#### **CONTENTS**

3825B

R

REFERENCE

<u>SHEET NO.</u>	<b>DESCRIPTION</b>
I	TITLE SHEET
2	LEGEND (SOIL & ROCK)
2A	SUPPLEMENTAL LEGEND (GSI)
3	SITE PLAN
4	PROFILE(S)
5-8	CROSS SECTION(S)
9-16	BORE LOG(S) & CORE REPORT(S)
17	ROCK TEST RESULTS
18-21	CORE PHOTOGRAPH(S)
22	SITE PHOTOGRAPH(S)

## STATE OF NORTH CAROLINA

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

# **STRUCTURE** SUBSURFACE INVESTIGATION

COUNTY Johnston

PROJECT DESCRIPTION NC 42 from SR 1902 (Glen Laurel Rd.) to SR 1003 (Buffalo Rd.)

SITE DESCRIPTION Bridge No. 75 on NC 42 over the Neuse River at -L- Sta. 64+20

# 34552 **PROJECT:**

STATE STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C. <b>R–3825B</b>	1	22

#### CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1991 707-680. THE SUBSIFICACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

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

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PERSONNEL

Lindsav Pugh

Mid Atlantic Drilling
INVESTIGATED BY Stone
DRAWN BY <u>J.L. Stone</u>
CHECKED BY
SUBMITTED BY
DATE June 2017
Engineers and Scientists
Washington, North Carolina
CARO
CENSS:
SEAL 2007
<b>F</b>
Magoh L. Statis
DocuSigned by:
Joseph 6 Stone 7/28/2017
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 C	DESCR	<b>IPTIO</b>	N						GR	ADATION						ROCK DE	SCRIPTION
BE PENET ACCORDIN IS B	RATED WIT NG TO THE BASED ON T	D UNCONSOLIDA H A CONTINUOL STANDARD PE HE AASHTO SY R, TEXTURE, MOI!	JS FLIGHT PO NETRATION TE STEM. BASIC∣	WER AUG EST (AAS) DESCRIPT	GER AND ' GHTO T 20 'TIONS GE	YIELD LESS 06,ASTM D NERALLY I	5 THAN 100 1586). SOIL NCLUDE THE	BLOWS PE CLASSIFIC FOLLOWIN	R FOOT ATION IG:	<u>WELL GRADED</u> - INDICAT <u>UNIFORMLY GRADED</u> - IN <u>GAP-GRADED</u> - INDICATE	NDICATES ES A MIX	S THAT SOIL (TURE OF UNI	PARTICLES ARE AL	LL APPROXIN	MATELY THE SAME SIZE.	ROCK LINE SPT REFUSA BLOWS IN N	INDICATE AL IS PE NON-COAS	S THE LEVEL NETRATION B STAL PLAIN	_ AT WHICH NON-CO Y A SPLIT SPOON S	WOULD YIELD SPT REFUSAL IF TEST ASTAL PLAIN MATERIAL WOULD YIELD AMPLER EQUAL TO OR LESS THAN Ø. ANSITION BETWEEN SOIL AND ROCK
AS	S MINERALO	GICAL COMPOS	ITION, ANGULA	ARITY, STR	RUCTURE,	PLASTICIT	Y,ETC. FOR	EXAMPLE,		THE ANGULARIT			SOIL GRAINS IS D		BY THE TERMS:		IALS AR	E TYPICALLY	DIVIDED AS FOLLO	
			ND AND					5/1C+A-1-0		ANGULAR, SUBAN						WEATHERED ROCK (WR)			NON-COASTAL PLA 100 BLOWS PER F	NIN MATERIAL THAT WOULD YIELD SP OOT IF TESTED.
GENERAL CLASS.		Granular Mater (≤ 35% Passing •	200)	(>	T-CLAY MA 35% Passin	NG \$200)		ANIC MATERIA	ALS		MES SUCH	H AS QUARTZ	CAL COMPOS	TALC, KAOLII		CRYSTALLIN ROCK (CR)	E		FINE TO COARSE WOULD YIELD SP1 GNEISS, GABBRO, S	GRAIN IGNEOUS AND METAMORPHIC RO REFUSAL IF TESTED. ROCK TYPE IN CHIST.ETC.
GROUP CLASS. 4	A-1 A-1-a A-1-b	A-3 A-2-4 A-	A-2 -2-5 A-2-6 A-2	_	A-5 4	A-6 A-7 A-7-5. A-7-6	A-1, A-2 A-3	A-4, A-5 A-6, A-7					RESSIBILITY			NON-CRYSTA	LLINE		FINE TO COARSE	GRAIN METAMORPHIC AND NON-COAST
SYMBOL				3								MPRESSIBLE COMPRESSIBL	F	LL < 31 LL = 31		COASTAL PL			ROCK TYPE INCLL	DES PHYLLITE, SLATE, SANDSTONE, ET EDIMENTS CEMENTED INTO ROCK. BUT
% PASSING	0000000000		2010 PM . PM PM .				····	SILT-	******		LY COMPR	RESSIBLE		LL > 50		SEDIMENTAR (CP)	Y ROCK			CK TYPE INCLUDES LIMESTONE, SAND
	50 MX 30 MX 50 MX	51 MN					GRANULAR SOILS	CLAY	MUCK, PEAT		P		GE OF MATER							HERING
	15 MX 25 MX	10 MX 35 MX 35	MX 35 MX 35	MX 36 MN	36 MN 36	. MN 36 MN		50125		ORGANIC MATERIAL TRACE OF ORGANIC M	-	GRANULAR <u>SOILS</u> 2 - 3%	SILT - CLAY <u>SOILS</u> 3 - 5%	<u>OTH</u> TRACE	<u>ER MATERIAL</u> 1 - 10%	FRESH		RESH, CRYSTA		NTS MAY SHOW SLIGHT STAINING. ROCK
MATERIAL PASSING #40 LL	_		I MN 40 MX 41 M				SOILS LITTLE			LITTLE ORGANIC MAT MODERATELY ORGANIC HIGHLY ORGANIC	TER	2 - 3% 3 - 5% 5 - 10% > 10%	5 - 12% 12 - 20% > 20%	LITTLE	E 10 - 20% 20 - 35%	VERY SLIGHT (V SLI.)	т воск о	GENERALLY FR	ESH, JOINTS STAINED	, SOME JOINTS MAY SHOW THIN CLAY C SHINE BRIGHTLY. ROCK RINGS UNDER F
PI GROUP INDEX	6 MX Ø	NP 10 MX 10	1 MX 11 MN 11 M 4 MX	_		MN 11 MN MX NO MX	MODER	RATE	HIGHLY ORGANIC				JND WATER		SS% HIND HEOVE			CRYSTALLINE		
USUAL TYPES S	STONE FRAGS. GRAVEL, AND	FINE SILT	Y OR CLAYEY	SIL	ILTY	CLAYEY	AMOUNT ORGAI MATT	NIC	SOILS	▽		R LEVEL IN E	BORE HOLE IMMEDIA		R DRILLING	SLIGHT (SLI.)	1 INCH.	OPEN JOINTS	S MAY CONTAIN CLAY	) AND DISCOLORATION EXTENDS INTO RC . IN GRANITOID ROCKS SOME OCCASIONA RYSTALLINE ROCKS RING UNDER HAMMEI
MATERIALS	SAND	SAND GRAV	'el and sand		DILS	SOILS							VEL AFTER <u>24</u>			MODERATE (MOD.)				ISCOLORATION AND WEATHERING EFFECT DULL AND DISCOLORED, SOME SHOW CL4
gen, Rating As Subgrade		EXCELLENT TO G	000		FAIR TO F	OOR	Fair to Poor	POOR	UNSUITABLE	: - ────		NG OR SEEP	ATURATED ZONE, OF	: WAIER BE	ARING SIRATA		DULL S			SHOWS SIGNIFICANT LOSS OF STRENGTH
		PI OF A-7-5 SUB	GROUP IS ≤ LL				> LL - 30									MODERATELY				OR STAINED. IN GRANITOID ROCKS, ALL
					NGE OF ST		RANGE	E OF UNCO	NFINED				NEOUS SYMBO	<u>JL3</u>		SEVERE (MOD. SEV.)	AND C4	AN BE EXCAVA	TED WITH A GEOLOG	KAOLINIZATION. ROCK SHOWS SEVERE L ST'S PICK. ROCK GIVES "CLUNK" SOUND
PRIMARY S		COMPACT CONSIS	STENCY	PENET	IRATION R (N-VALU		COMPR	ESSIVE SI (TONS/FT	TRENGTH	L ROADWAY EMB			OF ROCK STRU SPT	JCTURES	SLOPE INDICATOR	SEVERE (SEV.)	ALL R	ОСК ЕХСЕРТ С		DR STAINED. ROCK FABRIC CLEAR AND E IN GRANITOID ROCKS ALL FELDSPARS
GENERAL GRANULA		LOU	DSE	Í -	4 TO 10 TO	10		N/A		SOIL SYMBOL			OPT DMT TEST BOP		INSTALLATION				OME FRAGMENTS OF TELD SPT N VALUES	STRONG ROCK USUALLY REMAIN. > 100 BPF
MATERIA (NON-COH		VERY	NSE DENSE	<b> </b>	30 TO > 50	50 1		< 0.25		ARTIFICIAL FI THAN ROADWA	AY EMBAN		) AUGER BORING	۵ ۵	CONE PENETROMETER TEST SOUNDING ROD	VERY SEVERE (V SEV.)	ALL RO BUT M	DCK EXCEPT O ASS IS EFFEC	WARTZ DISCOLORED ( TIVELY REDUCED TO	DR STAINED. ROCK FABRIC ELEMENTS AN SOIL STATUS, WITH ONLY FRAGMENTS O F ROCK WEATHERED TO A DEGREE THA
GENERAL SILT-CL4 MATERIA	AY	SO MEDIUM ST	FT STIFF		2 TO 4 TO 8 TO	4 8		0.25 TO 0 0.5 TO 1. 1 TO 2				MWC		ELL –	TEST BORING WITH CORE	COMPLETE	VESTIG ROCK F	ES OF ORIGIN	AL ROCK FABRIC REN SOIL. ROCK FABRIC N	MAIN. <u>IF TESTED, WOULD YIELD SPT N</u> DT DISCERNIBLE, OR DISCERNIBLE ONLY NY BE PRESENT AS DIKES OR STRINGER:
(COHESI)		VERY	STIFF		15 TO > 30	30		2 TO 4 > 4		ALLUVIAL SOI	IL BOUND		PIEZOMETER INSTALLATION	Ċ	)- SPT N-VALUE			AN EXAMPLE.		
		T	EXTURE	OR G	RAIN	SIZE				<u> </u>	RE	ECOMMEN	DATION SYMB	JOLS		VERY HARD				HARDNESS ARP PICK. BREAKING OF HAND SPECIMEN
U.S. STD. SIE			4 10	40			270					CLASSIFIED EX SUITABLE WAS			ASSIFIED EXCAVATION - PTABLE.BUT NOT TO BE		SEVERA	AL HARD BLOW	S OF THE GEOLOGIS	T'S PICK.
OPENING (MM BOULDEF	R CC	DBBLE G	4.76 2.00 RAVEL	0.4 COAR SAN	RSE	25 0.075 FINE SAND	S	ILT	CLAY	SHALLOW UNDERCUT		LASSIFIED E		USED	IN THE TOP 3 FEET OF NKMENT OR BACKFILL	HARD	TO DET	TACH HAND SP	ECIMEN.	NLY WITH DIFFICULTY. HARD HAMMER B
(BLDR.) GRAIN MM		COB.) 75	(GR.) 2.0	(CSE.		(F SD.		SL.) 0.005	(CL.)	AR - AUGER REFUSAL			REVIATIONS MEDIUM	VST	- VANE SHEAR TEST	HARD	EXCAVA		BLOW OF A GEOLOG	GOUGES OR GROOVES TO 0.25 INCHES D IST'S PICK. HAND SPECIMENS CAN BE D
SIZE IN.		3 SOIL MOIS	TURE -	CORRI			TERMS			BT - BORING TERMINATED - CL CLAY - CPT - CONE PENETRATION		MOD	MICACEOUS MODERATELY ION PLASTIC	$\gamma$	N WEATHERED - UNIT WEIGHT - DRY UNIT WEIGHT	MEDIUM HARD	CAN BE		IN SMALL CHIPS TO	S DEEP BY FIRM PRESSURE OF KNIFE ( PEICES 1 INCH MAXIMUM SIZE BY HARD
	MOISTURE ERBERG LI		FIELD MI DESCRI		GL	IDE FOR F	TIELD MOIS	TURE DES	CRIPTION	CSE COARSE DMT - DILATOMETER TES DPT - DYNAMIC PENETRA	БТ	ORG PMT -	ORGANIC PRESSUREMETER TI SAPROLITIC	EST <u>S</u>	SAMPLE ABBREVIATIONS BULK	SOFT	CAN BE	E GROVED OR CHIPS TO SEV	GOUGED READILY BY	KNIFE OR PICK. CAN BE EXCAVATED IN E BY MODERATE BLOWS OF A PICK POIN
LL		) LIMIT	- SATUR (SAT.				DUID:VERY			e - VOID RATIO F - FINE - FOSS FOSSILIFEROUS		SD S SL S	AND, SANDY ALT, SILTY SLIGHTLY	SS ST	- SPLIT SPOON - SHELBY TUBE - ROCK	VERY SOF T	CAN BE OR MOR	E CARVED WIT RE IN THICKN	H KNIFE. CAN BE EX	CAVATED READILY WITH POINT OF PICK. BY FINGER PRESSURE. CAN BE SCRATCH
PLASTIC RANGE <			- WET -	(W)			EQUIRES D			FRAC FRACTURED, FRAC FRAGS FRAGMENTS	TURES	TCR -	TRICONE REFUSAL	RT	- RECOMPACTED TRIAXIAL		FINGER	NAIL.		BEDDING
(PI) PL		IC LIMIT								HI HIGHLY		V - VE			RATIO	TERM			SPACING	TERM
OM . SL .		UM MOISTURE KAGE LIMIT	- MOIST	- (M)	SC	LID; AT OF	R NEAR OP1	TIMUM MOI	STURE	DRILL UNITS:	ADVAN	NCING TOOLS:	ON SUBJECT	HAMMER	R TYPE:	VERY WI WIDE MODERAT		3 SE 1	THAN 10 FEET TO 10 FEET TO 3 FEET	VERY THICKLY BEDDED THICKLY BEDDED 1 THINLY BEDDED 0.
			- DRY -	(D)			DITIONAL MUM MOIST			X CME-45C		CLAY BITS 6. CONTINUOUS	S FLIGHT AUGER			CLOSE VERY CL	OSE		6 TO 1 FOOT THAN 0.16 FEET	VERY THINLY BEDDED 0.0 THICKLY LAMINATED 0.0 THINLY LAMINATED 4
	1		PLr	ASTIC	ITY							8 HOLLOW AU		в	П-н					RATION
	PLASTIC		PLAST		NDEX (PI)			Y STRENGI VERY LOW	гн	CME-550		HARD FACED		X-N	<u>0                                    </u>			OCKS, INDURA		NING OF MATERIAL BY CEMENTING, HE FINGER FREES NUMEROUS GRAINS;
SL1G	GHTLY PLAS			0-5 6-15			Ň	SLIGHT		VANE SHEAR TEST			E INSERTS W/ ADVANCER	HAND T	OOLS:	FRIA	ЗLE			BY HAMMER DISINTEGRATES SAMPLE.
	ERATELY P HLY PLAST			16-25 26 OR M	IORE			MEDIUM HIGH		PORTABLE HOIST			W7 ADVANCER 15/16 • STEEL TEETH		OST HOLE DIGGER AND AUGER	MODE	RATELY	INDURATED		E SEPARATED FROM SAMPLE WITH S Y WHEN HIT WITH HAMMER.
				COLOF	<u> </u>					X D-25			' TUNGCARB.	🔲 s	OUNDING ROD	INDUF	RATED			DIFFICULT TO SEPARATE WITH STEEL BREAK WITH HAMMER.
		INCLUDE COLO UCH AS LIGHT										CORE BIT			ANE SHEAR TEST	EXTR	EMELY I	NDURATED	SHARP HAMME	R BLOWS REQUIRED TO BREAK SAMPLI

