CONTENTS

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STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

RICHMOND COUNTY _ PROJECT DESCRIPTION BRIDGE NO. 760140 ON SR 1971 (SANDHILL ROAD) OVER SOLOMONS CREEK

STATE PROJECT REFERENCE NO. SF-760140

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (1991) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BORCHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS INCLORDED TO CLIMATIC CONDITIONS INCLORDED TO CLIMATIC CONDITIONS INCLORDING TO CLIMATIC CONDITIONS INCLORDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISTY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

- NOTES:

 1. 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 BY 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 PLUMMER, K. R. DUGGINS, W. T. TANNER, M. INVESTIGATED BY PLUMMER, K. R. FIELDS, W. D. DRAWN BY AFKJ CHECKED BY RIGGS, A.F. PLUMMER, K.R. **APRIL** 2022

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Consulting Engineers and Scientists

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Kelly R. Plummer ABAD25CBS&BNATURE

5/19/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REFERENCE

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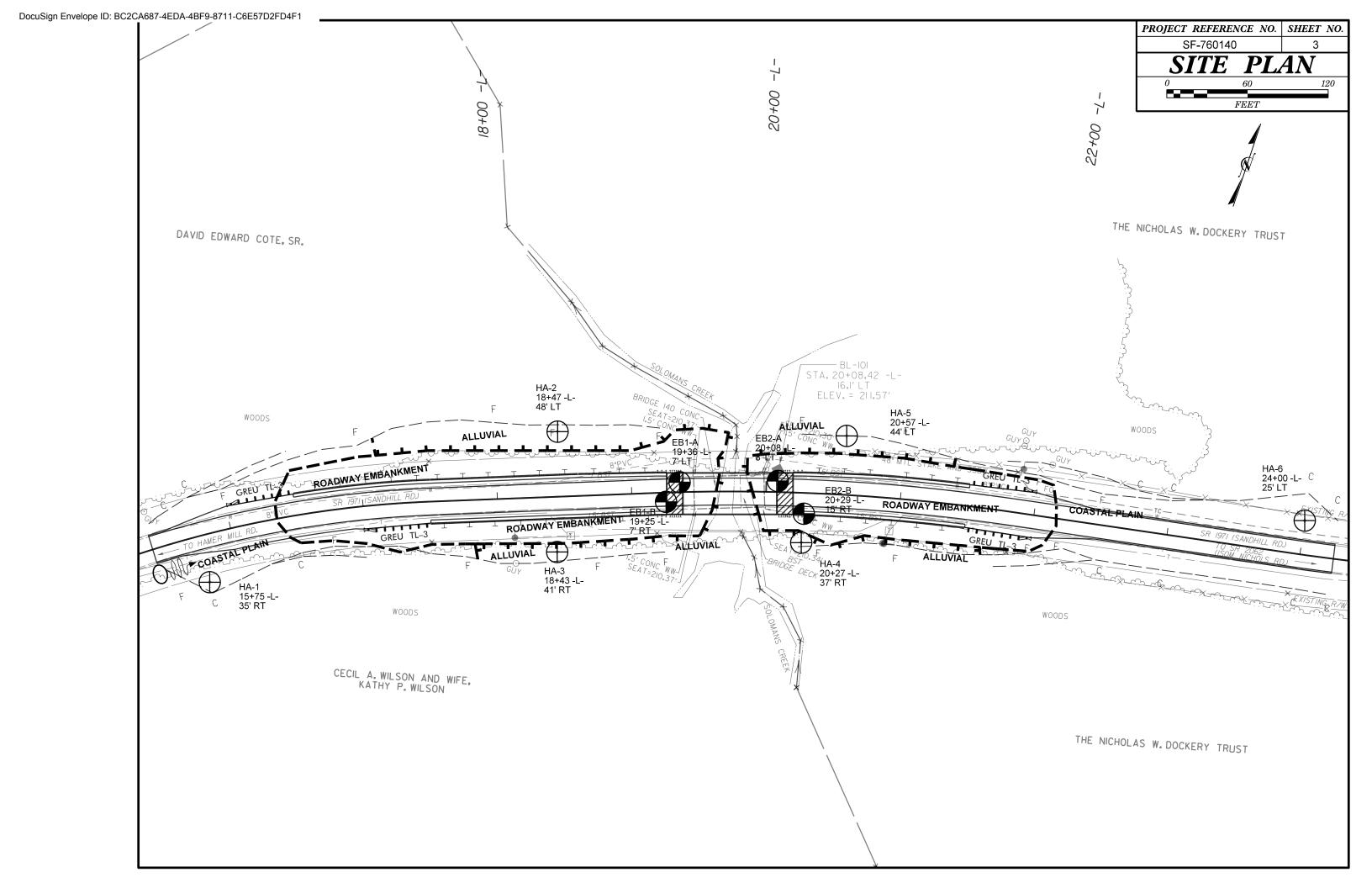
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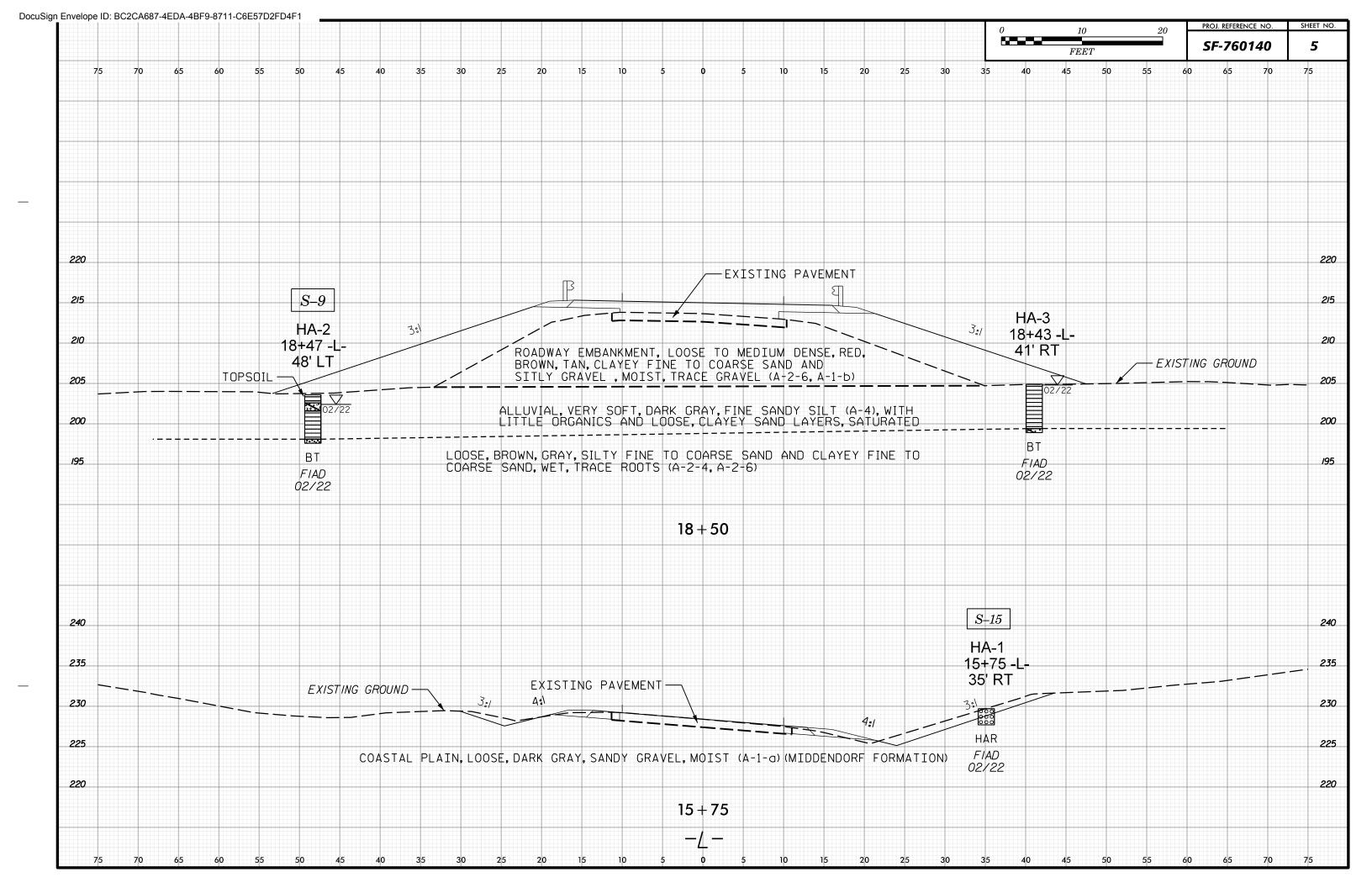
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

