm							
1240 1,240.5 69.5 <td></td> <td></td> <td>ŧ</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>1</td> <td></td> <td></td> <td>WEATHERED ROCK</td> <td></td> <td></td> <td>Ŧ</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>			ŧ								1			WEATHERED ROCK			Ŧ							
- - <td>1240</td> <td>1,240.5</td> <td>69.5</td> <td>52</td> <td>47/01</td> <td></td> <td></td> <td></td> <td>+</td> <td></td> <td></td> <td></td> <td>97. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1</td> <td>1,240.6 SAPROLITE</td> <td>69.4</td> <td></td> <td>Ī</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	1240	1,240.5	69.5	52	47/01				+				97. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	1,240.6 SAPROLITE	69.4		Ī							
		.	£		-17.01					. 100/0.6	T I			WEATHERED ROCK			Ţ							
			Ŧ											GREY/BLUISH-GREY FRACTURE			Ŧ							
	1235		T								!				/4.4		1		1					

MADISO	N			GEOL	.OGIST Johnson,	C. D.		
h Broad Riv	er and F	Private	Drive	е			GROUN	D WTR (ft)
OFFSET (CL			ALIG	MENT -L-		0 HR.	N/A
NORTHING	i 801.9	23		EAST	ING 868,105		24 HR.	2.1
	DRILL		DN		W/SPT & Core			Automatic
COMP. DAT		28/20						
COIVIP. DA		28/20	L	SURF	ACE WATER DEP	TH N//	4	
75 100	SAMP. NO.	моі	O G		SOIL AND ROC	K DESC	RIPTION	
	+			1,234.3				,
				1,231.6	BROWN SOFT to NON-CRYSTALLIN			
				- 1,229.8	RES		BOCK	
				1,227.6		IDUAL	RUCK	82.4
					BROWN VERY SOF w/ traces of SILT &			.AY, /
				_	NON-CRYST	ALLINE	ROCK	<u> </u>
				1,223.2	GREY/BL	UISH-GF	REY	86.8
				• • • • • •	BROWN VERY SOF	T to MEI		
<u> </u>				_	NON-CRYST GREY/BLUISH-G			_
				-		OMITE)	ACTORED	
				-				
				-				
				. <u>1,210.6</u>				99.4
				_1,209.7	RES		ROCK	100.3
					GREY/BLUISH-G	REY FR		
					(DOL	OMITE)		
				· 1,201.5				108.5
					NON-CRYST		POCK	
				<u>1,198.6</u>	GREY/BL			
			\mathbf{Z}	1,196.2		IDUAL		113.8
				1,195.2 1,194.0	NON-CRYST	ALLINE	ROCK	114.8
				1,192.9	NON-CRYST	-	ROCK	117.1
				-	RES BROWN VERY SOF	IDUAL	STIFE CI	ΔΥ
<u> </u>				-	w/ traces of			5.11,
				-				
			N					105 -
<u> </u>				1,184.7	NON-CRYST	ALLINE	ROCK	125.3
				1,182.6 1,181.6	RFS	IDUAL		127.4 128.4
				1,180.2	NON-CRYST	ALLINE		129.8
					GREY/BLUISH-G (DOL	REY FR OMITE)	ACTURED	
					Boring Terminated	at Eleva		
				_	IN NON-CRYSTAL DOLO	LINE RO OMITE)	JUR (SHA	זט
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(ft) (ft) <th< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th<>																		
BORING ND. B3-C STATION 21+82 OFFSET CL ALIGNMENT -L- PAIR 0 HR. NA COLLAR ELV. 1310.0 ft TOTAL DEPTH 120.8 ft NORTHING 801.023 EASTING 808.105 24 HR. 26 HR. 24 HR. 26 HR. <th></th> <th>-</th> <th></th> <th></th> <th>ST Johnso</th> <th>n, C. D.</th> <th></th> <th></th>												-			ST Johnso	n, C. D.		
COLLAR ELEV 1,310.0 ft TOTAL DEPTH 128.8 ft NORTHING 601,923 EASTING 868,105 24 HR 2.1 COLLAR ELEV 1,310.0 ft TOTAL DEPTH 128.8 ft MORTHING 601,923 EASTING 868,105 24 HR 2.1 CORL SEE NWL TOTAL NET DATE DESCRIPTION INCOMPOSITION AND REMAINES IMPRACE WATER DATE MORTHING 80.0 ft DESCRIPTION AND REMAINES DESCRIPTION AND REMAINES CORE SEE NWL TOTAL RUN 59.6 ft SUPPACE DESCRIPTION AND REMAINES DESCRIPTION AND REMAINES 1288 J 44 65 607.0 ft 50.0 ft SUPPACE RESOUAL 70.2 ft 1285 J 74.8 ft 50.0 ft C.23 77.8 ft 50.0 ft C.23 77.4 ft 50.0 ft C.23 77.4 ft SUPPACE RESOUAL 76.4 ft 75.5 ft RESOUAL 76.4 ft 75.5 ft RESOUAL 76.4 ft 75.5 ft					place Brid				0 ove	r Fren			and PrivateDriv				4	. ,
DRILL ROH-NAMER CHER CHeek, D. O. START DATE OPACE OPACE OPACE OPACE SURFACE WATER DEPTH NA CORE SUE< NVNL TOTAL RUN, SO & 6 ft COMP. DATE 09/25/20 SURFACE WATER DEPTH NA CORE SUE NVNL TOTAL RUN, SO & 6 ft COMP. DATE 09/25/20 SURFACE WATER DEPTH NA CORE SUE NVNL TOTAL RUN, SO & 6 ft DESCRIPTION AND REMARKS DESCRIPTION AND REMARKS <th>_</th> <th></th> <th></th> <th></th> <th></th> <th>-</th> <th></th> <th></th> <th></th> <th></th> <th><u> </u></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>4</th> <th></th>	_					-					<u> </u>						4	
DRILLER Chuek, D. D. START DATE 09/25/20 COMP. DATE 09/25/20 SURPACE WATER DEPTH N/A CORE SEE NWL TOTAL RUN 56.6 Image: Control of the control of th											NO				,	1		
CORE SIZE NXVI. TOTAL RNN S0.6 ft ELEV BUT REX ADD	DRILL	. Rig/Hai	VIMER E	FF./DA	TE AFO	8963 CN	/IE-550X	94% 04/0	08/2019)		D	RILL METHOD N	W Casing W/SP	T & Core	HAMIN	ER TYPE	Automatic
ELED PELPS DEPTH RUN PATLE PELPS NON PELPS DESCRIPTION AND REMARKS DESCRIPTION AND REMARKS 220.4	DRIL	LER C	heek, D	0. 0.		STA	rt da	TE 09/2	5/20		со	MP. DATE	09/28/20	SURFACE	WATER DE	PTH N	/A	
Like Eine Beam Ref Res Res<	COR	E SIZE	NXWL	<u> </u>				N 59.6 f										
228.9 128.8 70.2 4.6 55.0 1 128.8 </td <td></td> <td>RUN ELEV</td> <td></td> <td></td> <td></td> <td>REC.</td> <td>RQD</td> <td></td> <td>REC.</td> <td>RQD</td> <td></td> <td></td> <td></td> <td>DESCRIPTION</td> <td>AND REMARI</td> <td>KS</td> <td></td> <td></td>		RUN ELEV				REC.	RQD		REC.	RQD				DESCRIPTION	AND REMARI	KS		
1.2393 1.2393 NON-CRYSTALLINE ROCK 702 1235 1235.7 74.8 0.001.0 235.1 74.8 <td< td=""><td>(π)</td><td>(ft)</td><td>(π)</td><td>(π)</td><td>(Min/ft)</td><td>(II) %</td><td>(II) %</td><td>NO.</td><td>(II) %</td><td>(IL) %</td><td>G</td><td>ELEV. (ft)</td><td></td><td></td><td></td><td></td><td></td><td>DEPTH (ft)</td></td<>	(π)	(ft)	(π)	(π)	(Min/ft)	(II) %	(II) %	NO.	(II) %	(IL) %	G	ELEV. (ft)						DEPTH (ft)
1235 1235 74.8 1041.0 71.7 1235 1235.2 74.8 1041.0 71.7 1235 1235.2 74.8 1041.0 73.1 74.8 1235 1235.2 74.8 1041.0 73.1 74.8	1239.84	1 239 8	70.2	16	0.25/0.6	(1.0)	(0,0)					1 0 0 0						70.0
1225 7.8.8 0.091/0 - 74.4 1226 1.235.2 7.8.8 0.091/0 2.337.0 74.4 1220 1.235.2 7.9.8 3.337.0 74.6 1.233.6 NON-CRYSTALLINE ROCK 72.6 1220 1.235.2 7.9.8 3.337.0 74.6 1.233.6 NON-CRYSTALLINE ROCK 72.6 1225 1.225.2 79.8 3.337.0 74.6 1.223.6 NON-CRYSTALLINE ROCK 72.6 1225 1.225.2 60.8 2.111.0 74.6 1.223.6 NON-CRYSTALLINE ROCK 72.4 1220 1.220.2 60.8 2.111.0 6.0 2.111.0 74.6 1220 1.220.2 60.8 6.0 6.0 6.0 7.111.0 6.0 7.111.0 7.1222 RESIDUAL 72.6 1220 1.220.2 60.8 7.111.0 7.111.0 7.1222.0 7.1222.0 7.1222.0 7.1222.0 7.1222.0 7.1222.0 7.1222.0 7.1222.0 7.1222.0 7.1222.0		-		4.0	0:59/1.0	39%										<i>,</i> ,,		
F 6.0 5211.6 (2.3) NON-CRYSTALLINE ROCK 72 1200 1202 7 78.8 3.111.0 (6.1) (2.2) (2.3) NON-CRYSTALLINE ROCK (2.2) 1200 1202 7 78.8 5.0 (2.3) NON-CRYSTALLINE ROCK (2.2) 1201 1202 7 88.8 5.0 (2.1) (2.2) (2	1235	- 1,235.2	- 74.8		0:09/1.0							- - 1,235.6						74.4
1200 1202 79.8 1201 <th< td=""><td>1200</td><td>-</td><td>-</td><td>5.0</td><td>1:32/1.0</td><td>(2.3)</td><td></td><td></td><td></td><td></td><td></td><td>1,234.3</td><td></td><td></td><td></td><td>ĸ</td><td></td><td>75.7</td></th<>	1200	-	-	5.0	1:32/1.0	(2.3)						1,234.3				ĸ		75.7
1230 1230 27 78.5 3:13:10 3:13:10 4:10 12:20 Residual 9:22 1225 1225 2 84.8 2:25:10 12:30 12:30 12:30 12:30 0 0 0:22 12:22:10 0:20:10 0:20:10		-	-		0:12/1.0		0470					- - 1,231.6						78.4
1:16:10 1:25 4:95 1:27:6 NON-GRYSTALLINE ROCK 0:2 1:25 1:25:2 84.8 2:30:10 4:30 3:4	1230	1,230.2	79.8	50	3:13/1.0		(2.2)				臺	1,229.8				ĸ		80.2
1225 1225 225/10 1221 1225 1222 94.8 2.56(1.0) 4 6.4		-	-	5.0	1:16/1.0	72%						- - 1.227.6		RES	SIDUAL			82.4
50 12210 12210 12222 RESIDUAL 30 1220 1.222.2 9.8 3.111.0 88 87 1220 1.222.2 9.8 3.111.0 88 87 1221 1.222.2 9.8 3.111.0 98 3.411.0 98 1215 1.215.2 94.8 2.051.0 1.410.0 98 97 1210 1.210.2 99.8 0.331.0 98 97 97 1210 1.210.2 99.8 0.331.0 1.0 98 97 1210 1.210.2 99.8 0.331.0 1.0 1.111.0 <t< td=""><td></td><td>-</td><td>-</td><td></td><td>2:23/1.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>NON-CRYS</td><td>TALLINE ROC</td><td>K</td><td></td><td></td></t<>		-	-		2:23/1.0							-		NON-CRYS	TALLINE ROC	K		
1220 12202 88.8 2.61/10 67.8 1210 1.202.2 98.8 3.11/10 6.9 3.11/10 6.9 3.11/10 6.9 3.11/10 6.9 3.11/10 6.9 3.11/10 6.9 3.11/10 6.9 3.11/10 6.9 3.11/10 6.9 3.11/10 6.9 3.11/10 6.9 3.11/10 6.9 3.11/10 6.9 3.11/10 6.9 3.11/10 9.8 0.33/10 9.8 0.33/10 9.9 9.8 0.33/10 9.9 9.8 0.33/10 9.9 9.8 0.33/10 9.9 9.8 0.33/10 9.9 9.8 0.33/10 9.9 9.8 0.33/10 9.9 9.8 0.33/10 1.9 9.8 0.9 9.8 0.9 9.8 0.9 9.8 0.9 9.8 0.9 9.8 0.9 9.8 0.9 9.8 9.8 9.8 9.8 9.8 9.8 9.8 9.8 9.8 9.8 9.8 9.8 9.8 9.8	1225	1,225.2	- 84.8	5.0	1:24/1.0	(4.4)					臺							
1220 1.220.2 89.8 3.111/10 4 1.111 1210 5.0 2.131/10 96.90 3.4% 1.111 1210 1.212.2 94.8 2.051/10 4.43 1.111 1210 1.212.2 94.8 2.051/10 4.43 1.111 1210 1.212.2 94.8 2.051/10 4.43 1.111 1210 1.212.2 94.8 2.051/10 4.43 1.111 1210 1.212.2 94.8 2.051/10 4.43 1.111 1.1206 RESIDUAL .003 1205 1.202.2 104.8 2.061/10 7.111 4.45 1.015 RESIDUAL .003 1205 1.202.2 105.8 5.0 2.411/10 4.45 1.111 1.102.5 .001.6 .001.7 .002.1 .003 1105 1.102.2 100.8 1.102.4 RESIDUAL .003 .013.2 .013.2 .013.2 .013.2 .013.2 .013.2 .013.2 .013.2 .014.2 .013.2 .014.2 .014.2 .014.2 .014.2 <t< td=""><td></td><td>-</td><td>-</td><td></td><td>2:13/1.0</td><td>88%</td><td>68%</td><td></td><td></td><td></td><td></td><td></td><td></td><td>RES</td><td>SIDUAL</td><td></td><td></td><td></td></t<>		-	-		2:13/1.0	88%	68%							RES	SIDUAL			