# PROJECT REFERENCE NO.



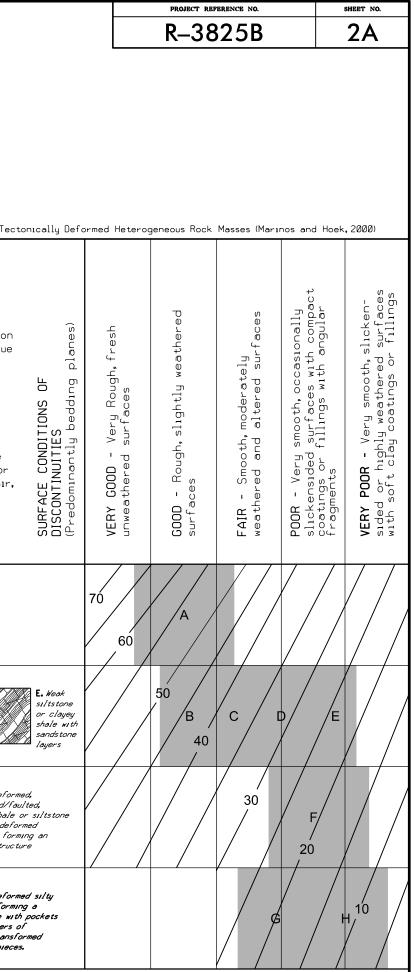
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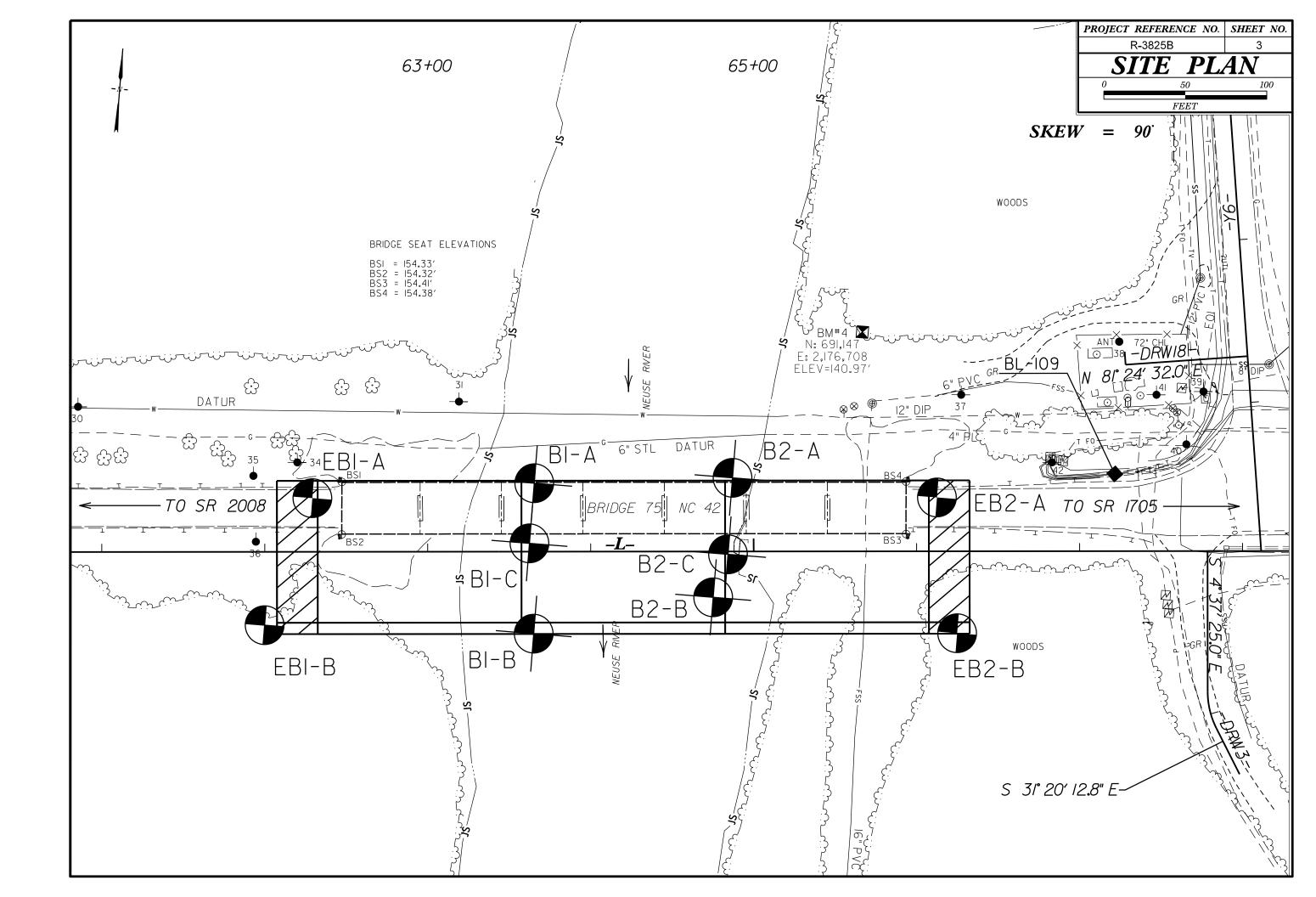
	TERMS AND DEFINITIONS
D. AN INFERRED	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
SPT REFUSAL. FOOT PER 60	AQUIFER - A WATER BEARING FORMATION OR STRATA.
IS OFTEN	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING
N VALUES >	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
	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
CK THAT CLUDES GRANITE.	SURFACE.
L PLAIN	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
F TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
MAY NOT YIELD	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED
TONE, CEMENTED	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
RINGS UNDER	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
	HORIZONTAL.
ATINGS 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 . 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.
. IN Y. ROCK HAS	FLOAT - 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
DSS OF STRENGTH	FIELD.
HEN 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.
RE 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
E DISCERNIBLE STRONG ROCK	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE
ONLY MINOR	OF AN INTERVENING IMPERVIOUS STRATUM.
ALUES < 100 BPF	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
N SMALL AND SAPROLITE IS	ROCK DUALITY DESIGNATION (RDD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EDUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
OWS REQUIRED	<u>SILL</u> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
EP CAN BE TACHED	<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 I FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL
FRACHENTO	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY
FRAGMENTS 1. SMALL, THIN	TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
PIECES 1 INCH ED READILY BY	<u>STRATA ROCK QUALITY DESIGNATION (SROD)</u> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OK GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
	BENCH MARK: BM # 4
THICKNESS 4 FEET	END BENT ELEVATION DATA COLLECTED USING A SURVEY GRADE GPS
5 - 4 FEET	ELEVATION: 141.0 FEET
6 - 1.5 FEET 3 - 0.16 FEET	NOTES:
8 - 0.03 FEET 0.008 FEET	
AT, PRESSURE, ETC.	
EEL PROBE;	
PROBE:	
;	
	DATE: 8-15-14