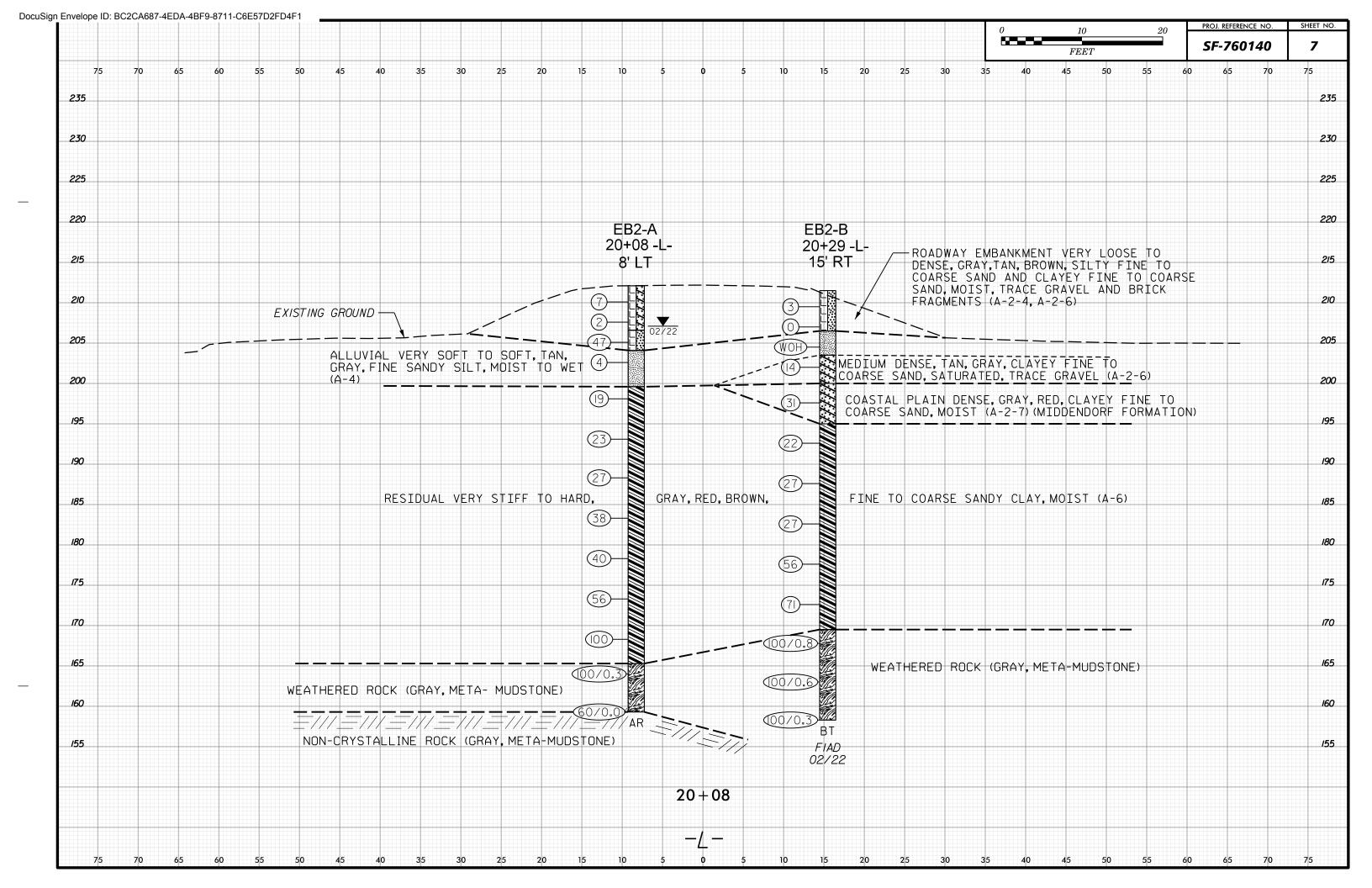
SUBSURFACE INVESTIGATION

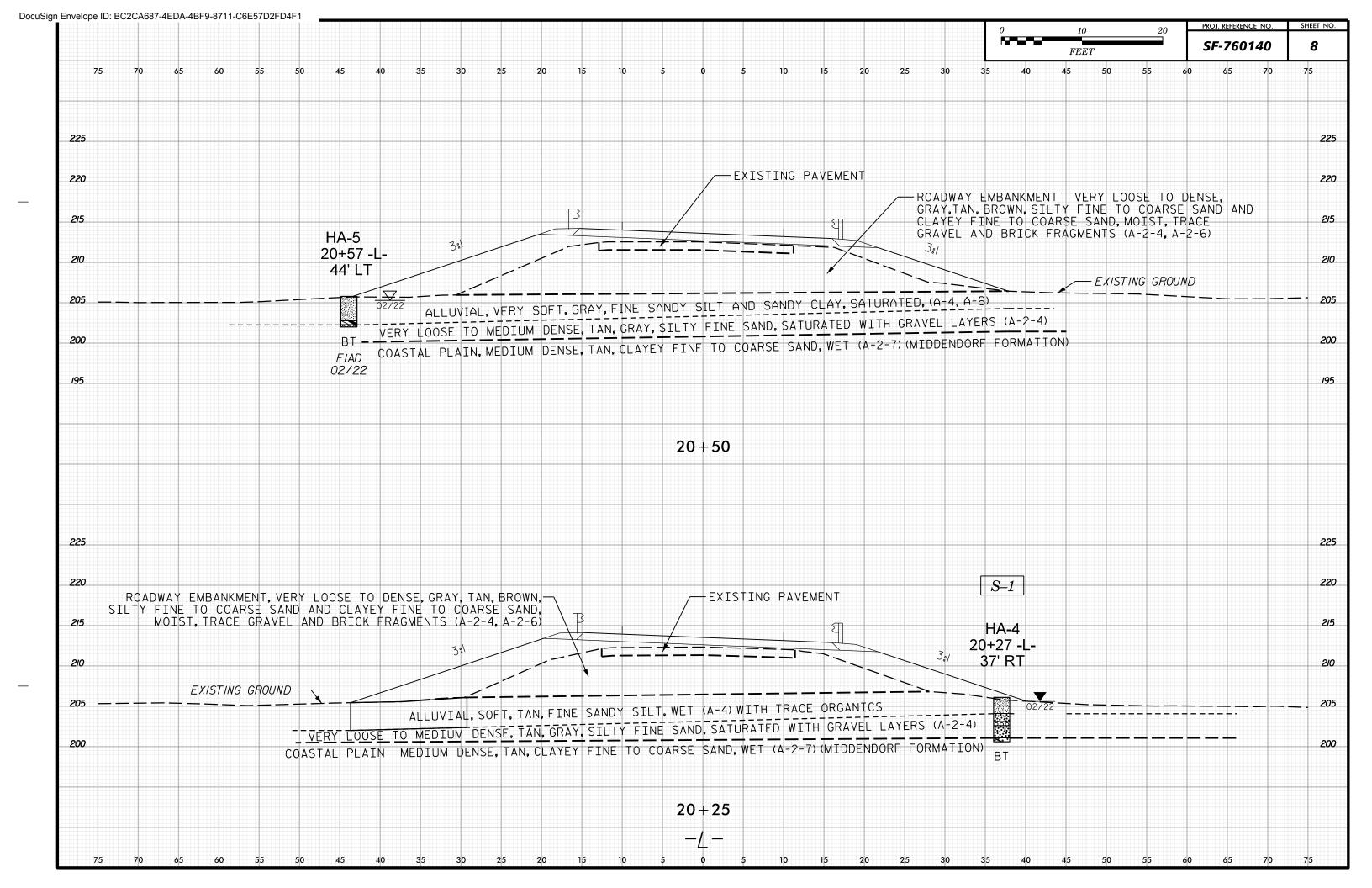
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