1215 1215 1215 1216 1211 <th< td=""><td>1220</td><td>- 1,220.2</td><td>- 89.8</td><td></td><td>2:16/1.0</td><td></td><td></td><td></td><td></td><td></td><td>囊</td><td></td><td></td><td>NON-CRYS</td><td>TALLINE ROC</td><td>ĸ</td><td></td><td></td></th<>	1220	- 1,220.2	- 89.8		2:16/1.0						囊			NON-CRYS	TALLINE ROC	ĸ		
1215 1.215 1.215 2 94.8 1.051.0 2051.0 1.121.0 98.8 1.215.0 98.4 1.210.0 99.8 1.210.0 99.8 1.210.0 99.8 1.210.0		-	-	5.0	2:13/1.0	(4.8)					囊	-						
1215 1.215.27 94.8 2.06/1.0 (4.4) (3.1) 1210 1.210.27 98.8 2.331.0 (4.4) (3.1) 1210 1.210.27 99.8 5.0 0.2471.0 (5.8) (1.4) 1205 1.205.27 104.8 2.2401.0 (1.301.0) (1.301.0) (1.301.0) 1205 1.205.27 104.8 2.2401.0 (1.0) (1.0) (1.0) (1.0) 1200 1.200.27 109.8 1.301.0 (2.6) (1.0)		-	-		1:05/1.0		0				臺	-						
1210 1.54/1.0 68% 62% 1210 1.210.2 99.8 0.33/1.0 0.5 1.44/1.0 99.4 1205 1.05.2 104.8 2.20/1.0 99.4 1.309.7 RESIDUAL 100.3 1205 1.205.2 104.8 2.00/1.0 7% 2% 1.00 1.00.7 1.00.1	1215	1,215.2	- 94.8	50	2:05/1.0		(3.1)					-						
1210 1210 2231.0 99.8 2231.0 99.8		-	-	0.0	1:54/1.0	88%					臺	-						
1210 1205 1205 0 0.38/10 0 <th0< th=""> <th0< th=""> 0</th0<></th0<>		1 210 2-	- 00 0		2:23/1.0							- - 1.210.6						99.4
1205 1205 1204 220710 100 208710 1206 1.205.2 104.8 2.06710 2087117710 208710 2087117710	1210	1,210.2	-	5.0	0:42/1.0	(3.5)						1,209.7						
1205 1.205.2 104.8 2.00(1.0) 4.71(1.0) 94% 58% 1200 1.202.2 109.8 1.30(1.0) 1.30(1.0) 1.20(1.0) 1.201.5 106.5 1200 1.202.2 109.8 1.30(1.0) 0.47(1.0) 52% 20% 1.198.6 NON-CRYSTALLINE ROCK 1114. 1195 1.195.2 114.8 2.28(1.0) 1.198.8 NON-CRYSTALLINE ROCK 1138. 1195 1.195.2 114.8 0.33(1.0) 0.09 0.4.4 1.195.2 NON-CRYSTALLINE ROCK 114.8 1190 1.192.2 118.8 0.09(1.0) 0.09 0.4.4 1.192.9 NON-CRYSTALLINE ROCK 114.8 1190 1.192.2 118.8 0.09(1.0) 0.09 0.04 1.192.9 NON-CRYSTALLINE ROCK 114.8 1191 1.192.2 1.181.0 0.09(1.0) 0.09 0.04 1.192.9 NON-CRYSTALLINE ROCK 122.3 1182 1.182.2 1.192.6 1.192.6 1.192.6 1.192.6 1.192.6 1.192.6 1.192.6 1.192.6 1.192.8 1.192.6 1.192.6		-	-		2:40/1.0		28%				븊	-		NUN-CRTS	ALLINE RUC	'n		
5.0 2:11/1.0 (4.7) (2.9) 1200 1.202.2 109.8 1:351.0 105.0 1200 1.201.1 0.94% 58% 1201.1 105.0 1200 1.201.2 109.8 1:00.1 1:00.1 106.5 1195 1.195.2 114.8 22801.0 0.09 0.4 1195 1.195.2 114.8 22801.0 0.9 0.4 1190 1.192.2 119.8 0.031.0 0.9 0.4 1190 1.192.2 119.8 0.031.0 0.9 0.4 1190 1.192.2 119.8 0.031.0 0.9 0.4 1190 1.192.2 119.8 0.031.0 0.9 0.4 1190 1.192.2 10.9 0.451.0 0.00 0.0 1185 1.185.2 124.8 0.151.0 0.9 0.4 1185 1.182.6 NON-CRYSTALLINE ROCK 127.4 1.182.7 NON-CRYSTALLINE ROCK 128.3 <td>1205</td> <td>1,205.2</td> <td>104.8</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>囊</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	1205	1,205.2	104.8								囊	-						
1200 109.8 1:15/1.0 1201 1:201.5 108.5 1200 1.09.8 3.24/1.0 (2.6) (1.0) 108.5 1195 1.195.2 114.8 2.28(1.0) 11.195.2 114.8 2.28(1.0) 11.195.2 NON-CRYSTALLINE ROCK 111.4 1195 1.195.2 114.8 2.28(1.0) 11.195.2 NON-CRYSTALLINE ROCK 113.8 1190 1.192.2 119.8 0.03(1.0) 0.04 1.195.2 NON-CRYSTALLINE ROCK 113.8 1190 1.192.2 119.8 0.03(1.0) 0.04 1.192.9 NON-CRYSTALLINE ROCK 117.1 1190 1.192.2 119.8 0.03(1.0) 0.04 1.192.9 NON-CRYSTALLINE ROCK 117.1 1185 1.185.2 124.8 0.187.10 (2.5) 1.114.7 1.184.7 1.184.7 1.184.7 1185 1.185.2 124.8 0.187.10 1.194.9 1.184.7 1.184.7 1.184.7 1.184.7 1185 1.185.2 124.8 0		-	-	5.0							臺	-						
1200 1.200.2 ± 109.8 1.300/1.0 1.100.2 1.100.2 RESIDUAL 1.100.2 1195 1.195.2 ± 114.8 5.0 0.324/1.0 0.008/1.0 1.198.6 NON-CRYSTALLINE ROCK 1114.4 1195 1.195.2 ± 114.8 5.0 0.328/1.0 1.198.6 NON-CRYSTALLINE ROCK 114.8 1195 1.195.2 ± 114.8 5.0 0.328/1.0 0.0.9 0.0.4 1.198.2 NON-CRYSTALLINE ROCK 114.8 1190 1.190.2 ± 119.8 5.0 0.357/1.0 0.0.9 0.0.0 1.194.0 RESIDUAL 116.0 1190 1.192.2 ± 119.8 1.197.1 0.0.0 0.0.0 1.194.0 RESIDUAL 116.0 1190 1.192.2 ± 124.8 0.07/1.0 0.0.9 0.0 0.0.0 0.0.0 1.184.7		-	-		1:15/1.0						薑							
1195 1,195.2 114.8 5.0 0.38/1.0 (0.9) (0.4) 1195 1,195.2 114.8 5.0 0.38/1.0 (0.9) (0.4) 1190 1,190.2 119.8 0.03/1.0 (0.9) (0.4) 1190 1,190.2 119.8 0.03/1.0 (0.9) (0.4) 1190 1,190.2 119.8 0.03/1.0 (0.0) (0.0) 1190 1,190.2 119.8 0.03/1.0 (0.0) (0.0) 1190 1,190.2 119.8 0.03/1.0 (0.0) (0.0) 0.07/1.0 0.07/1.0 0.00/1.0 (0.0) (0.0) (0.0) 0.07/1.0 1/28/1.0 0.07/1.0 78% 50% 1.184.7 1.184.7 1.182.7 1.185 1,180.2 124.8 1.162/1.0 78% 50% 1.184.7 1.184.7 1.182.8 1.180.2 1.180.2 NON-CRYSTALLINE ROCK 128.3 1.182.4 1.180.2 1.180.2 1.180.2 1.180.2 1.18	1200	1,200.2	- 109.8	50	1:30/1.0		(1.0)									ĸ		/
1195 1.195.2 114.8 0.08/1.0 1195.2 NON-CRYSTALLINE ROCK 114.8 1190 1.001.0 18% 8% 1195.2 NON-CRYSTALLINE ROCK 114.8 1190 1.190.2 119.8 0.03/1.0 0.00/1.0 118% 1195.2 NON-CRYSTALLINE ROCK 114.8 1190 1.190.2 119.8 0.03/1.0 0.00/1.0 0.00/1.0 1190.2 119.8 1190.2 119.8 1195.2 NON-CRYSTALLINE ROCK 114.8 1190 1.190.2 119.8 0.015/1.0 0.00		-	-		0:47/1.0	52%						- 1,198.6 -						111.4
1190 1.00 (0.9) (0.4) 1.190 (0.9) 1.19	1105	- 1 195 2	- 114 8		0:08/1.0											Υ.		
1190 0.46/1.0 NON-CRYSTALLINE ROCK 1190 1.190.2 119.8 0.09/1.0 0.00 1185 1.185.2 124.8 0.015/1.0 0.00 0.00/1.0 0.00/1.0 0.00 0% 0% 1185 1.185.2 124.8 0.017/1.0 0% 0% 1185 1.185.2 124.8 0.017/1.0 0.39 (2.5) 1180 1.181.0 RESIDUAL 122.3 1.180.2 129.8 1.56/1.0 1.181.6 RESIDUAL 128.4 1.180.2 1.56/1.0 1.180.2 NON-CRYSTALLINE ROCK 122.4 1.180.2 1.180.2 NON-CRYSTALLINE ROCK 129.8 1.180.2 NON-CRYSTALLINE ROCK 129.8 1.180.2 1.180.2 I.180.2 I.100.20 I.000.00 1.1	1195		-	5.0	0:38/1.0	(0.9)						1,194.0			-	/N		116.0
1190 1.190.2 119.8 0.039/1.0 0 1190 1.190.2 119.8 0.039/1.0 0 0 1190 1.190.2 119.8 0.039/1.0 0 0 1185 1.185.2 124.8 0.138/1.0 0 0 0 1185 1.185.2 124.8 0.138/1.0 3.9) (2.5) 1.184.7 125.3 1.180.2 1.227/1.0 1.227/1.0 1.181.6 RESIDUAL 128.4 1.180.2 1.49/1.0 1.181.6 RESIDUAL 128.4 1.180.2 1.56/1.0 1 1.180.2 NON-CRYSTALLINE ROCK 129.8 1.180.2 1.180.2 NON-CRYSTALLINE ROCK 129.8 1.180.2 1.18		-	-		0:46/1.0		8%					1,192.9				ĸ		
1185 0:17/1.0 0%	1190	1,190.2	119.8		0:09/1.0		(-			JIDUAL			
1185 1,185.2 124.8 0:07/1.0 125.3 5.0 0:07/1.0 (3.9) (2.5) 1:27/1.0 1:27/1.0 1:49/1.0 1.182.6 1.182.6 1.180.2 129.8 1:56/1.0 1.180.2 1.180.2 NON-CRYSTALLINE ROCK 129.8 1.180.2 1:56/1.0 1:66/1.0 1.180.2 I.180.2 NON-CRYSTALLINE ROCK 129.8 6 1.180.2 1:00/1.0 1:49/1.0 1.180.2 I.180.2 NON-CRYSTALLINE ROCK 129.8 1.180.2 1.180.2 I.180.2		-	-	5.0	0:17/1.0	0%						-						
5.0 0:07/1.0 (3.9) (2.5) 1:02/1.0 1:27/1.0 1:27/1.0 1:182.6 1:149/1.0 1:49/1.0 1:156/1.0 1:180.2 1:156/1.0 1:56/1.0 1:56/1.0 1:180.2 Image: State of the		-	-		0:07/1.0							-						
1:02/1.0 78% 50% 1:27.4 1:182.6 127.4 1.180.2 129.8 1:56/1.0 11.181.6 RESIDUAL 128.4 1.180.2 1:56/1.0 1.180.2 NON-CRYSTALLINE ROCK 129.8 GSI : 70.2' - 78.4' : 10-20 * w/ CLAY IN-FILL ZONES 78.4' - 95.8' : 30-40 * w/ CLAY IN-FILL ZONES 95.8' - 109.8' : 35-45 109.8' - 117.1' : 10-20 * LOW RECOVERY 109.8' - 117.1' : 10-20 * LOW RECOVERY 109.8' - 117.1' : 10-20 * LOW RECOVERY	1185	1,185.2	- 124.8	5.0			(2.5)					1,184.7						125.3
1:49/1.0 1:49/1.0 1:61.0 120.4 1:180.2 129.8 1:56/1.0 129.8 120.4 129.8 Boring Terminated at Elevation 1,180.2 ft IN NON-CRYSTALLINE ROCK (SHADY DOLOMITE) 129.8 129.8 129.8 GSI : 70.2' - 78.4' : 10-20 * w/ CLAY IN-FILL ZONES 78.4' - 95.8' : 30-40 * w/ CLAY IN-FILL ZONES 129.8 109.8' - 117.1' : 10-20 * LOW RECOVERY 109.8' - 117.1' : 10-20 * LOW RECOVERY 109.8' - 117.1' : 10-20 * LOW RECOVERY		-	-		1:02/1.0	78%					薑				_	'n		
Boring Terminated at Elevation 1,180.2 ft IN NON-CRYSTALLINE ROCK (SHADY DOLOMITE) GSI : 70.2' - 78.4' : 10-20 * w/ CLAY IN-FILL ZONES 78.4' - 95.8' : 30-40 * w/ CLAY IN-FILL ZONES 95.8' - 109.8' : 35-45 109.8' - 117.1' : 10-20 *LOW RECOVERY 117.1' - 125.3' : CLAY IN-FILL, NO RECOVERY		- 1.180.2	- 129.8		1:49/1.0							~				к		
GSI : 70.2' - 78.4' : 10-20 * w/ CLAY IN-FILL ZONES 78.4' - 95.8' : 30-40 * w/ CLAY IN-FILL ZONES 95.8' - 109.8' : 35-45 109.8' - 117.1' : 10-20 *LOW RECOVERY 117.1' - 125.3' : CLAY IN-FILL, NO RECOVERY			-		1.50/1.0								Boring Terminated	at Elevation 1,1	80.2 ft IN NO		ALLINE R	
- 78.4' - 95.8' : 30-40 * w/ CLAY IN-FILL ZONES - 95.8' - 109.8' : 35-45 - 109.8' - 117.1' : 10-20 *LOW RECOVERY - 117.1' - 125.3' : CLAY IN-FILL, NO RECOVERY		-	_									-		(SHADY	DOLOMITE)			
- 78.4' - 95.8' : 30-40 * w/ CLAY IN-FILL ZONES - 95.8' - 109.8' : 35-45 - 109.8' - 117.1' : 10-20 *LOW RECOVERY - 117.1' - 125.3' : CLAY IN-FILL, NO RECOVERY		-	_									-						
- 95.8' - 109.8' : 35-45 109.8' - 117.1' : 10-20 *LOW RECOVERY 117.1' - 125.3' : CLAY IN-FILL, NO RECOVERY		-	_									_	GSI : 70.2' - 7	8.4': 10-20	* w/ CLAY II	N-FILL Z	ONES	
109.8' - 117.1' : 10-20 *LOW RECOVERY 117.1' - 125.3' : CLAY IN-FILL, NO RECOVERY		-	_									-			* w/ CLAY IN	N-FILL Z	ONES	
Image: Line state s		-	-									-			*LOW REC	OVERY		
		-	-									-	117.1' - 1	25.3' : CLAY			'ERY	
		-	-									-	125.3' - 1	29.8' : 30-40				
		-	F									<u></u>						
		-	F									-						
		-	Ł									-						