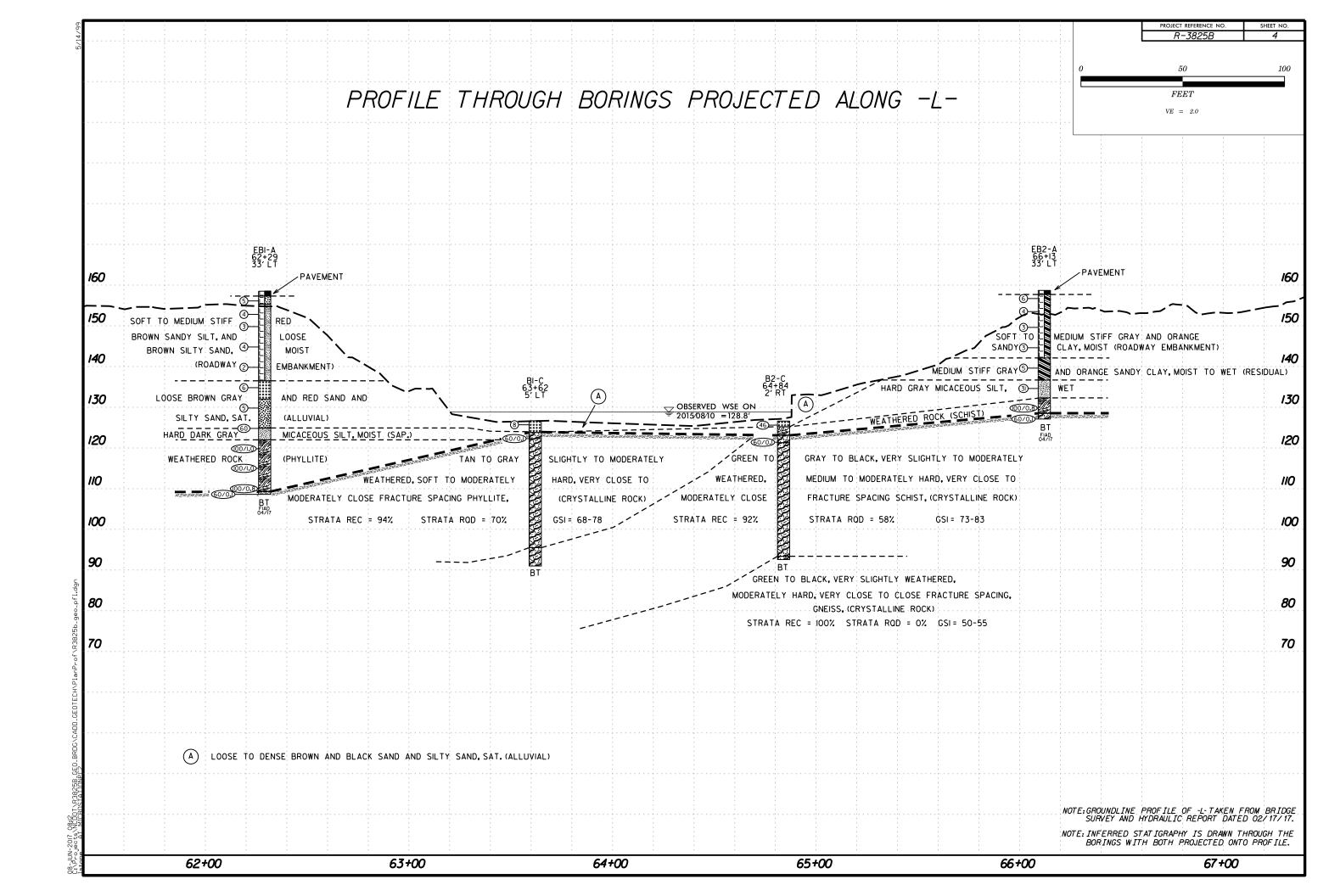
## NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

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

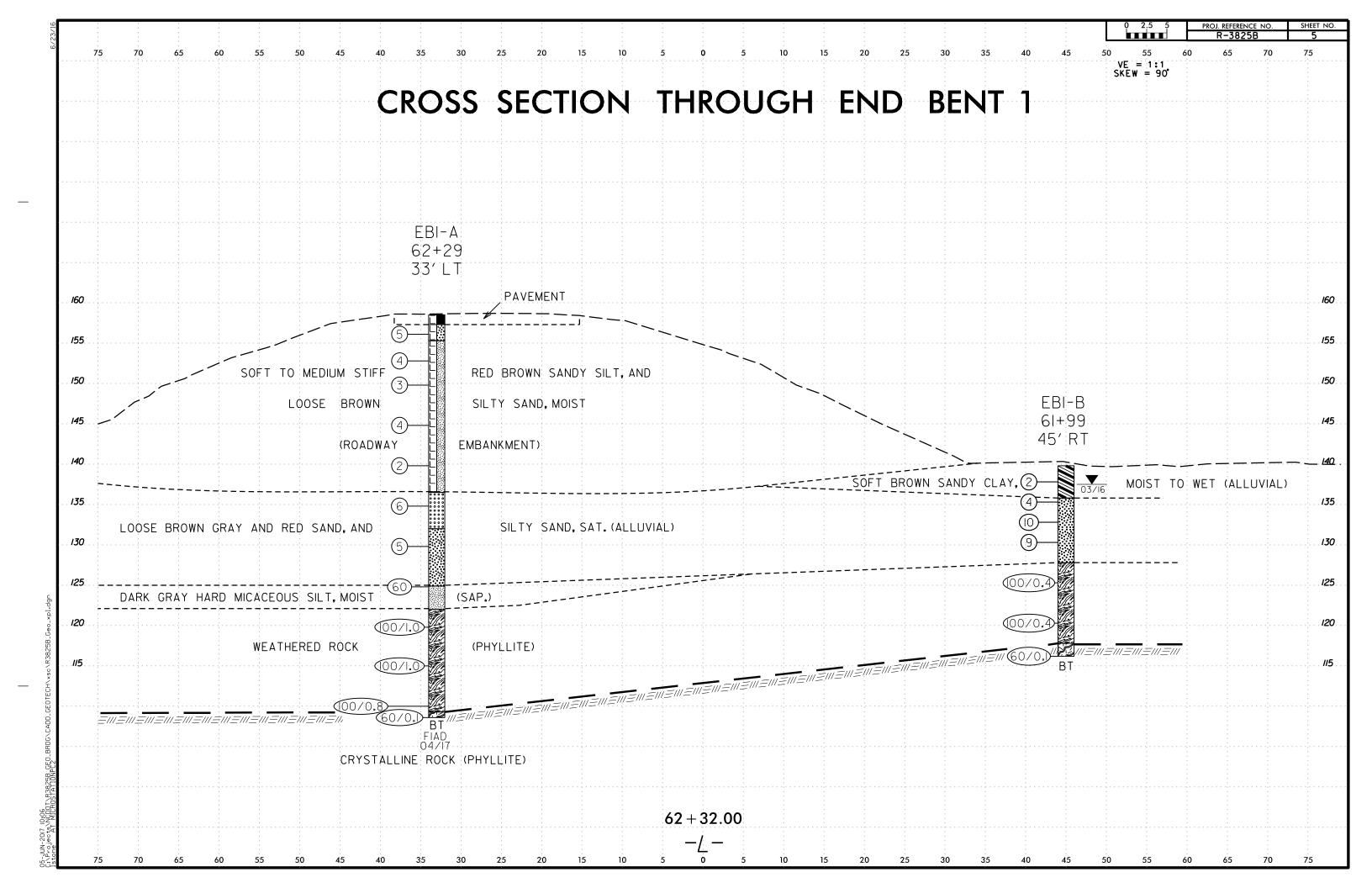
AASHTO LRFD Figure 10.4.6.4–1 — Determination of GSI for Jointed F	Rock Mass (Marı	nos and Hoek,2	2000)			AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for T
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000) From the lithology, structure and surface conditions of the discontinuities, 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	0D gh, fresh unweathered surfaces	slightly weathered, iron stained	ch, moderately weathered and ed surfaces	POOR Slickensided, highly weathered surfaces with compact coatings or fillings or angular fragments	<b>VERY POOR</b> 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
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.		<b>GOOD</b> Rough, surface	FAIR Smoot alter		~	not change the value of GSI and it is dealt with by using effective stress analysis.
STRUCTURE	DEC	CREASING SU	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.
BLOCKY - well interlocked un- disturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets		70 60				B. Sand- stone with thin inter-
VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets		5	0			layers of siltstone amounts stone layers
BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity			40	30		<b>C, D, E,</b> and <b>G</b> - 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 <b>F</b> and <b>H</b> .
discontinuity sets. Persistence of bedding planes or schistosity 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	Main Means deformation after tectonic disturbance