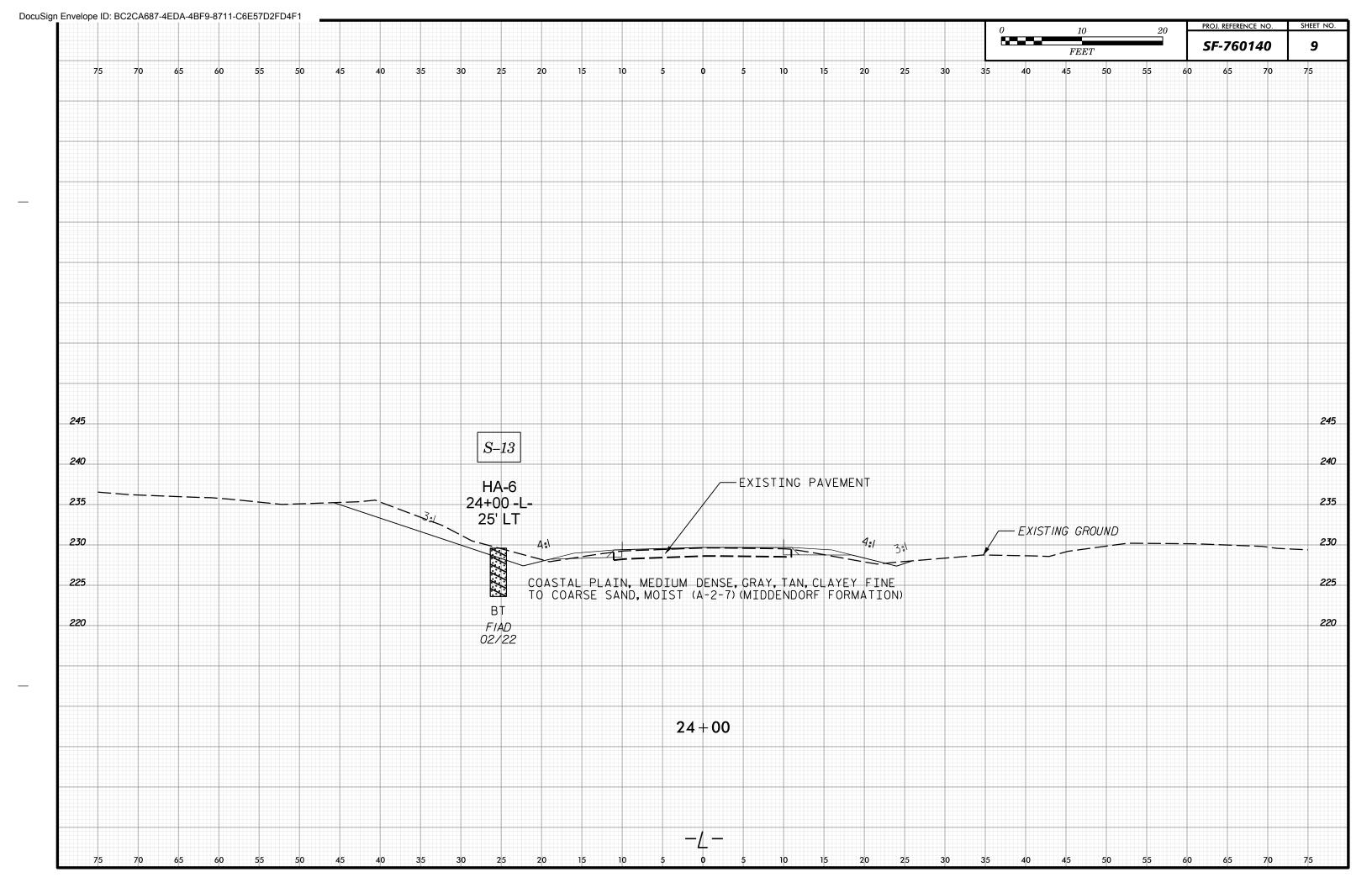
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST MASHITO T 206, ASTM D1580, SOIL CLASSIFICATION IS BASED ON THE ASHITO SYSTEM, BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, ASHITO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SULTY CLAY, MOIST WITH INTERREDOED FINE SAND LAFER, FINGHLY PLASTIC, A-7-6 SOIL LEGEND AND AASHTO CLASSIFICATION.	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES. ANGULARITY OF GRAINS THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EDUAL TO OR LESS THAN Ø.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
CENERAL CRANULAR MATERIALS C 30% PASSING 2000 C 30% PASSING 20% PASSIN	MINERALOGICAL COMPOSITION MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE. COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LL 31 - 50 HIGHLY COMPRESSIBLE LL > 50 PERCENTAGE OF MATERIAL ORGANIC MATERIAL SOILS SOILS TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC > 10% > 20% HIGHLY ORGANIC > 35% AND ABOVE	CRYSTALLINE ROCK (CR) FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GMEISS, GABRO, SCHIST, ETC. NON-CRYSTALLINE ROCK (NCR) SDIMENTARY ROCK THAT WOULD VEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD VEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SEDIME	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
CROUP INDEX 0 0 0 0 4 MX 8 MX 12 MX 16 MX NO MX	GROUND WATER WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP MISCELLANEOUS SYMBOLS	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO (SLI.) 1 INCH. DPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. MODERATE (MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM, FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
RANGE OF STANDARD RANGE OF UNCONFINED COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTENCE COMPRESSIVE STRENGTH (TONS/FT²)	ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY OTHER STRUCTURES SPT DOT INT TEST BORING CONE PENETROMETER TEST INFERRED SOIL BOUNDARY TEST BORING SOUNDING ROD TEST BORING TEST BORING TEST BORING TEST BORING TEST BORING TEST BORING	(MOD, SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK, ROCK GIVES "CLUNK' SOUND WHEN STRUCK, IF TESTED, WOULD YIELD STY REFUSAL SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT, SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, WOULD YIELD SPT IN VALUES > 100 BPF VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK (V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT IN VALUES < 100 BPF	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTILED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTILING IN SOILS USUALLY INDICATES POOR AFRATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	INFERRED ROCK LINE MONITORING WELL WITH CORE WITH CORE THE PROPERTY ALLUVIAL SOIL BOUNDARY ALLUVIAL SOIL BOUNDARY PIEZOMETER INSTALLATION SPT N-VALUE RECOMMENDATION SYMBOLS [XX] UNCLASSIFIED EXCAVATION -	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS ALSO AN EXAMPLE. ROCK HARDNESS VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	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 RUM AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
U.S. STD. SIEVE SIZE	UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL ABBREVIATIONS AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERALE EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
GRAIN MM 305 75 2.0 0.25 0.05 0.005 SIZE IN. 12 3 SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE OBSCRIPTION OF TERMS (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION - SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED CLI CLAY MOD MODERATELY 7 - UNIT WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC 7- DRY UNIT WEIGHT CSE COARSE ORG ORGANIC DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAPLE ABBREVIATIONS DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY CAN BE CARVED WITH KNIFE, CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH	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. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. 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
LL LIQUID LIMIT PLASTIC RANGE (PI) PL PLASTIC LIMIT - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	F - FINE	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL. FRACTURE SPACING IERM SPACING VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET	THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (15.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. BENCH MARK: BL-IOI: STA. 20+08.42 -L-, I6.I' LEFT N-413,836; E-I,758,702 ELEVATION: 211.57 FEET
OM OPTIMUM MOISTURE SL SHRINKAGE LIMIT - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE PLASTICITY	DRILL UNITS:	WIDE	NOTES: FIAD - FILLED IMMEDIATELY AFTER DRILLING HAR - HAND AUGER REFUSAL
PLASTICITY INDEX (PI) NON PLASTIC SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH COLOR DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	CME-550	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINCER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHAPP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	