10000	1000					n n										_		0.4.4							
	48088					P B-589			Y MADISC				GEOLOGIST Jo	onnson, C. D.		_	S 4808			lana Dri I	TIP B-			COUNT	
						NO. 67 Or		over Fren	ch Broad Ri			IEDLIA	e ALIGNMENT -L		GROUND WTR (ff 0 HR. 1.9 FIAE	·	E DESCI			lace Brid	ř.	ON 21+		ver ren	-
	NG NO.		•	,				0.6							-					,					
							PTH 119.		NORTHIN				EASTING 868,1		24 HR. N/A					π TE AFO8			1 119.8		N
									0010 04				-	-		_									
	LER C			W CO			TE 09/30/	PER FOOT				, /	SURFACE WATE	RDEPTH N	//A			DEPTH		W COUNT	L		09/30/20		C
ELEV (ft)	ELEV (ft)	DEPTH (ft)	<u> </u>	0.5ft		0	25	50 SER FOUL	, 75 100				SOIL A	AND ROCK DES	CRIPTION DEPTH (ELEV (ft)	ELEV (ft)	DEPTH (ft)	0.5ft			25		50	י 75
	(11)								I						DEPTH	0	(11)							<u> </u>	
1310													1,310.0	GROUND SURF.	ACF	.0 1230							Matc	h Line	
1310												000		ALLUVIAL		1200	+	+			-+			T	.
	-	-										000	to V. STIFF,	FINE-to-COURS	SE SANDY-SILT,			ŧ		i	.		· · · · · · · ·	· · · ·	
1305	-	-					· · · · ·	V. HARD ALL		-		000	– W/ GRAVEL	3.1' & 5.1' & 12	BOULDERS @ 2.8'	1225		ŧ		i		· · ·			· -+
	-	-					·					000	-					Ŧ		i			· · · · ·		
1300	1.299.9	- 10.1					• • • • • • • • • •		· · · · · ·			000	-			1220		ŧ		i			· · · · ·		
	1,299.9	- 10.1	17	7	12		19				w	000	-					Ŧ		i					
	-	-				· · · ;		IV. COBBLES	S & BOULDERS	•		000	-					Ŧ		i					
1295	1,294.9	- - 15.1	3	1	1					-		000	-			1215		Ŧ		i		· · ·	· · · ·		
	-	-									M	000	-		10			Ŧ		i					.
1290	1.289.9	20.1				· <u>· ·</u>	:			1								Ŧ		i					
	1,203.3	_	52	10	24					1	м			& some ROCK F				Ŧ			-				
	-1,207.3		7	6	5	• ¶11			· · · · · · · · · · · · · · · · · · ·		м		- BROWN/0	SAPROLITE GRAY HARD bed				Ŧ		i	.				.
1285	1,284.9	25.1	1	2	9					-	М			T, w/ trace CLAY GMENTS (W.R. I	/ & some ROCK LAYERS)	1205		Ŧ		i				+	+
	1,281.7-				-	• • • 11 • • • •							1,282.0	,	28			Ŧ		i					
1280	-1,201.7	- 20.3	60/0.0						W.R. @ 28.0 60/0.0	•				NEATHERED R		3/ 1200		Ŧ		i					
	-	_										臺	C	RYSTALLINE R	ROCK			Ŧ		i					
2	-									!			- OKE1/B	(DOLOMITE)				Ŧ		i					
1275	_	_								•		薑	1,274.1		35	9 1195		Ŧ		i					-
	-	-													ED STIFF CLAY,			ŧ		i				· · ·	
1270	-	-											- 1,270.5	traces of SILT &		5		<u> </u>		\square	<u> </u>				
1	-	-										Ζ	1,268.2	RESIDUAL	41			ŧ							
1005	-	-							· · · · · ·					RYSTALLINE R	RACTURED 7	4		ţ		i					
1265	-	-								{			_ \	(DOLOMITE))			ŧ		i					
	-	-							. .	!				RY SOFT to ME traces of SILT &	ED STIFF CLAY, SAND			‡		i					
1260	-	-																ŧ		i					
5	-	-											1,258.2	RYSTALLINE R	51 51	8		‡							
4055	-	-					· · · · ·		. .				GREY/B	LUISH-GREY FI	RACTURED			‡							
1255	-	-								i			1,254.8 1,254.3	(DOLOMITE) RESIDUAL	55	Z Z		‡							
4	-	-							· · · · · ·					RYSTALLINE R	RACTURED			‡							
1250	-	-						· · · ·					1,250.2	(DOLOMITE)		8	.	‡							
1250	-	-													ED STIFF CLAY,			‡							
1	-	-					· · · · ·		· · · · · · ·									‡							
1245	-	-								1			-				· ·	‡							
1	-	-					· · · · ·						-					ŧ							
1240	-	-							· · · · · ·	4							.	ŧ							
1025	-	-														-		Ŧ							
1235	-	-					• • • • •		· · · · · ·	!			- GREY/B - 1,235.2	LUISH-GREY FI) 74	8		Ŧ							
1235	-	-								1				RESIDUAL RY SOFT to ME		71	.	Ŧ							
1230	-	-							· · · · · ·					traces of SILT &		7		Ŧ							
1230	-						• • • • •	• • • •				幸						t							

MADISON	GEOLOGIST Johnson, C. D.	
h Broad River and PrivateDriv	e	GROUND WTR (ft)
OFFSET 19 ft RT	ALIGNMENT -L-	0 HR. 1.9 FIAD
NORTHING 801,903	EASTING 868,108	24 HR. N/A
DRILL METHOD	W Casing W/SPT & Core HAMM	ER TYPE Automatic
COMP. DATE 09/30/20	SURFACE WATER DEPTH N	/Α
75 100 NO. MOI G	SOIL AND ROCK DESC	CRIPTION
	CRYSTALLINE R GREY/BLUISH-GREY FF (DOLOMITE) (cont	RACTURED
₹		85.1
	- 1,222.7 - CRYSTALLINE R	87.3
	- GREY/BLUISH-GREY FF	RACTURED 90.1
	RESIDUAL	
	CRYSTALLINE R GREY/BLUISH-GREY FF (DOLOMITE)	RACTURED
	-	
	-	
	-	
	-	
	- - 1,202.5	107.5
	- RESIDUAL BROWN VERY SOFT to ME	
<u>├</u>] <mark> </mark>	-1,199.5 w/ traces of SILT &	SAND
	CRYSTALLINE R GREY/BLUISH-GREY FF	RACTURED
	(DOLOMITE)	
	-	
	- 1,190.2	119.8
	Boring Terminated at Eleva	ation 1,190.2 ft
	IN NON-CRYSTALLINE R DOLOMITE)	
	-	
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	48088					B-589					MADISON GEOLOGIST Johnson, C. D.	WBS
SITE	DESCR	IPTION	Rep	place Brid	lge No	. 67 on	US 25/7	70 ove	r Fren	ich B	Broad River and PrivateDrive GROUND WTR (ft)	SITE
BORI	NG NO.	. B3-B	(ALT	.)	STA	TION	21+88			OF	FFSET 19 ft RT ALIGNMENT -L- 0 HR. 1.9 FIAD	BOR
COLL	AR ELE	EV. 1,	310.0	ft	тот	AL DEF	PTH 11	9.8 ft		NC	ORTHING 801,903 EASTING 868,108 24 HR. N/A	COL
DRILL	. RIG/HAI	MMER E	FF./DA	TE AFO	3963 CIV	/E-550X	94% 04/	08/2019)		DRILL METHOD NW Casing WSPT & Core HAMMER TYPE Automatic	DRILI
DRIL	LER C	heek. [D. O.		STA		TE 09/3	30/20		СС	OMP. DATE 09/30/20 SURFACE WATER DEPTH N/A	DRIL
							N 91.5 f					COR
-	RUN	1	1	DRILL				STR	RATA	L		ELEV
ELEV (ft)	ELEV	DEPTH (ft)	(ft)	RATE	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft)	RQD (ft) %	Ō G		(ft)
	(ft)			(Min/ft)	%	%		%	%	G		
281.69	1,281.7 1,280.2	28.3	1.5	N=60/0.0	(1.5)	(0.5)			-		Begin Coring @ 28.3 ft 1,281.7 CRYSTALLINE ROCK 28.3	120 <u>1.69</u> 1200
1280	1,280.2	29.8	5.0	N=60/0.0 2:51/1.5 1:37/1.0 1:47/1.0	100%	33%						1200
	-	ł		1:47/1.0	(4.7) 94%	(2.7) 54%						
1275	1,275.2	34.8		0:55/1.0 1:49/1.0								1195
	-	Ţ	5.0	1:25/1.0 0:15/1.0	(3.3) 66%	(0.9) 18%					1,274.1 35.9 RESIDUAL	
	-	t		0:15/1.0	0070	1070						
1270	1,270.2	39.8		0:43/1.0	(0.0)						1,270.5 39.5 1,269.5 CRYSTALLINE ROCK 40.5	
	-	ł	5.0	0:59/1.0 0:09/1.0	(2.3) 46%	(1.5) 30%					1,268.2 RESIDUAL 41.8	
	-	Ŧ		1:27/1.0 0:48/1.0							1,266.6 CRYSTALLINE ROCK 43.4	
1265	1,265.2	44.8	5.0	0:26/1.0 NA/1.0	(0.7)	(0.0)					RESIDUAL	
	-	‡	0.0	0:18/1.0	14%	0%						
	4 000 0	1 40 0		0:31/1.0								
1260	1,260.2	49.8	5.0	0:20/1.0	(1.5)	(0.7)					-	
	-	Ŧ		0:11/1.0	30%	14%					1,258.2 51.8 CRYSTALLINE ROCK	
1255	- 1,255.2	54.8		0:40/1.0 1:12/1.0								
1255	.,200.2	-	5.0	1:36/1.0		(0.4) 8%					1,254.8 55.2 1.254.3 C 55.2	
	-	t		1:40/1.0	90%	0%					CRYSTALLINE ROCK	
1250	1,250.2	59.8		2:10/1.0 0:10/1.0							1,250.2 59.8	
	-	Ŧ	5.0	NA/1.0 NA/1.0	(0.0) 0%	(0.0) 0%					RESIDUAL	ର
	-	Ŧ		NA/1.0 0:54/1.0	-							10/13/20
1245	1,245.2	64.8	5.0	0:02/1.0	(0.3)	(0.0)						1 1
	-	ŧ	5.0	0:58/1.0	6%	0%					1	DOT.GDT
	-			0:16/1.0								8
1240	1,240.2	69.8	5.0	0:11/1.0	(3.5)	(0.4)					1,238.7 71.3	NC NC
	-	Ŧ		0:47/1.0 1:22/1.0	70%	8%					CRYSTALLINE ROCK	.GP.
1235	- 1,235.2	74 8		1:08/1.0 2:09/1.0							1,235.2 74.8	202(
1200	-	1	5.0	1:47/1.0	(1.1)	(0.4)					RESIDUAL	ALL
	-	t		2:18/1.0	22%	8%						E
1230	1,230.2	79.8		2:21/1.0 NA/1.0							T 1,231.3 78.7 CRYSTALLINE ROCK	LAD
	-	Ŧ	5.0	NA/1.0 NA/1.0	(1.9) 38%	(0.9) 18%						n_ s
	-	Ŧ		NA/1.0 NA/1.0								IOLE
1225	1,225.2	84.8	5.0	NA/1.0 1:56/1.0	(4.2)	(1.0)				Ħ	1,224.9 85.1	REH
	-	t	5.0	1:38/1.0	(4.2) 84%	20%					RESIDUAL 87.3	BC
	-	±		1:28/1.0							CRYSTALLINE ROCK	BRDG0067_MADISON_BOREHOLES_UPDATED FALL 2020.GPJ
1220	1,220.2	89.8	5.0	0:49/1.0 1:47/1.0	(5.0)	(1.8)		L—	L		1,219.9 90.1 1.219.1 RESIDUAL 90.9	MAC
	-	Ŧ		1:39/1.0 2:08/1.0	100%						- CRYSTALLINE ROCK	067
1015	- 1,215.2	- 94.8		2:15/1.0								DGO
1215		-	5.0	1:12/1.0	(4.4)	(2.8)						BB
	-	t		1:39/1.0	88%	56%						B5895_
1210	1,210.2	99.8		2:14/1.0 2:06/1.0								
	-	Ŧ	5.0	1:09/1.0	(4.5) 90%	(3.6) 72%						OUB
	-	‡		1:50/1.0	3070	12/0						NCDOT CORE DOUBLE
1205	1,205.2	104.8		1:52/1.0	(0.0)							ĊĊ
	-	t	5.0	0:58/1.0	(2.6) 52%	(2.6) 52%						TOO
		Į		0:32/1.0							1,202.5 107.5	N N