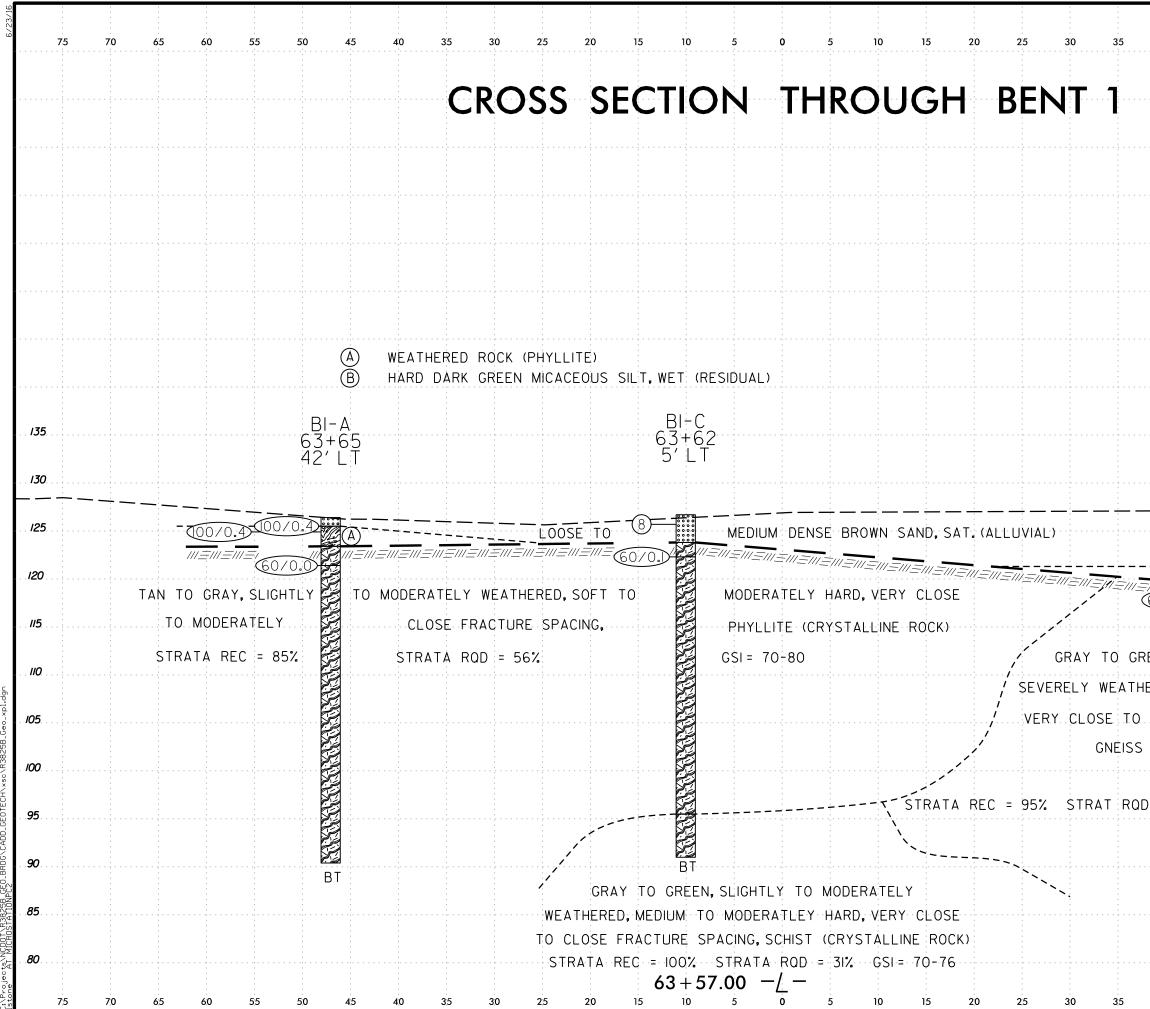




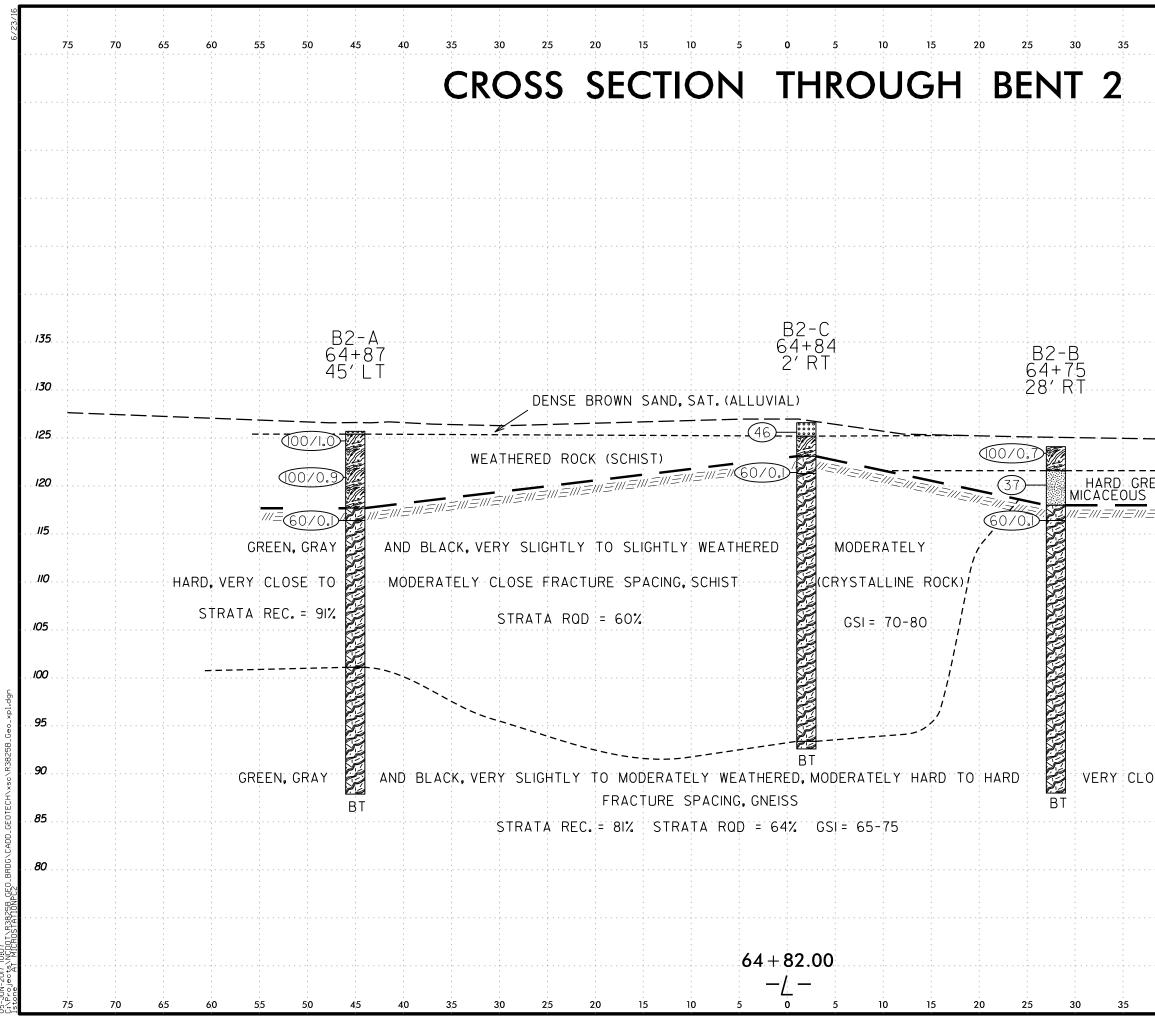


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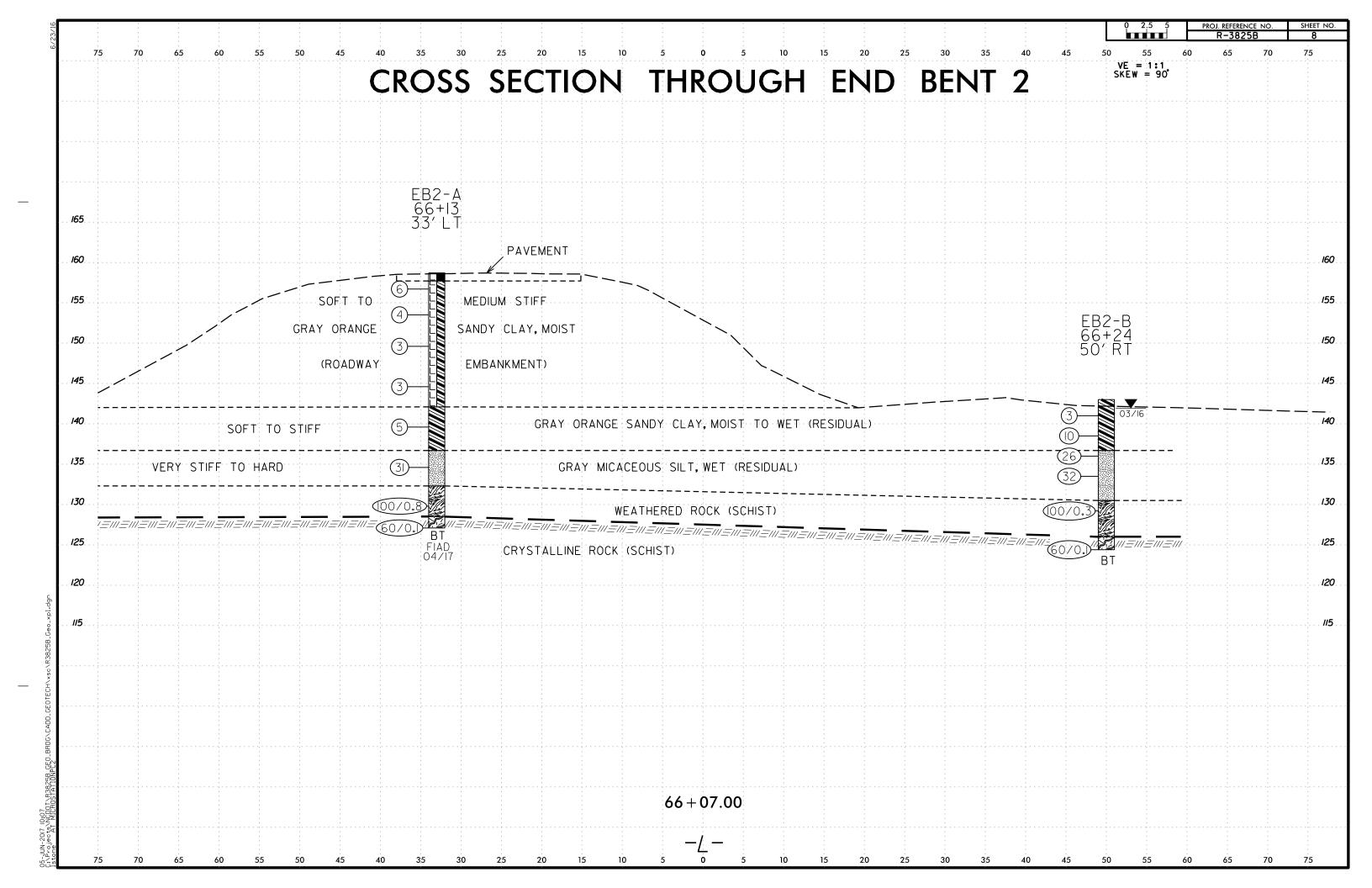




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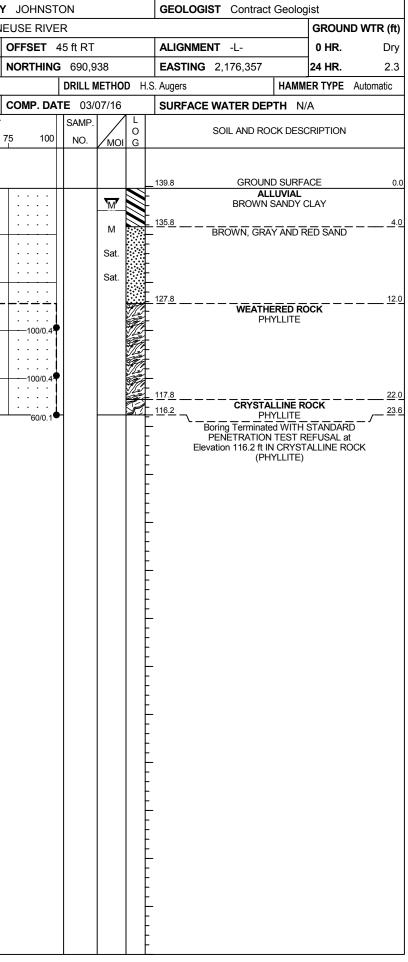


		0 2.5 5	P	ROJ. REFEREN	CE NO.	sheet no. <b>7</b>
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DSE TO WIE	DE					
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40 45	50	55	60	65	70	75



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		2.1.FR3					R-3825					JOHNS				(	GEOLO	GIST Lindsay Pugh					52.1.FR				<b>P</b> R-3825		COUNT	
				IDGE I						R TH		USE RIV							_	ND WTR (ft)					IDGE		5 ON -L- (N	-	ER THE I	
BORI	NG NO	. EB1-	A				ON 6				_	OFFSET						MENT -L-	0 HR.	FIAD			<b>0.</b> EB1				TATION 6			0
COLL	AR ELI	<b>EV.</b> 15	58.5 ft		T	OTAI	L DEP	TH 4	49.9 f	t	1	NORTHIN	<b>IG</b> 691,	018		I	EASTIN	<b>G</b> 2,176,380	24 HR.	N/A	COL	LAR E	<b>LEV.</b> 1	39.8 ft		Т	OTAL DEPT	<b>H</b> 23.6 f	ť	N
DRILL	RIG/HA	MMER E	FF./DA	TE M	D5464	CME-	-45C 84	% 08/0	09/2016	6			DRILL	METH	IOD	Mud F	Rotary	HAM	MER TYPE	Automatic	DRIL	L RIG/H	AMMER	EFF./DA	TE B	RI2974 (	CME-45C 79%	6 06/03/2015	5	
DRIL		1. COO	GAN		S	TAR	T DAT	<b>E</b> 04	4/22/1	7	0	COMP. D	<b>ATE</b> 04	/22/1	7	5	SURFA	CE WATER DEPTH	N/A		DRIL		Contrac	t Drille	r	S	TART DATE	03/07/1	6	С
ELEV	DRIVE ELEV			ow co						PER FC			SAMP	?. <b>▼</b> ∕		5		SOIL AND ROCK DE	SCRIPTION	1	ELEV	DRIVE		· —	ow co				PER FOO	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0		25	į	50	7	5 10	NO.	/м	OI G	EI EI	LEV. (ft)			DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	25	50	75
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	157.3	+				+		· ·		· · ·				-			58.5 57.3	GROUND SUR ROADWAY EMBA		0.0	4 1	138.8	1.0 +	1	1	1			· · · ·	:
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		‡					· · · · · ·		· · · · · ·		· · · ·	· · · · ·				∭- ∭- 13	36.5			22.0		116.3	+						· · · ·	
135	135.8 -	<u>+ 22.7</u> +	3	3	3	┨┝┧	 6	· ·	· · ·	· ·	•••		_	Sat	t. 000			GRAY AND RED	SAND				+	60/0.1						
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	120.8	I 37.7				.				. Ĺ			-		H	<u> </u>	22.0	WEATHERED		36.5			Ŧ							
120	120.0	+ 31.1	29	71/0.5					· · ·	· ·		100/1.0	<b>,</b>			j.		PHYLLITE					Ŧ							
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110	110.8 -	+ 47.7 +	50	50/0.3				•	· · ·	· ·	•••	100/0.8				10	19.3			49.2			‡							
	108.7	<u>+ 49.8</u> +	60/0.1			<u>   ·</u>						60/0.				- 10	18.6	CRYSTALLINE PHYLLITE	ROCK	49.9			‡							
		ŧ		1												Ł		Boring Terminated WIT	I STANDA				ţ							
	-	ŧ														F	E	PENETRATION TEST Elevation 108.6 ft IN CRYS	REFUSAL	at ROCK			$\pm$							
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#### SHEET 9