GEOTECHNICAL BORING REPORT **BORE LOG**

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	AR ELE		0 7 ft		_		DEPT		Λ ft		-			413,62	2/1		+	1,758,327		24 HR.	FIA
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GEOTECHNICAL BORING REPORT BORE LOG

SHEET 10 OF 17

										В	ORE	L	OG						
	WBS	BP8.R0	013			TII	Р	SF-76014	10	COUNT	Y RICHM	101	1D			GEOLOGIST PLUMME	R, K.		
	SITE	DESCRI	PTION	BRID	GE N	O. 760	114	40 ON SR	1971 (SA	NDHILL F	RD.) OVEF	S	OLOMO	NS CF	REEK			GROUND	WTR (ft)
L	BORI	NG NO.	HA-2			ST	ГΑ	TION 18-	⊦ 47		OFFSET	4	8 ft LT			ALIGNMENT -L-		0 HR.	1.2
Ŀ	COLI	AR ELE	V . 20	3.6 ft		TC	тс	AL DEPTH	d 6.0 ft		NORTHI	NG	413,81	2		EASTING 1,758,537		24 HR.	FIAD
L	DRILL	RIG/HAMI	MER EF	F./DATI	E N/A								DRILL M	ETHOD) Han	d Auger	HAMM	ER TYPE N/A	A
L	DRIL	LER N/	A			ST	ГΑ	RT DATE	02/09/2	2	COMP. [PΑ	E 02/0	9/22		SURFACE WATER DEP	TH N/	A	
	LEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft	0.5ft	UNT 0.5ft	_	0 25		PER FOOT 50		00	SAMP.	MOI	L O G	SOIL AND RO	CK DES	CRIPTION	DEPTH (ft)
	205		- - -												-		OIL, MOIS		0.0
	200											: - -	S-9			LOOSE, BROWN COARSE SAND,	UVIAL N, CLAYI WET, W IICS (A-2 K GRAY) LITTLE 8.9% OF IN, SILT RACE R at Eleva	EY FINE TO /ITH LITTLE 2-6) ORGANICS, RGANICS) Y FINE TO OOTS (A-2-4 tion 197.6 ft If	2.0 2.0 1 5.5 7



GEOTECHNICAL BORING REPORT

SHEET 11 OF 17

COLLAR ELEV. 204.9 ft TOTAL DEPTH 6.0 ft NORTHING 413,727 EASTING 1,758,565 24 HR. FIAE	Cons	ulting En	gineers	and So	cientist	s				В	ORE L	.OG						
STATION 18-43 STATION 18-43 OFFSET 41 ft.RT ALIGNMENT -L- 0 HR. 0.	WBS	BP8.R	013			TI	IP	SF-76014	10	COUNT	Y RICHMO	ND			GEOLOGIST PLUMME	ER, K.		
COLLAR ELEV. 204.9 ft	SITE	DESCR	IPTION	BRIE	DGE N	O. 760)14	0 ON SR	1971 (SAI	NDHILL I	RD.) OVER S	SOLOMO	ONS CI	REE	(GROUN	D WTR (ft)
RILLER RIJAMMER EFF, DATE NA	BOR	ING NO.	HA-3			S ⁻	TA	TION 18-	+43		OFFSET	41 ft RT			ALIGNMENT -L-		0 HR.	0.1
START DATE 02/09/22 COMP. DATE 02/09/22 SURFACE WATER DEPTH N/A	COL	LAR ELE	EV. 20	4.9 ft		T	OT	AL DEPTH	d 6.0 ft		NORTHING	413,7	27		EASTING 1,758,565		24 HR.	FIAD
Lie City C	DRILL	RIG/HAM	IMER EF	F./DATI	E N/A							DRILL I	METHO	D Ha	and Auger	HAMN	IER TYPE	N/A
(ft) (ft) 0.5ft 0.5ft 0.5ft 0.5ft 0.2ft 0 25 50 75 100 NO. MOI 0 ELEV.(ft) DEPTH DEPTH 0.5ft 0.5	DRIL	LER N	/A			S ⁻	TA	RT DATE	02/09/2	2	COMP. DA	TE 02/	09/22		SURFACE WATER DEF	TH N	/A	
(10) (ft) (10) 0.5ft 0.5ft 0.5ft 0.25 50 75 100 NC. MOI G ELEV.(ft) DEPTH. (201) 204.9 GROUND SURFACE C ALLIUNIA. (A-4) WITH LITTLE ORGANICS. (A-3) WITH LITTLE ORGANICS. (A-3) STANTARTED (A-4) WITH LITTLE ORGANICS. (A-5) STANTARTED (A-6) STANTARTED (A-7) STANTARTED (A-8) STANTARTED (A-8) STANTARTED (A-9) STANTARTED (A-1) STANTARTED (A-2) STANTARTED (A-3) STANTARTED (A-4) S	ELEV	DRIVE FLEV		BLC	w co	UNT						SAMP	. 🔻		SOIL AND RO	CK DES	CRIPTION	
ALLUVIAL VERY SOFT, DARK GRAY, CLAYEY SILT (A-4) WITH LITTLE ORGANICS, SATURATED T19.4 LOOSE, GRAY, CLAYEY FINE TO COARSE SAND, WET (A-2-6) Boing Terminated at Elevation 198,9 ft In ALLUVIAL, CLAYEY FINE TO COARSE SAND ALLUVIAL SAND TO COARSE SAND	(ft)		(ft)	0.5ft	0.5ft	0.5ft	C	0 25	5 5	50	75 100	NO.	MO					DEPTH (ft
ALLUVIAL VERY SOFT, DARK GRAY, CLAYEY SILT (A-4) WITH LITTLE ORGANICS, SATURATED T19.4 LOOSE, GRAY, CLAYEY FINE TO COARSE SAND, WET (A-2-6) Boing Terminated at Elevation 198,9 ft In ALLUVIAL, CLAYEY FINE TO COARSE SAND ALLUVIAL SAND TO COARSE SAND																		
VERY SOFT, DARK GRAY, CLAYEY SILT (A-4) WITH LITTLE ORGANICS, SATURATED 199.4 LOOSE, GRAY, CLAYEY FINE TO COARSE SAND, WET (A-2-6) Boring Terminated at Elevation 198.9 ft IN ALLUVIAL, CLAYEY FINE TO COARSE SAND	205						Ш						∇				ACE	0.0
SATURATED 199.4 W SON 139.9 LOOS GRAY, CLAYEY FINE TO COARSE SAND, WET (A-2-6) Boring Terminated at Elevation 199.9 ft IN ALLUVIAL, CLAYEY FINE TO COARSE SAND ALLUVIAL, CLAYEY FINE TO COARSE SAND		-	_												VERY SOFT, DAR	K GRAY		SILT
W BXX 198.3 LOOSE, GRAY, CLAYEY FINE TO COARSE SAND, WET (A-2-6) Boring Terminated at Elevation 198.9 ft IN ALLUVIAL, CLAYEY FINE TO COARSE SAND SA	000	-	-										Sat.					
Boring Terminated at Elevation 183.9 t. N ALLUVIAL, CLAYEY FINE TO COARSE SAND SAND SAND SAND SAND SAND SAND SAND	200	_	-				止						w	· · ·	- 199.4 - 198.9 A LOOSE GRAY	CL AVE	Y FINE TO	5.5
ALLÚVIAL, CLAYEY FINE TO COARSE SAND ALLÚVIAL, CLAYEY FINE TO CARSE SAND ALLÚVIAL, CLAYET FINE TO CARSE SAND ALLÚVIAL, CLAY		-	_											1	COARSE SA	ND, WE	T (A-2-6)	1
		-	_												ALLŪVIAL, CLAY	EY FINE	TO COAR	π IN SE
		-													_ _	SAND		
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GEOTECHNICAL BORING REPORT BORE LOG