	WBS						B-589			OUNT	
					lace Brid	-			'0 ove	r Fren	1
		ING NO.		(ALT.	-			21+88			0
					tte afo8			PTH 119			Ν
		LER C						TE 09/3			С
		E SIZE	NXWL					N 91.5 f			
	ELEV	RUN	DEPTH		DRILL	REC.	JN	SAMP.	STR	ATA RQD	L
	(ft)	ELEV (ft)	(ft)	(ft)	RATE (Min/ft)	(ft) %	RQD (ft) %	NO.	REC. (ft) %	(ft) %	0 G
	1201.69										L
	1200	1,200.2	109.8	5.0	0:07/1.0	(5.0)	(3.9)				
		-	-	0.0	0:06/1.0 1:15/1.0 1:02/1.0	100%	78%				
	1195	- 1,195.2	- 114.8		2:04/1.0 1:42/1.0						
		-	-	5.0	1:02/1.0 1:50/1.0	(3.6) 72%	(2.8) 56%				
		-	E		0:24/1.0 0:50/1.0						
		1,190.2	<u>119.8</u>		1:59/1.0						
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NC_DOT.GDT 10/13/20		-	-								
DT 10		-	-								
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NCDOT CORE DOUBLE B5895_BRDG0067_MADISON_BOREHOLES_UPDATED FALL 2020.GPJ		-	÷								
NCDC		-	<u> </u>								

Ń	ADISO	N		son, C. E).							
h B	road Riv	er	and PrivateD	rive						GROUN		R (ft)
OF	FSET 1	19 f	t RT		ALI	GNMEN	IT -L-			0 HR.	1.9 F	IAD
NO	RTHING	; 8	301,903		EAS	STING	868,108			24 HR.		N/A
			RILL METHOD	NW			· · ·			ER TYPE		
со	MP. DA	TE	09/30/20		SUF	REACE	WATER I		N//	Δ		
										•		
L												
Ō G		*)		D	ESCR	IPTION	AND REM/	ARKS				TH (ft)
<u> </u>	ELEV. (f	<u>()</u>		<u> </u>	ntinu	od from	proviour				DEF	
					R	ESIDUA	n p <u>revious</u> L <i>(continue</i>	ed)				
	— 1,200.0 -				с	RYSTAL	LINE ROO	к				111.0
H	-											
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봂	_											
	_											
	1,190.2	В	oring Terminat	ed at					ST	ALLINE R	ОСК	119.8
	_				(SHADY	DOLOMIT	E)				
	F											
	-											
	F		GSI : 28.3									
	-						IN-FILL,					
	-						'MULTI Z IN-FILL, I					
	_		71.3'	- 90).9' :	15-20 *	w/ CLAY					
	_					30-40 *CLAY	'IN-FILL,		RF	COVER	v	
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	В	ORE LOG		
WBS 48088.1.1	TIP B-5895 COUNT	Y MADISON	GEOLOGIST Johnson, C. D.	WBS 480
SITE DESCRIPTION Replace Bri	dge No. 67 on US 25/70 over Frer	hch Broad River and PrivateDrive		GROUND WTR (ft) SITE DES
BORING NO. B3-B	STATION 21+90	OFFSET 23 ft RT	ALIGNMENT -L-	0 HR. 0.8 BORING N
COLLAR ELEV. 1,309.6 ft	TOTAL DEPTH 44.9 ft	NORTHING 801,899	EASTING 868,110 2	4 HR. N/A COLLAR I
DRILL RIG/HAMMER EFF./DATE AFC	08963 CME-550X 77% 07/31/2017	DRILL METHOD NW	Casing W/SPT & Core HAMMER	RTYPE Automatic DRILL RIG/
DRILLER Cheek, D. O.	START DATE 07/24/19	COMP. DATE 07/25/19	SURFACE WATER DEPTH N/A	DRILLER
ELEV DRIVE DEPTH BLOW COUN			SOIL AND ROCK DESCR	
(ft) (ft) (ft) 0.5ft 0.5ft (0.5ft 0 25 50	75 100 No Z	ELEV. (ft)	DEPTH (ft) ELEV (ft) ELE
1310			1,309.6 GROUND SURFAC	E 0.0 1303.12 1,303
1305 1,304.6 5.0 72 28/0.3	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	GRAY/BLUISH-GRAY/BRO DENSE to VERY DENSE, FINE-to-COURSE SA GRAVELS/COBBLES & BC	, SILTY, 1,299 ND, 1,299
1300	- · · · 100/0.8 BLDRS : BEGI	· · · · ·		<u>1295</u> <u>1,294</u>
1295			1,294.7	1290 1,285
			WEATHERED ROC 1,292.8 NO RECOVERY : ASSUMED	
1290			1.290.7 NON-CRYSTALLINE R GREY/BLUISH-GREY H	IGHLY
1285			FRACTURED (DOLOMITE), ** OF CLAY IN-FILL, ROCK FR THROUGH-OUT RECOV RESIDUAL	AGMENTS, 1280 1,279
1280		· · · · ·	NO RECOVERY : CLAY MATERIALS 1,281.3 1,279.7 NON-CRYSTALLINE R	28.3 1275 1,272
			1,277.7 CREY/BLUISH-GREY FRA 1,277.7 RESIDUAL NO RECOVERY : CLAY	IN-FILL 31.9 1270 1 260
1275			1,275.7 NON-CRYSTALLINE R GREY/BLUISH-GREY FRA RESIDUAL NO RECOVERY : CLAY	
1270			NON-CRYSTALLINE R GREY/BLUISH-GREY FRA 1,268.7	
1265			RESIDUAL NO RECOVERY : CLAY MATERIALS 1,264.7	IN-FILL 문 연 44.9 8
			Boring Terminated at Elevation RESIDUAL CLAY-INFILL M/ (IN-SITU)	IN-FILL 44.9 1,264.7 ft IN ATERIALS BOBSE BRD 2000 NOSIDEW 29005 000 100 100 100 100 100 100 100 100

BOREHOLES_UPDATED FALL 2020.GPJ NC_DOT.GDT 10/12/20

	WBS	48088	.1.1			TIP	B-589	5	C	OUNT
	SITE	DESCR	IPTION	Rep	lace Brid	ge No	. 67 or	n US 25/7	0 ove	r Fren
	BOR	ING NO.	B3-B			STA	ΓΙΟΝ	21+90		
	COLI	LAR ELE	V 1:	309.6	ft	тот	AL DEI	PTH 44.	9 ft	
			,			963 CIV	1E-550X	77% 07/3	-	
	DRIL		heek, D			STA	RT DA	TE 07/2-	1/10	
		E SIZE					AL RUI			
		RUN	NXWL		DRILL					ATA
	ELEV (ft)	ELEV	DEPTH (ft)	RUN (ft)	RATE	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %
		(ft)		. ,	(Min/ft)	%	%		%	%
	1303.12	1,303.1	6.5	3.4	3:35/1.0	(0.8)	(0.6)			
	1300	1,299.7_	- 9.9		0:23/1.0 0:33/1.4	24%	18% BLDRS			
		- 1,299.7-	- 9.9	5.0	0:20/1.0	(0.9)	(0.0)			
		-	-		0:35/1.0 1:13/1.0	18%	0% BLDRS			
	1295	1,294.7_	- - 14.9		2:11/1.0 0:32/1.0					
		-	-	5.0	0:50/1.0 0:50/1.0	(2.1) 42%	(1.5) 30%			
		-	_		1:43/1.0 2:27/1.0	1270	0070			
	1290	1,289.7_	_ 19.9	5.0	0:42/1.0	(0.0)	(0.0)			
		-	-	5.0	0:55/1.0 0:09/1.0	(0.0) 0%	(0.0) 0%			
	1285	-	-		0:35/1.0 0:20/1.0					
	1200	1,284.7_	<u>-</u> 24.9 -	5.0	0:32/1.0 0:15/1.0	(1.6)	(0.4)			
		-	-		0:15/1.0 0:55/1.0	32%	8%			
	1280	1,279.7_	- 29.9		2:09/1.0 1:15/1.0					
		-	-	5.0	0:18/1.0 0:14/1.0	(0.9) 18%	(0.0) 0%			
		-	-		2:16/1.0	1070	0 70			
	1275	1,274.7_	- 34.9		1:10/1.0 0:07/1.0					
		-	-	5.0	0:16/1.0 0:14/1.0	(1.1) 22%	(0.0) 0%			
	4070	-	-		0:17/1.0 1:42/1.0					
20	1270	1,269.7_	- 39.9 -	5.0	1:05/1.0 1:19/1.0	(0.4)	(0.0)			
10/12/20		-	-		0:07/1.0 0:09/1.0	8%	0%			
	1265	1,264.7_	- - 44.9		0:11/1.0 0:28/1.0					
DOT.GDT		-	-		0.20/1.0					
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NCDOT CORE DOUBLE B5895_BRDG0067_MADISON_BOREHOLES_UPDATED FALL 2020.GPJ N			-							
g		-	-							