#### **GEOTECHNICAL BORING REPORT** BUDEIUC

# **GEOTECHNICAL BORING REPORT**

	C	ORE L	OG				
	COUNTY	Y JOHNST	ON		GEOLOGIST Lindsay F	Pugh	
/E	R THE N	IEUSE RIVE	R				GROUN
		OFFSET 4	42 ft LT		ALIGNMENT -L-		0 HR.
) ft	t	NORTHING	691,038		EASTING 2,176,515		24 HR.
			DRILL METHOD	NQ2	2 Casing W/SPT&Core	HAMM	ER TYPE
14	7						20

	B	BORE LOG			C	CORE LOG	
<b>WBS</b> 34552.1.FR3	TIP R-3825B COUNT	TY JOHNSTON	GEOLOGIST Lindsay Pugh	WBS 34552.1.FR3	TIP R-3825B COUNT	TY JOHNSTON	GEOLOGIST Lindsay Pugh
SITE DESCRIPTION BRIDGE	NO. 75 ON -L- (NC 42) OVER THE	NEUSE RIVER	GROUND WTR (ft)	SITE DESCRIPTION BRIDGE NO	D. 75 ON -L- (NC 42) OVER THE	NEUSE RIVER	GROUND WTR (ft)
BORING NO. B1-A	STATION 63+65	OFFSET 42 ft LT	ALIGNMENT -L- 0 HR. N/A	BORING NO. B1-A	STATION 63+65	OFFSET 42 ft LT	ALIGNMENT -L- 0 HR. N/A
COLLAR ELEV. 126.4 ft	TOTAL DEPTH 36.0 ft	NORTHING 691,038	<b>EASTING</b> 2,176,515 <b>24 HR.</b> N/A	COLLAR ELEV. 126.4 ft	TOTAL DEPTH 36.0 ft	<b>NORTHING</b> 691,038	<b>EASTING</b> 2,176,515 <b>24 HR.</b> N/A
DRILL RIG/HAMMER EFF./DATE MI	ID0314 D-25 86% 08/04/2016	DRILL METHO	DD NQ2 Casing W/SPT&Core HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE MIDO	0314 D-25 86% 08/04/2016		NQ2 Casing W/SPT&Core HAMMER TYPE Automatic
DRILLER B. Fowler	<b>START DATE</b> 05/01/17	COMP. DATE 05/02/17	SURFACE WATER DEPTH 5.9ft	DRILLER B. Fowler	START DATE 05/01/17	COMP. DATE 05/02/17	SURFACE WATER DEPTH 5.9ft
ELEV (ft)         DRIVE ELEV (ft)         DEPTH (ft)         BLOW COL		75 400	0 SOIL AND ROCK DESCRIPTION	CORE SIZE NQ2	TOTAL RUN 31.0 ft		
(ft) (ft) (ft) 0.5ft 0.5ft	0.5ft 0 25 50	75 100 NO. MO	I G ELEV. (ft) DEPTH (ft) WATER SURFACE (05/01/17)		RUN         STRATA           REC.         RQD         SAMP.         REC.         RQD           (ft)         (ft)         NO.         (ft)         (ft)         (ft)		DESCRIPTION AND REMARKS
					% % %	===::(:;)	
130				121.4 120 121.4 5.0 2.4 N=60/0.0	0 (2.3) (2.2) (23.9) (13.8	3) 121.4 TAN TO GRAY, S	Begin Coring @ 5.0 ft LIGHTLY TO MODERATLEY WEATHERED, MEDIUM 5
126.4 0.0			- 126.4 RIVER BED 0.0		96% 92% (3.7) (3.1)	TO MODERAT	TELY HARD, VERY CLOSE TO CLOSE FRACTURE SPACING, PHYLLITE, WITH A
125.4 0.0 125.3 1.1 3 100/0.4	4	Sat.	125.5         ALLUVIAL         0.9           BROWN SAND		0 74% 62%	VOID A	AT 11.4 +/-, AND A CLAY SEAM AT 25.0 +/- GSI = 72-82
		. 100/0.4	WEATHERED ROCK /- 3.0	$\pm$ $\pm$ $\pm$ 1 1/20/10			
121.4 + 5.0		· · · · · · · · · · · · · · · · · · ·		4.7 3:10/1.0	) (4.7) (1.8) ) 100% 38%		
		· · · · · · · · · · · · · · · · · · ·	PHYLLITE TAN TO GRAY, SLIGHTLY TO J	$    _{110}   +   _{4:44/1.0}$			
			MODERATLEY WEATHERED, MEDIUM TO MODERATELY HARD, VERY CLOSE		, 0 (3.3) (1.4) 0 85% 36%	67	
115			TO CLOSE FRACTURE SPACING, PHYLLITE, WITH A		0 85% 36%		
		· · · · · · · · · · · · · · · · · · ·	1214 	105 105.4 21.0 10:54/0.9 5.0 4:14/1.0	9 ) (2.9) (0.9) ) 58% 18%	3) 121.4 TAN TO GRAY, S TO MODERAT VOID A VOID A 90.4 Boring Terminated a	
			REC. =77%, RQD = 45% GSI = 72-82				
		· · · · · · · · · · · · · · · · · · ·		$   _{100}   100.4 + 26.0    _{4.43/1.0}$			
				5.0 4:18/1.0 5:27/1.0 5:55/1.0	0 (4.2) (3.1) 84% 62% RS-1		
105				5:26/1.0			
					) (2.8) (1.3) ) 56% 26%		
		· · · · · · RS-1		90.4 + 36.0 2:50/1.0		90.4 Boring Terminated :	36.1 at Elevation 90.4 ft IN CRYSTALLINE ROCK (PHYLLITE)
						-	
			90.4 36.0				
			Boring Terminated at Elevation 90.4 ft IN CRYSTALLINE ROCK (PHYLLITE)				
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## **GEOTECHNICAL BORING REPORT** PODEIOC

#### **GEOTECHNICAL BORING REPORT**

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				В	ORE L	.OG														(	CORE	E LO	G					
WBS 34552.1.FR3		TIP R-3825	В	COUNT	NTY JOHNSTON GEOLOGIST Lindsay Pugh								34552	.1.FR3			TIP R-	3825B		COUN	TY JOHN	NSTON			GEOLOGI	ST Lindsay	<sup>,</sup> Pugh	
SITE DESCRIPTION	BRIDGE NO.	75 ON -L- (N	C 42) OV	ER THE N	NEUSE RIVE	R				GR	OUND WTR (ft)	SITE	DESCR	IPTION	BRID	DGE NO	). 75 ON -	L- (NC 42	) OVE	R THE	NEUSE R	RIVER					GR	OUND WTR (ft
BORING NO. B1-C		STATION 6	3+62		OFFSET	5 ft LT		ALIG	NMENT -L-	0 H	ir. N/A	BOR	ING NO.	B1-C			STATIO	N 63+62	2		OFFSE	<b>T</b> 5 ft I	LT		ALIGNMEN	NT -L-	0 H	<b>R.</b> N/A
COLLAR ELEV. 126	.7 ft	TOTAL DEPT	<b>TH</b> 35.7 1	ft	NORTHING	<b>G</b> 691,	001	EAST	<b>ING</b> 2,176,51	5 <b>24 H</b>	ir. N/A	COLL	LAR ELE	<b>EV.</b> 126	6.7 ft		TOTAL	DEPTH	35.7 ft		NORTH	<b>IING</b> 6	91,001		EASTING	2,176,515	24 H	<b>R.</b> N/A
DRILL RIG/HAMMER EFF	./DATE MID03	14 D-25 86% 08/	/04/2016			DRILL	METHOD	NQ2 Casing	g W/SPT&Core	HAMMER TY	PE Automatic	DRILL	. RIG/HAI	MMER EF	F./DATI	E MID0	314 D-25 80	5% 08/04/20	16			DR	RILL METHO	OD NQ2	2 Casing W/SF	PT&Core	HAMMER TY	PE Automatic
DRILLER B. Fowler		START DATE	E 04/20/	17	COMP. DA	<b>TE</b> 04	/21/17	SURF	ACE WATER D	DEPTH 2.2ft		DRIL	LER B	. Fowler			START	DATE 04	4/20/1	7	COMP.	DATE	04/21/17	7	SURFACE	WATER DE	PTH 2.2ft	
	BLOW COUNT			PER FOOT		SAMP			SOIL AND	ROCK DESCRIPT	ION	COR	E SIZE	NQ2				RUN 31.										
(ft) (ft) (ft) (	0.5ft 0.5ft 0.5	Sft 0 2	25	50	75 100	NO.	MOI G	ELEV. (f	t)		DEPTH (fi	ELEV (ft)	RUN ELEV	DEPTH		DRILL RATE	RUN REC. R	D SAMP	P. RE					DE	ESCRIPTION	I AND REMARI	KS	
													(ft)	(ft)	(ft)	(Min/ft)	(ft) ( %	ft) NO.	(ft %	t) (ft) %	G <sub>ELE</sub>	EV. (ft)						DEPTH (1
130								F	WATER S	SURFACE (04/20/1	17)	122.3	122.3 -	4.4	5.0	3:13/1.0	(4.6) (3	.6)	(25	5.3) (18.3	7)	2.3 TA	N TO GRA	Y, SLIGH	ITLY TO MOD	ring @ 4.4 ft DERATELY SE	EVERELY WEA	THERED, 4
126.7 - 0.0								126.7		RIVER BED	0.	120	-	-		5:00/1.0	(4.6) (3 92% 72	2%	94	% `70%		SC	OFT TO MO	DERATE	LY HARD, VE	ERY CLOSE T PACING, PHY	O MODERATEL	YCLOSÉ
	VOH 1 7	·•8 · ·					Sat.		BE	ALLUVIAL ROWN SAND			- 117.3 -	- 9.4		3:11/1.0 4:50/1.0										l = 68-78		
		• ـ ـ ـ ـ			╞┝╧╧╧┥			123.8		TALLINE ROCK	2.9	115	- 115.5	- 11.2	1.8	2:36/1.0 4:50/0.8	(1.6) (1	.1) I%										
	0/0.1				• • 60/0.1			<u>122.3</u>	٦	PHYLLITE BRAY, SLIGHTLY			-	F	4.0	3:32/1.0 4:40/1.0	(4.6) (4	.3)		i.3) (18. % 70%								
									MODERATELY S	SEVERELY WEA	THERED,		110.9	15.8		4:19/1.0 5:17/1.0 5:30/0.6												
									CLOSE TO I	DERATELY HARD MODERATELY CL SPACING, PHYL	OSE	110			5.4	3:55/1.4	(3.0) (3	.1)										
115								Ł	REC. = 94%	RQD = 70% GSI =	LITE = 68-78		-	-		3:45/1.0 4:03/1.0		70										
			· · · ·									105	105.5 -	21.2		3:51/1.0 5:17/1.0		-										
													-			4:39/1.0	(5.0) (5 100% 10	.0) 0%										
			<u> </u>	<u> </u>									100 5	26.2		4:36/1.0 5:43/1.0 7:00/1.0												
												100	100.5 -	- 20.2	5.0	3:39/1.0	(4.5) (1 90% 32	.6)										
105			· · · ·										-			4:10/1.0	1 1	2%										
												95	95.5 -	31.2	4.5	6:57/1.0 8:25/1.0		4		<u> </u>	95.							31.
													-	E I	4.5	4:34/1.0	(4.5) (1 100% 3	.4) I%	100	.5) (1.4 0% 31%		Gr	TO MODE	ERATEL	Y HARD, CLO	OSE TO VERY	WEATHERED,	TURE
				<u> </u>									91.0	35.7		4:20/1.0 5:13/1.0 4:16/0.5	1 1				91.					CHIST GSI = 7		35.
													-			4.10/0.5	1					B	oring Termi	inated at	Elevation 91.0	0 ft IN CRYST	ALLINE ROCK (	SCHIST)
95 –								95.5	GRAY TO GR	EEN, MODERATE	31.2 ELY TO		-															
									SLIGHTLY WE	EATHERED, MEDI HARD, CLOSE T	IUM TO		-	E I														
		· · · ·						91.0	CLOSE FRACT	TURE SPACING, S RQD = 31% GSI =	SCHIST 35.3		-								_							
								F	Boring Termina	ated at Elevation 9	1.0 ft IN		-															
								Ę	CRYSTAL	LINE ROCK (SCHI	151)		_															
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# GEOTECHNICAL BORING REPORT

