-0003

HB

REFERENCE

#### **CONTENTS**

**DESCRIPTION** 

TITLE SHEET LEGEND (SOIL & ROCK)

CROSS SECTIONS BORE LOGS CPT & DMT LOGS

SOIL TEST RESULTS

SITE PHOTOGRAPH

CONSOLIDATION TEST RESULTS

SITE PLAN

<u>SHEET NO.</u>
1
2
3
4-5
6-14
15-20
21
22-34
35

## STATE OF NORTH CAROLINA

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

# **STRUCTURE** SUBSURFACE INVESTIGATION

COUNTY\_HAYWOOD

PROJECT DESCRIPTION REPLACE BRIDGE NO. 239 ON I-40 OVER INCINERATOR ROAD

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HB-0003	1	35

#### CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY. PLANNIKG AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL LENGMERENIG UNIT AT 1991 707-6860. 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 BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-FLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOLL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOLL MOISTIGE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO LIMATIC CONDITIONS INCLUDING 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 OFINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONSTRUCTIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDENSATION OF FOR AN THE SITE 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.

C. MOLONEY
J. LITTLE
INVESTIGATED BYS&ME, Inc.
DRAWN BYJ. SWARTLEY
CHECKED BY <u>J. DAILY</u>
SUBMITTED BY <u>S&amp;ME, Inc.</u>
DATE <u>NOVEMBER</u> 2022
3201 SPRING FOREST ROAD RALEIGH, NC 27616 (919) 872-2660
SEAL 045672
DocuSigned by:
Thomas J. Daily 11/16/2022
F29CA6BB83F449F SIGNATURE DATE
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

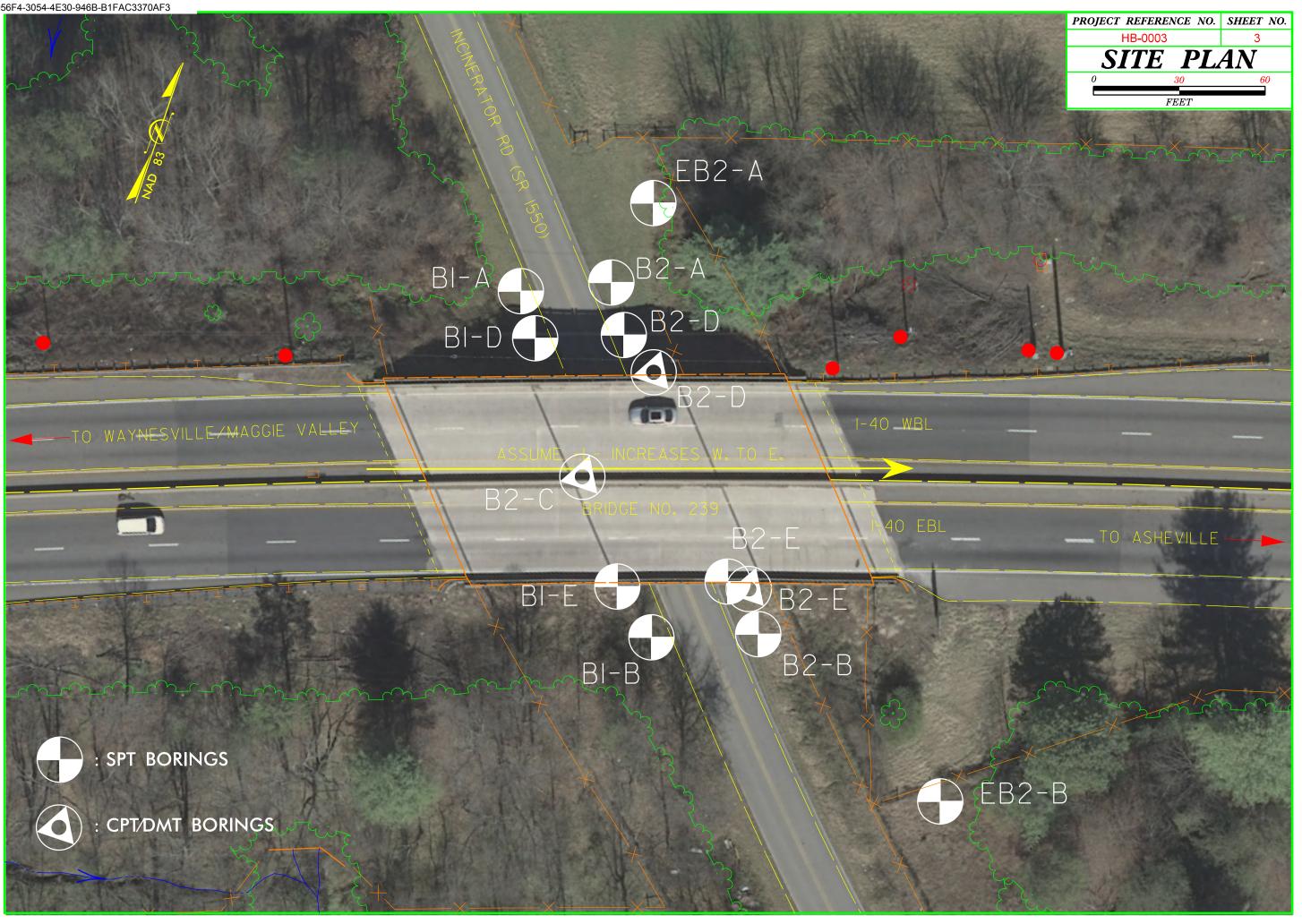
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

