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STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY _GUILFORD

PROJECT DESCRIPTION REPLACE BRIDGES 109 AND 121 ON SR 4240 (E. GATE CITY BLVD.) OVER SOUTH

BUFFALO CREEK

SITE DESCRIPTION DUAL STRUCTURES AT -L-**STATION** 21+22.00

5673 4 PROIEC

STATE PROJECT REFERENCE NO. STATE SHEETS NO. 39 N.C B-5717 1

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOLT TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (1991) 707-8050. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORNICS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU UN-FLACED TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOL MOISTURE CONDITIONS MOLATED IN THE SUBSURFACE RELIVESTIGATIONS AND REAS RECORDED AT THE TIME OF THE INVESTIGATION. THES WATER LEVELS OR SOL MOISTURE CONDITIONS MAY LARY CONSIDERABLY WITH THE ACCORDING TO CLIMATIC CONDITIONS NICULDING 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 WARANT 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 INVESTIGATION 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 CONDENTIONS OF CONTANT THE SIDE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- 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.

PERSONNEL

P.M. WEAVER

C.R. PASTRANA

TRIGON EXPLORATION

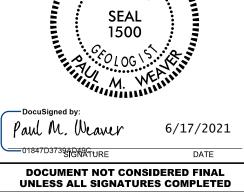
INVESTIGATED BY <u>ESP</u> Associates, Inc. DRAWN BY ______. WALKER

CHECKED BY _____. WEAVER

SUBMITTED BY <u>ESP</u> Associates, Inc.

DATE <u>June</u> 2021

ESP ASSOCIATES, INC. 7011 ALBERT PICK RD SUITE E GREENSBORO, NC 27409 FIRM # C-0587 WWW.ESPASSOCIATES.COM CAROL H SEAL



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

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

		SOIL (DESCRI	IPTIO	N					GRA	ADATION			<u> </u>			ROCK DE	SCRIPTION	
BE PENETRATE ACCORDING T IS BASED	SIDERED UNCONSOLIDA ED WITH A CONTINUO TO THE STANDARD PE D ON THE AASHTO SY	JS FLIGHT PO NETRATION TE STEM. BASIC	WER AUGE ST (AASH) DESCRIPTI	TO T 20	YIELD LESS 06,ASTM D1 NERALLY IN	THAN 100 BLOWS 586), SOIL CLASS CLUDE THE FOLLC	PER FOOT FICATION WING:	WELL GRADED - INDICAT UNIFORMLY GRADED - IN GAP-GRADED - INDICATE	NDICATES ES A MIXI	THAT SOIL P TURE OF UNIF	ORM PARTICLES ARE ALI	L APPROXIMA ZES OF TWO	ATELY THE SAME SIZE.	ROCK LINE INDI SPT REFUSAL I	ICATES THE S PENETRAT -COASTAL P	E LEVEL TION BY PLAIN MA	AT WHICH NON-COA A SPLIT SPOON SA ATERIAL, THE TRA	WOULD YIELD SPT REFL ISTAL PLAIN MATERIAL IMPLER EQUAL TO OR L INSITION BETWEEN SO	WOULD YIELD LESS THAN Ø.
AS MI	, COLOR, TEXTURE, MOI INERALOGICAL COMPOS	ITION, ANGULA	RITY, STRU	UCTURE,	PLASTICITY	, ETC. FOR EXAMP	_E,				TY OF GRAIN SOIL GRAINS IS DE		Y THE TERMS.				DIVIDED AS FOLLOW	/S:	
VERY	SOIL LEGE	ND AND					6	ANGULAR, SUBAN	NGULAR, <u>S</u>	SUBROUNDED, O			THE TENNS:	WEATHERED ROCK (WR)			NON-COASTAL PLA 100 BLOWS PER FO	IN MATERIAL THAT WOU DOT IF TESTED.	JLD YIELD SP1
GENERAL CLASS.	Granular Mater (≤ 35% Passing			-Clay Ma 15% Passin		ORGANIC MA1	ERIALS		MES SUCH	H AS QUARTZ,	FELDSPAR, MICA, T	ALC, KAOLIN,		CRYSTALLINE ROCK (CR)				GRAIN IGNEOUS AND ME REFUSAL IF TESTED.	
CLASS. A-1-a		A-2 -2-5 A-2-6 A-2	A-4	A-5 A	A-7-5 A-7-5 A-7-6	A-1, A-2 A-4, A- A-3 A-6, A-		ARE USED IN			THEY ARE CONSID		SNIF ICANCE.	NON-CRYSTALLI ROCK (NCR)			FINE TO COARSE O	CRAIN METAMORPHIC AN	
SYMBOL 00000			777	17.1				MODEI MODEI		MPRESSIBLE COMPRESSIBLE	:	LL < 31 LL = 31 -	- 50	COASTAL PLAIN SEDIMENTARY R			COASTAL PLAIN SE	DES PHYLLITE,SLATE,S EDIMENTS CEMENTED IN CK TYPE INCLUDES LIME	NTO ROCK.BUT
% PASSING 10 50 MX						GRANULAR SILT-	MUCK,				E OF MATER	LL > 50		(CP)			SHELL BEDS, ETC.		ESTONE, SHINDS
	x 50/ MX 51/ MN x 25 MX 10/ MX 35/ MX 31	5 MX 35 MX 35	MX 36 MN	36 MN 36	MN 36 MN	SOILS	PEAT	ORGANIC MATERIAL		GRANULAR SOILS	SILT - CLAY SOILS	OTHEF	R MATERIAL	FRESH R		CRYSTAL		TS MAY SHOW SLIGHT ST	
MATERIAL PASSING #40 LL	40 MX 4	L MN 40 MX 41 I	MN 40 MX	41 MN 40	MX 41 MN	SOILS WITH LITTLE OR MODERATE	HIGHLY	TRACE OF ORGANIC MA LITTLE ORGANIC MATT MODERATELY ORGANIC HIGHLY ORGANIC	1ATTER TER	2 - 3% 3 - 5% 5 - 10% > 10%	3 - 5% 5 - 12% 12 - 20% > 20%	TRACE LITTLE SOME HIGHLY	1 - 10% 10 - 20% 20 - 35% 35% AND ABOVE	H VERY SLIGHT R (V SLI.) C	IAMMER IF CF	RYSTALLI ALLY FRES N A BROKE	INE. SH, JOINTS STAINED, EN SPECIMEN FACE	SOME JOINTS MAY SHOW SHINE BRIGHTLY. ROCK F	W THIN CLAY C
USUAL TYPES STONE OF MAJOR GRAV		4 MX Y OR CLAYEY YEL AND SAND	8 MX SILT SOIL	тү	MX NO MX CLAYEY SOILS	AMOUNTS OF ORGANIC MATTER	ORGANIC SOILS	 		R LEVEL IN BO	ND WATER		DRILLING	(SLI.) 1 C	INCH. OPEN RYSTALS ARE	JOINTS N RE DULL A	MAY CONTAIN CLAY. AND DISCOLORED. CF	AND DISCOLORATION EX IN GRANITOID ROCKS SC RYSTALLINE ROCKS RING	OME OCCASIONA UNDER HAMMEI
MATERIALS SI GEN. RATING AS SUBGRADE	EXCELLENT TO C			FAIR TO P		FAIR TO POOR POOR	UNSUITABLE	 ₹ ∑₽₩ 	PERCH		EL AFTER <u>24</u> H TURATED ZONE, OR		RING STRATA	(MOD.) G	RANITOID RO	OCKS,MOS UNDER HA	T FELDSPARS ARE [SCOLORATION AND WEATH DULL AND DISCOLORED, S SHOWS SIGNIFICANT LOSS	SOME SHOW CLA
	PI OF A-7-5 SUB	GROUP IS ≤ LL				> LL - 30					IEOUS SYMBO			MODERATELY A	LL ROCK EXC	CEPT QUA		R STAINED. IN GRANITOI KAOLINIZATION. ROCK SH	
PRIMARY SOIL	COMPACT	NESS OR	RANG	GE OF SI		RANGE OF U				25 (025				(MOD. SEV.) A	IND CAN BE E	EXCAVATE		ST'S PICK. ROCK GIVES	
GENERALLY	VERY	LOOSE DSE		(N-VALL < 4 4 TO	JE) 10	(TONS)		U WITH SOIL DE		м 🕂			SLOPE INDICATOR INSTALLATION	(SEV.) R	EDUCED IN S	STRENGTH TENT. SOM	H TO STRONG SOIL. ME FRAGMENTS OF S	R STAINED. ROCK FABRIC IN GRANITOID ROCKS ALI TRONG ROCK USUALLY R	L FELDSPARS 4
MATERIAL (NON-COHESI	IVE) MEDIUM DE VERY VERY	NSE DENSE		10 TO 30 TO > 50 < 2	50	N/ < 0.		ARTIFICIAL FI	Y EMBAN		- AUGER BORING	(CONE PENETROMETER TEST SOUNDING ROD	VERY AI SEVERE BI (V SEV.) RI	UL ROCK EXC UT MASS IS EMAINING, SA	CEPT QUA EFFECTI SAPROLITE	IVELY REDUCED TO S IS AN EXAMPLE OF	R STAINED. ROCK FABRIC SOIL STATUS,WITH ONLY F ROCK WEATHERED TO A	/ FRAGMENTS O A DEGREE THAT
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	SC MEDIUM ST VERY	FT STIFF IFF		2 TO 4 TO 8 TO 15 TO	8 15	0.25 T 0.5 T 1 TO 2 TO	0.5 1.0 2	INFERRED ROC	CK LINE	₩Ŭ	MONITORING WE PIEZOMETER	ш 🔶	TEST BORING WITH CORE - SPT N-VALUE	COMPLETE R	OCK REDUCED	D TO SOI	IL. ROCK FABRIC NO	AIN. <u>IF TESTED, WOULD</u> T DISCERNIBLE, OR DISC Y BE PRESENT AS DIKES	ERNIBLE ONLY
	H4			> 30		>					INSTALLATION						ROCK H	ARDNESS	
U.S. STD. SIEVE		4 10	40	1HIN 60		270				LASSIFIED EX	CAVATION - 🗗	ুন্গ UNCLAS	SIFIED EXCAVATION -				D BY KNIFE OR SHA OF THE GEOLOGIST	RP PICK. BREAKING OF ⊢ ′S PICK.	HAND SPECIMEN
OPENING (MM)		4.76 2.00	0.42 COARS	2 0.2		0.053		SHALLOW		UITABLE WAST	CAVATION -	USED IN	ABLE,BUT NOT TO BE N THE TOP 3 FEET OF MENT OR BACKFILL		AN BE SCRAT			NLY WITH DIFFICULTY. H	IARD HAMMER B
BOULDER (BLDR.) GRAIN MM	COBBLE G (COB.) 305 75	RAVEL (GR.) 2.0	SAND (CSE, SI	o	SAND (F SD.	SILT (SL.) 0.05 0.0	CLAY (CL.)		ALLE	EPTABLE DEGR ABBRI MED M	EVIATIONS		- VANE SHEAR TEST	HARD E		BY HARD E		OUGES OR GROOVES TO (ST'S PICK. HAND SPECIM	
	SOIL MOIS							BT - BORING TERMINATED CL CLAY CPT - CONE PENETRATION		MICA MOD M	MICACEOUS MODERATELY N PLASTIC	WEA γ- υ	- WEATHERED UNIT WEIGHT DRY UNIT WEIGHT	HARD C		AVATED IN	N SMALL CHIPS TO F	DEEP BY FIRM PRESSU PEICES 1 INCH MAXIMUM	
	STURE SCALE ERG LIMITS)	FIELD M DESCR	IPTION			IELD MOISTURE (CSE COARSE DMT - DILATOMETER TES DPT - DYNAMIC PENETRA		ST SAP S	RESSUREMETER TE	U.	MPLE ABBREVIATIONS	F	ROM CHIPS 1	TO SEVER		KNIFE OR PICK. CAN BE BY MODERATE BLOWS O SURE.	
	LIQUID LIMIT	- SATUR (SAT.		FR	OM BELOW	UID; VERY WET, U THE GROUND WA	TER TABLE	e - VOID RATIO F - FINE - FOSS FOSSILIFEROUS		SL SII SLI SI		ST - RS -		SOFT 0				AVATED READILY WITH P BY FINGER PRESSURE. CA	
RANGE <		- WET -	(W)			EQUIRES DRYING MUM MOISTURE	TO	FRAC FRACTURED, FRAC FRAGS FRAGMENTS	TURES	w - MOI	RICONE REFUSAL		RECOMPACTED TRIAXIAL - CALIFORNIA BEARING		RACTURE				BEDDING
ом	PLASTIC LIMIT OPTIMUM MOISTURE SHRINKAGE LIMIT	- MOIST	- (M)	sc	LID;AT OF	NEAR OPTIMUM	MOISTURE	HI HIGHLY EQU DRILL UNITS:		V - VER NT USED	ON SUBJECT	PROJEC		TERM VERY WIDE WIDE MODERATELY	CLOSE	MORE T	<u>SPACING</u> THAN 10 FEET O 10 FEET O 3 FEET	TERM VERY THICKLY BI THICKLY BEDDED THINLY BEDDED	
52 1	SHRINKHUE LIMIT	- DRY -	(D)			DITIONAL WATER MUM MOISTURE	TO	CME-45C		CLAY BITS 6'CONTINUOUS	FLIGHT AUGER	CORE SIZ		CLOSE VERY CLOSE			TO 1 FOOT HAN 0. 16 FEET	VERY THINLY BEI THICKLY LAMINAT THINLY LAMINATE	DDED 0.0
		PL	ASTICI	ΤY						8"HOLLOW AUG		🗌 -в	🗌 -н					RATION	
NON PLA SLIGHTL	ASTIC Y PLASTIC	PLAST	<u>ICITY INE</u> Ø-5 6-15	JEX (PI)		<u>DRY_STRE</u> VERY_L SLIGH	OW	X CME-550	<u> </u>	HARD FACED FI	INSERTS			FOR SEDIMENTA		INDURATI	RUBBING WITH	NING OF MATERIAL BY FINGER FREES NUMERO BY HAMMER DISINTEGR	OUS GRAINS;
MODERAT	TELY PLASTIC PLASTIC		16-25 26 OR MOI			MEDIU	м			CASING TRICONE 2 15/	W/ ADVANCER <u>/16 </u> •STEEL TEETH	POS	ST HOLE DIGGER	MODERAT	ELY INDURA	ATED		E SEPARATED FROM SAN Y WHEN HIT WITH HAMM	
			COLOR								' TUNGCARB.		INDING ROD	INDURATE	ED			FFICULT TO SEPARATE BREAK WITH HAMMER.	WITH STEEL
	DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRA MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.							X CORE BIT VANE SHEAR TEST						EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAM			BREAK SAMPLE		

PROJECT REFERENCE NO.



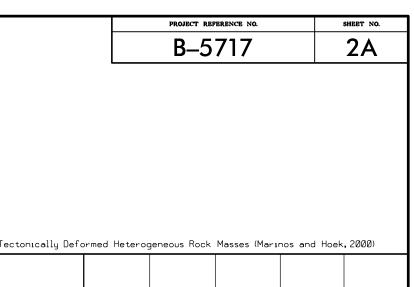
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	TERMS AND DEFINITIONS
ED. AN INFERRED D SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
1 FOOT PER 60 IS OFTEN	AOUIFER - A WATER BEARING FORMATION OR STRATA.
	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
T N VALUES >	ARGILLACEDUS - 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.
OCK THAT	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.
NCLUDES GRANITE,	SURFALE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
AL PLAIN IF TESTED. IC.	<u>COLLEVILOUS COLCE</u> SULLS THAT CONTACT AT THE CHORE A MODIFY OF CHOCKING CHOCKING. <u>COLLEVILOUT</u> ON CROCK 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.
	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
RINGS UNDER	$\underline{\text{DIP}}$ - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
COATINGS IF OPEN, HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
OCK UP TO AL FELDSPAR	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
R BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
TS. IN AY. ROCK HAS H AS COMPARED	<u>FLOAT</u> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
H HO CUMPAKED	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
FELDSPARS DULL LOSS OF STRENGTH	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
EVIDENT BUT ARE KAOLINIZED	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
THE RECEIVIZED	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 DF STRONG ROCK	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE
T ONLY MINOR VALUES < 100 BPF	OF AN INTERVENING IMPERVIOUS STRATUM.
IN SMALL AND	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
IS. SAPROLITE IS	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
NS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
BLOWS 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.
DEEP CAN BE DETACHED	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
OR 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.
N FRAGMENTS NT. SMALL, THIN	STRATA CORE RECOVERY (SREC.) - 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
HED READILY BY	THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. <u>TOPSOIL (TS.)</u> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
	BENCH MARK: BL-3: STA. 29+63.74, N 839124.4010, E 1781313.8740
THICKNESS 4 FEET	ELEVATION: 715.91 FEET
1.5 - 4 FEET .16 - 1.5 FEET	
03 - 0.16 FEET	
08 - 0.03 FEET < 0.008 FEET	F.I.A.D = FILLED IMMEDIATELY AFTER DRILLING
EAT, PRESSURE, ETC.	
TEEL PROBE:	
PROBE:	
.E;	DATE: 8-15-14

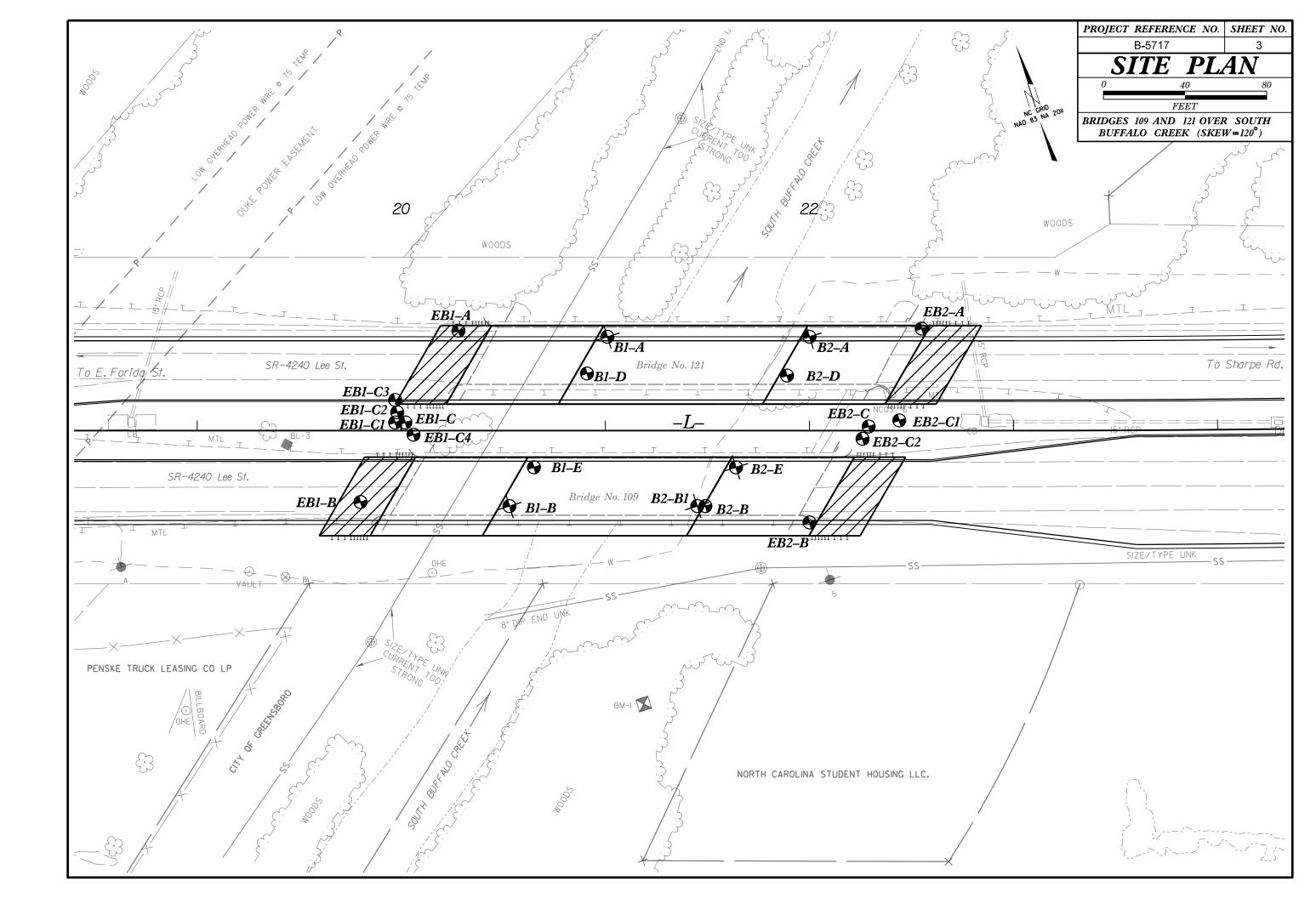
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