GEOTECHNICAL BORING REPORT CORE LOG

IT	ΥN	ADIS	ON			GEOLOGIST	Johnson,	C. D.		
en	ch B	road R	liver	and PrivateD	rive				GROUN	D WTR (ft)
	OF	FSET	23	ft RT		ALIGNMENT	-L-		0 HR.	0.8
	NO	RTHIN	G	801,899		EASTING 8	368,110		24 HR.	N/A
			D	RILL METHOD	NW	Casing W/SPT &	& Core	HAMM	ER TYPE	Automatic
	со	MP. D		07/25/19		SURFACE W	ATER DEP	TH N/	Α	
						•••••				
	L									
D)	O G		(ft)		D	ESCRIPTION A	ND REMARKS	6		
	0	ELEV.	. (11)		<u> </u>	ntinued from		~~~		DEPTH (ft)
					0	ntinued from ALLUVIAL	continued)	je		
		-								
	000	F								
		-								
			7							14.9
		1,292.	8			WEATHER				16.8
		_ _ 1,290.	7			NON-CRYSTA	LLINE ROCK			18.9
		-				RESI	DUAL			
		F								
		F								
		-								
		- - 1,281.	3							28.3
		1,279.				NON-CRYSTA	LLINE ROCK			29.9
			7			RESI	DUAL			31.9
		- - 1,275.	7			NON-CRYSTA	LLINE ROCK			33.9
		-				RESI	DUAL			
		_ _ 1,271.	7							37.9
		- 1,271.				NON-CRYSTA	LLINE ROCK			51.5
		1,268.	7							40.9
		-				RESI	JUAL			
		- 1,264.	7							44.9
		-		Boring Termina	ated	at Elevation 1,2 MATERIAL	64.7 ft IN RES 5 (IN-SITU)	IDUAL C	LAY-INFIL	L
		-								
		-								
		L								
		F								
		F			5.	14.9' : ALL	I\/ IM			
		F				- 16.8' : WE/		ROCK	, NO RI	EC.
		È.		16	.8' -	- 18.9' : 15-2	.5			
		È				- 28.3' : CLA				
		L		28	.3'	- 44.9' : 10-	15 (N.C.R.	w/ CL	AY IN-F	ILL)
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								B	ORE L	<u>.0G</u>			1			
WBS	48088.	1.1			Т	IP B-5895		COUNT	Y MADISO	N			GEOLOGIST Johnso	on, C. D.	_	
SITE	DESCRI	PTION	I Rep	lace E	Bridge	No. 67 on U	S 25/70 o	ver Frend	ch Broad Riv	er and	Private	Drive)		GROUI	ND WTR (ft)
BOR	ING NO.	EB2-	A		S	TATION 23	+13		OFFSET 3	84 ft LT			ALIGNMENT -L-		0 HR.	12.9 FIAD
COL		V. 1,	344.4	ft	Т	OTAL DEPTI	H 46.2 ft		NORTHING	i 801,9	942		EASTING 868,239		24 HR.	N/A
DRILL	RIG/HAM	MER E	FF./DA	TE A	FO8963	3 CME-550X 77	% 07/31/20	17		DRILL	VIETHOD	NV	U V Casing w/ SPT	HAMM	ER TYPE	Automatic
DRIL	LER Ch	eek. [0. 0.		S	TART DATE	07/31/19)	COMP. DAT	FE 07/	31/19		SURFACE WATER DE	EPTH N/	A	
ELEV		DEPTH		ow co			BLOWS P			SAMP.		L				
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	5 5	0	75 100	NO.	моі	O G	SOIL AND R	OCK DESC	CRIPTION	
	(/											<u> </u>				
1045																
1345						 · · · ·			· · · · ·			-		ND SURFA		0.0
	1											-		Tto 0.6' into		
1340	1.339.6	4.8										-	- 1,339.6			4.8
	1,339.0	4.0	2	1	1	\downarrow_2 · · ·						-	ROADWA			
												F	RED/BROW SANDY-SILT,	w/ trace CL	AY & som	
1335	1,334.6	9.8										<u> </u>	- PEBBLES/GF	RAVELS &	COBBLES	6
	1		1	1	2	• <u>3</u> · · · ·						<u> </u>				
	1											Ľ				
1330	1,329.6	14.8	2	1	1							Ľ	-			
	ĮŦ			'	'	• ²						F				
1325	ļ											Ę				
	1,324.6	19.8	2	2	2							_ F	-			
	1					1	· · · · ·					Ē				
1320	1.319.6	24.8										-	1,320.4	LLUVIAL		24.0
	,010.0	24.0	2	3	3	6						E	BROWN MED	STIFF to V		
	ĮŦ											E	SANDY-SILT, F	w/ trace C EBBLES	LAY, a fev	N
1315	1,314.6	29.8		10	15							Ē	-			
	‡		7	13	15		28					_				
4040	1						· · · · ·	· · · · ·				<u> </u>				
1310	1,309.6	34.8	2	3	5				<u> </u>			<u> </u>	-			
	±						· · · ·					-				37.0
1305	4 204 0	20.0				``\	· · · ·					-	GRAY/BLUISH			
	1,304.6	39.0	7	24	14		· • 38					F	DENSE, SILTY, I GRAVI	-INE-to-CC ELS/COBB		ND,
												-	1,302.1 SA			42.3
1300	1,299.6	44.8					· · · · · ·	· · · ·					RED/ORANG	E/BROWN		,
	1,298.2	46.2	8 60/0.0	54	46/0.2		· · <u> .</u> .		100/0.7 60/0.0	-		<u>-</u>	1,298.4	LT, w/ trac HERED RC		46.0
	1		00/0.0						60/0.0			E	GRAY/BLU FRACTURE	ISH-GRAY	HIGHLY	
	±											Ŀ	Boring Termina	ated WITH	STANDAF	
	+											F	PENETRATIC Elevation			at
												F	CRYSTALL	INE ROCK	(SHADY	
	‡											F	_ D'	OLOMITE)		
	‡											Ę				
	<u>+</u>											F	_			
	7											F				
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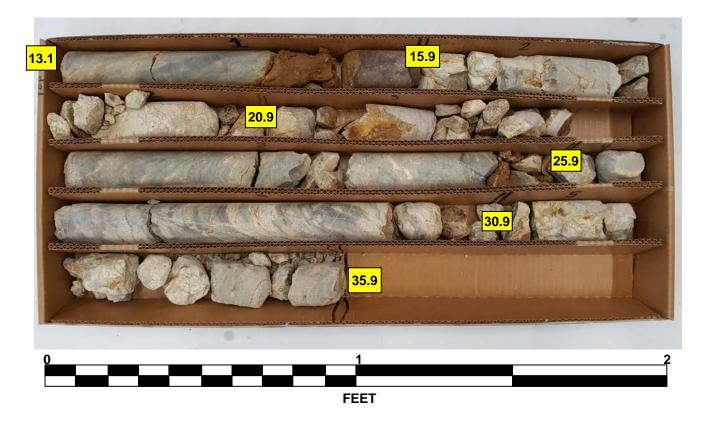
I) ELEV (f) 0.5ft 0.5ft 0.5ft 0 25 50 75 100 NO. MOI G ELEV. (f) DEPTH (f) DEPTH (f) ELEV. (f) DEPTH (f) DEPTH (f) DEPTH (f) DEPTH (f) DEPTH (f) DEPTH (f) ELEV. (f) DEPTH (f) DEPTH (f) DEPTH (f) DEPTH (f) DEPTH (f) ELEV. (f) DEPTH (f) DEPTH (f) ELEV. (f) ELEV. (f) DEPTH (f) DE										ORE L								.		40000
DRING NO. EB2-B (RW-1) STATION 23+12 OFFSET 35 ft RT ALIGNMENT L. 0 HR. FIAD DULAR ELEV. 1,317.5 ft TOTAL DEPTH 30.5 ft NORTHING 801,874 EASTING 868,230 24 HR N/A BUL RIGHAMMER EFF.DATE ACCRSS CACE 560X 77% 073/0712/017 DRILL METHOD NV Casing WSPT & CAC 44MRER TYPE Automatic DRILL RC Cheek, D.O. START DATE 0/226/19 COMP. DATE 0/226/19 SUBFACE WATER DEPTH N/A DRILLED DRILL RC Cheek, D.O. START DATE 0/226/19 COMP. DATE 0/226/19 SUBFACE WATER DEPTH N/A DRILLED DRILL RC Cheek, D.O. SOIL AND ROCK DESCRIPTION DRILL RC DRILL RC <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>10 07/</th><th></th><th></th><th></th><th><u> </u></th><th><u> </u></th><th></th><th>n, C. D.</th><th></th><th></th><th></th><th></th><th></th></td<>								10 07/				<u> </u>	<u> </u>		n, C. D.					
DLLAR ELEV 1,317.5 ft TOTAL DEPTH 30.5 ft NORTHING 801,874 EASTING 868,230 24 HR NA SULL RGHAMMER EFF/DATE AF0883 CME-550X 77% 07/31/2017 DRILL METHOD NVC asing WSPT & Core HAMMER TYPE Automatic DRILL RG MARE TYPE Automatic DRILL RG NA DRILL METHOD NVC asing WSPT & Core HAMMER TYPE Automatic DRILL RG DRILL RG <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>over Frend</th> <th></th> <th></th> <th></th> <th>Drive</th> <th></th> <th></th> <th>_</th> <th></th> <th></th> <th></th> <th></th>									over Frend				Drive			_				
BILL RIGHAMMER EFF-DATE AFOC6830 OM-5500X 77% 07/31/2017 DRILL METHOD NUC Ossing WSPT & Core HAMMER TYPE Automatic RILLER Check, D. O. START DATE 02/25/19 COMP. DATE 02/25/19 SURFACE WATER DEPTH N/A EV DRILL BLOWS PER FOOT ISAMP I						_										-		-		
RULLER Check, D. O. START DATE 0/2/25/19 SURFACE WIRE OPENTH N/A EV DEPTH BLOW COUNT BLOWS PER FOOT SOIL AND ROCK DESCRIPTION DEPTH (II) ODEPTH (III) DEPTH (III) DEPTH (IIII) DEPTH (IIII) DEPTH (IIIII) DEPTH (IIIIII) DEPTH (IIIIIII) DEPTH (IIIIIIIII) DEPTH (IIIIIIIIIIIIIII) DEPTH (IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII										NORTHING					1					
EV DEV DEPTH BLOW COUNT BLOWS PER FOOT SAMP L Solid and rot statistic to the scription 0 0.5ft													UN	-			Automatic			
EV ELEV DEPTIN 0 (f) (h) 0.5ft 0.5ft 0.5ft 0 25 50 75 100 NO. MOO G ELEV (h) DEPTH (h	DRIL		1	1								-		SURFACE WATER DEI	PTH N	I/A				
20	LEV (ft)	ELEV	UEPIN	·⊢	-		0 2					17	0		OCK DES	CRIPTION	DEPTH (ft)	E	LEV	RUN ELEV (ft)
15 1.312.7 4.8 16 84/0.4 1.3 1.3 1.3 1.316.2 COSE SLLTY, FINE-to-COURSE SAND w/ a few PEBBLES/GRAVELS 1.3 10 1.307.7 9.8 9.8 9.8 9.8 9.8 9.4 1.5 2.0 15 2.3 1.5 2.0 1.5 2.3 1.2 1.28	1320													- 1 317 5 GROUN	ID SURF	ACE	0.0	12	99.1	1,299.1 1,297.0
1.312/1 4.8 16 84/0.4 Image: constraint of the standard of the stan	1315	-												1,316.2 ROADWAY LOOSE SILTY, FIN a few PEB	EMBAN IE-to-CC BLES/GF	IKMENT DURSE SANE RAVELS	1.3	1	295	
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TIP B-5895 COUN 1.1 PTION Replace Bridge No. 67 on US 25/70 over Fre EB2-B (RW-1) **STATION** 23+12 **V.** 1,317.5 ft TOTAL DEPTH 30.5 ft IMER EFF./DATE AF08963 CME-550X 77% 07/31/2017 **START DATE** 02/25/19 neek, D. O. NXWL TOTAL RUN 12.1 ft DRILL RATE (Min/ft) RUN C. RQD t) (ft) 6 % DEPTH RUN (ft) (ft) SAMP. NO. REC (ft) REC. (ft) % 18.4 2.1 20.5 (0.8) (0.0) 38% 0% (4.6) ALUV 92% BLDR\$ (4.2) 84% 2:45/1.0 N=60/0.1 BLDR 2:45/1.0 2:50/1.1 5.0 2:17 25.5 04% N.C.R. 21.0' (2.3) 46% 1:50, 1:<u>55/1.0</u> (3.0) 60% 5.0 2:53/1.0 1:17/1.0 1:27/1.0 1:42/1.0 1:34/1.0 30.5

GEOTECHNICAL BORING REPORT CORE LOG

NT	YN	IADISO	N		GEOLOGIST John	ison, C	. D.			
ren	ch B	road Riv	ver and PrivateD	rive	I			GROUN	D WTR	(ft)
	OF	FSET :	35 ft RT		ALIGNMENT -L-			0 HR.	۶I	
	NO	RTHING	3 801,874		EASTING 868,230			24 HR.	Ν	I/A
			DRILL METHOD	NM	Casing W/SPT & Core	H	AMM	ER TYPE	Automat	ic
	со	MP. DA	TE 02/25/19		SURFACE WATER	DEPTH	I N/	A		
A QD ft) %	L O G	ELEV. (ft)	D	ESCRIPTION AND REM	ARKS			DEPT	H (ft)
		_		Со	ntinued from previou	s page				
		- - 1,296.5			ALLUVIAL (continue	ed)				21.0
			1		NON-CRYSTALLINE R	ROCK				
	薑	-								
		-	G	SSI	: 18.4' - 21.0' : ALL	UVIU	М			
		-			21.0 - 30.5' : 35-4	5				
		1,287.0	Dening Tomation (ad -	t Flowetian 4 007 0 ft Ibl					30.5
		-	Boring Terminate	ed a	t Elevation 1,287.0 ft IN I (SHADY DOLOMIT	NON-CF E)	4121	ALLINE R	UUK	
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B1-A BOX 1 of 1: 13.1 - 35.9 FEET