	inting Line		33 007 A 7 (00 530 0 23	0.0				D	JKE L	UG				
WBS	BP8.R	013			TI	P SF-760	140	COUNTY	RICHMOI	ND			GEOLOGIST PLUMMER, K.	
SITE	DESCRI	PTION	BRID	DGE N	O. 760	140 ON SR	1971 (SAN	NDHILL RE	D.) OVER S	OLOMO	NS C	REEK		GROUND WTR (
	NG NO.					TATION 19	` `		OFFSET				ALIGNMENT -L-	0 HR. N
					-						0.5			-
COLL	AR ELE	V. 21	2.2 ft		10	OTAL DEPT	H 53.2 ft		NORTHING	413,8	05		EASTING 1,758,635	24 HR. 5
DRILL	RIG/HAMI	MER EF	F./DAT	E TEF	R0012 G	eoprobe 3230	DT 93% 09/0	9/2021		DRILL N	IETHO	D Mu	d Rotary HAMM	ER TYPE Automatic
DRILL	ER DU	JGGIN	S, W.	T.	S	TART DATE	02/08/22	2	COMP. DA	TE 02/0	08/22		SURFACE WATER DEPTH N/	'A
ELEV	DRIVE	DEPTH	BLC	ow co	UNT		BLOWS F	ER FOOT		SAMP.	V /	1		
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	25 5	50 7	75 100	NO.	МО	0 II G	SOIL AND ROCK DES	CRIPTION DEPTH
	(11)									+) IVIO		ELEV. (II)	DEFII
215		-											_	
	1												- 212.2 GROUND SURF.	ACE
	211.2	1.0				 1 · · · ·				+			ROADWAY EMBAN	
210	4	-	3	3	3	6					M		LOOSE, RED, BROWN, T FINE TO COARSE SAND, N	
-	208.7	3.5	1	3	4	1 1					l_		GRAVEL (A-2-	
	206.2	6.0				* *<							- 206.7	DAV MOIST
205	- 1		4	12	14		26				M		- _{204.2} SILTY GRAVEL (A	
-	203.7	· 8.5	3	18	17						M		DENSE, TAN, SILTY FINE	
	+			"	''		●35				IVI		SAND, MOIST, TRACE GR	RAVEL (A-2-4)
200	100.1	- 40 4					<u> </u>		• • • •			₩.		
-	199.1	13.1	1	0	0	0					w		198.1 VERY LOOSE, GRAY, CLA	AYEY FINE TO
	Ŧ												COARSE SAND, WE	T (A-2-6) /
95	40	- 40 :									W		= ^{195.2} ¬ VERY SOFT, GRAY, SILT	Y CLAY, WET ,-
ŀ	194.1	_18.1_	4	6	7			: : : :			М		- <u>(A-7-5) (MIDDENDORF F</u>	
	‡							: : : :					RESIDUAL STIFF TO HARD, GRA	Y, FINE TO
90	1					\							COARSE SANDY CLAY,	
ŀ	189.1	23.1	9	12	16						M		•	
	1						728				"		•	
35													- -	
-	184.1	28.1	10	18	24		\				M		-	
	1						/ .				""		•	
80	<u>†</u>												•	
7	179.1	33.1	8	14	22		/				M		-	
	1						- 436 -				IVI		•	
75	+	•				• • • •		×. · · · ·					•	
	174.1	38.1	21	35	37								-	
	1				0.				72		M		• •	
70	+													
7	169.1	43.1	20	40	60/0.4								- 168.6	
	‡		20	-0	00/0.4				100/0.9	'			• WEATHERED RO • (GRAY, META-MUD)	
65	+	•											. (GIVIT, META-MODI	OTOIVE)
\neg	164.1	48.1	56	44/0.4	-									
	‡		50	177/0.7					100/0.9	'			• •	
60	+												•	
	159.1	53.1	60/0.1						60/0.1	\dashv			159.1 159.0 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	ROCK /
	t		00/0.1	1					00/0.1-				NON-CRYSTALLINE (GRAY, META-MUD	
	Ŧ												Boring Terminated WITH	
	1	-											 PENETRATION TEST F Elevation 159.0 ft IN NON-0 	
	+											1 1	ROCK (GRAY, META-M	
	Ŧ													
	†												-	
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GEOTECHNICAL BORING REPORT BORF I OG