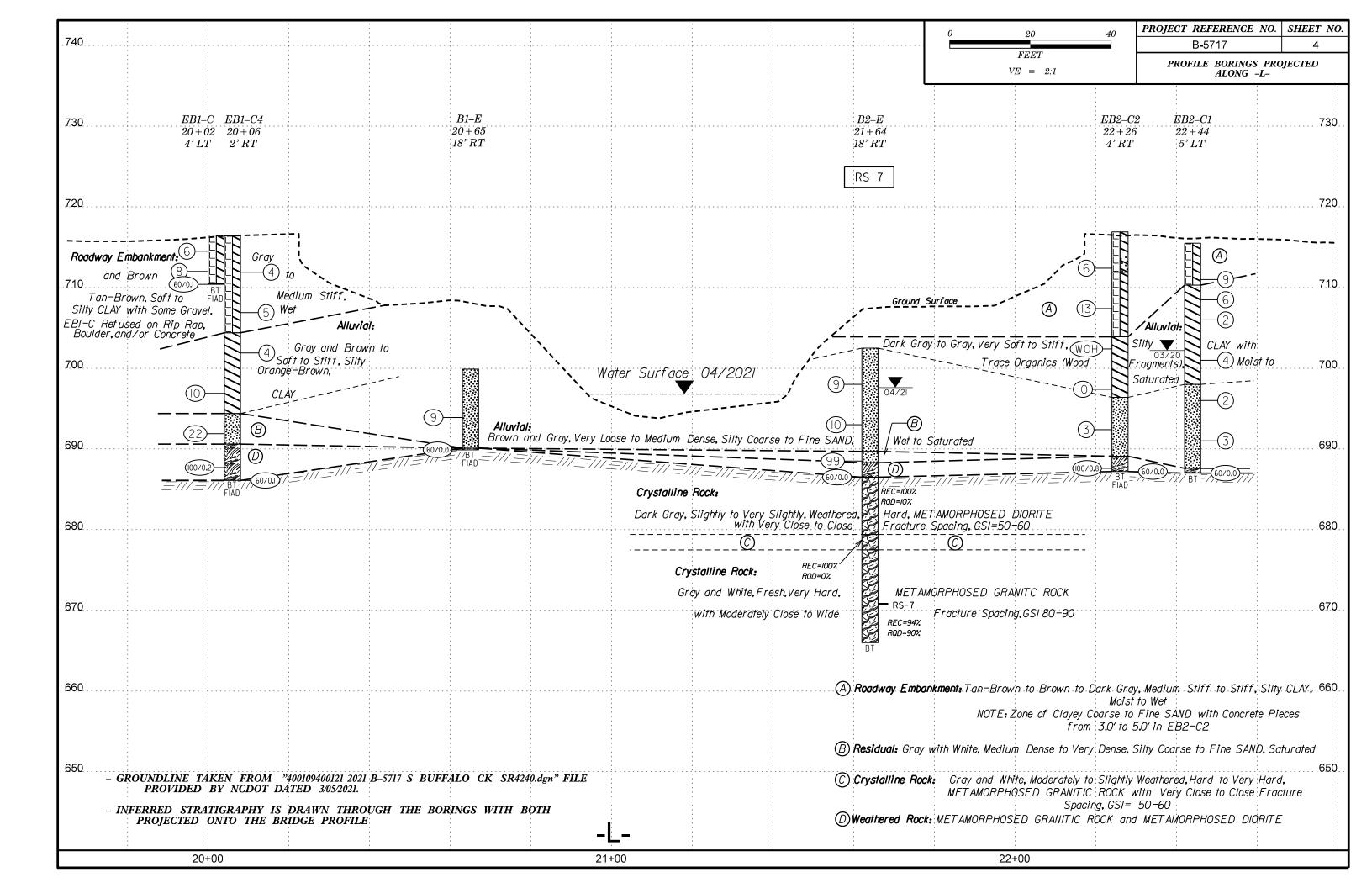
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

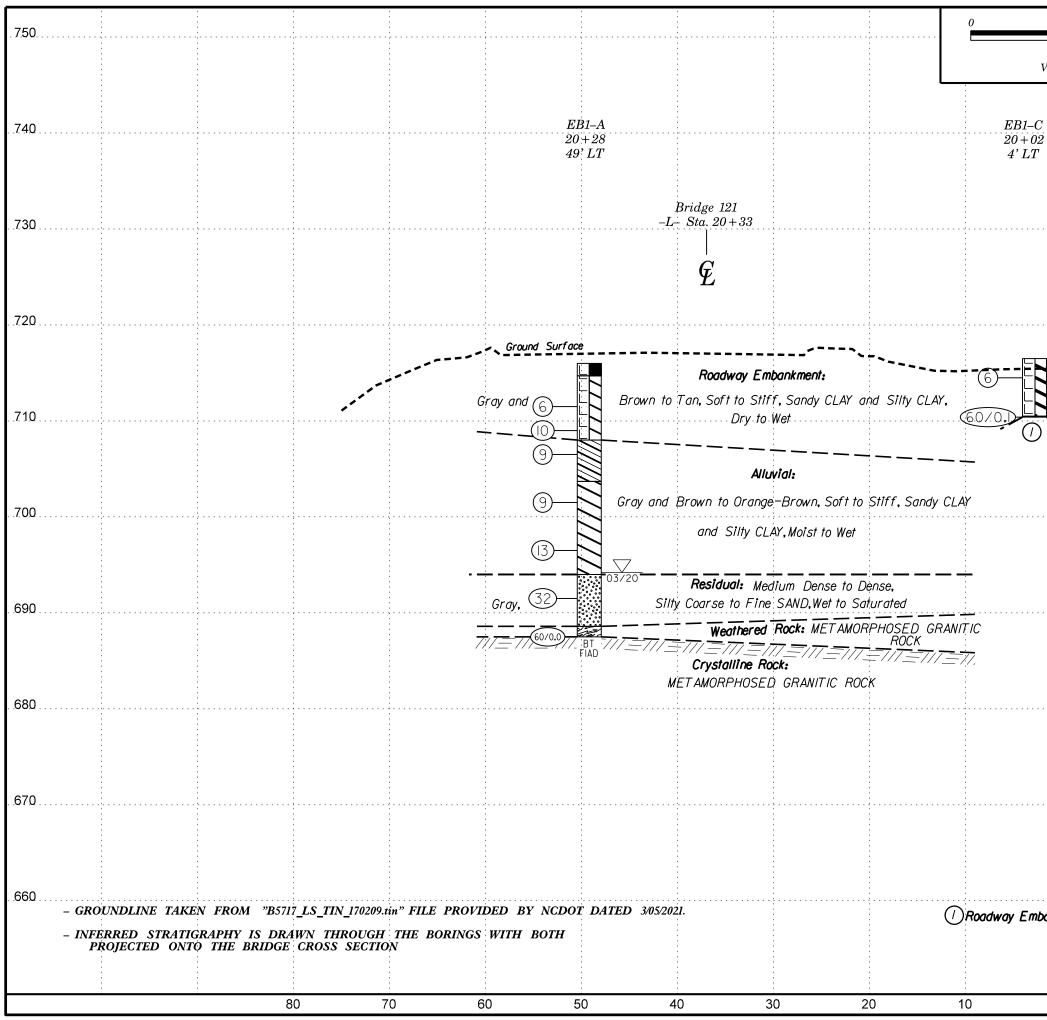
AASHTO LRFD Figure 10.4.6.4–1 — Determination of GSI for Jointed F	Rock Mass (Marı	nos and Hoek,2	2000)			AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for T
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000) From the lithology, structure and surface conditions of the discontinuities, 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	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
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.		GOOD Rough, s surface	FAIR Smoot alter		VERY Slick with	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. Sond- stone with thun 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		C. D. E. and G - may be more or less folded than illustrated but this does not change the strength. Tectonic deformation, faulting and loss of continuity moves these categories to F and H.
discontinuity sets. Persistence of bedding planes or schistosity 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	Mans deformation after tectonic disturbance



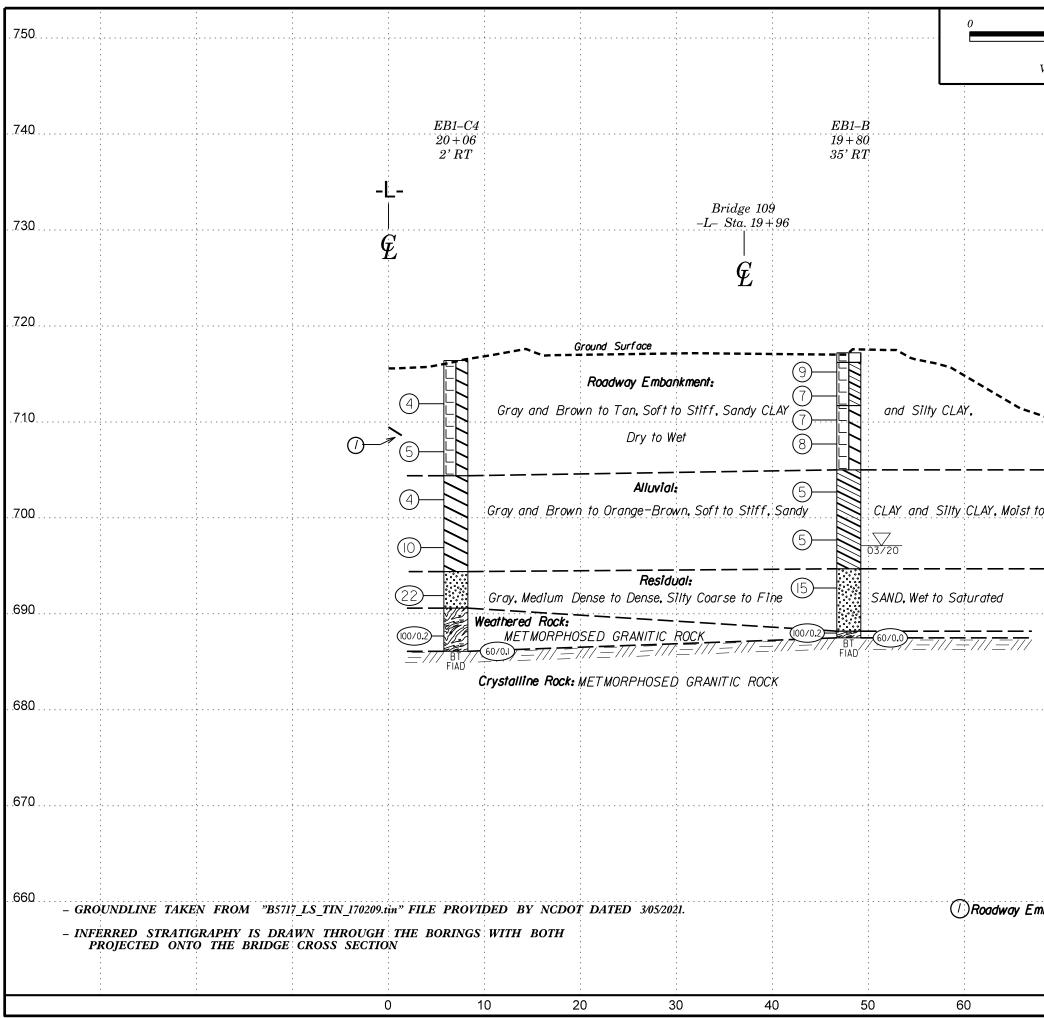
ق ق ق ق ق ق ق 5 SURFACE CONDITIONS OF DISCONTINUITIES (Predominantly bedding planes)	VERY GOOD - Very Rough, fresh unweathered surfaces	600D - Rough, slightly weathered surfaces	FAIR - Smooth, moderately weathered and altered surfaces	POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments	VERY POOR - Very smooth, slicken- sided or highly weathered surfaces with soft clay coatings or fillings
	70 60	A			
E. Weak suitstone or clayey shale with sandstone layers		50 B 40	С	P E	
eformed, d/faulted, hale or siltstone deformed forming an tructure			30	F 20	
eformed silty forming a with pockets ers of ensformed pieces.			\$	H	+ ¹⁰



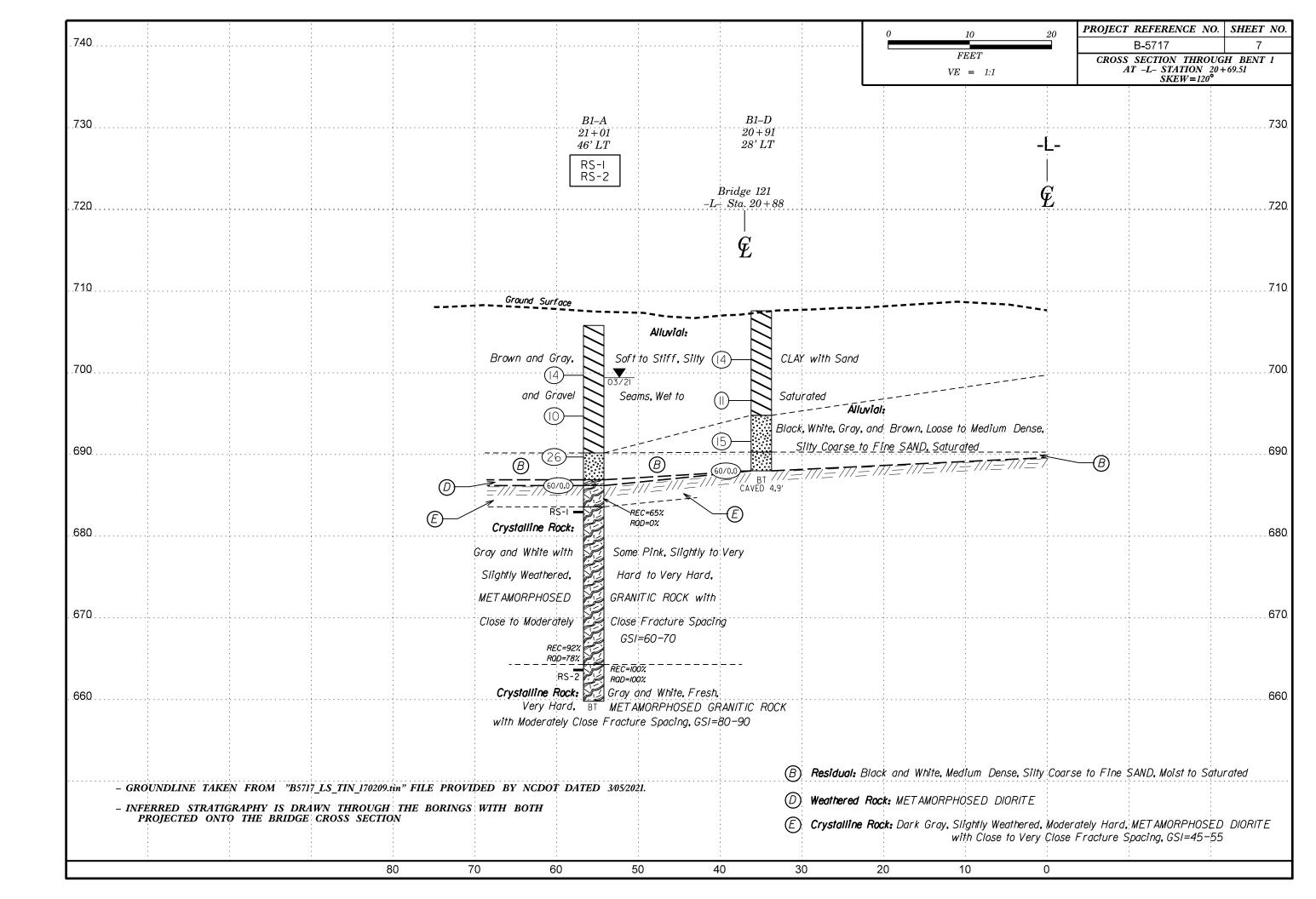


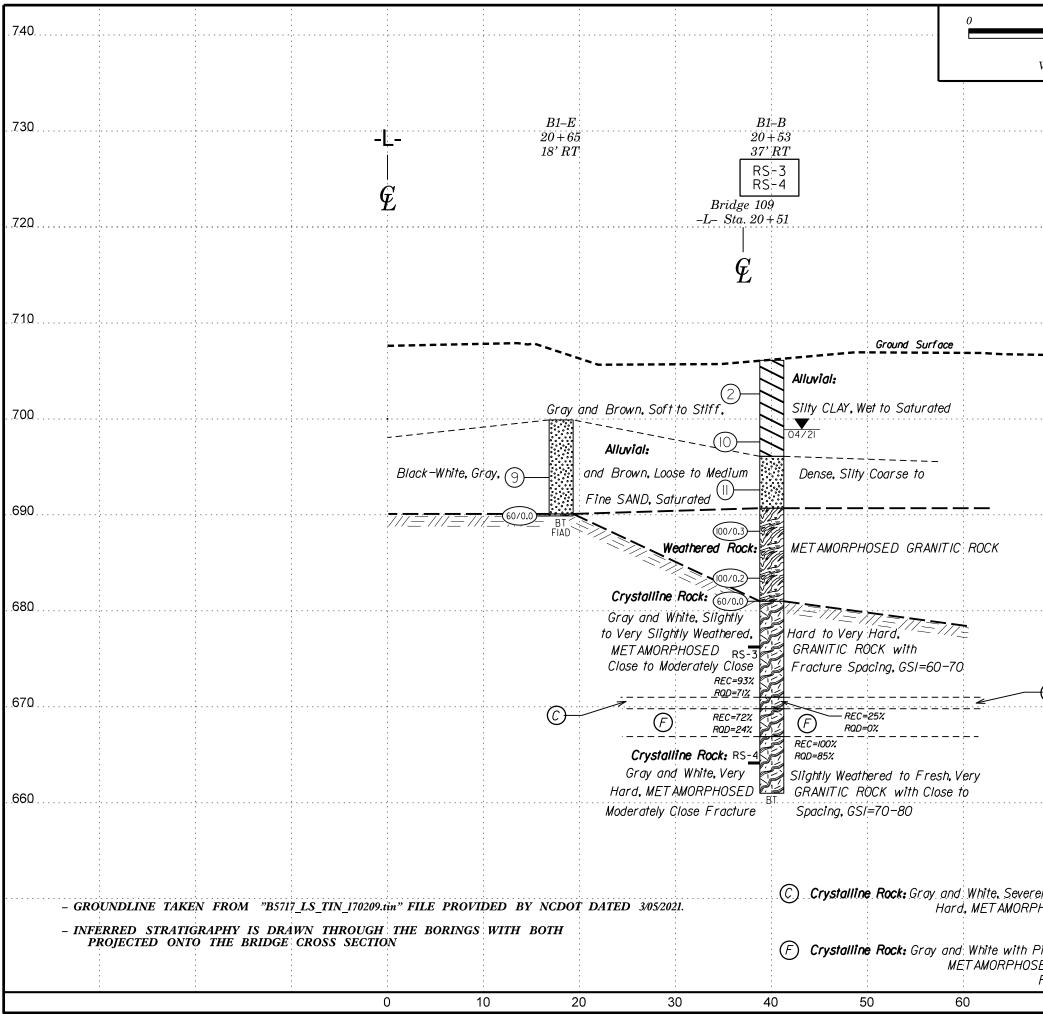


10	20	PROJE	CT R	<i>NO</i> .	O. SHEET NO.				
				-5717				5	
<i>FEET</i> <i>VE = 1:1</i>		CROSS	SEC AT	TION 2 -L- ST SK	THROU ATION CEW=1	U GH 1 20 + 120°	END 14.50	BENT 1	
								7.40.	
É								7.30.	
								7.20.	
8									
								690.	
								680.	
								670.	
nbankment: Rip Rap a	nd/or	Boulder	and	∕or Ca	oncrete	9		660.	
0			<u>.</u>						