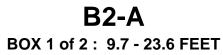


GEOLOGICAL STRENGTH INDEX: GSI 13.1' - 35.9' : 10 - 20



GEOLOGICAL STRENGTH INDEX: GSI 9.7' - 23.6' : 20 - 30

SHEET : 23 B-5895 / MADISON REPLACEMENT BRIDGE NO. 0067



B2-A BOX 2 of 2 : 23.6 - 33.6 FEET



GEOLOGICAL STRENGTH INDEX: GSI 23.6' - 33.6' : 15 - 25 SHEET : 24 B-5895 / MADISON REPLACEMENT BRIDGE NO. 0067

B3-A BOX 1 of 5: 26.4 - 39.3 FEET



GEOLOGICAL STRENGTH INDEX: GSI 26.4' - 39.3' : 35 - 45



GEOLOGICAL STRENGTH INDEX: GSI 39.3' - 47.4' : 15 - 25 *CLAY IN-FILL 46.3'-47.3' 47.4' - 52.5' : 30 - 40

SHEET : 25 B-5895 / MADISON REPLACEMENT BRIDGE NO. 0067



FEET

B3-A BOX 3 of 5 : 52.5 - 69.3 FEET **B3-A**



GEOLOGICAL STRENGTH INDEX: GSI 52.5' - 54.3' : 45 - 55 54.3' - 69.3' : 15 - 25* *N.C.R. w/ CLAY IN-FILL ZONES



GEOLOGICAL STRENGTH INDEX: GSI 69.3' - 75.0' : 10 - 20 *N.C.R. w/ CLAY IN-FILL ZONES 75.0' - 82.6' : 40 - 50

SHEET : 26 B-5895 / MADISON REPLACEMENT BRIDGE NO. 0067



B3-A BOX 5 of 5 : 82.6 - 89.3 FEET

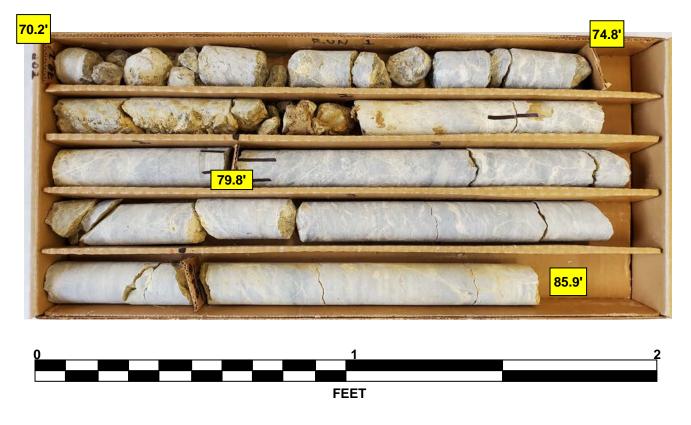


FEET

GEOLOGICAL STRENGTH INDEX: GSI 82.6' - 89.3' : 40 - 50 SHEET : 27 B-5895 / MADISON REPLACEMENT BRIDGE NO. 0067

B3-C BOX 1 of 4 : 70.2' - 85.9' FEET

B3-C BOX 2 of 4 : 85.9' - 95.8' FEET



GEOLOGICAL STRENGTH INDEX: GSI 70.2' - 78.4' : 10-20 *w/ CLAY IN-FILL ZONES 78.4' - 85.9' : 30-40 *w/ CLAY IN-FILL ZONES



SHEET : 28 B-5895 / MADISON REPLACEMENT BRIDGE NO. 0067

FEET

GEOLOGICAL STRENGTH INDEX: GSI 85.9' - 95.8' : 30-40 *w/ CLAY IN-FILL ZONES

B3-C BOX 3 of 4 : 95.8' - 107.2' FEET

B3-C BOX 4 of 4 : 107.2' - 129.8' FEET





GEOLOGICAL STRENGTH INDEX: GSI 95.8 - 107.2' : 35-45





GEOLOGICAL STRENGTH INDEX: GSI 107.2' - 109.8' : 35-45 109.8' - 117.1' : 10-20 * LOW RECOVERY 117.1 - 125.3' : CLAY IN-FILL, NO RECOVERY (SOME FROM 124.8' to 125.3') 125.3' - 129.8' : 30-40

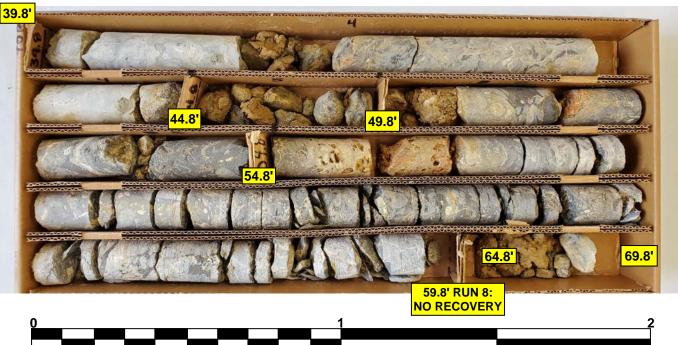
SHEET : 29 B-5895 / MADISON REPLACEMENT BRIDGE NO. 0067

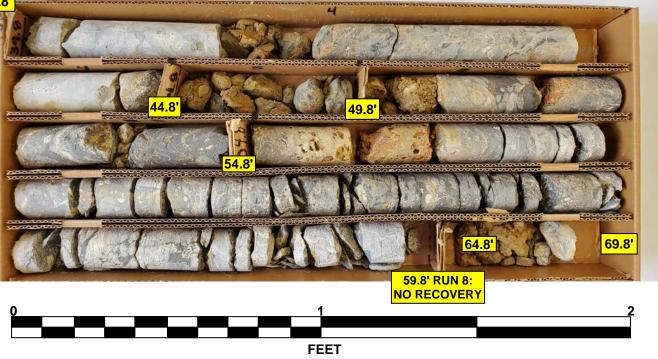
B3-BALT BOX 1 of 6 : 28.3' - 39.8' FEET





GEOLOGICAL STRENGTH INDEX: GSI 28.3' - 35.9' : 20-30 35.9' - 39.5' : CLAY IN-FILL, SOME RECOVERY





GEOLOGICAL STRENGTH INDEX: GSI 39.8' - 59.8' : 5-15 *ZONES OF FRACTURED N.C.R. w/ CLAY IN-FILL, LOW to MOD RECOVERY

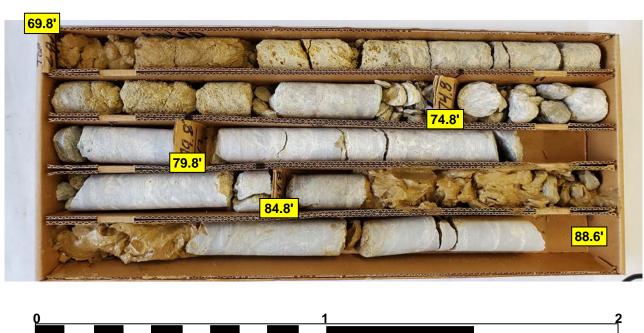
SHEET : 30 B-5895 / MADISON REPLACEMENT BRIDGE NO. 0067

B3-BALT BOX 2 of 6 : 39.8' - 69.8" FEET

59.8' - 69.8' : CLAY IN-FILL, NO RECOVERY (TRACE of REC. 64.8-69.8)

B3-BALT

BOX 3 of 6 : 69.8' - 88.6" FEET





GEOLOGICAL STRENGTH INDEX: GSI 69.8' - 71.3' : CLAY IN-FILL, SOME RECOVERY 71.3' - 88.6' : 15-20 *w/ CLAY IN-FILL ZONES



GEOLOGICAL STRENGTH INDEX: GSI 88.6' - 90.9' : 15-20 *w/ CLAY IN-FILL ZONES 90.9' - 98.6' : 30-40

SHEET : 31 B-5895 / MADISON REPLACEMENT BRIDGE NO. 0067

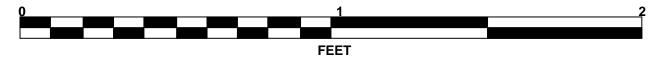
B3-BALT BOX 4 of 6 : 88.6' - 98.6' FEET

FEET

B3-BALT BOX 5 of 6 : 98.6'- 110.4' FEET

B3-BALT BOX 6 of 6 : 110.4' - 119.8' FEET





GEOLOGICAL STRENGTH INDEX: GSI 98.6' - 107.5' : 30-40 **107.5' - 110.4' : CLAY IN-FILL, SOME RECOVERY**



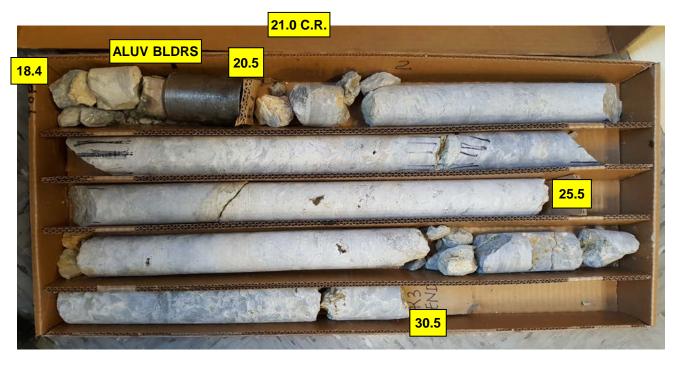


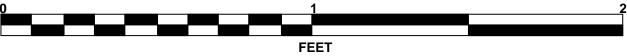
GEOLOGICAL STRENGTH INDEX: GSI 110.4' - 111.0' : CLAY IN-FILL 111.0' - 119.8' : 30-40

SHEET : 32 B-5895 / MADISON REPLACEMENT BRIDGE NO. 0067

B3-B BOX 1 of 1 : 6.5 - 44.9 FEET

EB2-B BOX 1 of 1: 18.4 - 30.5 FEET





GEOLOGICAL STRENGTH INDEX: GSI 21.0' - 30.5' : 45-55



GEOLOGICAL STRENGTH INDEX: GSI 16.8' - 19.9' : 30 - 40 19.9' - 24.9' : Barrel had NO RECOVERY 24.9' - 44.9' : 10 - 15

SHEET : 33 B-5895 / MADISON REPLACEMENT BRIDGE NO. 0067

CONTENTS SHEET NO.

3 5-7 8-9

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REFERENCE

DESCRIPTION TITLE SHEET LEGEND SITE PLAN PROFILE CROSS SECTIONS BORE & CORE LOGS

STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

MADISON

COUNTY_

REPLACE BRIDGE # 0067 ON PROJECT DESCRIPTION US-25/70 OVER FRENCH BROAD RIVER

RETAINING WALL I SITE DESCRIPTION STATION 23+90 TO 27+50 RT

48088 PROJEC

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5895	1	9

CAUTION NOTICE

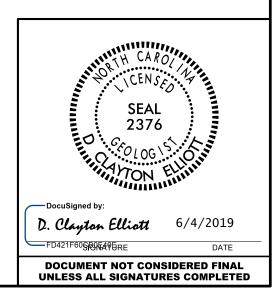
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNIKG AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEICH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1999 707-6805. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOL 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 UNI-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DECREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOLI MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOL MOISTURE CONDITIONS MAY YARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OF 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 OPHION 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 SATISY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OF FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDENSATION.

- NOTES: I. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT. 2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE. 2.

FERSUNNEL
NCDOT
DC CHEEK
CJ COFFEY
CD JOHNSON
DC ELLIOTT
INVESTIGATED BY DC ELLIOTT
DRAWN BY DC ELLIOTT
CHECKED BY JC KUHNE
SUBMITTED BY JC KUHNE
DATE



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

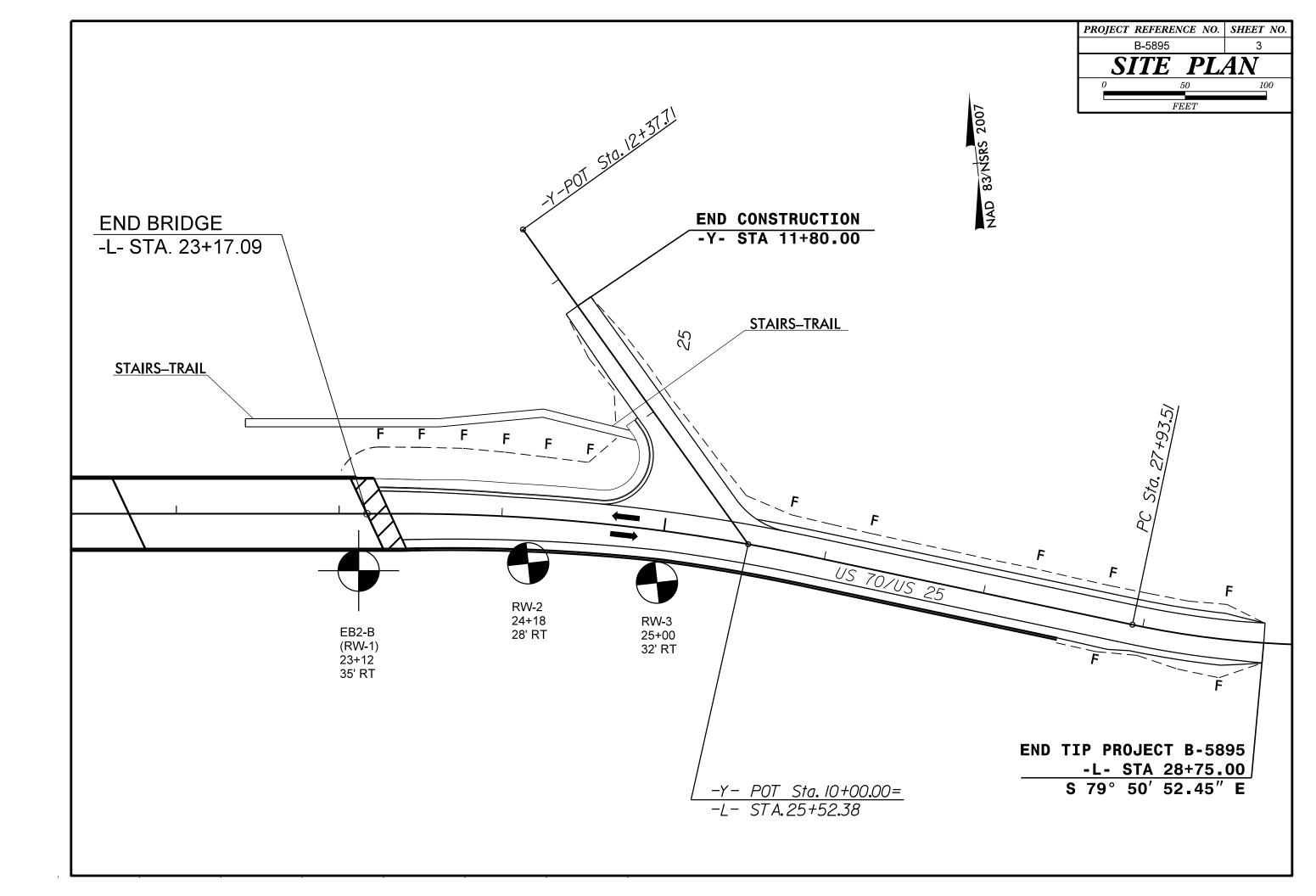
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