	C	ORE L	.0G					
	COUNT	Y JOHNST	ON		GEOLOGIST Lindsay F	Pugh		
'E	ER THE N	IEUSE RIVE	R				GROUN	D WT
		OFFSET	50 ft RT		ALIGNMENT -L-		0 HR.	
f	t	NORTHING	690,946		EASTING 2,176,522		24 HR.	
			DRILL METHOD	NQ	2 Casing W/SPT&Core	HAMM	ER TYPE	Auton
1	7	COMP. DA	TE 05/04/17		SURFACE WATER DEP	<b>TH</b> 8.8	Bft	

								B	DRE	LOG	ì																CO	RE	LOG				
WBS 3	34552.1.FR	3		TIP	R-3825	5B	С	OUNTY	JOHNS	STON GEOLOGIST Lindsay Pugh								<b>S</b> 345	52.1.F	R3			TIP	R-38	325B		COUNTY	JOHN	STON	G	GEOLOGIST Lindsay Pu	gh	
SITE DE	SCRIPTIO	N BRID	DGE NO	0. 75 (	ON -L- (N	IC 42) O	VER	THE NE	USE RIV	/ER					GROUNE	WTR (ft)	SIT	E DESC	CRIPT	ION	BRID	GE NC	D. 75 C	DN -L-	(NC 42)	OVEF	THE NEU	ISE RI	VER			GROUN	D WTR (
BORING	<b>g no.</b> B1-E	В		ST	ATION 6	63+64			OFFSET	50 ft F	RT		A	LIGNMENT -L-	0 HR.	N/A	BO	ring n	<b>ю</b> . в	1-B			STA	TION	63+64		0	FFSET	50 ft RT	Δ	LIGNMENT -L-	0 HR.	N/
COLLA	<b>R ELEV.</b> 1	25.9 ft		то	TAL DEP	<b>TH</b> 37.9	9 ft		NORTHI	<b>IG</b> 690	),946		E/	<b>ASTING</b> 2,176,522	24 HR.	N/A	CO	LLAR E	ELEV.	125.	.9 ft		тот		EPTH 3	37.9 ft	N	ORTHI	<b>NG</b> 690,946	E	<b>EASTING</b> 2,176,522	24 HR.	N/
DRILL RI	G/HAMMER B	EFF./DAT	E MID	0314 D-	25 86% 08	8/04/2016				DRIL	L MET	HOD	NQ2 Ca	asing W/SPT&Core HAMI	MER TYPE	Automatic	DRI	LL RIG/H	HAMME	REFF	./DATE	E MIDO	0314 D-2	25 86%	08/04/201	16	•		DRILL METHOD	NQ2 C	Casing W/SPT&Core	IAMMER TYPE	Automatic
	R B. Fowle			ST	ART DAT	<b>E</b> 05/03	3/17		COMP. D	<b>ATE</b> 0	5/04/	17	SI	JRFACE WATER DEPTH 8	3.8ft		DRI	LLER	B. Fo	wler			STA	RT D	<b>ATE</b> 05	5/03/17	C	OMP. I	DATE 05/04/17	s	SURFACE WATER DEPT	<b>H</b> 8.8ft	
		H BLO	W COUN					R FOOT			P. 🔻			SOIL AND ROCK DES	SCRIPTION		CO	RE SIZ	E NG	02			тот	'AL RI	<b>JN</b> 29.8								
(ft)	(ft) (ft)	0.5ft	0.5ft	0.5ft	0	25	50	7	75 10	0 NO	. /n	AOI G	ELE			DEPTH (ft)	ELE			PTH F		DRILL RATE	REC. (ft) %	RUN	SAMP	. ST REC	RATA         L           .         RQD         O           .         (ft)         G			DES	SCRIPTION AND REMARKS		
																	(ft)	(ft)		π)	(ft)	(Min/ft)	(ft) %	(ft) %	NO.								DEPTH
135												<b>Z</b> .	_ <del>  .</del>	WATER SURFACE	(05/03/17)		117.8		<u>8 - 8</u>	.1	1.4 7	7:02/1.0	) (1 1)	(0.4)	1	(28 4	) (19 2)	117.	8 GRAY TO GR	E REEN VI	Begin Coring @ 8.1 ft ERY SLIGHTLY TO MODER/	TI FY SEVEREI	Y
	Ŧ												E				115		4 9		4 - 4	4:44/0.4	1 79%	29%		95%	64%	Ł	WEATHERED, M	MODER	ATLEY HARD TO HARD, VE ACTURE SPACING, GNEISS	RY CLOSE TO V	VIDE
130	Ŧ												E						ŧ			2:45/1.0 7:19/1.0 7:18/1.0 7:52/1.0	91%	33%	,						GSI = 78-88		
	ł												F				140		<u>9   14</u>			8:18/0.5		(3.2)	)								
1	25.9 0.0												_ 125			0.0	110		+		1.5	0.40/ I.U	, ,	64%									
125	+	10	2	3	- <b>6</b> 5						S	at.		ALLUVIAL BROWN SAM		106.	<u>9   19</u>			5:02/1.0 7:22/1.0			_										
1;	22.6 <mark>- 3.3</mark>	10	12	10			· · ·					0.0	- - 121	3	4.6	105	_	‡		4	5:32/1.0 4:21/1.0	) 98%	35%										
120	‡						•	· · · ·	<u> </u>				E 119	ESIDUAL			102	1 + 23	3.8	0.00	9:50/1.0 9:51/1.0 23:57/0.8												
_1	17.9 - 8.0	60/0.1			 			· · · · ·	60/0				117	.8 CRYSTALLINE I	<u></u>	100		+		5.1 1	2 <u>3:57/0.8</u> 1:56/1.0 9:20/1.0	0 (5.1) 100%	(4.4)	2		) (19.2) 64%							
115	ŧ	60/0.1			· · · · ·			· · · · ·		1			1	GRAY TO GREEN, MODER	ERE	100		Ŧ		1	1:17/1.0 6:34/1.0	0		'									
110	Ŧ									1			<b>}</b>	TO VERY SLIGHTLY W MODERATLEY HARD TO	Y		97.0	<u> 28</u>		1	5:04/1.1 0:46/1.0	1	(4.2)	<u>,</u>									
	Ŧ				· · · ·		.   .	· · · · ·					4	CLOSE TO WIDE FRACT GNEISS			95	_	Ŧ		I F	6:48/1.0 7:10/1.0	)   100%	6 100%	RS-2	_							
110	Ŧ				· · · ·			· · · · ·					<u>_</u>	REC. = 95% RQD = 64%	8		92.8	<u>3   33</u>		48 5	7:36/1.0 5:23/0.2	(43)	(3.8)				Ŧ						
	Ŧ				· · · · ·		.   .	· · · · ·									90		Ŧ		1	2.51/1.0 7·49/1 0	90%	79%				E					
105	Ī												£					88.0	<u>)   37</u>	7.9	1	9:31/1.0  2.58/1.0  4:37/0.8						88.0	I				
	Ŧ												£						ŧ									L	Boring Terminat	ted at Ele	evation 88.0 ft IN CRYSTALL	NE ROCK (GNE	ISS)
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100	+					<u> </u>				-11									‡									F					
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		SORE LOG							ORE LUG		
<b>WBS</b> 34552.1.FR3		TY JOHNSTON	GEOLOGIST Lindsay Pugh		WBS 34552.1		<b>TIP</b> R-3825B		<b>FY</b> JOHNSTON	GEOLOGIST Lindsay Pugh	
SITE DESCRIPTION BRIDGE NO	1		-	ROUND WTR (ft)			O. 75 ON -L- (NC 42) O	ER THE	1		GROUND WTR (ft)
BORING NO. B2-A	STATION 64+87	OFFSET 45 ft LT		HR. N/A	BORING NO.		STATION 64+87		OFFSET 45 ft LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 125.7 ft	TOTAL DEPTH 37.8 ft	NORTHING 691,051	EASTING 2,176,636 24 H	HR. N/A	COLLAR ELEV		TOTAL DEPTH 37.8	ft	<b>NORTHING</b> 691,051	EASTING 2,176,636	24 HR. N/A
DRILL RIG/HAMMER EFF./DATE MIDO	0314 D-25 86% 08/04/2016	DRILL METHOD N	Q2 Casing W/SPT&Core HAMMER T	TYPE Automatic	DRILL RIG/HAMM	ER EFF./DATE MI	00314 D-25 86% 08/04/2016			D NQ2 Casing W/SPT&Core HAM	MER TYPE Automatic
DRILLER Contract Driller	<b>START DATE</b> 05/02/17	COMP. DATE 05/03/17	SURFACE WATER DEPTH 7.8ft		DRILLER Cor		START DATE 05/02	/17	COMP. DATE 05/03/17	SURFACE WATER DEPTH 7	7.8ft
ELEV DRIVE DEPTH BLOW COUN			SOIL AND ROCK DESCRIPT	TION	CORE SIZE N		TOTAL RUN 28.5 ft	070474			
(ft) (ft) (ft) 0.5ft 0.5ft 0	0 25 50	75 100 NO. G	ELEV. (ft) WATER SURFACE (05/02/	2/17) DEPTH (ft)	(ff) ELEV	EPTH RUN DRILI (ft) (ft) (Min/f	REC. RQD SAMP. (ft) (ft) NO.	STRATA REC. RQD (ft) (ft) % %		DESCRIPTION AND REMARKS	
					(it) (ft)	(IL) (IL) (Min/f	(ft) (ft) NO.	% %	G ELEV. (ft)		DEPTH (ft
130			-		116.4 115 116.4 -	9.3 12 4.54/1	0 (12) (07)	14 1) (8 5)	GRAY VERY	Begin Coring @ 9.3 ft SLIGHTLY TO SLIGHTLY WEATHERED,	MODERATELY 9
					115 115.2	9.3 1.2 4:54/1 0.5 4.6 5:02/0 5:36/1 5:33/1 9:16/1 9:16/1	$\frac{2}{0}$ $\frac{100\%}{58\%}$	92% 56%	116.4 GRAY, VERY HARD, VE	RY CLOSE TO CLOSE FRACTURE SPACI GSI = 65 - 75	NG, SCHIST
125 125.7 0.0 2 98/0.5		Sat. \$777	- 125: <u>7</u> RIVER BED - ALLUVIAL	8.9		5:33/1 9:16/1	0 91% 54%				
			BROWN SAND		110 110.6 -		$\begin{array}{c} 0 \\ 6 \\ 0 \end{array}$ (4.3) (2.2)				
121.8 3.9			WEATHERED ROCK SCHIST			5.1 6:49/1 6:04/1 4:49/1	0 84% 43%				
		100/0.9	_		105 105.5 - 1	4:55/1 3:38/1	0				
			. 117.7 CRYSTALLINE ROCK	8.0		4.4 5:31/1 7:38/1	0 100% 70%				
<u>116.5 + 9.2</u> 115 <u>60/0.1</u>			- <u>116.4</u> CRYSTALLINE ROCK - SCHIST - GRAY, VERY SLIGHTLY TO SL	<u> </u>		8:44/1	0		101.1		24.6
			WEATHERED, MODERATELY	Y HARD,	100		4 (4.6) (4.6) 0 96% 96% RS-3	12.1) (11.5) 92% 87%	) GRAY, VERY	SLIGHTLY TO SLIGHTLY WEATHERED,	MODERATELY
			VERY CLOSE TO CLOSE FRA SPACING, SCHIST		‡	12:05/1 12:57/1 5:58/0	0         (4.6)         (4.6)         RS-3           .0         96%         96%         RS-3           .0         .0         .0         .0           .0         .0         .0         .0           .0         .0         .0         .0           .0         .0         .0         .0           .0         .0         .0         .0			D, MODERATELY CLOSE TO WIDE FRAC GNEISS GSI = 79 TO 90	
			REC. = 92% RQD = 56% GSI	l = 65-75	96.3 + 2	<u>9.4</u> 14:11/1 4.8 16:43/0	.0 .7 (3.9) (3.3)			661 - 79 10 90	
						5:01/1	0 81% 69%				
105			—		91.5 -	4.2 4.2 4.2 4.2 4.2 4.2 4.2 4.2 4.2 5:01/1 10:29/1 8:22/1 9:18/1 10:32/0	Ŏ <u>8</u>				
					90	3.0 6:15/1	0 (3.6) (3.6)				
			101.1	24.6	87.9	7.8 11:45/1 14:37/0	.0 . <u>6</u>		87.9 Boring Termin	ated at Elevation 87.9 ft IN CRYSTALLINE F	37.8 ROCK (GNEISS)
		RS-3	GRAY, VERY SLIGHTLY TO SL WEATHERED, MODERATELY H	HARD TO							
			HARD, MODERATELY CLOSE T FRACTURE SPACING, GN	IEISS							
95 7			REC. = 92% RQD = 87% GSI	I = 79-90	I I Ŧ						
					I I I						
90		· · · · · · · · · · · · · · · · · · ·	-		I I I				-		
			Boring Terminated at Elevation 8	37.8 87.9 ft IN	IIII						
			. CŘYSTALLINE ROCK (GNE	EISS)							
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## **GEOTECHNICAL BORING REPORT** CORE LOG