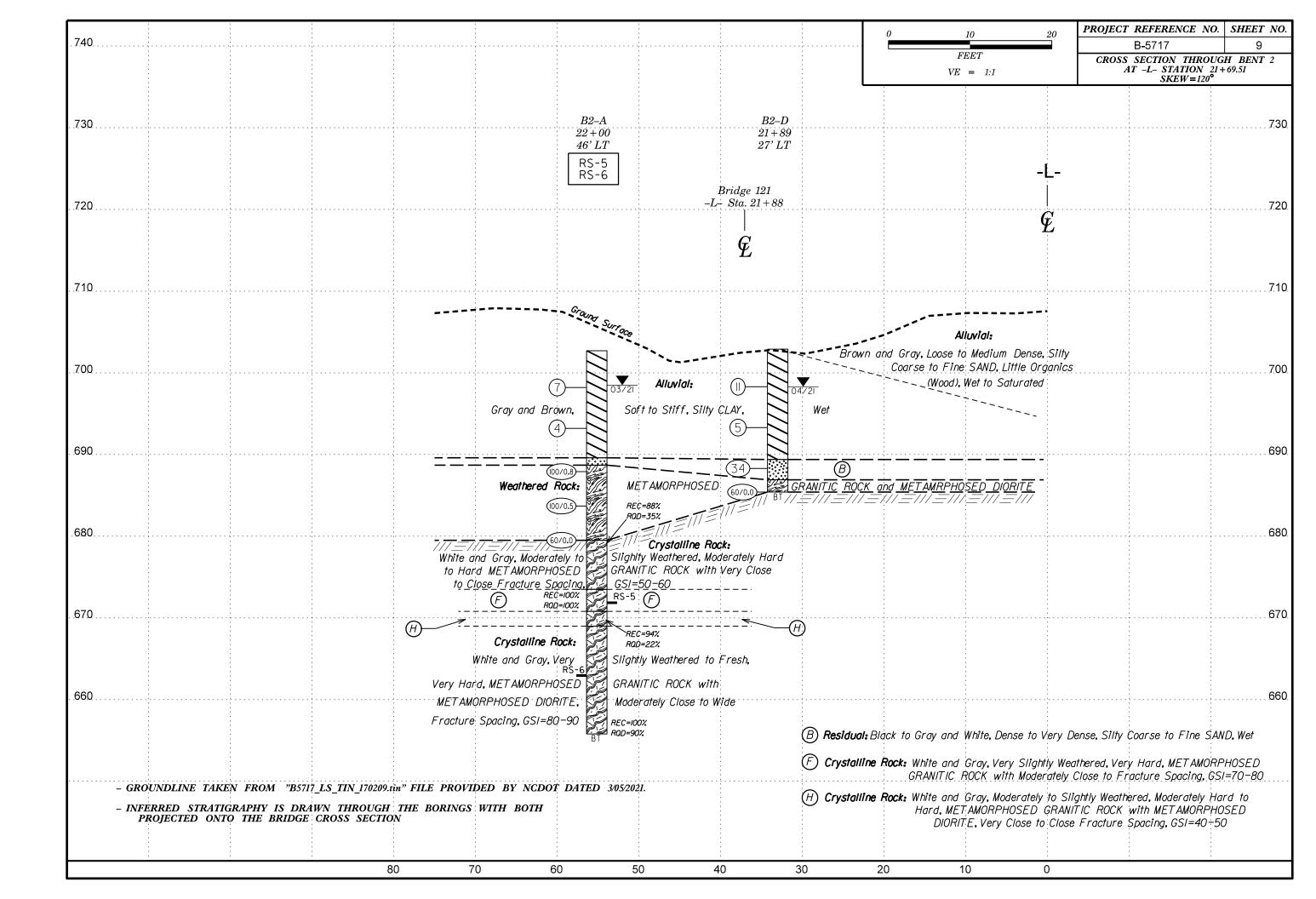


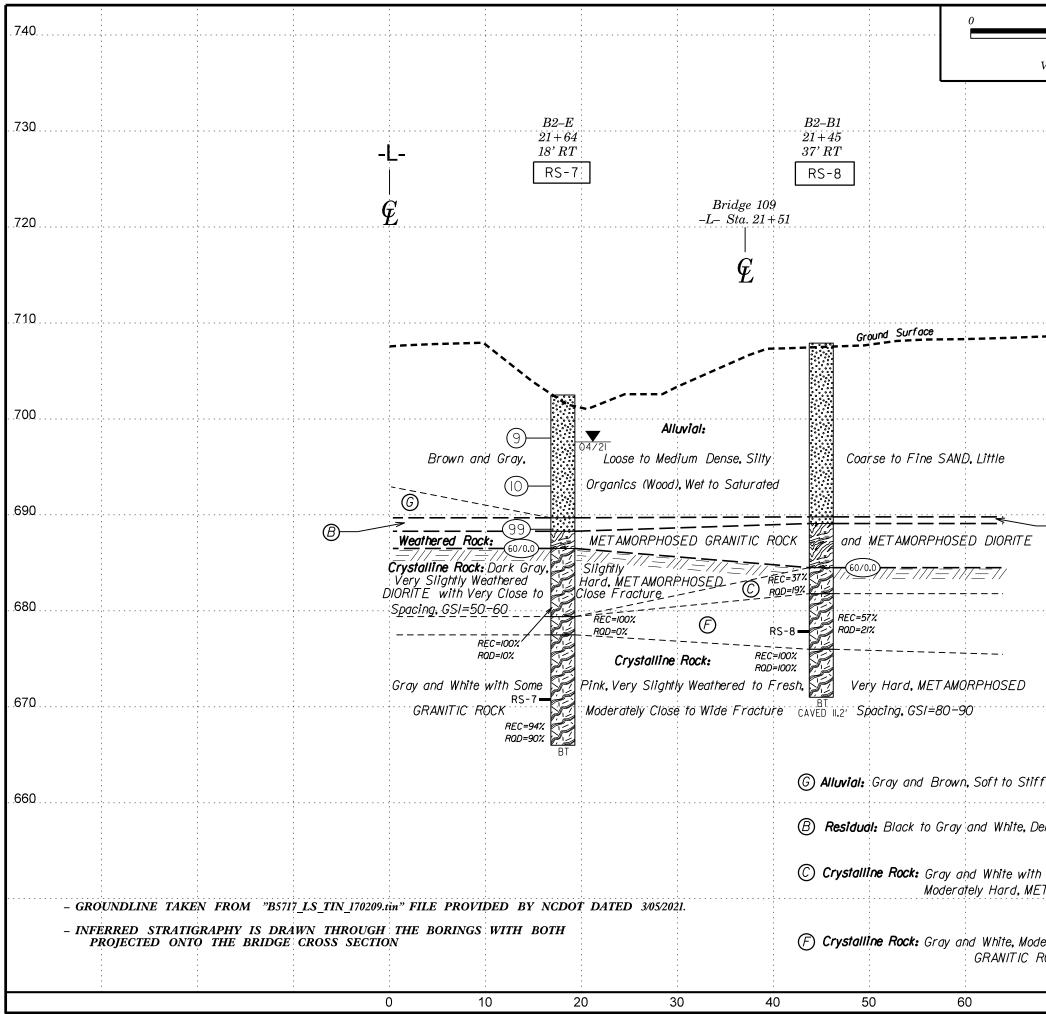
10	20	PROJECT	REFERENCE NO	D. SHEET NO.
	20		B-5717	6
FEET $VE = 1:1$		CROSS S	ECTION THROUGH 4T -L- STATION 2 SKEW=120°	H END BENT 1 0+14.50
				740
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mbackmont. Die D	an and /-	r Douldo-	and for Concert	
mbankment: Rip R	0 לטוט קט	i Douider		
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70	80		· · ·	



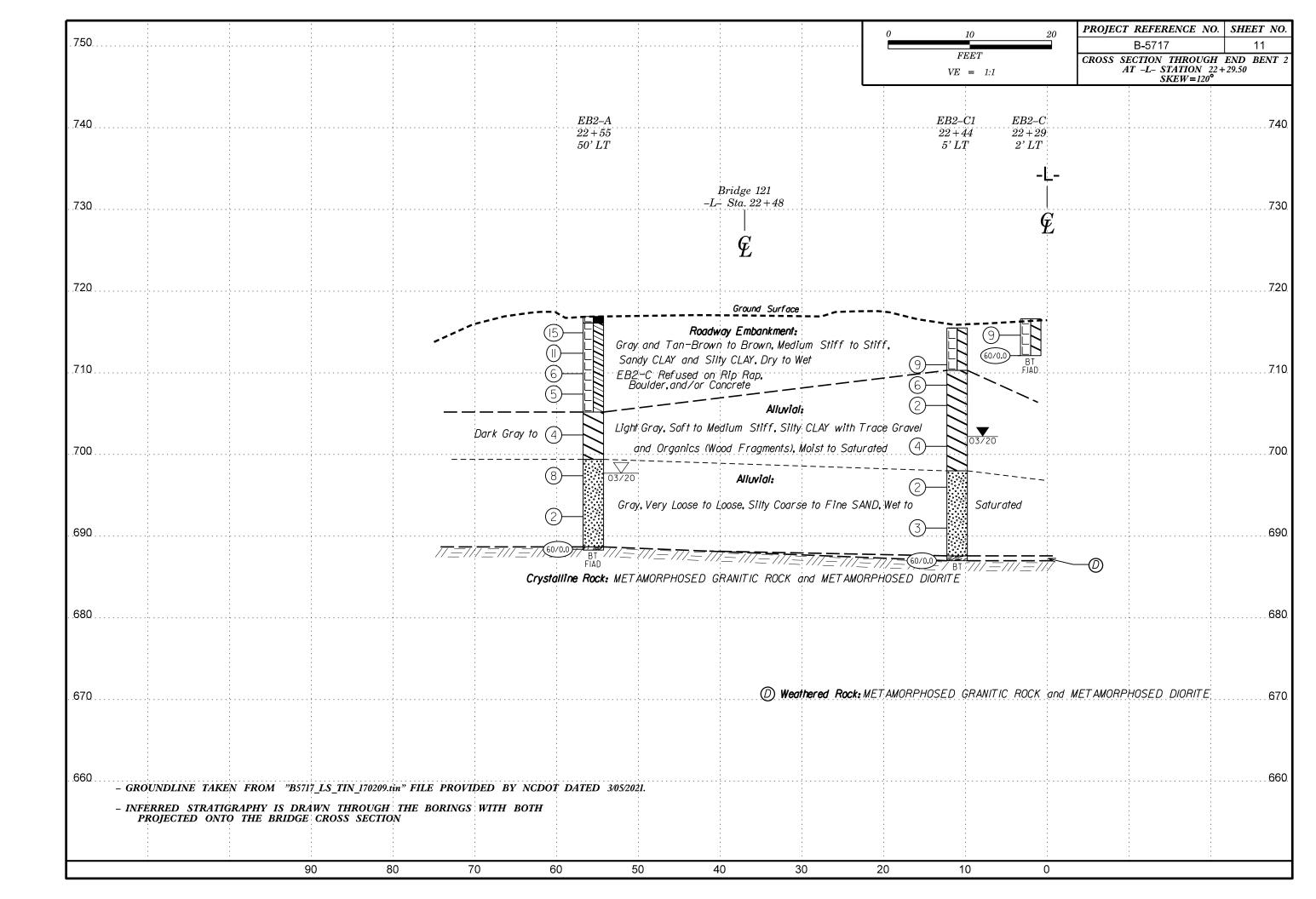


	10	20	PROJECT	REFERENCE	NO.	SHEET	NO.
				B-5717		8	
	EET		CROSS	SECTION THE		H BENT	1
VE	= 1:1		A	T -L- STATION SKEW=1	204 20°	- 09.31	
	- - - -						
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ely t	o Moderately S	everely V	Veathered,	Medium Hard	to M	oderately	
PHOS	SED GRANITIC			lose Fracture	Spac	cing,	
	G	SI=20	50		-		
	Moderately We				•		
	GRANITIC ROU			to Close			
	cture Spacing,		00				
7	U	80					





10	20	PROJECT	REFERENCE N	IO. SHEET NO.
	20		B-5717	10
FEET		CROSS	SECTION THRO	OUGH BENT 2
VE = 1:1		Л	T -L- STATION SKEW=120	21 + 09.51)°
				710
				700
				690
— B				
	1 1 1 1			
ff, Silty CLAY, W	et			
Densë to Very De	nse, Silty C	Coarse to F	ine SAND, Wet	
		-		
	1	Course to t	Maday -t-1 141	borod
h Red-Orange, M ETAMORPHOSEL				
Fracture S	Spacing, GS	1=30-40	in close to very	C103E
	,	//		
derately to Slighi	tly Weathere	ed, Hard to	Very Hard, ME	TAMORPHOSED
ROCK with Very				
70	80			

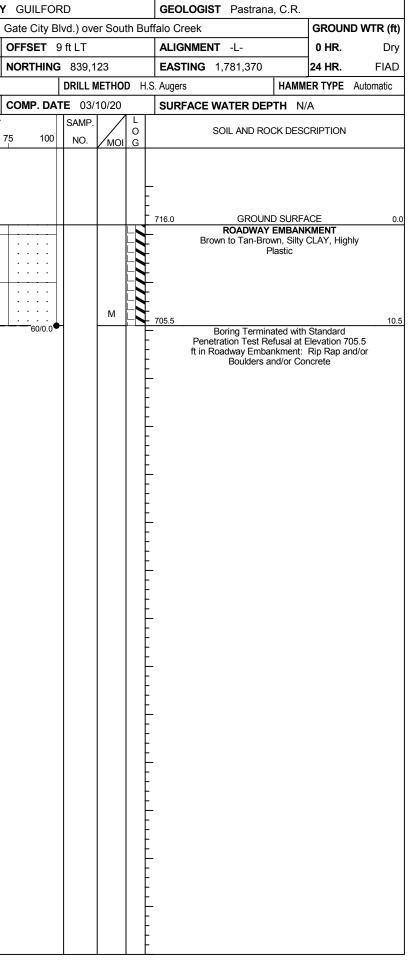


					0	10	20 PROJEC	T REFERENCE N	O. SHEET NO.
.750								B-5717	12
						FEET $VE = 1$	CROSS S	SECTION THROUG AT -L- STATION 2 SKEW=120	H END BENT 2 22+29.50
					:			SKEW=120	0
. 740	$\begin{array}{c} EB2-C2\\ 22+26\end{array}$			$\begin{array}{c} EB2 -B \\ 22 + 00 \end{array}$					7.40
	22 + 26 4' RT			45' RT					
	- <u>L</u> -	Bride	so 100						
730		Bridg –L– Sta	e 105 1. 22 + 11						730
	G								
		(Ë						
		1	L.						
720									720
		Cround Surface							
	#===	Ground Surface							
		Roadway Embankment: Brown, Soft to Stiff, Silty CLAY	with Thin Zonoc		Clayey SAND.				
		Dry to Wet			Cidyey SAND,				710
.710	ER2-C. Refused								
	(13)—L EB2-C Refused Boulder, and /c	pr Concrete		0					
		Alluvial:			-				
			AV. Caturated		20				
. 700	Gray to Tan-B	rown, Very Soft to Stiff, Silty CL	Ar, Saturated						7.00.
		Alluvial:		(4)					
		: : : : : : : : : : : : : : : : : : :	ND with I sugge a						
	(3)	o Loose, Silty Coarse to Fine SA	WD WITH Layers of		/ IN EB2-B, Sail	ir died			
. 690	·····								690
	(00/0.8) MET AMORI	Weathered Rock: PHOSED GRANITIC ROCK and N		(100/0.2)					
	BT // BT //		<u>ETAMORPHOSED</u> ////		0/0.0 DIORITE				
		Crystalline Rock:		·····					
. 680	METAMORPHOSE	D GRANITIC ROCK and METAM	URPHUSED DIUR	11 E					680
. 670									670
660									000
. 660 – GROUNDLINE TAKEN FROM	M "B5717_LS_TIN_170209.tin" FILE PROVIDED BY NO	CDOT DATED 3/05/2021.			· · · · · · · · · · · · · · · · · · ·	····· (·······························			660
- INFERRED STRATIGRAPHY	IS DRAWN THROUGH THE BORINGS WITH BOT BRIDGE CROSS SECTION	Н							
PROJECTED ONTO THE	BRIDGE CROSS SECTION								
· · · · · · · · · · · · · · · · · · ·	0 10	20 30	40	50	60	70 8	0	· · · · · ·	