SHEET 12 OF 17

COLLAR ELEV. 212.1 ft												B	<u>ORE</u>	L	UG							
BORING NO. EB1-B	WBS	BP8.R	R013			T	IP :	SF-760	0140		cou	NTY	' RICHM	۸O	ID			GEOLOGI	ST PLUMMI	ER, K.		
COLLAR ELEV. 212.1 ft	SITE	DESCR	IPTION	BRII	DGE N	10. 760)140	ON S	R 19	71 (SA	NDHIL	L R	D.) OVER	SC	OLOMOI	NS C	REEK				GROUN	ID WTR (ft)
DRILLER DUGSINS, W.T. START DATE 02/99/22 COMP. DATE 02/99/22 SURFACE WATER DEPTH NIA	BORI	NG NO.	EB1-	В		S	TAT	ION	19+2	5			OFFSET	7	ft RT			ALIGNME	NT -L-		0 HR.	N/A
DRILLER DUGGINS, W. T. START DATE 02/09/22 COMP. DATE 02/09/22 SURFACE WATER DEPTH N/A	COLI	AR ELE	EV. 21	12.1 ft		T	OTA	L DEF	PTH	53.3 ft	t		NORTHIN	IG	413,78	38		EASTING	1,758,630		24 HR.	FIAD
ELEV CRIVE	DRILL	RIG/HAN	IMER EF	F./DAT	E TER	R0012 G	Geopr	obe 323	30DT 9	93% 09/0	09/2021				DRILL M	ЕТНО	D Mu	d Rotary		HAMM	ER TYPE	Automatic
Control Cont	DRIL	LER D	UGGIN	IS, W.	T.	S	TAR	RT DAT	ΓE (2/09/2	2		COMP. D	ΑT	E 02/0	9/22		SURFACE	WATER DEF	PTH N	Ά	
2111 10 2 4 4 4 2 8 8 5 3 8 M		ELEV		'——			0						75 10	0		MO	0	ELEV. (ft)	SOIL AND RC	OCK DES	CRIPTION	DEPTH (ft)
211.1 10	215	-	ļ															_				
206		-	10			-	Щ.							_				212.1				0.0
206.1 6.0 3 3 4 3 4 3	210		1.0	2	4	4	11	8	<u> </u>			• •			SS-38	М		LOC	OSE, RED, BRO	DWN, CL	AYEY FIN	
205. 206.1 6.0 3 3 3 3 3 3 4		208.6	3.5	3	4	3		. :L <u>.</u>	: :			: :				M			COARSE SAI	ND, MOI	ST (A-2-6)	
203.6 8.5 5 2 2 200 198.9 13.2 7 8 7 195 195 198.9 13.2 7 8 7 195 196 197 198 13.2 7 9 13 198 13.2 7 9 13 199 188 9 23.2 7 9 13 188 188 9 23.2 7 9 13 188 188 188 188 188 188 188 188 188 188		206.1	6.0					. T '	: :			: :				IVI			OOSE, RED, E	BROWN,	TAN, SILT	Y
198.9 13.2 7 8 7 9 15 198.9 13.2 7 8 7 9 15 198.9 13.2 7 9 13 18.2 5 5 8 190 188.9 13.2 14 24 34 185 183.9 28.2 14 16 22 22 33 165 165 163.9 48.2 26 27 35 35 35 35 35 35 35 3	205	2026 -		3	3	3	H	6	+		 		 	+		М		204.1				8.0
200		203.6	8.5	5	2	2	╢╏	14	. .							Sat.						
198.9 13.2 7 8 7 9 15	200	-	Ŧ				i		: :		: :	: :						•	SATUR	ATED (A	-2-4)	-, <u>11</u> . <u>5</u>
195	200	198.9	13.2	7		7	1		- -		1							- · STI				NDY
193.9 18.2 5 5 8			‡	'	°	'		· · •1	5 -			: :				M		. (lF.
190	195	_	‡				L		<u> </u>			• •						195.1			., - — — — -	17.0
188 9 23 2 7 9 13 22		193.9 -	18.2	5	5	8	-		: :			: :				М			STIFF TO HAP	RD, GRA	Y, FINE TO)
185		-	+					🔨	- -									. С	OARSE SAND	Y CLAY,	MOIST (A	-6)
185 183.9 28.2 14 16 22 180 178.9 33.2 14 24 34 175 175 173.9 38.2 28 27 35 170 168.9 43.2 19 22 33 165 165 163.9 48.2 36 52 48/0.1 166 167 168.9 48.2 36 52 48/0.1 170 168.9 48.2 36 52 48/0.1 170 168.9 48.2 36 52 48/0.1 170 168.9 48.2 36 52 48/0.1 170 168.9 48.2 36 52 48/0.1 170 168.9 48.2 36 52 48/0.1 170 168.9 48.2 36 52 48/0.1 170 168.9 48.2 36 52 48/0.1 170 168.9 48.2 36 52 48/0.1 170 188.9 188.9 NON-CRYSTALLINE ROCK (GRAY, META-MUDSTONE) 158.9 53.2 60/0.1 170 170 180 180 180 180 180 180 180 180 180 18	190	-	Ī						<u> </u>		ļ : :		1	4				-				
183.9 28.2 14 16 22		188.9 -	23.2	7	9	13		!	22 -			: :				М		•				
183.9 28.2 14 16 22	405	-	‡						:`\.:			: :										
180 178.9 33.2 14 24 34 175 170 168.9 43.2 19 22 33 165 163.9 48.2 36 52 48/0.1 160 158.9 53.2 60/0.1 160 158.9 53.2 60/0.1 160 158.9 53.2 60/0.1 160 160 160 160 160 160 160	185	183.9	28.2				H			· · ·	+		 	\dashv				_				
178.9 33.2 14 24 34		-		14	16	22] .		. .	- 38-						М		•				
178.9 33.2 14 24 34	180		ļ						. :	/.								•				
175	100	178.9	33.2	11	0.4	0.4					\. ·		1	\exists				-				
173.9 38.2 26 27 35 662 MM 168.9 43.2 19 22 33 M655 MM 165 163.9 48.2 36 52 48/0.1 100/0.6 (GRAY, META-MUDSTONE) 160 158.9 53.2 60/0.1 60/0.1 158.9 53.2 60/0.1 158.9 Significant formula (GRAY, META-MUDSTONE) 160 158.9 53.2 60/0.1 158.9 Significant formula (GRAY, META-MUDSTONE) 160 158.9 53.2 60/0.1 158.9 Significant formula (GRAY, META-MUDSTONE) 160 158.9 53.2 60/0.1 158.9 Significant formula (GRAY, META-MUDSTONE) 160 158.9 53.2 60/0.1 158.9 Significant formula (GRAY, META-MUDSTONE) 160 158.9 Significant formula (GRAY, META-MUDSTONE)		-	ţ	14	24	34			: :		55	B				М		• •				
170	175	-	ŧ								i:											
170		173.9 -	38.2	26	27	35	-		- -		. !					M						
165		-	Ŧ						: :		1	62				IVI						
165	170		‡						<u> </u>		· /-			4				-				
163.9 48.2 36 52 48/0.1 163.4 48. 160 158.9 53.2 60/0.1 60/0.1 60/0.1 163.4 48. 160 158.9 53.2 60/0.1 60/		168.9 -	43.2	19	22	33			: :		55	: :				М		• •				
163.9 48.2 163.9 48.2 163.9 48.2 163.9 48.2 163.4 WEATHERED ROCK (GRAY, META-MUDSTONE) 158.9 53.2 158.9 NON-CRYSTALLINE ROCK (SRAY, META-MUDSTONE) Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 158.8 ft IN NON-CRYSTALLINE ROCK (GRAY, META-MUDSTONE)		-	<u> </u>						: :		To:											
160 158.9 53.2 60/0.1 60/0.1 163.4 WEATHERED ROCK (GRAY, META-MUDSTONE) 158.9 53.2 60/0.1 60/0.1 60/0.1 163.4 WEATHERED ROCK (GRAY, META-MUDSTONE) 158.9 Significant formula for the second of the	165	163.9	48.2				H		+		 		+	\dashv				_				40.7
158.9 53.2 60/0.1 60/0.1 158.9 158.9 158.9 158.8 NON-CRYSTALLINE ROCK (GRAY, META-MUDSTONE) Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 158.8 ft IN NON-CRYSTALLINE ROCK (GRAY, META-MUDSTONE) ROCK (GRAY, META-MUDSTONE)		-		36	52	48/0.1	11		- -		<u> -</u>		+ - _{100/0} .	6 •				163.4				48.7
158.9 53.2 60/0.1 60/0.1 60/0.1 158.9 158.9 53. NON-CRYSTALLINE ROCK (GRAY, META-MUDSTONE) Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 158.8 ft IN NON-CRYSTALLINE ROCK (GRAY, META-MUDSTONE) ROCK (GRAY, META-MUDSTONE)	160		Ŧ						. .		: :							•	(GRAY, ME	TA-MUD	STONE)	
NON-CRYSTALLINE ROCK (GRAY, META-MUDSTONE) Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 158.8 ft IN NON-CRYSTALLINE ROCK (GRAY, META-MUDSTONE)	100	158.9	53.2	00/0.4			止					: :	1	1				158.9				53.2
Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 158.8 ft IN NON-CRYSTALLINE ROCK (GRAY, META-MUDSTONE)		-	‡	60/0.1	4								60/0.	1				. 158.8.7				_53.3
FENETRATION TEST REPUSAL at Elevation 158.8 ft IN NON-CRYSTALLINE ROCK (GRAY, META-MUDSTONE)		-	+														H		oring Terminat	ed WITH	STANDA	
ROCK (GRAY, META-MUDSTONE)		-	F														l F	Ele	vation 158.8 ft	NON-	CRYSTALI	INE
			ļ																ROCK (GRAY,	META-N	IUDSTON	≣)
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GEOTECHNICAL BORING REPORT BORE LOG