	<b>E</b>	BORE LOG			1 1	CORE LOG	1	
WBS 34552.1.FR3	TIP R-3825B COUN	TY JOHNSTON	GEOLOGIST Lindsay Pugh	<b>WBS</b> 34552.1.FR3	<b>TIP</b> R-3825B <b>COU</b>	JNTY JOHNSTON	GEOLOGIST Lindsay Pugh	
SITE DESCRIPTION BRIDGE N	NO. 75 ON -L- (NC 42) OVER THE	NEUSE RIVER	GROUND WTR (ft)	SITE DESCRIPTION BRIDGE NO	0. 75 ON -L- (NC 42) OVER TH	E NEUSE RIVER		GROUND WTR (ft)
BORING NO. B2-C	STATION 64+84	OFFSET 2 ft RT	ALIGNMENT -L- 0 HR. N/A	BORING NO. B2-C	STATION 64+84	OFFSET 2 ft RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 126.6 ft	TOTAL DEPTH 34.0 ft	NORTHING 691,004	EASTING 2,176,637 24 HR. N/A	COLLAR ELEV. 126.6 ft	TOTAL DEPTH 34.0 ft	NORTHING 691,004	EASTING 2,176,637	24 HR. N/A
DRILL RIG/HAMMER EFF./DATE MIL	D0314 D-25 86% 08/04/2016	DRILL METHOD N	Q2 Casing W/SPT&Core HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE MID0	)314 D-25 86% 08/04/2016	DRILL METHOD	NQ2 Casing W/SPT&Core HAN	IMER TYPE Automatic
DRILLER B. Fowler	START DATE 04/18/17	COMP. DATE 04/19/17	SURFACE WATER DEPTH 2.5ft	DRILLER B. Fowler	<b>START DATE</b> 04/18/17	COMP. DATE 04/19/17	SURFACE WATER DEPTH	2.5ft
			1	CORE SIZE NQ2	TOTAL RUN 28.7 ft			
(ft) ELEV (ft) 0.5ft 0.5ft		75 100 NO. MOI G	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)	ELEV RUN DEPTH RUN DRILL	RUN STRAT			
				(ft) (ft) (ft) (ft) (ft) (ft) (Min/ft)	RUN REC. ROD (ft) (ft) NO. (ft) % (ft) %	A         L           QDD         O           (ft)         G           ELEV. (ft)	DESCRIPTION AND REMARKS	DEPTH (ft)
130				121.3			Begin Coring @ 5.3 ft	
			WATER SURFACE (04/18/17)	120 121.3 + 5.3 5.0 4:44/1.0	(4.2)         (4.0)         (24.2)         (1           84%         80%         91%         6	6.5) 121.3 GREEN TO C	GRAY TO BLACK VERY SLIGHTLY TO ODERATELY HARD, MODERATELY O	O SLIGHTLY 5.3
			- 126.6 RIVER BED 0.0	1 4:35/1.0		22/0 VEATHERED, W	LOSE FRACTURE SPACING, SCHIST	r
125 3 8	38	<u>· · · · ·</u> Sat.	- 125.2 ALLUVIAL 1.4	116.3 10.3 4:02/1.0 3:54/1.0			GSI = 75-85	
			123.1 WEATHERED ROCK 3.5	115         5.0         8:03/1.0           7:21/1.0         7:21/1.0	(5.0) (4.4) 100% 88%			
121.5 + 5.1		· · · · · · · · · · · · · · · · · · ·		5:34/1.0 6:56/1.0				
					(3.5) (1.1) 100% 31%			
			- SLIGHTLY TO SLIGHTLY WEATHERED, - MODERATELY HARD, VERY CLOSE TO	1 1070 T 100 1 7:52/1.0	100% 31%			
115			- MODERATELY CLOSE FRACTURE	107.0 + 10.0	(3.8) (3.3) 100% 87%			
				105 104.0 22.6 3.8 5.31/1.0 6.20/1.0 6.23/1.0 6.23/1.0 6.23/1.0 6.23/1.0				
			-		(3.6) (1.9) 73% 39%			
			-	100 00 4 07 5 07 5 07 5 07 5 07 5 07 5 07				
			-	99.1 27.5 3:38/0.9	(4.1) (2.8)	6.5) 2% 4121.3 GREEN TO C WEATHERED, M C 000 94.6 94.6 0.0) 92.6 GREEN TO BLA HARD, VERY		
105			-	3:48/1.0	91% 62%			
			-	95 94.6 32.0 4:13/1.0 3:24/1.0 4:13/1.0		94.6		32.0
				92.6 - 34.0 2.0 3:12/1.0	(1.0) (0.0) 50% 0% (1.0) (1.0) (0 50% 0% (1.0) (1.0) (0 50% (1.0) (1.0) (0 50% (1.0) (1.	0.0) GREEN TO BLA 0% 92.6 HARD VERY	CK VERY SLIGHTLY WEATHERED, CLOSE TO CLOSE FRACTURE SPAC	MODERATELY
100 -			-				GSI = 50-55	/
						Boring Terminated	I at Elevation 92.6 ft IN CRYSTALLINE	RUCK (GNEISS)
95			- 94.6 32.0 - GREEN TO BLACK VERY SLIGHTLY					
			- 92.6 WEATHERED, MODERATELY HARD, 34.0					
			- VERY CLOSE TO CLOSE FRACTURE - SPACING, GNEISS					
			REC. = 50% RQD = 0% GSI = 50-55 Boring Terminated at Elevation 92.6 ft IN					
			Boring Terminated at Elevation 92.6 ft IN CRYSTALLINE ROCK (GNEISS)					
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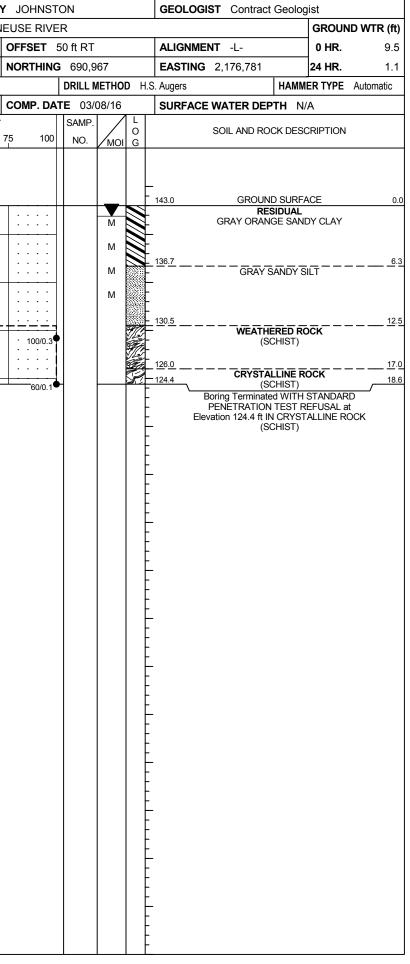
#### **GEOTECHNICAL BORING REPORT** CORE LOG