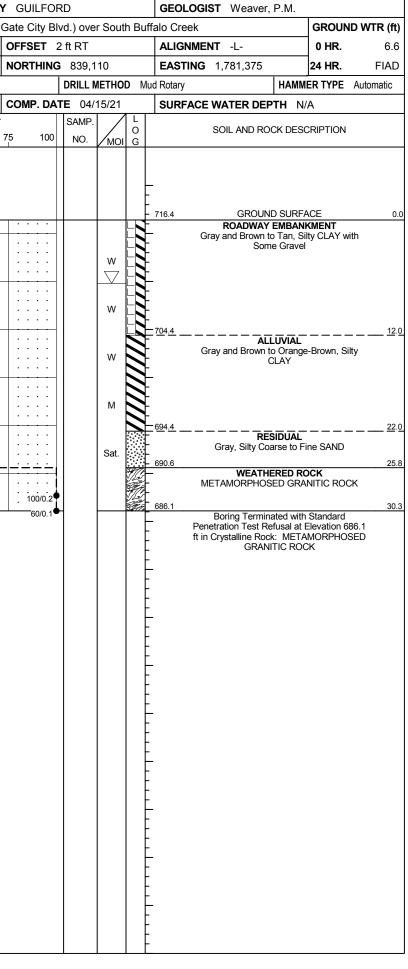
											JRE I																	
	45673						-5717				GUILFC					OLOGIST Pastrana, C.R.	1		-	45673					P B-571		COUN	
SITE	DESCR	IPTION	Rep	blace I					SR 424		ate City E			uth B			GROUND WT	R (ft)	SITE	DESCR	PTION	Rep	lace B			121 on SI	R 4240 (E	E. Ga
BOR	NG NO.	EB1-	-A		s	STATIO	ON 2	0+28		0	OFFSET	49 ft LT			AL	IGNMENT -L-	0 HR.	21.8	BOR	NG NO.	EB1-	-C		S	TATION	20+02		OF
COLI	AR ELE	EV. 71	16.0 ft		т	OTAL	DEP1	FH 28.	5 ft	1	NORTHIN	G 839, ⁻	153		EA	STING 1,781,411	24 HR.	FIAD	COLI	AR ELE	V. 71	16.5 ft		т	OTAL DEF	PTH 6.1 f	t	NO
DRILL	. RIG/HAI	MMER E	FF./DA	TE S	UM312	3 CME-	-550X 9	3% 11/18	3/2019			DRILL	METH	OD I	H.S. Aug	ers HAMM	ER TYPE Autom	natic	DRILL	. RIG/HAN	IMER E	FF./DA	TE SL	JM3123	CME-550X	93% 11/18/	2019	
	LER G				s	START	DATE	E 03/09	9/20	0	COMP. DA	TE 03/	/09/20)	SU	RFACE WATER DEPTH N/	/A		DRIL	LER G	onzale	s, L.		S		E 03/10	/20	CC
ELEV	DRIVE ELEV	DEPTH	BLO	oo wc	UNT			BLOW	/S PER	FOOT		SAMP.				SOIL AND ROCK DESC	RIPTION		ELEV	DRIVE ELEV	DEPTH	BLC	W COL	JNT		BLOWS	9 PER FOO)T
(ft)	(ft)	(ft)		0.5ft	0.5ft	0	2	25	50	7	5 100	NO.	Имс	DI G				PTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
720		L													L				720		_							
	-	Ļ													Ł					-	-							
	-														716.0			0.0		- 715.5 -	- 10				.			•
715	-	F				-		· · ·				-			714.7	0.8' Asphalt over 0.5' Soil ar ROADWAY EMBANI		1.3	715		-	3	3	3	6			
	712.5	3.5	2	3	3		· · ·	· · ·	· ·			SS-5	24%			Dark Gray, Silty CLAY, T	Frace Sand			713.0	3.5	2	3	5				
710	710.0	6.0				_ 	6 <u>.</u>					- 55-5	1							710.5 -	6.0	60/0.1						<u>· </u>
	- 707.5 -		3	4	6		10	· · ·		· · ·			M		708.0			8.0		-	-	00/0.1						
	- 101.5	0.5	5	4	5	1 ∶∙	9	· · ·	· ·	· · · ·	· · · ·		м			ALLUVIAL Dark Gray, Sandy (CLAY			-	-							
705	_	F					<u>.</u>	· · ·				-			703.7			12.3		-	-							
	702.5 -	13.5	3	3	6	41:		· · ·	· ·	· · ·	· · · ·		М		È	Dark Gray with Brown, Silty Organic Odor	CLAY, Trace			-	-							
700	-	L					9 9									organio oddi				-	-							
	- 697.5 -	10 5					<u>.</u> 	· · ·	· ·	· · ·					ł					-	-							
		10.5	4	6	7	11:	. 13	· · ·	· ·	· · ·			w							-	-							
695	_	F					<u> </u>					-			694.0			22.0		_	-							
	692.5	23.5	7	13	19		· · ·	N:::	· ·	· · ·						RESIDUAL Dark Gray, Silty S	AND			-	-							
690	-	L	·			·		32					W							-	-							
	- 687.5 -						· · ·	: <u> </u>		-: -: -: -: -				M	- <u>688.6</u> - 687.5	WEATHERED RO)CK	27.4 28.5		-	-							
	- 007.5		60/0.0			1'				I	60/0.0	•				METAMORPHOSED GRA	NITIC ROCK /			-	-							
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TY GUILFORD GEOLOGIST Pastrana, C.R. E. Gate City Blvd.) over South Buffalo Creek GROUND																	
Ξ.	Gate C	ity B	slv	/d.) ove	er Sout	th E	Buf	alo Creek	GROUND WTR (ft)								
]	OFFS	ET 4	4	ft LT				ALIGNMENT -L-		0 HR.	Dry						
	NORT	HING	3	839,1	17			EASTING 1,781,373		24 HR.	FIAD						
				DRILL	IETHOI	כ	H.S	. Augers	НАММЕ	ER TYPE	Automatic						
	COMP	. DA	Т	E 03/*	10/20			SURFACE WATER DEPT	H N/	Ą							
DT				SAMP.		L		SOIL AND ROC	K DESC	RIPTION							
	75	100		NO.	моі	G											
		100			MOI 24% M	0		716.5 GROUND ROADWAY E Brown to Tan-Brow Pla 710.5 210.4 Rip Rap and/or Bou Boring Terminat Penetration Test Ref ft in Roadway Embani Boulders and	SURFA MBANH n, Silty (istic Ider and red with usal at E kment:	CE (MENT CLAY, High Vor Concres Standard Elevation 7 Rio Rap au Rio Rap au	6.0 ete <u>6.1</u> 10.4						

WB	S 4	45673	.1.2			TI	B B	-5717	7		со	UNT	/ G	UILFO	RD				GE	OLOC	SIST	Pastra	ana, C.	R.				WBS	4567	3.1.2			-	TIP	B-571	7		COUNT
-				-	lace B						424(· ·		-	Blvd.) o		Sout	n Bu								ND WTR (place						4240 (E.
			EB1-			_	TATIC								4 ft LT					IGNM					HR.	D	Γ I H		NG NC						TION			
			EV. 71							6.2 ft			NOF	RTHING	3 839						3 1,7	'81,36			HR.	FIA			AR EL						AL DEF			
			MMER E		TE SL										DRILL			H.:	-						TYPE	Automati						ATE			ME-550X			
DRI			onzale				TART	DAT		3/10/2			COI	MP. DA	TE 03				SU	RFAC	E WA	TER D	EPTH	N/A										STA	RT DAT			
ELE (ft)			DEPTH (ft)		0W COU		0		BL 25	OWS I	PER I 50		75	100	SAMF			0			SOI	L AND	ROCK D	ESCRIF	PTION			ELEV (ft)	DRIVE ELEV	DEPTI (ft)		OW CO	DUNT	ft 0	า	BL 25		PER FOOT 50
()		(ft)	()	0.51	0.511	0.511								100	NO.	<u> </u>	MOI	G	ELEV	/. (ft)						DEPTH	l (ft)	(,	(ft)	(,	0.51	0.51	1 0.51			20		
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		-	-															E												ŧ								
-45			-															┯╞	716.1	1			UND SU				0.0	745		<u>†</u>								
715	<u>'</u>	4	-						+-		1.		+:				L		-	I			AY EMB Brown, S	ilty CLA		hly		715		‡					<u>. </u>			<u> </u>
		4	-					 		 		 		· · · · · ·			L						Plastic	:						‡					· · ·	· · · · ·
710	<u>7</u>	709.9	- 6.2	60/0.0			ļĻ	 	·	 	•	 		 - 60/0.0	L.		L		_709.9	9	Dor	ina Tar	minated	with Cto	ndord		6.2	710		‡					· · · ·	· ·	· · ·	· · · ·
		1	-	00/0.0														F			enetrati	ion Tes	minated t Refusa nbankme	at Elev	ation 7	709.9			707.5	+ 8.5					i: :		· · · · · ·	
		1	-															F					rs and/or						705.5	+ 10.5	3	3	4	\square	• ?		· · ·	
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	45673					IP B				COUN							_	OGIST Past	rana, C.R.	1			45673					P B-57			OUNTY
				lace E					SR 4	240 (E	_	-			Sout	h Bu	uffalo Cre			-	OWTR (ft)					blace E				SR 424	40 (E. Ga
BORI	NG NO	. EB1-	C3		S	STATIC	DN 19	9+97			OF	FSET	15 ft	LT			_	MENT -L-		0 HR.	Dry	BOR	ING NO	. EB1	-C4			TATION			C
COLL	AR EL	EV. 71	6.3 ft		Т	OTAL	DEPT	FH 13	3.2 ft		NO	RTHIN	IG 83	9,12	9		EASTI	NG 1,781,3	71	24 HR.	FIAD	COL	LAR EL	EV . 7	16.4 ft		Т	OTAL DE	PTH 30	.3 ft	N
DRILL	. RIG/HA	MMER E	FF./DA	TE SI	JM312	3 CME-	550X 93	3% 11/	18/2019	9			DRI	L ME	THO) Н.	.S. Augers		HAMM	IER TYPE	Automatic	DRIL	RIG/HA	MMER E	EFF./DA	TE TI	RI0055	CME-55 6	8% 02/20/2	2015	
DRILL	LER G	onzales	s, L.		s	START	DATE	E 03/	/10/20		со	MP. D	ATE	03/10	0/20		SURF	CE WATER	DEPTH N	/A		DRIL	LER T	oothm	an, R.		S	TART DA	TE 04/1	5/21	C
ELEV	DRIVE	DEPTH	BLC	w co	UNT			BLO	WS PE	R FOO	Т		SAI	MP.		L O	•	SOIL AND	ROCK DES			ELEV	DRIVE ELEV	DEPTH	BLC	ow co	UNT		BLOV	VS PER	R FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	2	25	50)	75	10	0 N	э. 🗸	моі		ELEV. (ft)		NOOR DEG		DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
720 715		+ + + +					· · ·	· · ·	 	· · · ·			-		l		- - - 716.3		DUND SURF. VAY EMBAN -Brown, Silty	KMENT	0.0 ly	720 715		+					· · · ·	· · · ·	
		ł									. .	· · ·			l		-		Plastic				712.9	3.5	1	2	2				
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705	-	‡				1	· · ·		•••			· · ·	_		l		-					705	-	‡						.	
-	703.1	13.2	60/0.0			<u> </u>			• •		• •		→	⊢		-5	703.1	Boring Te	rminated with	Standard	13.2		702.9	13.5	WOH	1	3	· · ·			
		ŧ	00/0.0													þ	-	Penetration Te ft in Roadway E	st Refusal at	Elevation 70	3.1	700		ŧ		'	3	•4···	· · · · ·		
	-	ŧ														þ	-	Boulde	ers and/or Co	ncrete	u/0i	700		‡							
		ŧ														þ	-						697.9	18.5 +	3	4	6	 . • •10	 		
	-	‡														þ	-					695	-	‡				· · \·		.	
		ŧ														þ	_						692.9	23.5					y 111		
		ŧ														E	-							ŧ	3	12	10		♦ ² 2 · · · ·	.	
	-	ŧ														E	-					690	-	ŧ							
		ł														E	_						687.9	1	100/0 2					.	
	_	Ł														E							686.2	<u> </u>	60/0.1						
		* * * * * * * * * * * * * * * * * * * *																													



											В	UF	<u>RE I</u>		JG								
WBS 4	5673.	1.2			Т	IP B-	5717			со	UNT	Y G	UILFC)			GEOLOGI	ST Pas	tran	a, C.R	ł.	
SITE DE	SCRI	PTION	Rep	blace E	Bridge	s 109 a	and 1	21 o	n SR	4240) (E.	Gate	City E	Blvd	I.) over	Sout	th But	falo Creek				GROU	ND WTR (f
BORING	NO.	EB1-	·B		S	ΤΑΤΙΟ	N 1	9+80)			OFF	SET	35	ft RT			ALIGNME	NT -L-			0 HR.	20.
COLLAR		V . 71	7.2 ft		Т	OTAL	DEP	TH 2	29.7 f	t		NO	RTHIN	IG	839,0	87		EASTING	1,781,3	340		24 HR.	FIA
DRILL RIG	G/HAM	MER E	FF./DA	TE SI	JM3123	B CME-5	550X 9	3% 1′	1/18/20)19					RILLM	ETHO	DH.	S. Augers			HAN	IMER TYPE	Automatic
DRILLEF	R Go	nzale	s, L.		S	TART	DATE	E 03	3/11/2	20		со	MP. DA	ATE	03/1	1/20		SURFACE	WATER	DE	ртн	N/A	
(ff) EL	RIVE _EV ft)	DEPTH (ft)	BLC 0.5ft	OW CO 0.5ft		0	2	BL 25	OWS I	PER 50		75	100		Samp. No.	моі	L O G	ELEV. (ft)				SCRIPTION	N DEPTH
720																		717.2			ND SUR		
715	6.2 	1.0 3.5	4	4	5	• 	9		· · ·		· · ·		· · · ·			D		716.2 0.7	ROAD	WAY	EMBA	I and Grave NKMENT Iy CLAY	I Mix
	+	0.0	2	3	4	•	,			.		.				М		711.7			, ,	j -	
10	1.2 T 	6.0 8.5	2	3	4		· · ·		· · · · · ·		· · · · · ·		· · · ·			М		- <u>-</u> Bro	own and G	ray t	o Dark	Gray, Silty C	
		0.0	4	4	4] :•	B		 	.	 		· · ·			D							
05	+						•••	· ·		ŀ	· · ·	·						705.0		·, -			12
70)3.7 +	13.5	3	2	3	j	· · · ·		· · · · · ·		· · ·	:	· · · · · ·		SS-7	22%			Dark Gra		LUVIA Gray, S	L Sandy CLAY	
0	‡					T °·	•••		· · ·	•	 	.	· · · · · ·										
	18.7 +	18.5								1:		+-						-					
	‡		2	2	3	• 5	•••		· · ·		· · · · · ·	:	· · · · · ·			W							
5	+					-`\·		· ·	· · ·	·	· · ·	·						694.7		=			2
69)3.7 +	23.5	7	7	8	::	• ●15		· · · · · ·		· · · · · ·	:	· · · · · ·			Sat.			(Silty S		
0	‡								· · · · · ·	:	· · · · · ·	:	· · · · · ·										
	8.7 +	28.5		100/2				1.		1:		+:						- 688.2					2
_68	87.5 	29.7	21 60/0.0	100/0.2	1		·	1		-		-	100/0.2	8				688.2 687.5			IERED	ROCK RANITIC RC	<u>2</u> 2 СК /
	+																	_	Boring T	ermiı	nated w	ith Standard	1
	‡																		n Cystalline	e Roo	ck: MET	at Elevation	
	‡																		G	RAN	NITIC R	UCK	
	+																						
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GEOTECHNICAL BORING REPORT ROPEIOC

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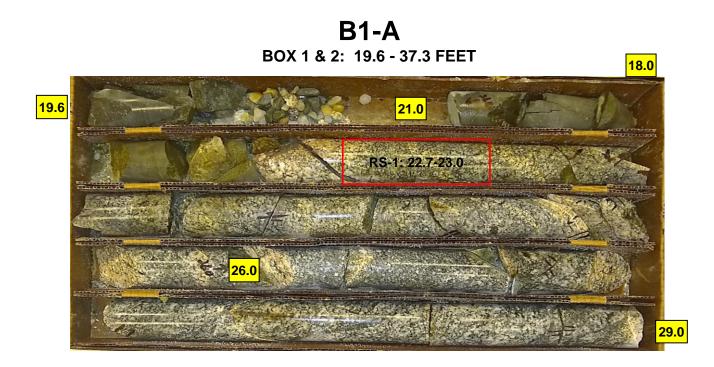
/BS	4567	312				т	I P B-5717		ORE L				GEOLOGIST Pastrana, C.R.	
				Ren	lace F		s 109 and 121 on §				r Sout	h Ruff		GROUND WTR (ft)
	NG NC			Пор			TATION 21+01	T(+2+0 (E.	OFFSET 4		loout	II Duii	ALIGNMENT -L-	0 HR. N/A
	AR EL			5 0 ft			OTAL DEPTH 46.	0.ft	NORTHING		20		EASTING 1,781,480	24 HR. 6.4
					TF T		CME-55 68% 02/20/2		l .			D OD		
					IE I				I			U 5P	-	IER TYPE Automatic
	LER T	-					TART DATE 03/2		COMP. DAT	SAMP.		L	SURFACE WATER DEPTH N	//A
EV (ft)	ELEV (ft)	DEP (ft)		0.5ft	0.5ft	1	0 25	/S PER FOOT 50	75 100	NO.	моі	0	SOIL AND ROCK DES	
	(it)	-		0.011	0.010	0.011		l		110.		G	ELEV. (ft)	DEPTH (f
<u>'10</u>		+												
		±												
05		<u>+</u>	\dashv									Ł	705.8 GROUND SURF. ALLUVIAL	ACE 0.
		Ŧ											Brown and Gray, Silty CLAY Silty SAND and Little	with Seams of
	700 7	Ŧ										N	Silty SAND and Little	Glaver
00	700.7	<u>+ 5.1</u>	\square	4	6	8	• • • • • • • • • • • • • • • • • • •							
		‡					: : <i> </i> : : : : :							
	695.7	+ 10.	1] <i> </i>] . <i>.</i>	· · · · ·						
95		+		3	3	7	10				W			
		+					🔪 .					N		
90	690.7	- 15.	1	8	12	14						N	690.2	15.
		‡		0		14					М	-	RESIDUAL Black and White, Silty Coars	
	686.2	‡ 10					.	· · · · · ·					686.9	18.
85	080.2	T 19.	0	60/0.0					· · 60/0.0			62	686.2 WEATHERED ROMETAMORPHOSED	
		ł											683.6 CRYSTALLINE R Dark Gray, Slightly Weather	
		Ŧ								<u>RS-1</u>		ZF.	Hard, MÉTAMORPHOSED	DIORITE with
80		‡										×1	Close to Very Close Frac Gray and White with Some	
		‡						· · · · ·				F1	Very Slightly Weathered, Ha	rd to Very Hard,
		±											METAMORPHOSED GRAN Close to Moderately Close F	
75		\pm										67		
		Ŧ										KF.		
70		Ŧ										RF.		
10		‡										F#		
		±						· · · · ·						
65		ł												
		Ŧ								RS-2		Æ	664.3 Gray and White, Fresh,	
		Ŧ								110-2			METAMORHOSED GRANI Moderately Close Fractu	
60		<u>+</u>						· · · · ·				Pér -	659.8	46.
		‡											Boring Terminated at Eleva Crystalline Rock: METAN	IORPHOSED
		±											GRANITIC RO	CK
		±												
		Ŧ										F		
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		+								1				