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WBS	BP8.R	013			TI	IP SF-7	60140	0	COUNT	Y R	ICHMO	ND			GEOLOGIST PLUMME	R, K.		
SITE	DESCR	IPTION	BRIE	DGE N	O. 760	140 ON	SR 19	971 (SAI	NDHILL I	RD.) (OVER S	OLOMO	NS CF	REEK	•	0	ROUND W	TR (ft)
	NG NO.					TATION					SET 8				ALIGNMENT -L-		0 HR.	N/A
										+-								
COLL	AR ELE	EV . 21	2.1 ft		T	OTAL DE	PTH	52.8 ft		NOI	RTHING	413,8	29		EASTING 1,758,704	2	4 HR.	5.0
DRILL	RIG/HAM	IMER EF	F./DAT	E TER	R0012 G	Seoprobe 3	230DT	93% 09/0	09/2021			DRILL N	/IETHOD) Muc	d Rotary	HAMMER	TYPE Auto	matic
DRIL	LER D	UGGIN	S, W.	T.	S	TART DA	ATE.	02/10/2	2	COI	MP. DA	TE 02/	10/22		SURFACE WATER DEP	TH N/A		
ELEV	DRIVE	DEPTH	T =: 0	ow co	UNT			BLOWS F	PER FOO			SAMP.	V /	11				
(ft)	ELEV (ft)	(ft)	0.5ft		0.5ft	10	25		50	75	100	NO.	моі	O G	SOIL AND ROO	CK DESCR		EDTI (
	(11)					\vdash						1	/ IVIOI		ELEV. (ft)		L	EPTH (fl
215														l ⊦	-			
	-	-												╽┟			_	
	211.1	1.0		-		 						-	-	 [212.1 GROUNE ROADWAY E	SURFAC		0.0
210		1.0	2	3	4	7	-			: :			М		VERY LOOSE TO L	OOSE, TA	N, BROWN,	
	208.6 -	- 3.5	3	1	1	[[-						_		CLAYEY FINE TO C	:OARSE S/ 2-6)	AND, MOIST	
	-	İ	3	'	1	2	.:		: : :						206.6			5.5
205	206.1	6.0	30	27	20	• • •				- -			М		DENSE, GRAY, SIL			
	203.6 -	8.5				r									- _{204.1} SAND, MOIST, TR	UVIAL	/EL (A-2-4)	8.0
		t	2	1	3	4			: : :	: :			M	鮲	SOFT, GRAY, FINE		ILT, MOIST	
200	-	-					-			. .				III.	·	A-4)		
_00	199.1	13.0	-	<u> </u>	14		1.		1				1.		-199.6 RES	IDUAL -		<u>12</u> .
	-	-	7	8	11		Q 19			- -			M		VERY STIFF TO HA	RD, GRAY		
	_	ļ					1								SANDY CLA	Y, MOIS I	(A-6)	
195	194.1	18.0] 	+			+					-			
	_		5	10	13		d 23	3	: : :		: : :		М					
	-	t				:::	- \		1:::	: :	: : :							
190	189.3	22.8					-		1	1					-			
			8	11	16	11 : : :		27					М					
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185	184.3	27.0							: : :						-			
	184.3	27.8	11	16	22		-	\					М					
	_	Į																
180	-	-					-	: : } :										
	179.3	32.8	12	17	23	1	-] .:					М		-			
	_	t				:::		• 40		: :			IVI					
175	-	-					-	\										
.,,	174.3	37.8	22	27	29				\						-			
	-	-	22	"	23		-		▶56	- -			М					
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170	169.3	42.8	07	45			-		 	- ``					-			
	-	F	27	45	55	: : :			: : :	. :	100		M					
	-	ţ				[]:::			: : :		:::				165.3			40
165	164.3	47.8]		 	-		ļ	- -					165.3 WEATHE	RED ROC	K	46.
		Ι	100/0.3	3		:::		: : : :	: : :		100/0.3	'[黨	(GRAY, META			
	-	t				· · ·	-		:	. .								
160	159.3	52.8						· · · ·	ļ : : : :	1		1			⁻ 159.3			52.
İ	159.5	JZ.8	60/0.0	1						<u> </u>	─60/0.0	7			Boring Terminated			<u> </u>
	_	Ι.												l F	PENETRATION Elevation 159.3 ft Of			
	_	t												ΙĿ	ROCK (GRAY, N			
	-	F												F				
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GEOTECHNICAL BORING REPORT BORE LOG

SHEET 13 OF 17

											D	אכ	<u> </u>	<u>UG</u>							
WBS	BP8.R	2013			T	IP S	SF-760	140		COU	INTY	RIC	IOMH	ND			GEOLOGI	ST PLUMME	ER, K.		
SITE	DESCR	IPTION	BRI	DGE N	O. 760)140	ON S	R 197	1 (SAI	NDHIL	L RE	D.) OV	ÆR S	OLOMO	NS CF	REEK				GROUNI	D WTR (ft)
BORI	NG NO.	EB2-	В		S	TATI	ON 2	20+29				OFFS	ET	15 ft RT			ALIGNME	NT -L-		0 HR.	N/A
COLI	AR ELE	EV . 21	11.5 ft		T	ОТА	L DEP	TH :	53.2 ft			NORT	HING	413,8	12		EASTING	1,758,730		24 HR.	FIAD
DRII I	RIG/HAN	IMFR FF	F /DAT	F TER	20012 G	eopro	nhe 323	ODT 9:	3% 09/0	19/2021				DRILL N	IFTHOD) Mi			HAMN	IER TYPE	Automatic
	LER D					<u> </u>	T DAT				_	COMI	- DΔ.	TE 02/0		- 1110		WATER DEF			ratornatio
	DRIVE		T =: -	ow co		П	· DAI		OWS F			001111		SAMP.	7	1 []	JOON AGE	WAILKDLI	111 14/		
ELEV (ft)	ELEV (ft)	DEPTH (ft)	0.5ft	_		0		25		50		75 	100	NO.	MOI	O G	ELEV. (ft)	SOIL AND RO	OCK DES	CRIPTION	DEPTH (fi
215	-																_ - -				
	- 210.5 -	1.0				Н.		Т.		T							- 211.5 -	GROUN			0.
210	210.5	- '.0	2	2	1	●3	3	+-							М			RY LOOSE, TAI	N, BROV	VN, SILTY F	
	208.0	3.5	1	0	0	/:				: :		: :	: :		W		- (O COARSE SA GRAVEL AND E			3
205	205.5	6.0	·			0.		:				: :	: :		V V		206.5		A-2-4) LUVIAL		5.
203	_	ţ	WOH	WOH	WOH	0.		+:		<u> </u>					Sat.			RY SOFT, TAN	N, GRAY		DY8.
	203.0	8.5	4	6	8	╢:	11	-				: :			Sat.			SILT, DIUM DENSE,	WET (A		
200	-	F				:	14			: :		: :				%		IE TO COARSÍ	E SAŃD,	SATURATE	
200	198.6 -	12.9						1										TRACE G	RAVEL		/— ``
	-		10	12	19	11 :		•3	31	: :	: :	: :	::		М		DE	NSE, GRAY, R	RED, CLA	YEY FINE	ТО
195	-	-				•											195.0	COARSE SAI (MIDDENDO			16.
	193.6 -	17.9] [:		! :										RE	SIDUAL		
	-	t	6	8	14	:	: : :	22		: :	: :	: :	: :		М			RY STIFF TO H E TO COARSE			
190	-	+				.		1									-		(A-6)		
	188.6 -	22.9] [:		1:									-				
	-		4	12	15]] :		Q 27							М		-				
185	-	+				-		-									-				
100	183.6 -	27.9						1:				1					- -				
	-		8	12	15]] :		2 7				: :	: :		М		-				
180	_	-				.		.	λ								-				
100	178.6 -	32.9						1:									- -				
	-		17	26	30	11:		-		56		: :			М		-				
175	_	-						.		. ,							-				
170	173.6 -	37.9						1:			χ.						-				
	-		25	31	40	11 :		:				71	: :		М		-				
170	-	}				-		-									-				
	168.6	42.9						1.				+				9	 169.5 -	WEATH	ERED R	OCK	42.
	-		47	53/0.3		:		:				1 10	00/0.8				-	(GRAY, ME			
165	-	-				.		-									-				
100	163.6 -	47.9				-											-				
		t	95	5/0.1		:		1:		: :		10	00/0.6	1			-				
160	-	+				:		-									-				
100	158.6 -	52.9				-		+:		: :		: :					- 158.3				53.
			100/0.3	3		Т						10	00/0.3	7				ing Terminated			
	_	-															-	WEATHERE MFTA-N	ED ROCI MUDSTO		
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GEOTECHNICAL BORING REPORT BORE LOG