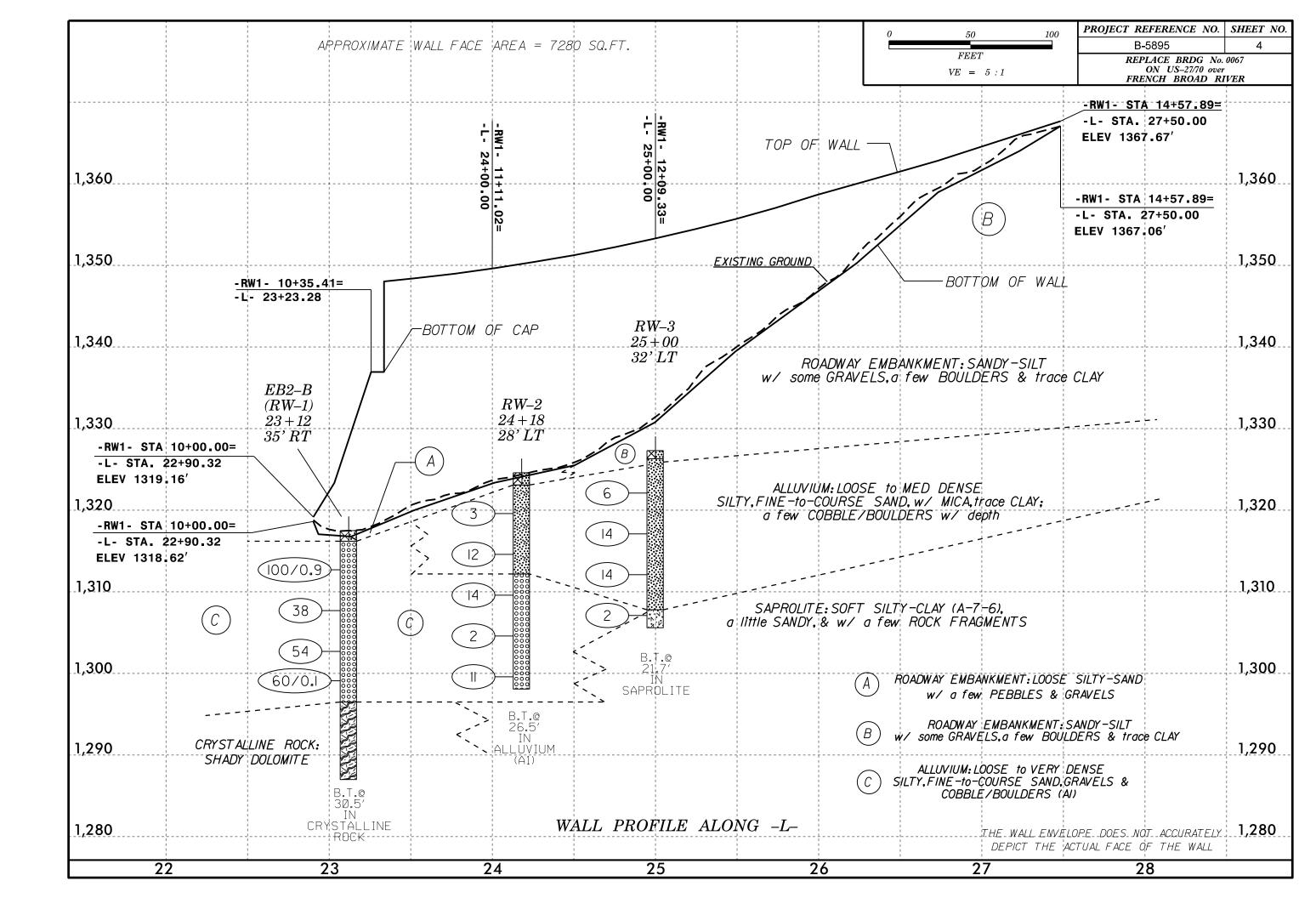
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLICHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AGASHTO I 206, ASTM DIS66). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING:	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN BLFOOT BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OF DEPENDECHTED, DX A. JONE OF UNATURED POORS
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,	ANGULARITY OF GRAINS	REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:
VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VA
SOIL LEGEND AND AASHTO CLASSIFICATION		ROCK (WR) 100 BLOWS PER FOOT IF TESTED.
CENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200)	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	CRYSTALLINE ROCK (CR) I T WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDE GNEISS, GABBRO, SCHIST, ETC.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-5 A-6, A-7	COMPRESSIBILITY	NON-CRYSTALLINE
SYMBOL 000000000000000000000000000000000000	SLIGHTLY COMPRESSIBLE LL < 31	ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
2 PASSING	MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY I SEDIMENTARY ROCK SPT REFUSAL, ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, (CP) SHELL BEDS, ETC.
1/0 50 MX GUN FE MY FE M	PERCENTAGE OF MATERIAL	WEATHERING
■280 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS
MATERIAL PASSING *40 LL 40 mx 41 mn 40 mx 41 mn 40 mx 41 mn 40 mx 41 mn 50ils With LL - LITLE DR	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	HAMMER IF CRYSTALLINE. VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATING (V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER
PI 6 MX NP 10 MX 11 MN 11 MN 10 MX 11 MN 11 MN 11 MN 11 MN 11 MN MODERATE ORGANIC GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX ND MX AMODERATE ORGANIC	GROUND WATER	OF A CRYSTALLINE NATURE.
USUAL TYPES STONE FRAGS. EINE SILTY OF CLAYEY SILTY OF CLAYEY MATTER	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP (SLI) I INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELL CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOW
OF MAJOR GRAVEL, AND SAND GRAVEL AND SAND SOILS SOILS	STATIC WATER LEVEL AFTER 24 HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN
GEN. RATING AS SUBGRADE EXCELLENT TO GOOD FAIR TO POOR FAIR TO POOR UNSUITABL	∇ PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY, ROC DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS CL WITH FRESH ROCK.
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ;PI OF A-7-6 SUBGROUP IS > LL - 30		MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSP
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF (MOD.SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN S
PRIMARY SOIL TYPE COMPACTNESS OR COMPACTNESS OR COMPACTNESS OR COMPACTNESS OR COMPACTNESS OR COMPACTNESS OF COM	L ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	IF TESTED, WOULD YIELD SPT REFUSAL
GENERALLY VERY LOOSE < 4 GENERALLY LOOSE 4 TO 10	↓ WITH SOIL DESCRIPTION ► OF ROCK STRUCTURES ↓ SOIL SYMBOL ● DPT DMT DPT DMT VST PMT TEST BORING SLOPE INDICATOR INSTALLATION	SEVERE ALL ROCK EXCEPT OUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT (SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KA TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.
MATERIAL MEDIUM DENSE 10 TO 30 N/A		IF TESTED. WOULD YIELD SPT N VALUES > 100 BPF
DENSE 30 TO 50 (NON-COHESIVE) VERY DENSE > 50 VERY DENSE > 50	THAN ROADWAY EMBANKMENT THOUGH BURING TEST	VERY ALL ROCK EXCEPT OUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISC SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOLI STATUS, WITH ONLY FRAGMENTS OF STRC (Y SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DECREE THAT ONLY
GENERALLY SOFT 2 TO 4 0.25 TO 0.5 SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0		VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES</u> COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SM/
MATERIAL STIFF 8 TO 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4	INFORME THE OFFICIENT OF PIEZOMETER INSTALLATION SPT N-VALUE	SCATTERED CONCENTIONS, QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPP ALSO AN EXAMPLE.
HARD > 30 > 4 TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	ROCK HARDNESS
		VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQU
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	UNDERCUT UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS F
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	SHALLOW UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF ACCEPTABLE DEGRADABLE ROCK EMBANKMENT OR BACKFILL	TO DETACH HAND SPECIMEN.
(BLDR.) (CUB.) (GR.) (CSE. SD.) (F SD.) (SL.) (UL.)	ABBREVIATIONS	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CA HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHE BY MODERATE BLOWS.
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN. 12 3	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK
SOIL MOISTURE - CORRELATION OF TERMS	CL CLAY MOD MODERATELY γ - UNIT WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC χ - DRY UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS POINT OF A GEOLOGIST'S PICK.
SOIL MOISTURE SCALE FIELD MOISTURE CUIDE FOR FIELD MOISTURE DESCRIPTION	CSE COARSE ORG ORGANIC	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGM
(ATTERBERG LIMITS) DESCRIPTION BODE FOR TILES MOISTONE BESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST <u>SAMPLE ABBREVIATIONS</u> DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMA PIECES CAN BE BROKEN BY FINGER PRESSURE.
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECE
(SAT.) FROM BELOW THE GROUND WATER TABLE	F - FINE SL SILT, SILTY ST - SHELBY TUBE FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED RE
PLASTIC SEMISOLID; REQUIRES DRYING TO	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL	
	FRAGS FRAGMENTS W - MDISTURE CONTENT CBR - CALIFORNIA BEARING HI HIGHLY V - VERY RATIO	FRACTURE SPACING BEDDING
	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FE
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.
	X CME-45C CLAY BITS X AUTOMATIC MANUAL	CLOSE 0.16 TO I FOOT VERY THINLY BEDDED 0.03 - 0. VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0
- DRY - (D) ATTAIN OPTIMUM MOISTURE	6* CONTINUOUS FLIGHT AUGER CORE SIZE:	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0. THINLY LAMINATED < 0.008
PLASTICITY	CME-55	INDURATION
PLASTICITY INDEX (PI) DRY STRENGTH	CME-550 HARD FACED FINGER BITS	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PR
NON PLASTIC 0-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT		FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH	X CASING X AVANCER POST HOLE DIGGER PORTABLE HOIST TRICONE STEEL TEETH HAND AUGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL P BREAKS EASILY WHEN HIT WITH HAMMER.
COLOR		INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE DIFFICULT TO BREAK WITH HAMMER.
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY), MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	CORE BIT VANE SHEAR TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE: SAMPLE BREAKS ACROSS GRAINS.