WBS	45673	3.1.2			TIP	B-571	7	С	OUNT	ΥC	GUILFORD		GEOLOGIST Pastrana	a, C.R.		
SITE	DESCR		l Rep	lace Brid	ges 10)9 and	121 on §	SR 424	40 (E.	Gate	e City Blvd.) over South Buff	alo Creek		GROUND	WTR (ft
BOR	ING NO.	. B1-A			STA	ΓΙΟΝ	21+01			OF	FSET 46	ft LT	ALIGNMENT -L-		0 HR.	N/A
COLI		EV. 70	5.8 ft		тот	AL DE	PTH 46.	0 ft		NC	RTHING	339,128	EASTING 1,781,480		24 HR.	6.4
DRILL	. RIG/HAI	MMER E	FF./DA	TE TRI00	55 CM	E-55 68	3% 02/20/2	2015		1	D	RILL METHOD SP	T Core Boring	НАММ	ER TYPE A	utomatic
DRIL	LER T	oothma	n R		STAF		TE 03/2	9/21		cc	MP. DATE			тн N/	/Α	
	E SIZE		,				N 26.4 f									
ELEV	RUN	DEPTH	RUN	DRILL	RI	JN	SAMP.	STR	ATA							
(ft)	ELEV (ft)	(ft)	(ft)	RATE (Min/ft)	REC. (ft) %	RQD (ft) %	NO.	REC. (ft) %	RQD (ft) %	0 G	ELEV. (ft)	C	ESCRIPTION AND REMARK	S		DEPTH (
686.2													Begin Coring @ 19.6 ft			
685	686.2 - 684.8 -	- 19.6 - 21.0	1.4	2:15/0.4 5:01/1.0	(0.5)	(0.0)		(1.7) 65%	(0.0) 0%	R	686.2	Dark Gray, Slightly	CRYSTALLINE ROCK Weathered, Moderately Hard			19
	-	ŧ	5.0	8:04/1.0 7:55/1.0 4:35/1.0	(4.8)	(3.3)	RS-1	(17.7)	(15.0)	E	- 683.6	DIORITE	with Close to Very Close Frac	ture Space		22
690	-	†		4:20/1.0	96%	66%	<u></u>	92%	78%		t L		undant low and high angle fra GSI=45 to 55			
680	679.8_	26.0	5.0	5:03/1.0 4:58/1.0	(4.7)	(4.6)				E			Some Pink, Slightly to Very Sli RPHOSED GRANITIC ROCK			
	-	ŧ		4:44/1.0 5:06/1.0	94%	92%				R	-		Close Fracture Spacing 0 degrees to 90 degrees with			,
675	674.8	31.0		5:19/1.0 6:57/1.0						R	<u> </u>		in run no. 5 due to numerous GSI=60 to 70			
_	-	Ł	5.0	6:19/1.0 6:23/1.0	(5.0)	(5.0) 100%				E.	Ł		661-00 10 70			
	-	Ł		5:50/1.0	10070	100/0				Ľ.	Ł					
670	669.8	36.0	5.0	4:42/1.0	(4.7)	(2.4)					F					
	-	F	0.0	4:39/1.0 4:38/1.0	94%	48%					F					
665	- - 664.8	L 41.0		8:10/1.0 4:33/1.0							-					
		+ +1.0	5.0	4:15/1.0	(4.2)	(4.2)	RS-2	(4.5)	(4.5)	ß	664.3	Gray and White, Fre	sh, Very Hard, METAMORHC	SED GR	ANITIC ROCK	41
	-	ŧ		4:48/1.0 3:34/1.0	84%	84%	<u></u>	100%	100%	P	-		Moderately Close Fracture S Two joints at 10 degrees			
660	659.8	46.0		3:23/1.0 4:00/1.0						Þ.	659.8	Note: Last 0.8 fee	GSI=80-90 et of core could not be retrieve	d from th	ne horehole	46
													TAMORPHOSED GRANITIC			

GEOTECHNICAL BORING REPORT

	RE	L	0	G
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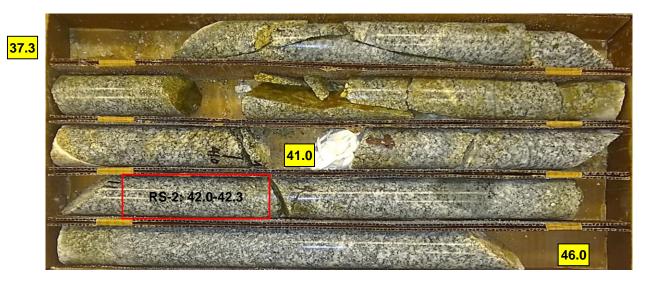
CORE PHOTOGRAPHS

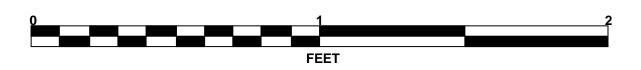






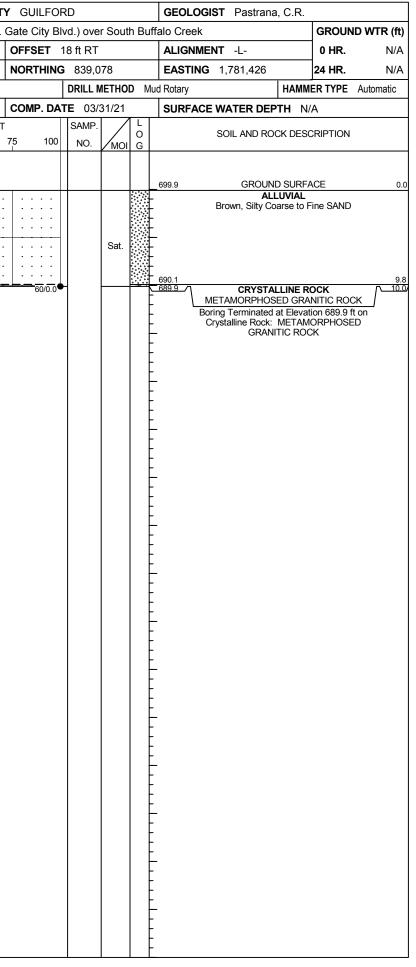
B1-A BOX 3: 37.3 - 46.0 FEET





SHEET 18 45673.1.1 (B-5717)/BRIDGE NOS. 109 & 121

WB	S 4	5673.1	1.2			ТІ	P B-5	717		COU	NTY	GUILFO	RD				GEOLOGIST Pastrana	, C.R.			WBS	4567	3.1.2			ТІ	Р В-	-5717		СС	UNT
SIT	e de	SCRIF	TION	Rep	lace E	Bridges	s 109 ar	nd 12	1 on SF	4240 (E. Ga	ate City B	vd.) ove	er So	uth B	uffa	alo Creek		GROUND WT	R (ft)	SITE	DESCI	RIPTION	Rep	blace E	Bridges	s 109	and 12	21 on S	R 424	0 (E.
BO	ring	NO.	B1-D			S	TATION	20-	+91		0	FFSET	28 ft LT				ALIGNMENT -L-		0 HR.	N/A	BORI	NG NC). B1-E			S	ΓΑΤΙΟ	DN 20)+65		
CO	LLAR	R ELE\	/ . 70	7.6 ft		т	OTAL D)EPTH	i 19.6	ft	N	ORTHING	3 839, ⁻	114			EASTING 1,781,465		24 HR. C	aved	COLL	AR EL	. EV . 69	99.9 ft		т	DTAL	DEPT	H 10.0) ft	
DRI	LL RIC	g/hami	MER E	FF./DA	TE TF	RI0055	CME-55	68%	02/20/20	5			DRILL	METH	OD	Mud	Rotary	HAMM	ER TYPE Autom	atic	DRILL	RIG/HA	MMER E	FF./DA	TE TF	RI0055	CME-5	5 68%	02/20/20)15	
DR	LLEF	R Too	othma	n, R.		S	TART D	ATE	03/30/	21	С	OMP. DA	TE 03/	/30/2	1		SURFACE WATER DEP	TH N/	/A		DRILI		Foothma	an, R.		S	TART	DATE	03/31	/21	
ELE		RIVE LEV	EPTH	BLC	w co				BLOWS				SAMP				SOIL AND ROO	CK DESC	CRIPTION		ELEV	DRIVE ELEV	DEPTH	·	ow co	-			BLOW		FOOT
(ft)		(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	5	50	75	100	NO.	/м			ELEV. (ft)			PTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	2	5	50	
710																F					700		+								
		ŧ.														<u> </u>	707.6 GROUNE		ACE	0.0			ŧ						· · · · · ·	: :	· · ·
705		‡						···	· · · · ·			· · · ·					ALL Brown and Gray, Sil Clayey Coarse to Fir	LUVIAL Ity CLAY	with Layers of		695	694.9	‡				· ·	· · ·	· · · · · ·		•••
		+								- · ·							Clayey Coarse to Fir at 1	ne SANE 5.0 feet) in the Sample		000	694.9	<u> </u>	6	5	4		9			
	70)2.6 + +	5.0	4	6	8		14	· · · · ·			· · · · ·		w									ŧ				:		· · · · · ·		•••
700		+						r. · ·		· ·	•••										690	689.9	+ 10.0	60/0.0				· · ·	· · ·	· ·	
	69	97.6 +	10.0									· · · · ·											ŧ	00/0.0	'						
695		‡		3	4	7		11 :	· · · · ·	· · ·		· · · · ·		W			2010			10.0			‡								
		+					 1 1			· ·							<u> </u>	arse to Fi	ine SAND	<u>12.8</u>			ŧ								
	69	92.6 +	15.0	2	3	12		••• ••15	· · · · ·		· ·	· · · · ·		Sat									‡								
690		+						[:		· ·							690.3 RES	SIDUAL		17.3			‡								
	68	38.0	19.6	60/0.0						· ·	•••	60/0.0				6	Black and White, Silt Boring Termina	ty Coarse		19.6			ŧ								
		‡		00/0.0												F	Penetration Test Re ft on Crystalline Rock	fusal at E	Elevation 688.0				ŧ								
		Ŧ														F	GRANI	TIC ROC	CK				Ŧ								
		Ŧ														F	Caved Ir	n at 4.9 f	eet				Ŧ								
		+														F							Ŧ								
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DT 5		‡														F							ŧ								
DT.G		+														F							ŧ								
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121.G		‡														Ę							ŧ								
109		‡														Ę							‡								
DC		+														F							‡								
7_BF		‡														Ę							‡								
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BLE		‡														þ							‡								
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SHEET 20

GEOTECHNICAL BORING REPORT POPEIOC

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NBS	45673	3.1.2			Т	ΊP	B-5717			Y GUILFO				GEOLOGIST Pastrana, C.R.		
SITE	DESCR	IPTIO	N Re	place	Bridge	s 1	109 and 12	21 on SR	4240 (E.	Gate City B	lvd.) ove	r Sou	th Bu	ffalo Creek	GROUN	ID WTR (fi
	NG NO.			1			ATION 20			OFFSET	,			ALIGNMENT -L-	0 HR.	N/A
2011		-V 7	06 1 ft				TAL DEPT			NORTHING		63		EASTING 1,781,409	24 HR.	7.2
-							ME-55 68%				,,				MER TYPE	
													0 0	1		Automatic
	LER TO DRIVE			214/ 02			ART DATE			COMP. DA		13/21	1 L 1	SURFACE WATER DEPTH	I/A	
LEV (ft)	ELEV	DEPTH (ft)	0.5ft	OW CC		-	0 2		PER FOOT 50	75 100	SAMP.		0	SOIL AND ROCK DES	CRIPTION	
. ,	(ft)	. ,	0.51	0.51	0.51	╂┼	-				NO.	/мо	I G	ELEV. (ft)		DEPTH (
710		-												-		
05	-	İ				╢	.							706.1 GROUND SURF		(
00	703.6 -	2.5					<u></u>							Gray to Brown, Silt		
	-		2	1	1		4 2 · · · ·					W		-		
'00	-	Ł					1					_		-		
	698.6 -	7.5			-	1							N	-		
	-	ŧ	4	4	6		. ● 10 .					W		- - 696.1		10
95	-	ŧ.								• • • •				Gray, Silty Fine to Coa	arse SAND	
	693.6 -	12.5	4	4	7	$\left \right $						Cat		-		
	-	F			<i>'</i>							Sat.		- - - 690.7		15
90	-	F							· · · · ·				10			
	688.6 -	17.5	100/0.	3			· · · ·	· · · ·		· 100/0.3				 METAMORPHOSED GR Note: Soft Layer from 2 		
	-	t												-		
85														_		
	683.6 -	22.5	100/0.	2						· 100/0.2				-		
~	681.0	25.1	00/0 (· · · · · · · · · · · · · · · · · · ·				681.0		25
680	-	F	60/0.0							60/0.0			R.	CRYSTALLINE I Gray and White, Slightly t		ntly
	-	F											R	Weathered, Hard to METAMORPHOSED GRAM	/ery Hard,	-
75	-	ŧ									RS-3		P	Close to Moderately Close F		
15	-	ŧ.												-		
	-	+												-		
70	-	F												671.0 669.8 Gray and White, Severely	to Moderat	35 ely 36
	-	ŧ												Severely Weathered, Me	dium Hard	to
	-	ŧ.												Moderately Hard, METAM 666.9 GRANITIC ROCK with Ver		
65	-	+											R	_ Spacing		
	-	F									RS-4		P	 Gray and White with Pin Weathered, Moderately 	Hard to Har	d,
	-	ŧ											P	METAMORPHOSED GRAN		-
	-						<u>I.,,</u> ,,	L <u></u>	I					Gray and White, Very Sligh Fresh, Very Hard, METAI GRANITIC ROCK with Clos	tly Weathere MORPHOSE se to Modera	ed to
	-	t t												Close Fracture S Boring Terminated at Elev Crystalline Rock: METAI GRANITIC RC	ation 661.0 /IORPHOSE	ft in ED
	-	ŧ												-		
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WPS	45673	212			тір	B-571	17		-	-	RE L		GEOLOGIST Pastran			
			l Ror	lace Rrid								vd.) over South Buf		а, о.п.	GROUN	ID WTR (f
					ĭ		20+53	511 42	+0 (L.	_	,	37 ft RT	ALIGNMENT -L-		0 HR.	N//
-								1 5		+		3 839,063	EASTING 1,781,409		-	
							PTH 45				RINN	,	, ,	1	24 HR.	7.2
				TE TRIOO						1		DRILL METHOD SF				Automatic
	LER T		an, R.				TE 04/1				MP. DA	TE 04/13/21	SURFACE WATER DEI	PTH N	/A	
COR	E SIZE	NQ				AL RU	N 20.0 f			<u> </u>						
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %	RQD (ft) %	L O G	ELEV. (1		DESCRIPTION AND REMARK	S		DEPTH (
681	004.0												Begin Coring @ 25.1 ft			
680 675	681.0 676.0	25.1	5.0	3:52/1.0 3:03/1.0 4:45/1.0 3:51/1.0 3:56/1.0 3:50/1.0 4:29/1.0 4:07/1.0	(4.7) 94% (4.6) 92%	(3.3) 66% (3.8) 76%	<u></u>	(9.3) 93%	(7.1) 71%		681.0 - - - - - -	METAMORPHOSE	CRYSTALLINE ROCK lightly to Very Slightly Weather ED GRANITIC ROCK with Clos Fracture Spacing t 10 degrees to 45 degrees wit fractures, some iron stainin GSI=60 to 70	se to Mod h isolated	lerately Clo	se
670	671.0	35.1	5.0	3:13/1.0 2:40/1.0 2:05/1.0 3:17/1.0 3:23/1.0	(4.0) 80%	(1.6) 32%		(0.3)			671.0 669.8		rerely to Moderately Severely V METAMORPHOSED GRANITI Fracture Spacing			
	666.0	† 40.1		2:38/1.0 4:38/1.0				(2.1)	(0.7) 24%	E.	666.9		GSI=20-30	Maral.	k. 11 14. 1	39
665	-		5.0	3:28/1.0 5:08/1.0 4:33/1.0	(4.3) 86%	(4.1) 82%	RS-4	(5.9) 100%	(5.0) 85%		- - -	MÉTAMORPHOSEI	Pink, Moderately Weathered, D GRANITIC ROCK with Very Spacing at 0 degrees to 10 degrees wi	Close to	Ćlose Frac	ture
	661.0	45.1		5:09/1.0 5:09/1.0						SE.	661.0		fractures GSI=50-60		a nigit aligi	4
												METAMORPHOSE 40.1' to 41.0' - M Boring Term	te, Very Slightly Weathered to ED GRANITIC ROCK with Clos Fracture Spacing Moderately Weathered with Ne Throughout and Iron Stainir Joints at 10 degrees to 20 deg GSI=70-80 inated at Elevation 661.0 ft in ETAMORPHOSED GRANITIC	se to Mod ar Vertica g rees Crystalline	lerately Clo	
		+ + + + + + + + + + + + + + + + + + +														

SHEET 20

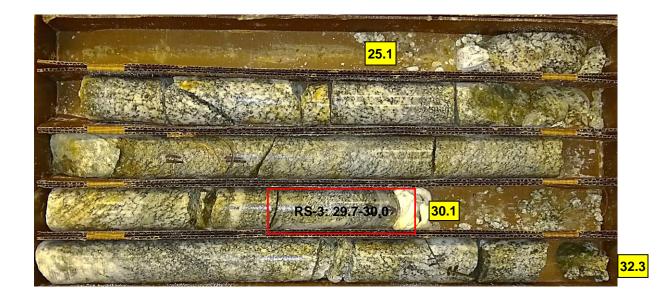
GEOTECHNICAL BORING REPORT

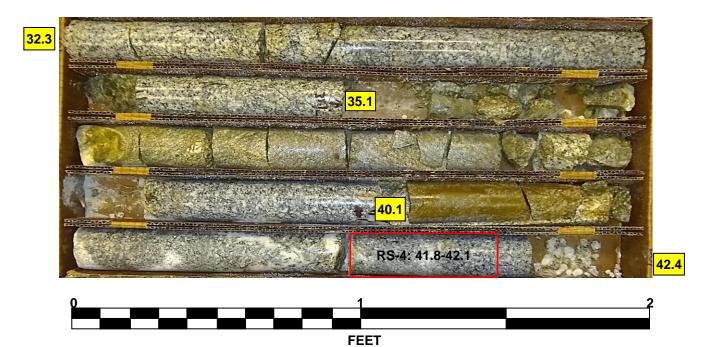
CORE PHOTOGRAPHS

<mark>42.4</mark>

B1-B BOX 1 & 2: 25.1 - 42.4 FEET

B1-B BOX 3: 42.4 - 45.1 FEET

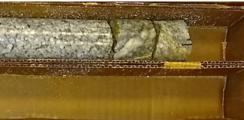








SHEET 21 45673.1.1 (B-5717)/BRIDGE NOS. 109 & 121



GEOTECHNICAL BORING REPORT ROPEIOC

GEOTECHNICAL BORING REPORT CODEIOC

							BC	DRE L	OG				
WBS	45673	3.1.2			TI	IP B-5717	COUNTY	GUILFOR	D			GEOLOGIST Pastrana, C.R.	1
SITE	DESCR	IPTION	N Rep	place I	Bridges	s 109 and 121 on SR	4240 (E. G	ate City Blv	d.) over	South E	Buff		GROUND WTR (ft)
BORI	ING NO.	. B2-A	4		S	TATION 22+00	(OFFSET 4	6 ft LT			ALIGNMENT -L-	0 HR. N/A
COLL	AR ELE	EV. 70	02.7 ft		Т	OTAL DEPTH 46.9 ft	1	NORTHING	839,09	98		EASTING 1,781,574	24 HR. 4.2
DRILL	. RIG/HAI	MMER E	FF./DA	TE T	RI0055	CME-55 68% 02/20/2015			DRILL M	ETHOD	SP	T Core Boring HAMM	ER TYPE Automatic
DRIL	LER T	oothma	an, R.		S	TART DATE 03/28/2	1 c	COMP. DAT	E 03/2	29/21		SURFACE WATER DEPTH N	/Α
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	OW CO 0.5ft	1	4	PER FOOT	5 100	SAMP. NO.	MOI G		SOIL AND ROCK DESC	CRIPTION DEPTH (ft
705	-	- - -				 						702.7 GROUND SURF/ ALLUVIAL	
700	699.2	3.5	2	3	4	$ \begin{vmatrix} \cdot \cdot \cdot \cdot \cdot \\ + \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \\ \bullet 7 \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \\ \bullet 7 \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \\ \\ \cdot \\ \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \\ \cdot \\ \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \\ \cdot \\ \\ \cdot \\ \cdot \\ \cdot \\ \cdot \\ \\ \\ \cdot \\$		· · · · ·	-			Dark Gray, Silty C	CLAY
695	- - 694.2	8.5	1	1	3		· · · · ·	· · · · · · · · · · · · · · · · · · ·		w			
690	689.2	13.5					· · · · ·	· · · · · · · · · · · · · · · · · · ·				-689.6 688.7 RESIDUAL	<u>13</u> <u>14</u> .
685	684.2	18.5	12 100/0.5	43	57/0.3			100/0.8				Black and White, Silty Coars WEATHERED RC METAMORPHOSED GRA	e to Fine SAND
80	- - - - - - - - - - -	23.2	60/0.0	-			· · · · ·	60/0.0				-679.5 CRYSTALLINE R	
675	-											White and Gray, Moderat Weathered, Moderately H METAMORPHOSED GRANI Very Close to Close Fract White and Gray, Very Slight	lard to Hard, TIC ROCK with ture Spacing 29.
570	-						· · · · ·	· · · · · ·	<u>RS-5</u>	XHAX	Z	670.8 Very Hard, METAMORPHOS 669.0 Spacing White and Gray, Moderate	SED GRANITIC 31. ose Fracture 33.
65	-	- - -					· · · · ·			XII XII X		Weathered, Moderately H METAMORPHOSED GRANI METAMORPHOSED DIORI to Close Fracture S	TIC ROCK with TE, Very Close pacing
60	-								<u>RS-6</u>			White and Gray, Very Slight Fresh, Very Hard, METAM GRANITIC ROCK with META DIORITE, Moderately Close t Spacing	ORPHOSED AMORPHOSED
	-						· · · · ·	· · · · ·				655.8 Boring Terminated at Eleva	
												Crystalline Rock: METAM GRANITIC ROC	