#### GEOTECHNICAL BORING REPORT CORE LOG

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<b>WBS</b> 3	34552.1.FR3	T	IP R-3825E	3	COUNT	Y JOHN	GEOLOGIST     Lindsay Pugh								WBS	<b>3</b> 3455	52.1.FR	3		TIP	R-382	25B	C	OUNT	<b>Y</b> J(	OHNSTO	N		GEOLOC	GIST Lindsay P		
SITE DE	ESCRIPTION BRID	GE NO. 75	5 ON -L- (NC	C 42) OVE		NEUSE R							GROUND	WTR (ft)	SITE	DESC	RIPTIO	N BRI	DGE NO	0. 75 0	)N -L- (	NC 42)	OVER	THE N	NEUS	E RIVE	۲				GR	OUND WTR (f
BORING	<b>g NO.</b> B2-B	S	TATION 64	4+75		OFFSE	<b>7</b> 28 ft R	Т		ALIGN	IMENT -L-		0 HR.	N/A	BOR	ING NO	<b>).</b> B2-E	3		STA	TION	64+75			OFF	<b>SET</b> 2	8 ft RT		ALIGNM	ENT -L-	0 H	<b>IR.</b> N/.
COLLAF	<b>R ELEV.</b> 124.1 ft	Т	OTAL DEPT	<b>H</b> 36.1 ft	t	NORTH	I <b>NG</b> 690	,977		EASTI	NG 2,176,	,630	24 HR.	N/A	COL	LAR EI	<b>_EV.</b> 1	24.1 ft		тот	AL DE	PTH 3	6.1 ft		NO	RTHING	690,977	7	EASTING	<b>G</b> 2,176,630	24 H	IR. N/
DRILL RI	IG/HAMMER EFF./DATE	E MID0314	D-25 86% 08/0	04/2016			DRILL	METH	OD N	Q2 Casing	W/SPT&Core	HAM	MER TYPE A	utomatic	DRILI	L RIG/H	AMMER I	FF./DA	re mid	0314 D-2	25 86% 0	)8/04/201	6				DRILL MET	THOD N	IQ2 Casing W/	SPT&Core	HAMMER T	PE Automatic
DRILLE	R B. Fowler	S	TART DATE	04/19/1	7	COMP.	DATE 04	1/20/17	7	SURF	ACE WATE	R DEPTH 5	5.4ft		DRIL	LER	B. Fowle	er		STA	RT DA	<b>TE</b> 04/	/19/17		COI	MP. DAT	E 04/20/	/17	SURFAC	E WATER DEPT	<b>H</b> 5.4ft	
ELEV DF		V COUNT		BLOWS F	PER FOOT	Г	SAMF	P. ▼∕			SOIL AN	ND ROCK DES	SCRIPTION		COR		NQ2					<b>N</b> 28.4										
(ft) (	(ft) (ft) 0.5ft (	0.5ft 0.5ft	0 2	5 5	50	75 1	00 NO.	мс		ELEV. (ft)				DEPTH (ft)		RUN ELEV	DEPTH		DRILL RATE	REC.	RQD (ft)	SAMP.	· REC.	RATA RQD (ft) %	L				DESCRIPTIC	N AND REMARKS		
															(ft)	(ft)	(ft)	(ft)	(Min/ft)	) (ft)	(ft) %	NO.	(ft) %	(ft) %	Ö G	ELEV. (ft	)					DEPTH
130									<u>'</u> _	<u> </u>	WATE	ER SURFACE (	(04/19/17)		116.4		+ 7.7	4.6	11:05/1.	0 (2.5)	(12)		(21.3)	(15.5)		116.4	GREEN			oring @ 7.7 ft VERY SLIGHTLY		ATELY
	‡									-					115		+	7.0	8:31/1.0 17:57/1.	54%	26%		75%			116.4	WEAT	THERED,	MODERATEL	LY HARD, VERY C WITH A 1.4' SANE	LOSE TO CL	OSE
125	‡									-						111.8	12.3		19:31/0. 2:55/0.8 \6:42/0.6	2					R	-	TRACTO		10.9' AND A	QUARTZ VEIN AT SI = 65-75		
125	24.1 0.0 49 5	1/0 2					· 🖌 🗕 🚽	_		124.1	10	RIVER BED		0.0	110	_	‡	4.9	<u>6:42/0.6</u> 4:19/1.0	$\frac{6}{2}$ (4.5) $\frac{92\%}{2}$	(3.3) 67%				R				G	51 = 05-75		
11				   <u></u> .	<u> </u>	· · 100/	0.7			<u>121.6</u>		SCHIST		2.5			±		4:19/1.0 5:25/1.0 5:39/1.0 5:40/1.0 6:09/1.0 6:25/1.0						R	-						
120	- 38	25 12		• • • • • •	· · ·		·	w		-	GREEN	SAPROLITI GRAY MICAC	E EOUS SILT		105	106.9	17.2	5.1	6:09/1.0	) ) (4.7)	(3.5)				R							
	‡			: : <u>  · ·</u>	+	·   · · · ·				118.0				6.1	105	_	‡		5:53/1.0 5:39/1.0	)   92% )	69%				R	-						
115	<u>16.5 + 7.6</u> + 60/0.1			· · · · ·	· · · ·	· · · 60/	L			- 116.4 -	GREEN T	TO GRAY TO E	BLACK VERY	7.7		101.8	22.3		7:29/1.0 5:37/1.1	1					R	-						
	<b>†</b>										WEATHER	RED, MODERA	ATELY HARD,		100	4	‡		4:37/1.0 5:08/1.0	) 92%	(3.8) 78%											
	‡					·   · · · ·   · · ·	.			-	SPACING,	GNEISS WITH	H A 1.4' SAND			06.0	+ 27.2		5:04/1.0 5:23/1.0	0					B	-						
110						· · · · ·				-	QU		T 31.9'		95	30.3	+ 27.2	5.0	6:26/0.9	) (2.7)	(2.3)											
	Ŧ					· · · · · · · · · ·	·			-	REC. = 75	% RQD = 55%	ତ ତଥା = ୧୨୦-12		35	1	‡		5:35/1.0	0	46%				R	-						
105	Ŧ									-						91.9	32.2	3.9	4:01/1.0		(1.4)				R.	-						
	Ŧ									-					90	_	‡	3.9	4:40/1.0	) 62%	(1.4) 36%				P.							
	Ŧ					·   · · · ·	·			-						88.0	36.1		11:05/0. 2:23/0.5 5:35/0.9	5		RS-4				88.0	Boring Te	rminated	at Elevation 8	8.0 ft IN CRYSTALI	INE BOCK	
100				· · · ·	· · · ·	· · · · ·				-							ŧ									-	Doning re					UNEI00)
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									بجمت	88.0			ation 88.0 ft IN	36.1			Ŧ									-						
	±									-	CRYST	ALLINE ROCK	(GNEISS)				Ŧ									-						
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				IDGE		-		ER THE	NEUSE RIV						GROUND WTR (ft					DGE N		ON -L- (NC 42) OV	ER THE NE
BOR	ING NO	. EB2-	A		S	TATION 6	6+13		OFFSET	33 ft LT	-		ALIGN	MENT -L-	OHR. FIAD	BOF	RING NO.	EB2	-В		ST	<b>ATION</b> 66+24	
COL	LAR ELI	<b>EV.</b> 15	58.7 ft		Т	OTAL DEP	<b>TH</b> 31.6	ft	NORTHI	<b>NG</b> 691,	049		EASTI	<b>NG</b> 2,176,762	24 HR. N/A	COL	LAR ELE	<b>EV.</b> 14	43.0 ft		ТС	<b>DTAL DEPTH</b> 18.6	ft I
DRILL	RIG/HA	MMER E	FF./DA	TE M	ID5464	CME-45C 84	% 08/09/20	16		DRILL	METHO	DD M	ud Rotary	НАММ	<b>IER TYPE</b> Automatic	DRIL	L RIG/HAI	MMER E	FF./DA	TE BF	RI2974 C	CME-45C 79% 06/03/201	15
DRIL	LER M	1. COO	GAN		S	TART DAT	E 04/22	′17	COMP. D	<b>ATE</b> 04	/22/17	7	SURF	CE WATER DEPTH N	/A	DRI	LER C	ontract	t Driller	-	ST	ART DATE 03/08/	/16
ELEV	DRIVE ELEV	DEPTH	BLC	ow co	UNT		BLOWS	PER FOC	т	SAMP	. 🔨			SOIL AND ROCK DES	CRIPTION	ELEV	DRIVE	DEPTH	·	W COL		BLOWS	S PER FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50 I	75 10	0 NO.	Имо	ы G	ELEV. (ft)		DEPTH (	t) (ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 25	50 7
160		L											_			145		L					
i.	157.7 ·						1						158.7	GROUND SURF/ PAVEMENT			-						
		T 1.0	3	3	3	↓ • • • • • • • • • • • • • • • • • • •		.			м			ROADWAY EMBAN	KMENT	11	142.0	1.0	1	1	2		
155	154.5 -	4.2											-	GRAY AND ORANGE SA	ANDY CLAY	140	139.5 -	3.5					
l	-	ŧ	2	2	2	<b>•</b> 4		·   · · · ·   · · ·	· · · · · ·		м						137.0	6.0	3	5	5	• • 10 · · · · ·	•   • • • • •
150	150.6 ·	8.1						· · · · ·	· · · · · ·				•			135	-	F	7	12	14		•   • • • •
	-	ŧ	1	1	2	• <u>3</u>					м		-				134.5	8.5	4	7	25	· · · · · · · · · · · · · · · · · · ·	
		ŧ				::::	· · · ·	·   · · · ·	· · · · · ·				-				-	ł					·   · · · · ·
145	145.6	+ 13.1 -	1	2	1						w	L	_			130	- 129.5 -	- 13.5				· · · · · · · · · · · · · · · · ·	<u>.                                    </u>
	-	ŧ				$\left  \begin{array}{cccc} \P^{3} & \cdot & \cdot \\ 1 & \cdot & \cdot & \cdot \end{array} \right $											-	- 10.0	100/0.3				
1	140.6 ·					::::							142.1	RESIDUAL	<u>16</u>		-	Ł					
140	- 140.0		1	2	3	<b>1•</b> 5	+				w		_	GRAY AND ORANGE SA	ANDY CLAY	125	124.5	18.5	60/0.1				· · · · · ·
1		Ŧ											. 136.7		22		-	F	00/0.1				
135	135.6 ·	23.1	<u> </u>			••••	†j::						. 130.7	GRAY MICACEOU	S SILT		-	F					
	-	ŧ	5	9	22	<del></del>	<b>9</b> 31				M		-					ŧ					
		ŧ					1÷÷	·   - · · · ·	÷ – ÷ ÷ ÷ ÷	- 1		977	132.3	WEATHERED RO	<u>оск</u> 26	4	-	÷					
130	130.6	<u>+ 28.1</u>	36	64/0.3	1					11			_	SCHIST				F.					
		1											<u>128.5</u>				-	ł					
1	127.2	31.5	60/0.1							1			127.1	SCHIST	/	6	-	L					
1	-	Ł											_	Boring Terminated WITH PENETRATION TEST R	REFUSAL at		-						
l		Ŧ											-	Elevation 127.1 ft IN CRYST (SCHIST)	ALLINE ROCK		-	F					
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#### SHEET 16



		R	ROCK TES	ST RES	SULTS	5
SAMPLE	OFFSET	STATION	DEPTH	ROCK	UNIT WT.	UNIAXIAL COMPRE
NO.	OFFSEI	STATION	INTERVAL	TYPE	$(lb/ft^3)$	STRENGTH, (ps
RS-1	42' LT	63 + 65	27.3' - 27.9'	PHYLLITE	165.1	1,570
RS-2	50' RT	63 + 64	30.5' - 32.5'	GNEISS	179.3	4,630
RS-3	45' LT	64+87	25.3' - 27.2'	GNEISS	174.2	7,700
RS-4	28' RT	64+75	35.4' - 36.1'	GNEISS	171.4	14,580

PROJECT REFERENCE NO.	SHEET NO.
R-3825B	17

psi)

# **CORE PHOTOGRAPHS B1-A** BOXES 1,2 AND 3: 5.0 TO 36.0 FEET 00 1F and and and and and and and 5.0 7.4 12.4 D. 15.8 17.1 17.1 27.3 26.0 D 27.3 FEET

**CORE PHOTOGRAPHS** 

**B1-C** 

BOXES 1,2 ,3 and 4: 4.4 TO 35.7 FEET



SHEET 18 34552.1.FR3 (R-3825B)

# **CORE PHOTOGRAPHS**

B1-B

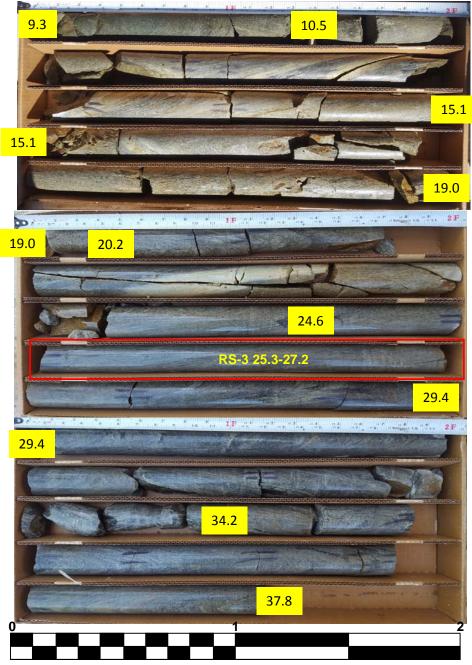
BOXES 1,2,3 AND 4: 8.1 TO 37.9 FEET



SHEET 19 34552.1.FR3 (R-3825B)

# **CORE PHOTOGRAPHS**

**B2-A** BOXES 1,2, and 3: 9.3 TO 37.8 FEET



SHEET 20 34552.1.FR3 (R-3825B) CORE PHOTOGRAPHS

B2-C



FEET

FEET

#### BOXES 1,2, and 3: 5.3 TO 34.0 FEET

# **CORE PHOTOGRAPHS**

# B2-B



SHEET 21 34552.1.FR3 (R-3825B)

# **SITE PHOTOGRAPH** Bridge No. 75 on NC 42 over the Neuse River



Looking west toward End Bent 1

PROJECT REFERENCE NO.	SHEET NO.	
R-3825B	22	