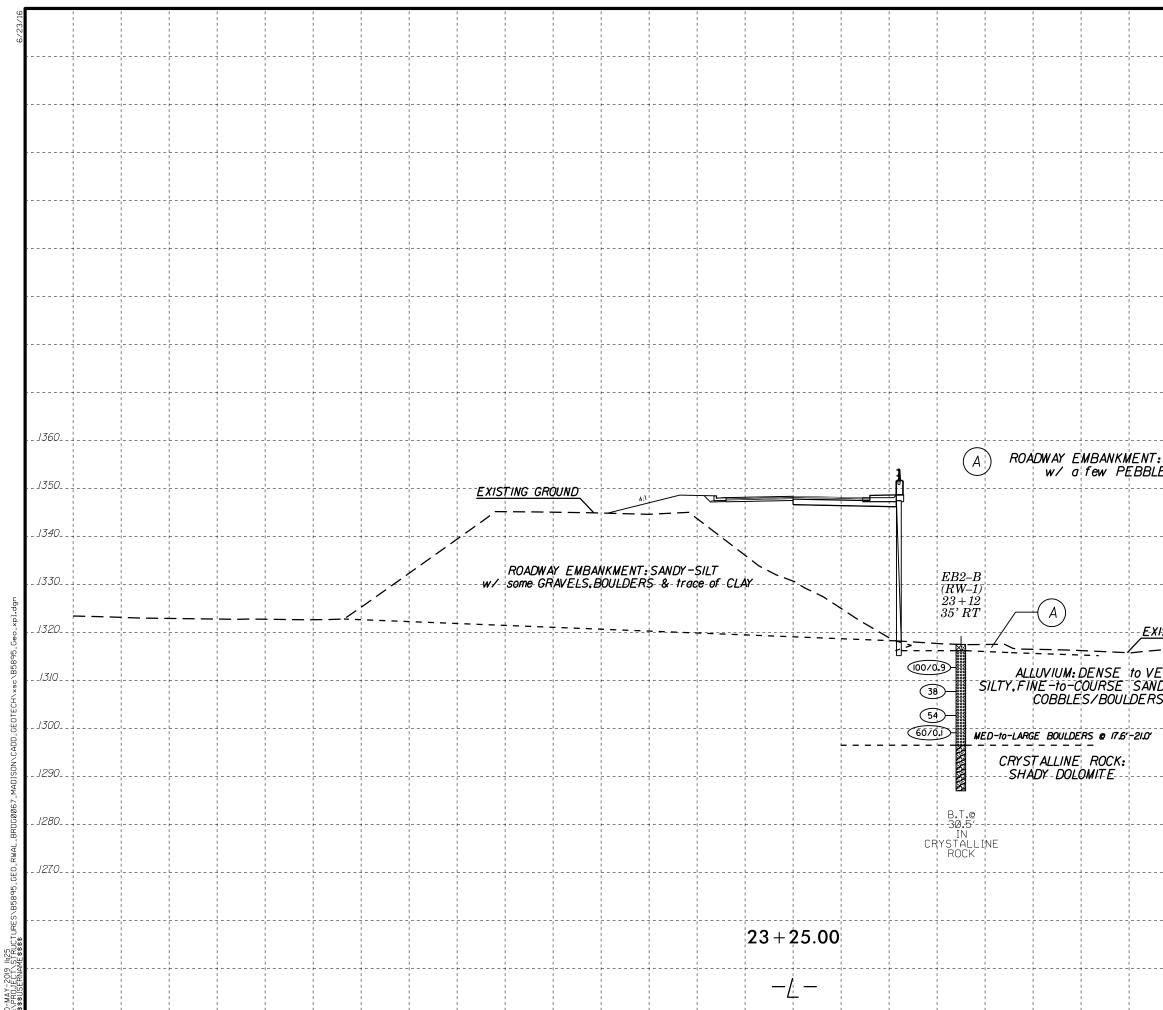




TERMS AND DEFINITIONS ED. AN INFERRED) SPT REFUSAL. 1 FOOT PER 60 IS OFTEN ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. ADUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS 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 IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND CK THAT SURFACE. CLUDES GRANITE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. AL PLAIN IF TESTED. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. MAY NOT YIELD STONE, CEMENTED 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. $\underline{\text{DIKE}}$ - 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 . NATINGS 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 ІСК ИР ТО SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FELDSPAR BLOWS. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. $\underline{\mathsf{FLOAT}}$ - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. Y. 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. ELDSPARS 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. RE DISCERNIBLE PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE STRONG ROCK T ONLY MINOR VALUES < 100 BPF OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK OUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SECMENTS EQUAL TO OR CREATER 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 S REQUIRES 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 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 ETACHED 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 R 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. FRAGMENTS $\underline{STRATA CORE RECOVERY (SREC.)}$ - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. IT. SMALL. THIN STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. PIECES 1 INCH ED READILY BY TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. BENCH MARK: ELEVATIONS TAKEN FROM CROSS-SECTIONS, FROM FILE FROM NCDOT CONNECT: "B-5895 Electronic Files", "b5895_rdy_xsc" THICKNESS 4 FEET ELEVATION: FEET .5 - 4 FEET 16 - 1.5 FEET NOTES: 3 - Ø.16 FEET 08 - 0.03 FEET 0.008 FEET FIAD - FILLED IMMEDIATELY AFTER DRILLING AT, PRESSURE, ETC. TEEL PROBE:





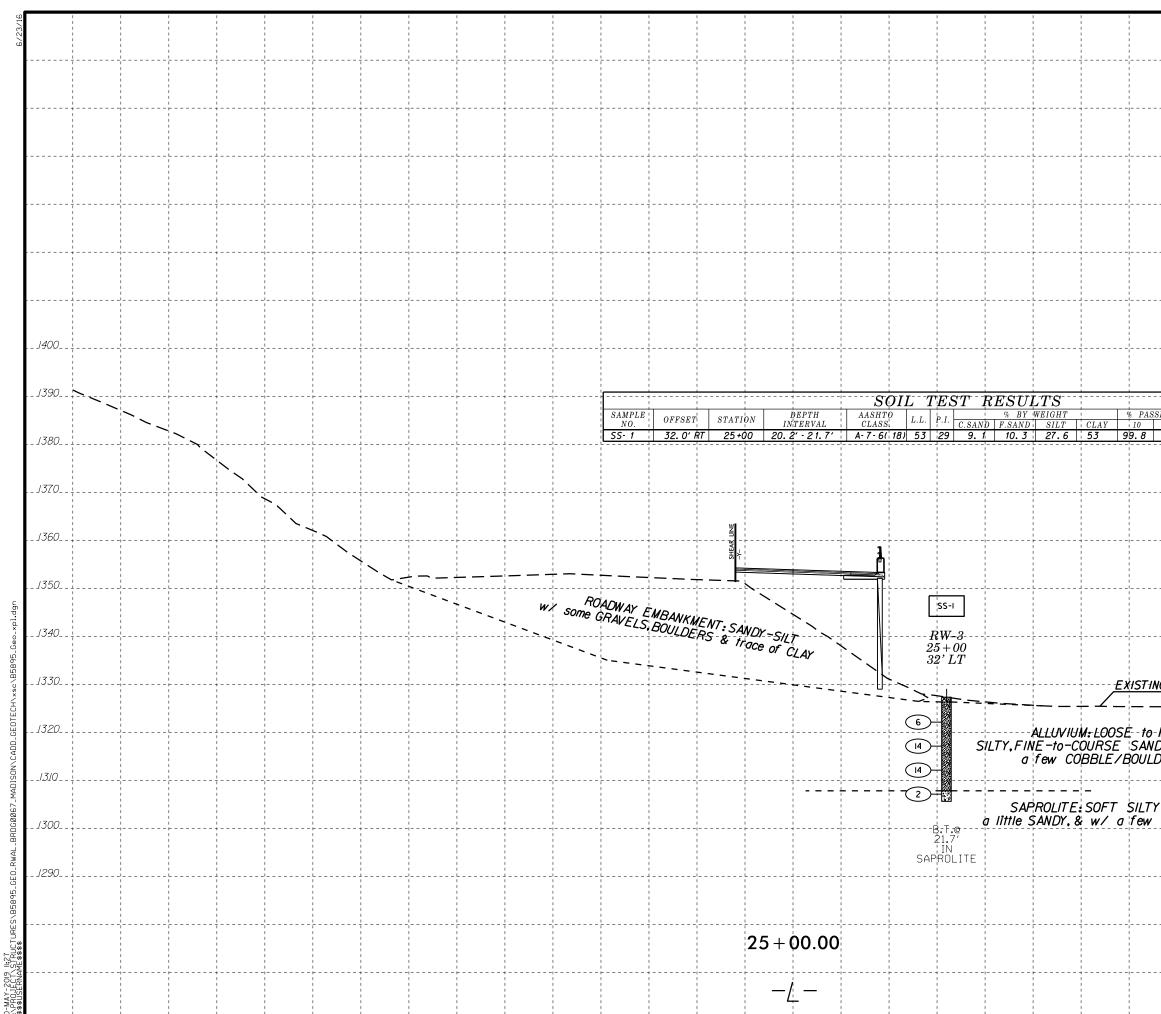


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SITE	SITE DESCRIPTION Replace Bridge No. 67 on US 25/70 over French Broad River and PrivateDrive BORING NO. EB2-B (RW-1) STATION 23+12 OFFSET 35 ft RT ALIGNMENT -L-														GROUN	D WTR (ft)			
BOR	ing no.	EB2-	B (RV	V-1)	ST	TATION 2	3+12		OFFSET 3	35 ft RT			ALIGNMENT -L-	0 HR.	FIAD				
COLI	LAR ELE	EV. 1,	317.5	ft	тс	TAL DEPT	FH 30.5 f	NORTHING	8 01,8	74		EASTING 868,230		24 HR.	N/A				
DRILL	_ RIG/HAI	MMER E	FF./DA	TE AF	-06744	CME - 45C 9	2%07/31/20	17		DRILL N	/IETHO	DN	W Casing W/SPT & Core	IAMM	ER TYPE	Automatic			
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WBS 48088.1.1 **TIP** B-5895 COUNTY SITE DESCRIPTION Replace Bridge No. 67 on US 25/70 over Frence BORING NO. EB2-B (RW-1) **STATION** 23+12 **COLLAR ELEV.** 1,317.5 ft TOTAL DEPTH 30.5 ft DRILL RIG/HAMMER EFF./DATE AF06744 CVE - 45C 92% 07/31/2017 DRILLER Cheek, D. O. **START DATE** 02/25/19 CORE SIZE N/A TOTAL RUN 12.1 ft RUN ELEV (ft) DRILL RATE (Min/ft) REC. RQD (ft) (ft) % % STRATA REC. RQD (ft) (ft) % % DEPTH RUN (ft) (ft) ELEV SAMP. (ft) NO. 1299.1 1,299.1 18.4 1,297.0 20.5 1295 1,292.0 25.5 1290 1,287.0 30.5

GEOTECHNICAL BORING REPORT CORE LOG

ORE LOG	1		
Y MADISON	GEOLOGIST Johnson	, C. D.	
ch Broad River and PrivateDrive			ID WTR (ft)
OFFSET 35 ft RT	ALIGNMENT -L-	0 HR.	FIAD
NORTHING 801,874	EASTING 868,229	24 HR.	N/A
	N Casing W/SPT & Core	HAMMER TYPE	Automatic
COMP. DATE 02/25/19	SURFACE WATER DEF	PTH N/A	
- L O G ELEV. (ft)	DESCRIPTION AND REMARK	S	DEPTH (ft)
0000	Begin Coring @ 18.4 ft ALLUVIAL (continued)		
<u> </u>	CRYSTALLINE ROCK		21.0
1,287.0			30.5
Boring Terminated at	Elevation 1,287.0 ft IN CRYS DOLOMITE)	TALLINE ROCK (SH	IADY
GSI: 18.5	' - 21.0': NA, ALUV BLE ' - 30.5': 45-55	DRS	
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BLOWS PER FOOT

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TIP B-5895

STATION 25+00

AFO6744 CME - 45C 92% 07/31/2017 **START DATE** 02/25/19

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TOTAL DEPTH 21.7 ft

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WBS	4808	38.1.1			1				TY MADISON GEOLOGIST Johnson, C. nch Broad River and PrivateDrive Vertex (Context) Vertext)								4 -		48088					ΓIP	
SITE	DESC	RIPTION	N Re	place	Bridge	e No	o. 67 on U	S 25/70 o	over Fren	ch Broad Riv	/er and	Privat	eDriv	e			GROUND WTR (ft)	·			lace B				
BOR	NG NO) . RW-	-2		\$	STATION 24+18			OFFSET 2	28 ft RT	-		ALIG	ALIGNMENT -L- 0 HR.				BOR	NG NO.	RW-3	3		S	ST/	
		L EV. 1,				TOTAL DEPTH 26.5 ft NORTHING 801,867				EAS	ING 868,334		24 HR. N/A	_		AR ELE					го				
DRILL	. RIG/H	AMMER E	EFF./D/	ATE A	FO674	14 CI	ME - 45C 92°	% 07/31/20	17		DRILL	METHO	OD N	WCasing	w/ SPT	HAMM	ER TYPE Automatic		DRILL	. RIG/HAI	VIMER E	FF./DA	TE AF	-06744	40
DRIL	LER	Cheek, l	D. O.		5	STA	RT DATE	02/25/1	9	COMP. DA	TE 02	/25/19)	SUR	ACE WATER D	EPTH N/	A		DRIL	LER C	heek, D). O.		S	ST/
ELEV	DRIVE		BL	ow co	UNT				PER FOOT		SAMP	. /			SOIL AND F	ROCK DESC	RIPTION		ELEV	DRIVE ELEV	DEPTH		W COL		_
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5f	it (0 25	5	50	75 100	NO.	Ис	0 G					╡	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	
1325														- 1,324.6	GROU	UND SURFA	CE 0.0		1330		-				
		1											X	1,323.1	ART LOOSE SILTY	SAND PAR				-	-				
		Ŧ						· · · ·						-		ALLUVIAL			4005	-	_				t
1320	1,319.	6 5.0	1	1	2	_ -	<u> </u> 							_	BROWN/GREY		E to COURSE		1325	-	-				
		Ŧ		'			9 ³					М		-	SAND, w/ MI COBBI	ICA, trace Cl LES/BOULD				1,322.1	5.2				
1315	4.044	Ţ.					·\							-					1320	-		3	4	2	
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310	1,309.	6 15.0					· · [. ·			· · · · · · ·				-		OSE to MED			1315	-	-				
		‡	4	6	8		14	· · · · ·		· · · · · ·		М	000	-	SAND, GRAVELS	S, COBBLES	& BOULDERS			1.312.1	-				
1205		‡					:/:::	· · · · ·		. .			000	-		(A1)			1310		-	6	8	6	
1305	1,304.	6+ 20.0	1	1	1		/					м	000	-					1310	-	-				
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	1,233.	20.0	8	6	5		• • 11					М	000	1,298.1			26.5			-	-				
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AL BORING REPORT **BORE LOG**

COUNTY MADISON GEOLOGIST Johnson, C. D. ace Bridge No. 67 on US 25/70 over French Broad River and PrivateDrive GROUND WTR (ft) OFFSET 32 ft RT ALIGNMENT -L-0 HR. FIAD **NORTHING** 801,846 **EASTING** 868,411 24 HR. N/A DRILL METHOD NW Casing w/ SPT HAMMER TYPE Automatic **COMP. DATE** 02/25/19 SURFACE WATER DEPTH N/A SAMP. MOI G SOIL AND ROCK DESCRIPTION 75 100 NO. ELEV. (ft) DEPTH (ft) GROUND SURFACE 1,327.3 1,326.3 ARTIFICIAL FILL LOOSE SILTY-SAND; PARKING AREA ALLUVIAL VERY LOOSE to MED DENSE BROWN/GREY SILTY, FINE to COURSE • • SAND, w/ MICA, trace CLAY; a few COBBLES/BOULDERS increasing with depth М М Μ 1,307.8 19 SAPROLITE . . . SS-1 М - 1,305.6 SOFT SILTY-CLAY, a little SANDY, & w/ a - few ROCK FRAGMENTS present (A-7-6) 21.7 Boring Terminated at Elevation 1,305.6 ft IN SAPROLITE (A-7-6)