WBS	45673	3.1.2			TIP	B-571	7	С			RE L		GEOLOGIST Pastran	a, C.R.		
			I Rep	lace Brid	ges 10	09 and	121 on \$	SR 424	40 (E.	Gat	e City Bl	vd.) over South Buffa			GROUND V	VTR (ft
BOR	NG NO	. B2-A			STA	TION	22+00			OF	FSET 4	46 ft LT	ALIGNMENT -L-		0 HR.	N/A
COLI	AR EL	EV. 70)2.7 ft		тот	AL DE	PTH 46	.9 ft		NC	RTHING	839,098	EASTING 1,781,574		24 HR.	4.2
DRILL	. RIG/HA	MMER E	FF./DA	TE TRIOC	55 CM	E-55 68	8% 02/20/2	2015		1		DRILL METHOD SPT	Γ Core Boring	HAMM	ER TYPE Aut	omatic
DRIL	LER T	oothma	in, R.		STA	RT DA	TE 03/2	8/21		cc	MP. DA	TE 03/29/21	SURFACE WATER DE	PTH N/	Ά	
COR	E SIZE	NQ			тот	AL RUI	N 23.7 f	ť					I			
ELEV	RUN	DEPTH	RUN	DRILL	REC.	JN RQD	SAMP.	STR REC.	ATA RQD	L				(0		
(ft)	ELEV (ft)	(ft)	(ft)	RATE (Min/ft)	(ft) %	(ft) %	NO.	(ft) %	(ft) %	0 G	ELEV. (f		ESCRIPTION AND REMARI	<s< td=""><td></td><td>DEPTH</td></s<>		DEPTH
679.5	070 5												Begin Coring @ 23.2 ft			
	679.5 ·	+ 23.2	3.7	3:39/0.7 6:06/1.0	(3.0) 81%	(1.7) 46%		(5.3) 88%	(2.1) 35%	×.	- 679.5 -		CRYSTALLINE ROCK oderately to Slightly Weather			23
675	675.8	26.9	5.0	5:11/1.0 7:43/1.0	(5.0)							Hard, METAMÓRPI	HOSED GRANITIC ROCK w Fracture Spacing	ith Very C	lose to Close	
010	-	ŧ	5.0	3:40/1.0	(5.0) 100%	(3.1) 62%				Nº.	- 673.5	Abundant hi	gh angle fracture with iron st GSI=50-60	aining con	nmon	29
		+		4:27/1.0			RS-5	(2.7)	(2.7) 100%	S.	-	White and Gray, Very	Slightly Weathered, Very Ha	ard, META	MORPHOSED	
670	670.8 .	- 31.9	5.0	3:56/1.0 3:17/1.0	(5.0)	(3.1)	<u> </u>	(1.7)	(0.4) 22%	R	670.8 669.0		OCK with Moderately Close I No natural fractures	-racture S	pacing	31
		ŧ		3:58/1.0 4:07/1.0	100%	62%		94% (13.2)	(11.9)	Þ	- 009.0	White and Gray, Mo	GSI=70-80 oderately to Slightly Weather	ed, Moder	ately Hard to	J
665	665.8	36.9		3:46/1.0 4:06/1.0				100%		B	-		HOSED GRANITIC ROCK wi E, Very Close to Close Fracti			
005	-	ŧ	5.0	3:35/1.0 3:17/1.0	(4.9) 98%	(4.2) 84%				R	-		loints at 0 degrees to 30 deg GSI=40-50		5	
		<u>+</u>		3:13/1.0			RS-6			R	-		, Very Slightly Weathered to GRANITIC ROCK with META			1
660	660.8 .	41.9	5.0	4:01/1.0 4:29/1.0	(5.0)	(5.0)				E	-	Moder	rately Close to Wide Fracture	e Spacing	JSED DIORITE	,
		ŧ		4:25/1.0	100%	100%				R	-	J	loints at 0 degrees to 10 deg GSI=80-90	rees		
	655.8	46.9		4:31/1.0 4:37/1.0							655.8					46
	-	ŧ									-		nated at Elevation 655.8 ft in TAMORPHOSED GRANITIC		e Rock:	
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CORE PHOTOGRAPHS

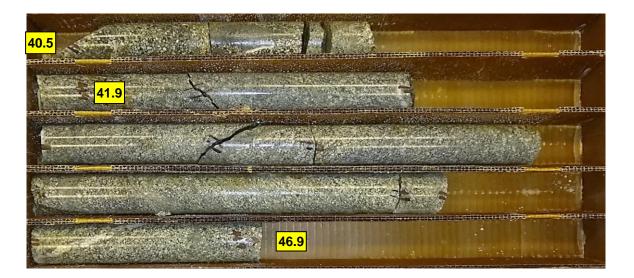
B2-A BOX 1 & 2: 23.2 - 40.5 FEET

B2-A BOX 3: 40.5 - 46.9 FEET





FEET





SHEET 23 45673.1.1 (B-5717)/BRIDGE NOS. 109 & 121

						D	<u>ORE L</u>					
WBS 4567	73.1.2			TI	I P B-5717	COUNT	Y GUILFOF	RD		GEOI	L OGIST Pastrana, C	.R.
SITE DESC	RIPTION	N Rep	lace E	Bridges	s 109 and 121 on S	R 4240 (E.	Gate City Bl	vd.) ove	r South I	Buffalo Cre	eek	GROUND WTR (f
BORING NO). B2-D)		S	TATION 21+89		OFFSET 2	27 ft LT		ALIG	NMENT -L-	0 HR. N//
COLLAR EI	LEV. 70	02.9 ft		т	OTAL DEPTH 17.	5 ft	NORTHING	i 839,0	83	EAST	ING 1,781,558	24 HR. 4.
DRILL RIG/H	AMMER E	FF./DA	TE TF	RI0055	CME-55 68% 02/20/2	015		DRILL N	IETHOD	Mud Rotary	. Н	AMMER TYPE Automatic
DRILLER	Toothma	an, R.		S	TART DATE 03/30)/21	COMP. DAT	FE 03/3	31/21	SURF	ACE WATER DEPTH	N/A
ELEV DRIVE (ft) (ft)	DEPTH (ft)	BLC 0.5ft	0.5ft		4	S PER FOOT 50	75 100	SAMP. NO.			SOIL AND ROCK	DESCRIPTION DEPTH
705 700 600 3						· · · · · ·	· · · · ·			702.9	GROUND S ALLUV Gray and Browr	'IAL
695		2	6	5		· · · · · · · · · · · · · · · · · · ·						
<u>590</u> 689.3	+ + + 13.6	9	13	21	•5	· · · · · · · · · · · · · · · · · · ·			×	<u>689.4</u> _	RESID Black and White, Silty C	CAND
685.4	+ + + + +	60/0.0			. k 		<u> </u>			<u>686.9</u> 685.4	WEATHERE METAMORPHOSED Boring Terminated	BROCK
	* *										Penetration Test Refus ft on Crystalline Rock: 1 GRANITIC	VIETAMORPHOSED

GEOTECHNICAL BORING REPORT

WBS	45673	312			т	P B-57	/17			ORE Y GUILF					GEOLOGIST Weaver, P.M		
			Rer	olace F				l on SR 4					r Sout	h Buf	falo Creek		ID WTR (ft
	NG NO.				-	TATION				OFFSET					ALIGNMENT -L-	0 HR.	N/A
-	AR ELE							36.5 ft		NORTH			48		EASTING 1,781,521	24 HR.	4.9
				TE TI				2/20/2015				-				MER TYPE	
	LER T							04/13/2		COMP.				0	SURFACE WATER DEPTH		Automatic
	DRIVE			OW CO				BLOWS F				SAMP.		1.1	SURFACE WATER DEPTH	IN/A	
ELEV (ft)	ELEV (ft)	DEPTH (ft)	0.5ft	0.5ft	0.5ft	0	25		0		00	NO.		0	SOIL AND ROCK D	ESCRIPTION	DEDTU
	(11)		0.010	0.010	0.011		1		Ĩ			110.	/моі	G	ELEV. (ft)		DEPTH (1
705		ŧ												ŀĿ	-		
	-	F		ļ										-	702.5 GROUND SU		0
700	-	Ŧ									:			-	ALLUVIA Brown to Light Gray, Sil		ine
	699.0	3.5	4	4	5								_	-	- SAND Note: 2.4' of Rip Rap wit	n Sand Was H	land
	-	ŧ			Ŭ	· • •9 ·		· · · ·	· · · ·		:			-	Cleared Before Dr		
695	-	‡									·			_	_		
	694.0	8.5	2	4	6						:		w				
	-	ŧ					-+-				:			-			
590	689.0	[13.5									-				689.7		12
	-	ł	26	26	73						÷	99	W	977	Gray with White, Silty Co	arse to Fine S	
685	686.5	† 16.0 †	60/0.0	1						60/0	0.0				686.5 WEATHERED		<u>16</u>
500	-	ŧ											Complet		CRYSTALLINE Dark Gray, Slightly to		
	-	ţ						· · · ·	· · · ·		:		loss of	60	Weathered, Hard, MET	AMÓRPHOŚE	
680	-	t					•				·	C C	irculatio	on M	DIORITE with Very Close		ture 23
	-	ŧ									:			1	Gray and White, Mode		
	-	ł					•							67	METAMORPHOSED GR	ANITIC ROCK	with
675	-	Ŧ									·			R#	Very Close to Close Fr Gray and White, Free		
	-	ŧ						· · · · ·			:			P\$	METAMORPHOSED GR/	ANITIC ROCK	with
270	-	ŧ									:				Moderately Close to Wide	e Fracture Spa	icing
670	-	ŧ									-	<u>RS-7</u>		P3	-		
	-	t															
															666.0 Boring Terminated at Ele	evation 666.0 f	36 ft in
	-	F												F	Crystalline Rock: MET GRANITIC F	AMORPHOSE	
	-	Ŧ												I F			
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									С	OF	ELOG				
WBS	45673	3.1.2			TIP	B-571	7	С	OUNT	Y G	JILFORD	GEOLOGIST Weaver	, P.M.		
SITE	DESCR	IPTION	l Rep	place Brid	lges 10)9 and	121 on 3	SR 424	40 (E.	Gate	City Blvd.) over South Bu	uffalo Creek		GROUND \	WTR (ft
BOR	ING NO.	B2-E			STA	ΓΙΟΝ	21+64			OF	SET 18 ft RT	ALIGNMENT -L-		0 HR.	N/A
COLI	LAR ELE	EV . 70	2.5 ft		тот	AL DE	PTH 36	.5 ft		NO	THING 839,048	EASTING 1,781,521		24 HR.	4.9
DRILL	RIG/HAI	MMER E	FF./DA	TE TRIO)55 CM	E-55 68	8% 02/20/2	2015			DRILL METHOD S	PT Core Boring	HAMM	ER TYPE Au	Itomatic
DRIL	LER TO	oothma	ın, R.		STA	RT DA	TE 04/1	3/21		со	IP. DATE 04/14/21	SURFACE WATER DE	PTH N	/A	
COR	E SIZE	NQ					N 20.51								
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)	DESCRIPTION AND REMARI	KS		DEPTH (1
686.5	CDC 5	10.0										Begin Coring @ 16.0 ft			
685 680	686.5 7 686.0 7 - - - - - -	<u>16:5</u> / 21.5	0.5 5.0 5.0	4:31/0.5 2:07/1.0 2:14/1.0 3:09/1.0 2:58/1.0 3:21/1.0 3:01/1.0	(5.0)	(0.0) 0% (0.7) 14% (1.1)		(7.1) 100%	(0.7) 10%		DIÕRIT	CRYSTALLINE ROCK to Very Slightly Weathered, Ha E with Very Close to Close Fra rertical fractures throughout with infilling of some fractures GSI=50-60	ture Space	cing	16.) 23.
	-	Ļ		2:55/1.0 3:28/1.0	100%	22%		(1.9)	(0.0)	R	Gray and White,	Moderately to Slightly Weather			
075	676.0	26.5		3:06/1.0 2:45/1.0				(10.8)	(10.3)	P		Spacing		CIUSE FIACIULE	
675	-	-	5.0	2:53/1.0 3:37/1.0 4:11/1.0 4:35/1.0	(5.0) 100%	(5.0) 100%		94%	`90%´	C.S.	Gray and White, Fr	tical to near vertical fractures the GSI=50-60 resh, Very Hard, METAMORPH foderately Close to Wide Fractu	OSED GF		<
670	671.0	31.5	5.0	5:03/1.0	(4.3)	(4.2)	RS-7	-				7' of core could not be retrieved GSI=80-90			
	-		0.0	2:55/1.0 4:16/1.0 5:23/1.0	86%	84%						631-60-90			
	666.0	36.5 L		7:01/1.0							666.0 Boring Terr	minated at Elevation 666.0 ft in	Crystallin	e Rock:	36.

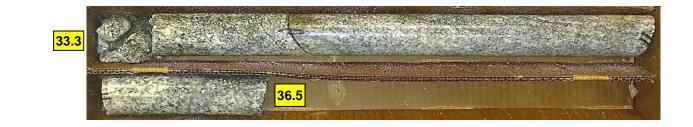
GEOTECHNICAL BORING REPORT CODELOC

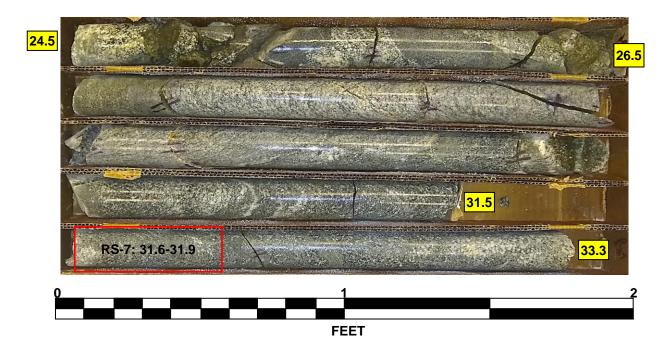
CORE PHOTOGRAPHS

B2-E BOX 1 & 2: 16.0 - 33.3 FEET

B2-E BOX 3: 33.3 - 36.5 FEET







FEET

SHEET 26 45673.1.1 (B-5717)/BRIDGE NOS. 109 & 121

								D	<u>ORE L</u>	.06							
WBS	45673	5.1.2			Т	IP B-5717	C	OUNT	Y GUILFO	RD			GEOLOGIS	ST Pastran	a, C.R.	-	
SITE	DESCR	IPTION	Rep	lace E	Bridges	s 109 and 12	21 on SR 42	40 (E.	Gate City B	lvd.) ove	r Sou	th Bu	ffalo Creek			GROUN	ND WTR (ft
BOR	NG NO.	B2-E	3		S	TATION 21	+49		OFFSET	37 ft RT			ALIGNMEN	IT -L-		0 HR.	N/A
COLI	AR ELE	EV. 70	07.6 ft		Т	OTAL DEPT	H 23.7 ft		NORTHING	3 839,0	34		EASTING	1,781,501		24 HR.	Caveo
DRILL	RIG/HAI	MMER E	FF./DA	TE TH	RI0055	CME-55 68%	02/20/2015			DRILL N	IETHC	DD M	ud Rotary		HAMM	ER TYPE	Automatic
DRIL	LER T	oothma	an, R.		S	TART DATE	04/01/21		COMP. DA	TE 04/	01/21		SURFACE	WATER DE	PTH N/	A	
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLC 0.5ft	OW CO 0.5ft		0 2	BLOWS PER	R FOOT	75 100	SAMP. NO.	мо	L O I G	ELEV. (ft)	SOIL AND RC	OCK DESC	CRIPTION	DEPTH (1
710	-	-											 707.6	GROUN	ID SURFA	ACE	0
705	704.1	3.5	11	3	2		· · · · ·	· · · · ·	· · · · ·				_	ray, Silty Coars	nics (Woo	d)	
700					2	•5 	· · · · ·	· · · · ·	· · · · ·		W		- · · · · · · · · · · · · · · · · · · ·		iece(s)		-
695	95 694.1 13.5				6		· · · · ·	· · · · ·			Sat.		- - -				
90 3 3				3	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	· · · · · · · · · · · · · · · · · · ·	· · · · ·			Sat.							
690	689.1	18.5											- 				16
	-	[6	17	100/0.4	1 ·····	┝━━━┿		100/0.9			<i>977</i>	688.1 Black	and White, S			SAND / 19
85	684.1	23.5	100/0.2					· · · · ·	100/0.2	-			683.9	WEATH ETAMORPHO: ing Terminated		NITIC RO	23
	-	-												eathered Rock GRAN	ITIC ROC	IORPHOS XK	
	-	-											-		In at 6.2 f		
		- - - - - - - - - - - - - - - - - - -											- hole — with	 Casing adva Boring was of offset boring () at which point 	offset 5 fee B2-B1) ad	et downsta vanced to	ition 23.4
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SHEET 28