		BORE LOG		
WBS BP8.R013	TIP SF-760140	COUNTY RICHMOND	GEOLOGIST PLUMMER, K.	
SITE DESCRIPTION BRIDGE NO.	760140 ON SR 1971 (SAI	NDHILL RD.) OVER SOLOMONS CF	EEK	GROUND WTR (ft)
BORING NO. HA-4	STATION 20+27	OFFSET 37 ft RT	ALIGNMENT -L-	0 HR. 0.5
COLLAR ELEV. 206.1 ft	TOTAL DEPTH 5.5 ft	NORTHING 413,791	EASTING 1,758,735	24 HR. 0.5
DRILL RIG/HAMMER EFF./DATE N/A	I	DRILL METHOD	Hand Auger HAMM	JER TYPE N/A
DRILLER N/A	START DATE 02/08/2		SURFACE WATER DEPTH N/	
ELEV DRIVE DEPTH BLOW COUNT	T BLOWS F	PER FOOT SAMP. NO. MOI	L SOIL AND ROCK DES	CRIPTION DEPTH (
		36% Sat. Sat. W	204.1 GROUND SURF ALLUVIAL 203.1 (A-4) WITH TRACE O VERY LOOSE, TAN, SILT SATURATED (A LOOSE, TAN, GRAY, SIL SATURATED (A MEDIUM DENSE, GRAY, T, TO COARSE SAND, TRA SATURATED (A COASTAL PLA (MIDDENDORF FOR Boring Terminated at Eleva COASTAL PLAIN, CLAY COARSE SAND (MIDD FORMATION	Y SILT, WET RGANICS TREGANICS 3.3. Y FINE SAND, 5.5. TY GRAVEL, -1-b) AN, SILTY FINE CE GRAVEL, -2-4) AN AYEY FINE TO AYEY FINE TO DENDORF

GEOTECHNICAL BORING REPORT BORE LOG

SHEET 14 OF 17

	D	URE LUG		
WBS BP8.R013	TIP SF-760140 COUNT	Y RICHMOND	GEOLOGIST PLUMMER, K.	
SITE DESCRIPTION BRIDGE NO. 7	760140 ON SR 1971 (SANDHILL F	RD.) OVER SOLOMONS CREEK		GROUND WTR (ft)
	STATION 20+57	OFFSET 44 ft LT	ALIGNMENT -L-	0 HR. 0.5
+	TOTAL DEPTH 3.8 ft	NORTHING 413,877	EASTING 1,758,742	24 HR . FIAD
DRILL RIG/HAMMER EFF./DATE N/A		DRILL METHOD Han	d Auger HAMME	R TYPE N/A
	START DATE 02/10/22	COMP. DATE 02/10/22	SURFACE WATER DEPTH N/A	
ELEV (ft) DRIVE DEPTH BLOW COUNT (ft) 0.5ft 0.	T BLOWS PER FOO	SAMP. L	SOIL AND ROCK DESC	
210			-	DEI III (II)
205		Sat. W	205.8 GROUND SURFA ALLUVIAL VERY SOFT, GRAY, FINE: SATURATED, (AS) WET (A-6) MEDIUM DENSE, GRAY, T GRAVEL, WET (A-6) Moring Terminated by hand a Elevation 202.0 ft in ALLUV GRAVEL	SANDY SILT, (-4) SANDY CLAY, (-3.0 3.6 3.8 -1-b) auger refusal at



GEOTECHNICAL BORING REPORT

SHEET 15 OF 17

Consi	ulting En	gineers	and Sc	ientists	5			В	ORE L	-00	;					
WBS	BP8.F	R013			TI	ΙP	SF-760140	COUNT	Y RICHMO	DND			GEOLOGIST PLUMN	IER, K.		
SITE	DESCR	IPTION	BRID	OGE N	O. 760)14	40 ON SR 1971 (SAN	NDHILL F	RD.) OVER S	SOLO	ONS (CREE	K		GROUND \	NTR (ft)
BOR	ING NO.	HA-6			S	TΑ	ATION 24+00		OFFSET	25 ft L	Т		ALIGNMENT -L-		0 HR.	0.5
COL	LAR EL	EV . 22	9.6 ft		TO	ОТ	TAL DEPTH 6.0 ft		NORTHIN	G 413	,925		EASTING 1,759,085		24 HR.	FIAD
DRILL	RIG/HAI	MER EF	F./DATI	E N/A	•					DRIL	L METH	OD H	land Auger	HAMN	IER TYPE N/A	4
DRIL	LER N	/A			S	TΑ	ART DATE 02/10/22	2	COMP. DA	TE (2/10/2	2	SURFACE WATER DE	PTH N	/A	
ELEV	DRIVE ELEV	DEPTH	BLC	W CO	UNT	П	BLOWS F	ER FOO	Γ	SAN	IP.	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	SOIL AND R	OCK DES	CRIPTION	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	Ц	0 25 5	0	75 100	NC). /M	OI Ğ				DEPTH (fi
230		ļ										7	229.6 GROU	ND SURF	ACE	0.
	,	‡											COA MEDIUM DENSI	STAL PLA GRAY.		,
		‡								S-1	3 M	/ /	FINE TO COARS (MIDDEND)	E SAND,	MOIST (A-2-7	
225	-	<u> </u>				H				1	М	/ /	223.6	JI 1 OI	avi/(11014)	6.0
													 Boring Terminate COASTAL PLA COARSE SA 	NN, CLAY	'EY FINE TO DENDORF	N O.

LABORATORY TESTING SUMMARY

PROJECT NUMBER:	BP8.R013	TIP:	SF-760140	COUNTY:	RICHMOND

DESCRIPTION: BRIDGE NO. 760140 ON SR 1971 (SANDHILL RD) OVER SOLOMONS CREEK

Sample No.	Station	Alignment	Offset (feet)	Depth Interval (feet)	AASHTO Class.	L.L.	P.I.	% by Weight				%	% Passing (sieves)				0/
								Coarse Sand	Fine Sand	Silt	Clay	Retained #4 Sieve	#10	#40	#200	% Moisture	% Organic
S-1 S-9 S-13	20+27	-L-	37 RT	1.0 - 2.0	A-4 (0) A-4 (0) A-2-7 (2)	29	6	32.2	35.5	14.6	17.7	1	98	82	37	36.2	4.2
S-9	18+47	-L-	48 LT	2.0 - 5.0	A-4 (0)	NP	NP	11.4	36.5	31.3	20.8	0	100	95	59	65.2	8.9
S-13	24+00	-L-	24 LT	2.5 - 3.0	A-2-7 (2)	42	24	55.9	11.2	1.5	31.4	0	99	65	33		
S-15	15+75	-L-	35 RT	1.0 - 2.0	A-1-a (0)	NP	NP	63.8	18.3	8.2	9.7	60	28	13	6		
SS-38	19+75	-L-	7 RT	1.0 - 2.5	A-2-6 (0)	28	13	49.2	22.3	5.4	23.1	3	92	63	28		
ND - NON-DI																	

NP - NON-PLASTIC

Stephanie H. Huffman

Certified Lab Technician Signature

114-01-1203

Certification Number

PROJECT REFERENCE NO.SHEET NO.SF-76014017

BRIDGE NO. 760140 ON SR 1971 (SANDHILL ROAD) OVER SOLOMONS CREEK



LOOKING WEST FROM END BENT 2 TOWARD END BENT 1



LOOKING DOWNSTREAM FROM RIGHT SIDE OF END BENT 2