GEOTECHNICAL BORING REPORT ROPEIOC

VPC	45673	312				TIP	B-5717		1		DRE L				GEOLOGIST Pastrana, C.R.	
				nlaco				21 on SE						h Duf	falo Creek	
	NG NO.			piace	-		ATION 21		4240 (t	_	OFFSET 3			II BUT	ALIGNMENT -L-	GROUND WTR (ft)
	AR ELI								f4		IORTHING				EASTING 1,781,497	-
						-			-			,			· · ·	24 HR. Caved
				AIE			ME-550X 93							U SF		ER TYPE Automatic
	LER G		-	014/ 0			ART DATE				OMP. DA	1		1 L T	SURFACE WATER DEPTH N/	A
LEV (ft)	ELEV (ft)	DEPTH (ft)	1 BL 0.5ft	1	OUNT it 0.5ft	ť	0 2		PER FO	75	5 100	SAMP. NO.	моі	O G	SOIL AND ROCK DESC ELEV. (ft)	CRIPTION DEPTH (f
10															-	
	•	<u>+</u>			_									-	707.9 GROUND SURFA	ACE 0.
05		Ŧ												F	Gray, Silty Coarse to Fine Organics (Woo	SAND, Little
														_	Note: Blow count influence	
															piece(s)	
										•					-	
		‡								:						
		t								:						
95	-	ł													-	
		Ŧ												F		
90		ŧ								:				F	C00 0	10
	-	ŧ													689.8 RESIDUAL	
		‡					· · · · ·			:					Black and White, Silty Coarse WEATHERED RC	
35	684.5 -	- 23 /								·					-684.5	
	- 004.0	 	60/0.0	ז						:	60/0.0				CRYSTALLINE R	OCK
		Ŧ													681.8 Gray and White with Re Moderately Severely to M	Moderately 20.
80	-	‡						· · · ·		•					Weathered, Moderate METAMORPHOSED GRANI	
		‡					· · · · ·			:				P2	Close to Very Close Fract	ure Spacing
		t								:		RS-8	1	Sé -	CRYSTALLINE R 676.0 Gray and White, Moderate	
75	-	+									· · · · ·			52-	Weathered, Hard, METAM GRANITIC ROCK with Very	
		Ŧ												87	Fracture Spacin	ng
		<u>†</u>		4		Ц				•				H2	671.0 CRYSTALLINE R Gray and White with Som	
	-	ŧ													 Slightly Weathered to Fres METAMORPHOSED GRANI 	h, Very Hard,
		t												ΙĿ	Moderately Close to Wide Fr	acture Spacing
		Ŧ												I F	Boring Terminated at Elevat Crystalline Rock: METAM	
	-	ŧ												F	GRANITIC ROC	
		‡													Caved In at 11.2	feet
		‡													-	
		t												ΙĿ	Note: Core barrel became st	uck in hole. Drill
		ł												-	crew afraid to core deepe continue. B2-E was cored to	
	-	Ŧ													_ sound rock along this bent	
	•	‡														
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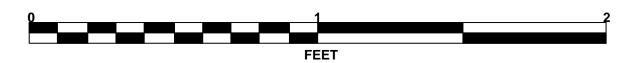
									С	:0	RE L	OG			
	45673					B-571					BUILFOF		GEOLOGIST Pastran	a, C.R.	1
				place Brid	-			SR 42	40 (E.	-		/d.) over South Buffa			GROUND WTR
BORI	NG NO	. B2-E	31		STA	TION	21+45			OF	FSET 3	7 ft RT	ALIGNMENT -L-		0 HR. 1
COLL	AR EL	EV. 70	07.9 ft		тот	AL DE	PTH 36	.9 ft		NO	RTHING	839,035	EASTING 1,781,497		24 HR. Cav
DRILL	RIG/HA	MMER E	FF./DA	TE SUM	3123 CN	/IE-550>	(93% 11/1	8/2019				DRILL METHOD SPT	Core Boring	HAMM	IER TYPE Automat
DRILI	ER G	Gonzale	s, L.		STA	rt da	TE 04/0	2/21		co	MP. DA	E 04/05/21	SURFACE WATER DE	PTH N	/A
CORE	E SIZE	NQ					N 13.5 f								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft) %	SAMP. NO.	STF REC. (ft) %	RATA RQD (ft) %	L O G	ELEV. (f		ESCRIPTION AND REMARI	KS	DEPT
684.5	004 5												Begin Coring @ 23.4 ft		
680	684.5 681.0	23.4 26.9	3.5 5.0	:59/0.5 1:26/1.0 4:09/1.0 6:26/1.0 2:46/1.0 2:25/1.0 1:33/1.0	(1.8) 51% (2.5) 50%	(0.5) 14% (1.2) 24%		(1.0) 37% (3.3) 57%	(0.5) 19% (1.2) 21%		- 684.5 	Weathered, Moderate	CRYSTALLINE ROCK th Red-Orange, Moderately S ely Hard, METAMORPHOSE use to Very Close Fracture S Majority of core is very brok GSI=30-40	D GRANI bacing	o Moderately TIC ROCK with
	676.0	31.9		1:30/1.0 3:42/1.0			RS-8	1		R	676.0	Gray and Wr	CRYSTALLINE ROCK nite, Moderately to Slightly W	eathered.	, Hard,
675	-		5.0	4:35/1.0 4:52/1.0 3:05/1.0 3:04/1.0	(5.0) 100%	(5.0) 100%		(5.0) 100%	(5.0) 100%		-	METAMORPHOSED	GRANITIC ROCK with Very Spacing generally at 10 degrees to 3 GSI=50-60	Close to	Close Fracture
-	671.0	<u>36.9</u>		3:40/1.0							671.0 		CRYSTALLINE ROCK Some Pink, Very Slightly W SED GRANITIC ROCK with Fracture Spacing One joint at 45 degrees GSI=80-90		
		ŧ									-	Boring Termin	nated at Elevation 671.0 ft in TAMORPHOSED GRANITIC	Crystallin	e Rock:
	•	ŧ									-	IVIE		RUCK	
	-	‡									-		Caved In at 11.2 feet		
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GEOTECHNICAL BORING REPORT

CORE PHOTOGRAPHS

B2-B1 BOX 1: 23.4 - 36.9 FEET



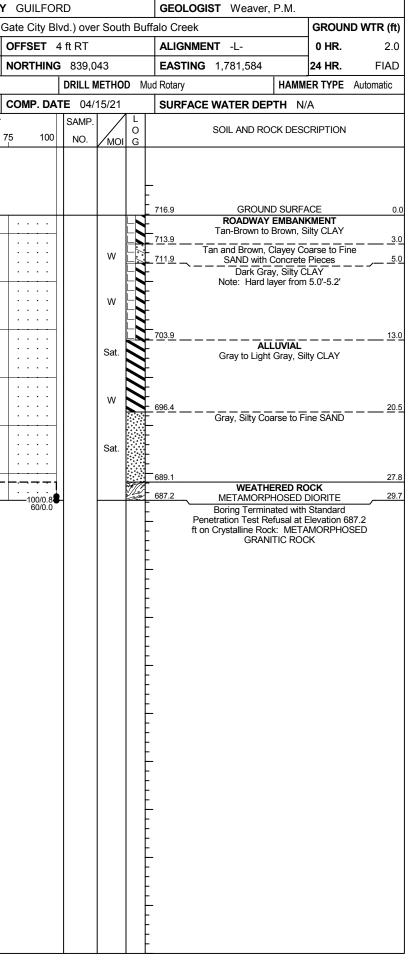


SHEET 29 45673.1.1 (B-5717)/BRIDGE NOS. 109 & 121

										URE																	
	45673					' IP B-5				Y GUILFO					LOGIST Pastrana, C.R.	1			45673					P B-571		COUN	
			-	blace I					4240 (E.	Gate City I			ιth Βι			GROUND		-			-	lace B			121 on S	R 4240 (
	ING NO.					TATION				OFFSET					GNMENT -L-	0 HR.	19.2		ING NO.					ATION			OF
COL	LAR ELE	EV. 7'	16.9 ft		<u>т</u>	OTAL C	DEPTH	1 28.6 f	t	NORTHIN	G 839,	086		EAS	TING 1,781,628	24 HR.	FIAD	COLI	LAR ELE	V. 7′	16.6 ft		т	DTAL DE	PTH 4.5	ft	NC
DRILI	RIG/HAI	MMER E	FF./DA	TE S	UM312	3 CME-55	50X 93%	% 11/18/20)19		DRILL	METHO	DD H	H.S. Auge	rs HAMM	ER TYPE Au	utomatic	DRILL	RIG/HAN	MMER E	FF./DA	TE SL	JM3123	CME-550X	93% 11/18	/2019	
DRIL	LER G		s, L.		S		DATE	03/09/2	20	COMP. D	ATE 03	/09/20)	SUR	FACE WATER DEPTH N/	/A		DRIL	LER G	onzale	s, L.		ST	ART DA	TE 03/1 ⁻	1/20	CC
ELEV	DRIVE ELEV		·	ow co	-				PER FOOT		SAMP	· 🔨 /			SOIL AND ROCK DESC	CRIPTION		ELEV	DRIVE ELEV	DEPTH		W COL				S PER FO	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25		50	75 100) NO.	Имо	I G	ELEV.			DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
720		Ļ												L				720		_							
	-	‡																	-	-							
745	715.9	1.0		-	<u> </u>	<u> </u>	Ţ.							716.9	GROUND SURFA	ACE	0.0	745	- 715.6 -	- 10				·			.
715	-	+	13	8	7		•15+		<u> </u>		-	D		-	ROADWAY EMBANI Brown to Dark Gray, Sandy		_	715	-	-	4	4	5	9			
	713.4	3.5	5	5	6	1 · j						D		-	Gravel				713.1	3.5	4	4	60/0.0	·			.
710	710.9	6.0	3	3	3						66.0	170/	L	F					-	-							
	708.4	8.5				● ⁶					- SS-8	17%		-					-	-							
	-	‡	2	3	2	• 5	· · ·	· · · · ·		· · · · · ·		M		\$					-	-							
705	-	ŧ.					• •			· · · · ·				705.2			<u> 11.7</u>		-	_							
	703.4	13.5	1	2	2	4 <u>t</u> :				.				Ł	ALLUVIAL Dark Gray, Silty CLAY, 1	Frace Sand			-	-							
	-	Ŧ	'		2	•4.	•••	• • • •				M		-					-	-							
700	_	Ŧ							+ • • •					<u>699.4</u>			17.5		_	-							
	698.4	18.5	5	5	3							W		÷	Gray, Silty SAN	ID			-	-							
695	-	‡				!		· · · · ·	· · · ·	· · · · · ·									-	-							
695	693.4	+ 22 5							1		-11			ļ-					_	-							
	- 095.4	- 23.5	2	1	1		· ·	· · · ·	· · ·			Sat.							-	F							
690	-	t												Ļ					-	_							
	688.4	28.5	60/0 0			' <u></u>	·	<u></u>		<u> </u>	•	<u> </u>		688.7	CRYSTALLINE R	ОСК	28.2		-	Ł							
	-	Ŧ	60/0.0	4	1					00/0.0				-	METAMORPHOSED I	DIORITE			-	_							
	-	Ŧ			1									F	Boring Terminated with Penetration Test Refusal at I	Elevation 688.	3		-	Ē							
	-	‡			1									‡	ft in Cystalline Rock: METAI DIORITE	MORPHOSED			-	-							
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T	Y GUIL	FOF	RD			GEOLOGI	ST Pastrana,	C.R.		
Ξ.	Gate Ci	ty Bl	vd.) ove	er Sout	th But	falo Creek			GROUN	D WTR (ft)
1	OFFSE	T 2	ft LT			ALIGNME	NT -L-		0 HR.	Dry
	NORTH	IING	839,0	48		EASTING	1,781,589		24 HR.	FIAD
			DRILL N		D H.S	L. Augers				Automatic
	COMP.	DAI	E 03/	11/20			WATER DEP	FH N//	Ą	
т			SAMP.		L	1				
	75	100	NO.	мо	O G		SOIL AND ROC	K DESC	RIPTION	
	75	100		D	0		GROUND ROADWAY E Tan-Brown to E Boring Termina etration Test Ref Roadway Emban Boulders an	SURFA STORNA Brown, Si ted with usal at E kment:	CE (MENT Ity CLAY Standard Elevation 7 Rip Rap ar	0.0 4.5 12.1 nd/or
						· · ·				

									URE L						,								
	45673					IP B-571			GUILFO				GEOLOGIST Pastrana, C.R.	1			45673.1.2				IP B-5717		COUNTY
SITE	DESCR	RIPTION	Rep	place				4240 (E.	Gate City E		er Sou	uth Bu	i		R (ft)		DESCRIPT		place I				4240 (E. G
BOR	ing no	. EB2-	-C1		s	TATION	22+44		OFFSET	5 ft LT			ALIGNMENT -L-	0 HR.	20.9	BOR	ING NO . E	B2-C2		S	TATION 2	2+26	
COLI	LAR EL	EV. 71	15.5 ft		т	OTAL DEF	TH 28.5	ft	NORTHIN	G 839,0	046		EASTING 1,781,604	24 HR.	13.3	COL	LAR ELEV.	716.9 f	t	Т	OTAL DEP	H 29.7 ft	t I
DRILL	RIG/HA	MMER E	FF./DA	ATE S	UM312	3 CME-550X	93% 11/18/2	019		DRILL	METHO	DDH.	S. Augers HAMN	IER TYPE Autor	natic	DRIL	RIG/HAMME	ER EFF./D/	ATE T	RI0055	CME-55 68%	02/20/2015	;
DRIL	LER G	Gonzale	s, L.		s	TART DAT	E 03/11/2	20	COMP. DA	TE 03/	11/20		SURFACE WATER DEPTH N	I/A		DRIL	LER Toot	hman, R.		S	TART DATI	04/15/2	1 (
ELEV	DRIVE ELEV	DEPTH	BLO	ow cc	UNT		BLOWS	PER FOOT		SAMP.	$\mathbf{\nabla}/$		SOIL AND ROCK DES			ELEV	DRIVE ELEV DE	PTH BL	ow co	UNT		BLOWS F	PER FOOT
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75 100	NO.	мо		ELEV. (ft)		PTH (ft)	(ft)	(ft) (ft) 0.5ft	0.5ft	0.5ft	0	25 5	50 7
720																720							
		Ŧ															-						
715		<u> </u>						+ • • • •	· · · · ·				715.5 GROUND SURF		0.0	715	<u> </u>						
		‡											Tan-Brown to Brown to Da CLAY				713.4 3	8.5	3	3			· · · ·
740	712.0	3.5	3	5	4						м		710.3		5.2	740			Ű		9 ⁶ · · ·		· · · ·
710	709.5-	6.0	3	3	3	$ -I^{\circ} - I$			· · · · ·		М					710	708.4 7 8	8.5					
1	707.0	8.5				P ⁶							Dark Gray to Gray, Silty Organics (Wood Fra	agments)			700.4 c	3	6	7		· · · ·	
705		t	2	1		• 2 · · ·	<u> · · · ·</u>	· · · ·			Sat.					705						· · · ·	
		ŧ															703.4 1	3.5	I WOH		//		
	702.0	13.5	2	2	2	-					Sat.	N					-				•••••••		
700		Ŧ					+	+				\mathbb{N}				700	I IIII						
	697.0	T 18.5											698.0 Gray, Silty SAN		<u> </u>		698.4 1	8.5 2	5	5			· · · · ·
695			2	1	1	• <u>2</u> · · ·				SS-9	Sat.		,, _ ,			695	Ŧ						
	-	Ŧ															693.4 2	3.5			1		
	692.0	23.5	1	1	2						Sat.						Ŧ	2	2	1	• 3		
690	-	Ŧ				● 3 · · ·			· · · ·		Jai.					690	+						
	687.0	28.5				····	 _ <u></u>		<u> </u>				687.6		27.9		688.4 + 28	8.5 9 7 12	88/0.3	3			
		- 20.5	60/0.0	D					60/0.0		1		687.0 WEATHERED R METAMORPHOSED		28.5			60/0.0	0				
	-	ŧ											Boring Terminated with Penetration Test Refusal at	h Standard Flevation 687 0			‡						
		‡											ft on Cystalline Rock: META	AMORPHOSED			‡						
		‡											DIORITE										
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WBS 456	73.1.2			ТІ	P B-5717		COUNT	Y GUIL	FORD			GEOLOGIST Pastrana, C.R.	
SITE DESC	RIPTION	l Rep	lace Bri	dges	s 109 and 1	21 on SR	4240 (E.	Gate Cit	/ Blvd.)	over S	South Bu	ffalo Creek	GROUND WTR (f
BORING N	O. EB2-	В		ST	TATION 2	2+00		OFFSE	r 45 ft	RT		ALIGNMENT -L-	0 HR. 19.
COLLAR E	LEV. 71	6.6 ft		тс	OTAL DEP	TH 31.2 f	t	NORTH	ING 8	39,011		EASTING 1,781,547	24 HR. 13.
DRILL RIG/H	AMMER E	FF./DA	TE SUN	13123	CME-550X 9	3% 11/18/20)19	I		ILL ME	тнор н	.S. Augers HAMN	IER TYPE Automatic
DRILLER				-	TART DAT			COMP.				SURFACE WATER DEPTH N	
			W COUN	<u> </u>			PER FOOT			MP.			
ELEV ELEV (ft) (ft)	/ DEPTH (ft)	0.5ft		0.5ft	0 :		50				MOI G	SOIL AND ROCK DES ELEV. (ft)	CRIPTION DEPTH
715 715.0	$\frac{1}{2}$				· · · · · ·				•			- 716.6 GROUND SURF - ROADWAY EMBAN	KMENT
	+	6	7	5	. 12				-			 Tan-Brown to Brown, Silty Gravel 	CLAY, Trace
713.*	1 3.5	1	1	2	4 3 · · ·	· · · · ·			·		мL	-	
710 710.6	$\frac{6}{4}$ 6.0	10	6	6	<u> </u>				•		мLD	-	
708.1	1 8.5				1 1 1 1 1 1 1 1 1 1				· _			- <u>708.6</u> ALLUVIAL	
	Ŧ	3	3	6	. • 9					5-10 2	2%	 Dark Gray to Gray to Tan- 	Brown, Sandy
705	Ŧ											- CLAY	
703.1	1 13.5	2	1	1	$ 1 \cdots $:			-	
00	‡			·		· · · · ·			•		Sat.	-	
	+				<u> </u>				-				1
698. ⁻	1 <u> </u> 18.5 	2	2	2		· · · ·			·	5	Sat.	Dark Gray, Silty SAND, with CLAY	Layers of Slity
5	Ŧ				i · · ·				•			-	
693. ⁻	1 23.5											-	
000.	<u> </u>	3	2	4					·	s	Sat.	-	
0	‡								·			-	
688.	1 28.5					+	+	+			977 J	689.0 WEATHERED R	<u>оск</u>
	Ŧ	41	59/0.2					· 100/				METAMORPHOSED	
685.4	4 <u>† 31.2</u> +	60/0.0							0.0 0			- 685.4 - Boring Terminated with	3 Standard
												Penetration Test Refusal at ft on Cystalline Rock: MET/ DIORITE	MORPHOSED

SOILS LABORATORY TESTS RESULTS

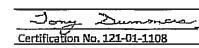
WBS NO.: 45673.1.2

TIP NO.: B-5717

COUNTY: Guilford

SITE DESCRIPTION: Replace Bridges 109 and 121 on SR 4240 (E. Gate City Blvd.) over South Buffalo Creek

BORING	SAMPLE	BORING	DEPTH	AASHTO	Ν	L.L	P.I.		% BY W	/EIGHT		% P.	ASSING SII	EVES	%	%
NO.	NO.	LOCATION	INTERVAL (FT)	CLASS				CSE. SAND	F. SAND	SILT	CLAY	10	40	200	MOISTURE	ORGANIC
EB1-A	SS-5	-L- STA. 20+28, 49' LT	3.5-5.0	A-7-6 (9)	6	41	23	23	21	40	16	88	77	53	23.7	-
EB1-C	SS-6	-L- STA. 20+02, 4' LT	1.0-2.5	A-7-6 (16)	6	49	27	17	21	44	18	98	89	65	24.3	-
EB1-B	SS-7	-L- STA. 19+80, 35' RT	13.5-15.0	A-6 (8)	5	28	13	1	29	55	15	100	100	81	21.6	-
EB2-A	SS-8	-L- STA. 22+55, 50' LT	6.0-7.5	A-6 (2)	6	28	12	25	31	35	9	92	81	46	17.2	-
EB2-C1	SS-9	-L- STA. 22+44, 5' LT	18.5-20.0	A-2-4 (0)	2	NP	NP	50	34	7	9	97	77	18	-	-
EB2-B	SS-10	-L- STA. 22+00, 45' RT	8.5-10.0	A-6 (4)	9	33	12	18	30	44	8	92	84	54	21.8	-





ASTM D 7012-14 Method C

This method does not report strain rate or deformation

Boring No.: B1-A

Moisture Condition: As received

22.7-23.0

RS-1

Depth (ft):

Sample ID:

Client: ESP Associates, Inc. B-5717 Client Project: Project No.: R-2021-116-001 Lab ID No.: R-2021-116-001-001

Specimen Weight (g):

63	8.	93	3	

SPECIMEN LENGTH (in)		SPECIMEN DIAMETER (in):	
Reading 1:	4.69	Reading 1:	1.98
Reading 2:	4.70	Reading 2:	1.98
Reading 3:	4.70	Average:	1.98
Average:	4.70	Area (in ²):	3.08
		L/D:	2.37
MOISTURE CONTENT			
Tare Number:	X-11	Total Load (lb):	32,140
Wt. of Tare & Wet Sample (g):	757.64	Uniaxial Compressive Strength (psi):	10,440
Wt. of Tare & Dry Sample (g):	756.97		
Weight of Tare (g):	142.71	Fracture Type:	Shear
Weight of Wet Sample (g):	614.93		
Sample Volume (cm ³):	236.95	Rate of Loading (lb/sec):	238
Moisture Content (%):	0.11	Time to Break (min:sec):	2:15.00
Unit Wet Weight (g/cm ³):	2.697	Deviation From Straightness ² :	Pass
Unit Wet Weight (pcf):	168.3		
Unit Dry Weight (g/cm ³):	2.694	AXIAL: Pass TOP: Pass E	BOTTOM: Pass
Unit Dry Weight (pcf):	168.1		

Physical Description: Gray Rock Core

Notes:

- 1) Moisture conditions at time of the test are: As received
- 2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
- 3) Deviation from straightness, Procedure A of ASTM D 4543-08 Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
- 4) Temperature is laboratory room temperature.
- 5) D4543 Prep and D7012 Testing Equipment Used: R176 Compression Machine, R525 Digital Calipers, R148 Feeler Gauge, R419 Scale
- R512 Rock Saw
- R148 Straight Edge
- R582 V-Block, R585 Dial Gauge

Tested By: 129-07-0411

page 1 of 1 DCN: CT45A; Revision No.: 1e3 Revision Date: 4/5/17

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Checked By:

AES

Date:

5/7/21

5/6/21

UNCONFINED COMPRESSIVE STRENGTH of INTACT ROCK CORE SPECIMENS

Client: Client Project: Project No.: Lab ID No.:	ESP Associates, Inc. B-5717 R-2021-116-001 R-2021-116-001-002		
Specimen	Weight (g):	657.69	
SPECIMEN	LENGTH (in)		
	Reading 1:	4.81	
	Reading 2:	4.81	
	Reading 3:	4.82	
	Average:	4.81	
MOISTURE	CONTENT		
Tare Number: SS-4			
Wt. of Tare	& Wet Sample (g):	720.45	
Wt. of Tare	& Dry Sample (g):	719.93	
Weight of T	are (g):	99.29	
Weight of W	/et Sample (g):	621.16	
Sample Vol	ume (cm ³):	243.43	
Moisture Co	Moisture Content (%):		
Unit Wet W	Unit Wet Weight (g/cm ³):		
Unit Wet W	eight (pcf):	168.6	
Unit Dry W	eight (g/cm³):	2.700	
Unit Dry Weight (pcf): 168.4			

Physical Description: Gray Rock Core

Notes:

- 1) Moisture conditions at time of the test are: As received
- 2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
- 3) Deviation from straightness, Procedure A of ASTM D 4543-08 Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
- 4) Temperature is laboratory room temperature.
- 5) D4543 Prep and D7012 Testing Equipment Used:
- R176 Compression Machine,
- R525 Digital Calipers,
- R148 Feeler Gauge, R419 Scale R512 Rock Saw
- R148 Straight Edge
- R582 V-Block, R585 Dial Gauge

Tested By:	129-07-0411	5/6/21

page 1 of 1 DCN: CT45A; Revision No.: 1e3 Revision Date: 4/5/17

SHEET 34



ASTM D 7012-14 Method C This method does not report strain rate or deformation

Boring No.:	B1-A
Depth (ft):	42.0-42.3
Sample ID:	RS-2
Moisture Condition:	As received

SPECIMEN DIAMETER (in):

- Reading 1: 1.98
- Reading 2: 1.98
- Average: 1.98
- Area (in²): 3.09
 - L/D: 2.43
- Total Load (lb): 43,960
- Uniaxial Compressive Strength (psi): 14,240

Fracture Type: Shear

Rate of Loading (lb/sec):	253
Time to Break (min:sec):	2:53.46
Deviation From Straightness ² :	Pass

TOP: Pass BOTTOM: Pass







ASTM D 7012-14 Method C

This method does not report strain rate or deformation

Client: ESP Associates, Inc. Client Project: B-5717 Project No.: R-2021-116-001 Lab ID No.: R-2021-116-001-003

Specimen Weight (g):

Depth (ft): 29.7-30.0 Sample ID: RS-3 Moisture Condition: As received

Boring No.: B1-B

SPECIMEN LENGTH (in)		SPECIMEN DIAMETER (in):
Reading 1:	4.31	Reading 1: 1.98
Reading 2:	4.31	Reading 2: 1.98
Reading 3:	4.31	Average: 1.98
Average:	4.31	Area (in ²): 3.09
		L/D: 2.17
MOISTURE CONTENT		
Tare Number:	TB-04	Total Load (lb): 23,540
Wt. of Tare & Wet Sample (g):	713.83	Uniaxial Compressive Strength (psi): 7,630
Wt. of Tare & Dry Sample (g):	712.95	
Weight of Tare (g):	134.67	Fracture Type: Shear
Weight of Wet Sample (g):	579.16	
Sample Volume (cm ³):	218.04	Rate of Loading (lb/sec): 266
Moisture Content (%):	0.15	Time to Break (min:sec): 1:28.50
Unit Wet Weight (g/cm ³):	2.668	Deviation From Straightness ² : Pass
Unit Wet Weight (pcf):	166.5	
Unit Dry Weight (g/cm ³):	2.664	AXIAL: Pass TOP: Pass BOTTOM: Pas
Unit Dry Weight (pcf):	166.3	

581.80

Physical Description: Gray and White Rock Core

Notes:

- 1) Moisture conditions at time of the test are: As received
- 2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
- 3) Deviation from straightness, Procedure A of ASTM D 4543-08 Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
- 4) Temperature is laboratory room temperature.
- 5) D4543 Prep and D7012 Testing Equipment Used: R176 Compression Machine, R525 Digital Calipers,
- R148 Feeler Gauge, R419 Scale
- R512 Rock Saw
- R148 Straight Edge
- R582 V-Block, R585 Dial Gauge

Tested By: 129-07-0411

page 1 of 1 DCN: CT45A; Revision No.: 1e3 Revision Date: 4/5/17

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5/6/21

UNCONFINED COMPRESSIVE STRENGTH of INTACT ROCK CORE SPECIMENS

Client: Client Project: Project No.: Lab ID No.:				
Specimen	Weight (g):	638.12		
SPECIMEN	N LENGTH (in)			
	Reading 1:	4.67		
	Reading 2:	4.67		
	Reading 3:	4.66		
	Average:	4.67		
MOISTURE				
Tare Numb	Tare Number:			
Wt. of Tare	& Wet Sample (g):	755.33		
Wt. of Tare	& Dry Sample (g):	754.81		
Weight of T	are (g):	135.14		
Weight of V	Vet Sample (g):	620.19		
Sample Vol	ume (cm ³):	236.42		
Moisture Co	ontent (%):	0.08		
Unit Wet W	Unit Wet Weight (g/cm ³):			
Unit Wet W	eight (pcf):	168.4		
Unit Dry W	eight (g/cm ³):	2.697		
Unit Dry W	Unit Dry Weight (pcf):			

Physical Description: Gray Rock Core

Notes:

- 1) Moisture conditions at time of the test are: As received
- 2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
- 3) Deviation from straightness, Procedure A of ASTM D 4543-08 Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
- 4) Temperature is laboratory room temperature.
- 5) D4543 Prep and D7012 Testing Equipment Used:
- R176 Compression Machine,
- R525 Digital Calipers,
- R148 Feeler Gauge, R419 Scale
- R512 Rock Saw
- R148 Straight Edge
- R582 V-Block, R585 Dial Gauge

Tes	sted By:	129-07-041	1		5/6/21
page	1 of 1	DCN: CT45A; Revis	on No.: 1e3 Re	evision Date: 4	1/5/17



SHEET 35



ASTM D 7012-14 Method C This method does not report strain rate or deformation

> Boring No.: B1-B Depth (ft): 41.8-42.1 Sample ID: RS-4 Moisture Condition: As received

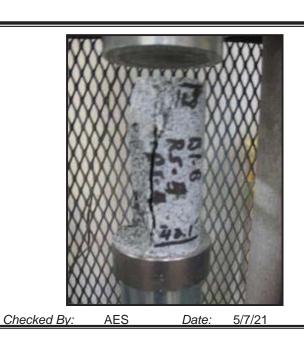
SPECIMEN DIAMETER (in):

- Reading 1: 1.98
- Reading 2: 1.98
- Average: 1.98
- Area (in²): 3.09
 - L/D: 2.35
- Total Load (lb): 32,360
- Uniaxial Compressive Strength (psi): 10,470

Fracture Type: Shear

Rate of Loading (lb/sec):	200
Time to Break (min:sec):	2:42.19
Deviation From Straightness ² :	Pass

TOP: Pass BOTTOM: Pass



AXIAL: Pass

ASTM D 7012-14 Method C

This method does not report strain rate or deformation

B2-A

30.7-31.0

Boring No.:

Depth (ft):

Client: ESP Associates, Inc. Client Project: B-5717 R-2021-116-001 Project No.: Lab ID No.: R-2021-

oject No.: b ID No.:	R-2021-116-001 R-2021-116-001-005		Sample ID: RS-5 Moisture Condition: As received	
Specime	n Weight (g):	633.92		
SPECIME	N LENGTH (in)		SPECIMEN DIAMETER (in):	
	Reading 1:	4.45	Reading 1:	1.98
	Reading 2:	4.44	Reading 2:	1.98
	Reading 3:	4.44	Average:	1.98
	Average:	4.44	Area (in ²):	3.08
			L/D:	2.24
MOISTUR	<u>E CONTENT</u>			
Tare Num	ber:	X-13	Total Load (lb):	23.150

		L/D: 2.24
MOISTURE CONTENT		
Tare Number:	X-13	Total Load (lb): 23,150
Wt. of Tare & Wet Sample (g):	749.15	Uniaxial Compressive Strength (psi): 7,510
Wt. of Tare & Dry Sample (g):	748.50	
Weight of Tare (g):	143.38	Fracture Type: Shear
Weight of Wet Sample (g):	605.77	
Sample Volume (cm ³):	224.35	Rate of Loading (lb/sec): 225
Moisture Content (%):	0.11	Time to Break (min:sec): 1:43.01
Unit Wet Weight (g/cm ³):	2.826	Deviation From Straightness ² : Pass
Unit Wet Weight (pcf):	176.3	
Unit Dry Weight (g/cm ³):	2.823	AXIAL: Pass TOP: Pass BOTTOM: Pass
Unit Dry Weight (pcf):	176.1	

Physical Description: Gray Rock Core

Notes:

- 1) Moisture conditions at time of the test are: As received
- 2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
- 3) Deviation from straightness, Procedure A of ASTM D 4543-08 Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
- 4) Temperature is laboratory room temperature.
- 5) D4543 Prep and D7012 Testing Equipment Used: R176 Compression Machine, R525 Digital Calipers, R148 Feeler Gauge, R419 Scale
- R512 Rock Saw
- R148 Straight Edge

R582 V-Block, R585 Dial Gauge

Tested By: 129-07-0411

5/6/21

5/7/21 Checked By: AES Date:

UNCONFINED COMPRESSIVE STRENGTH of INTACT ROCK CORE SPECIMENS

Client: Client Project: Project No.: Lab ID No.:	ESP Associates, Inc. B-5717 R-2021-116-001 R-2021-116-001-006		
Specimen	Specimen Weight (g):		
SPECIMEN	SPECIMEN LENGTH (in)		
	Reading 1:	4.06	
	Reading 2:	4.06	
	Reading 3:	4.06	
	Average:	4.06	
MOISTURE			
Tare Number	er:	X-17	
Wt. of Tare & Wet Sample (g):		691.98	
Wt. of Tare & Dry Sample (g):		691.71	
Weight of Tare (g):		143.50	
Weight of W	/et Sample (g):	548.48	
Sample Vol	ume (cm ³):	205.17	
Moisture Co	ontent (%):	0.05	
Unit Wet W	eight (g/cm ³):	2.925	
Unit Wet W	eight (pcf):	182.5	
Unit Dry W	eight (g/cm ³):	2.923	
Unit Dry W	eight (pcf):	182.4	

Physical Description: Dark Gray Rock Core

Notes:

- 1) Moisture conditions at time of the test are: As received
- 2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
- 3) Deviation from straightness, Procedure A of ASTM D 4543-08 Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
- 4) Temperature is laboratory room temperature.
- 5) D4543 Prep and D7012 Testing Equipment Used:
- R176 Compression Machine, R525 Digital Calipers,
- R148 Feeler Gauge, R419 Scale
- R512 Rock Saw
- R148 Straight Edge
- R582 V-Block, R585 Dial Gauge

Tested By:	129-07-0411	5/6/21
page 1 of 1	DCN: CT45A; Revision No.: 1e3 Revision Date:	4/5/17

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SHEET 36



ASTM D 7012-14 Method C This method does not report strain rate or deformation

> Boring No.: B2-A 39.6-39.9 Depth (ft): Sample ID: RS-6 Moisture Condition: As received

SPECIMEN DIAMETER (in):

- Reading 1: 1.98
- Reading 2: 1.98
- Average: 1.98
- Area (in²): 3.08
 - L/D: 2.05
- Total Load (lb): 29,100
- Uniaxial Compressive Strength (psi): 9,440

Fracture Type: Shear

Rate of Loading (lb/sec):	190
Time to Break (min:sec):	2:32.84
Deviation From Straightness ² :	Pass

ss BOTTOM: Pass



AXIAL: Pass



ASTM D 7012-14 Method C

This method does not report strain rate or deformation

Client: ESP Associates, Inc. Client Project: B-5717 Project No.: R-2021-116-001 Lab ID No.: R-2021-116-001-007

Specimen Weight (g):

Depth (ft): 31.6-31.9 Sample ID: RS-7 Moisture Condition: As received

Boring No.: B2-E

SPECIMEN LENGTH (in)		SPECIMEN DIAMETER (in):	
Reading 1:	4.69	Reading 1:	1.99
Reading 2:	4.68	Reading 2:	1.99
Reading 3:	4.69	Average:	1.99
Average:	4.69	Area (in ²):	3.10
		L/D:	2.36
MOISTURE CONTENT			
Tare Number:	X-5	Total Load (lb):	8,860
Wt. of Tare & Wet Sample (g):	809.02	Uniaxial Compressive Strength (psi):	2,860
Wt. of Tare & Dry Sample (g):	808.35		
Weight of Tare (g):	143.44	Fracture Type:	Shear
Weight of Wet Sample (g):	665.58		
Sample Volume (cm ³):	238.10	Rate of Loading (lb/sec):	168
Moisture Content (%):	0.10	Time to Break (min:sec):	0:52.83
Unit Wet Weight (g/cm ³):	2.805	Deviation From Straightness ² :	Pass
Unit Wet Weight (pcf):	175.0		
Unit Dry Weight (g/cm ³):	2.802	AXIAL: Pass TOP: Pass	BOTTOM: Pass
Unit Dry Weight (pcf):	174.8		

667.80

Physical Description: Dark Gray Rock Core

Notes:

- 1) Moisture conditions at time of the test are: As received
- 2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
- 3) Deviation from straightness, Procedure A of ASTM D 4543-08 Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
- 4) Temperature is laboratory room temperature.
- 5) D4543 Prep and D7012 Testing Equipment Used: R176 Compression Machine, R525 Digital Calipers, R148 Feeler Gauge, R419 Scale
- R512 Rock Saw
- R148 Straight Edge

R582 V-Block, R585 Dial Gauge

Tested By: 129-07-0411

page 1 of 1 DCN: CT45A; Revision No.: 1e3 Revision Date: 4/5/17

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Checked By:

AES

Date:

5/7/21

5/6/21

UNCONFINED COMPRESSIVE STRENGTH of INTACT ROCK CORE SPECIMENS

Client: Client Project: Project No.: Lab ID No.:	ESP Associates, Inc. B-5717 R-2021-116-001 R-2021-116-001-008	
Specimen	Weight (g):	607.93
SPECIMEN		
	Reading 1:	4.49
	Reading 2:	4.49
	Reading 3:	4.49
	Average:	4.49
MOISTURE	<u>CONTENT</u>	
Tare Numb	er:	TB-02
Wt. of Tare & Wet Sample (g):		725.23
Wt. of Tare & Dry Sample (g):		724.51
Weight of T	are (g):	133.78
Weight of W	Vet Sample (g):	591.45
Sample Vol	ume (cm ³):	225.93
Moisture Co	ontent (%):	0.12
Unit Wet W	eight (g/cm ³):	2.691
Unit Wet W	eight (pcf):	167.9
Unit Dry W	eight (g/cm ³):	2.688
Unit Dry W	eight (pcf):	167.7

Physical Description: Dark Gray Rock Core

Notes:

- 1) Moisture conditions at time of the test are: As received
- 2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
- 3) Deviation from straightness, Procedure A of ASTM D 4543-08 Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
- 4) Temperature is laboratory room temperature.
- 5) D4543 Prep and D7012 Testing Equipment Used:
- R176 Compression Machine,
- R525 Digital Calipers,
- R148 Feeler Gauge, R419 Scale R512 Rock Saw
- R148 Straight Edge R582 V-Block, R585 Dial Gauge

Tested By:	129-07-0411	5/6/2

page 1 of 1 DCN: CT45A; Revision No.: 1e3 Revision Date: 4/5/17

SHEET 37



ASTM D 7012-14 Method C This method does not report strain rate or deformation

> Boring No.: B2-B1 29.9-30.2 Depth (ft): Sample ID: RS-8 Moisture Condition: As received

SPECIMEN DIAMETER (in):

- Reading 1: 1.98
- Reading 2: 1.98
- Average: 1.98
- Area (in²): 3.07
 - L/D: 2.27
- Total Load (lb): 26,900
- Uniaxial Compressive Strength (psi): 8,760

Fracture Type: Shear

Rate of Loading (lb/sec):	248
Time to Break (min:sec):	1:48.53
Deviation From Straightness ² :	Pass

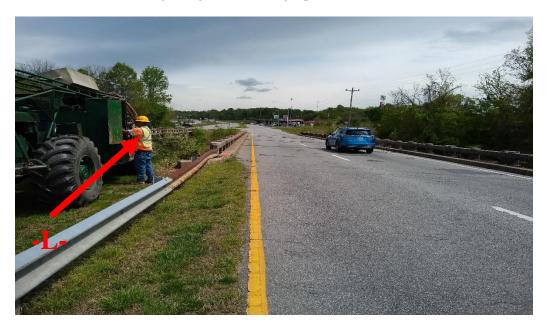
AXIAL: Pass TOP: Pass BOTTOM: Pass





SITE PHOTOGRAPHS Bridge Nos. 109 and 121 on –L– (SR 4240) over South Buffalo Creek

View Along Bridge 109 Looking Upstation from End Bent 1



View of Along Bridge 121 Looking Upstation from End Bent 1



View Looking Downstream from Bridge 109



View Looking Downstream from Bridge 121



SHEET 38 Project No. 45673.1.2 TIP No. B-5717 Guilford County