			SOIL	DESC	RIPTIC	)N						GRADATION		ROCK DESCRIPTION						
			IDATED, SEMI-CO NOUS FLIGHT P									D REPRESENTATION OF PART			HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TEST ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELI					
ACCORDIN	NG TO THE	STANDARD	PENETRATION 1	EST (AA	SHTO T 2	206, ASTM	D1586), SO	IL CLASSIFI	CATION			THAT SOIL PARTICLES ARE A URE OF UNIFORM PARTICLE S			SPT REFUSAL IS PENETATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN Ø. BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK					
CONSISTE	NCY, COLOR,	TEXTURE,	SYSTEM, BASIC MOISTURE, AASH	TO CLAS	SIFICATIO	DN. AND OTH	ER PERTIN	ENT FACTOR	IS SUCH		<u> </u>	NGULARITY OF GRA	INS		REPRESENTED	BY A	ZONE OF WEAT			
			POSITION, ANGUL AY.MOIST WITH II									NDNESS OF SOIL GRAINS IS	DESIGNATED	BY THE TERMS:	WEATHERED	LO HN	SILLIASILLIA		N MATERIAL THAT WOULD YIELD SPI	
	-		GEND AND				ICATIO	N		ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.								OT IF TESTED.		
GENERAL CLASS.		GRANULAR MA ≤ 35% PASSI			ILT-CLAY M > 35% PASS		0	RGANIC MATERI	ALS	MINERAL NAM		AS QUARTZ, FELDSPAR, MICA,		I, ETC.	CRYSTALLINE ROCK (CR)			FINE TO COARSE G WOULD YIELD SPT	RAIN IGNEOUS AND METAMORPHIC RC REFUSAL IF TESTED, ROCK TYPE IN	
GROUP	A-1	A-3	A-2	A-4	A-5	A-6 A-7	A-1. A-2	A-4, A-5		ARE USED IN	I DESCRIP	TIONS WHEN THEY ARE CONS		IGNIFICANCE.		EINE TO COARSE CRAIN METAMORPHIC AND				
CLASS. A	A-1-a A-1-b	A-2-4	A-2-5 A-2-6 A	2-7	ST	A-7-5, A-7:6	A-3	A-6, A-7		2 0.10	HTLY COMP		, LL < 31		NON-CRYSTALL ROCK (NCR)	.INE		SEDIMENTARY ROCK	THAT WOULD YEILD SPT REFUSAL ES PHYLLITE, SLATE, SANDSTONE, ETI	
SYMBOL 00				$\mathbf{S}$	17.1					MODE	RATELY CO	OMPRESSIBLE	LL = 31	- 50	COASTAL PLAT			COASTAL PLAIN SE	TYPE INCLUDES LIMESTONE, SANDS	
% PASSING #10 5	амх						GRANULAR	SILT-	MUCK,	HIGHL	LY COMPRE	RCENTAGE OF MATE	LL > 50		SEDIMENTARY (CP)	RULK		SHELL BEDS, ETC.		
*40 3	Ø MX 50 MX						SOILS	CLAY SOILS	PEAT		G	GRANULAR SILT - CLAY							IERING	
*200 15 MATERIAL	5 MX 25 MX	M CC XM BI	( 35 MX 35 MX 35	MX 36 P	N 36 MN 3	16 MN 36 MN				ORGANIC MATERIAL TRACE OF ORGANIC M	-	<u>SOILS</u> 2 - 3% 3 - 5%	UTHE TRACE	<u>R MATERIAL</u> 1 - 10%	FRESH		RESH, CRYSTALS		S MAY SHOW SLIGHT STAINING. ROCK	
PASSING #40							SOIL	.S WITH		LITTLE ORGANIC MATT MODERATELY ORGANIC		3 - 5% 5 - 12% 5 - 10% 12 - 20%	LITTLE SOME	10 - 20% 20 - 35%					SOME JOINTS MAY SHOW THIN CLAY C	
LL PI	6 MX		< 41 MN 40 MX 4 ( 10 MX 11 MN 11				LIT	TLE OR DERATE	HIGHLY	HIGHLY ORGANIC		> 10% > 20%	HIGHLY				ALS ON A BROKE RYSTALLINE NA		HINE BRIGHTLY. ROCK RINGS UNDER H	
GROUP INDEX	0	0	0 4 MX	8 M	X 12 MX !	16 MX NO MX	AMOL	UNTS OF	ORGANIC SOILS			GROUND WATER			SLIGHT	ROCK C	ENERALLY FREE	H, JOINTS STAINED	AND DISCOLORATION EXTENDS INTO RO	
	TONE FRAGS.	FINE	SILTY OR CLAYEY		SILTY	CLAYEY		RGANIC ATTER		$\nabla$	WATER	LEVEL IN BORE HOLE IMMED	DIATELY AFTE	R DRILLING	(SLI.)				IN GRANITOID ROCKS SOME OCCASIONA (STALLINE ROCKS RING UNDER HAMMER	
OF MAJOR ( MATERIALS	GRAVEL, AND SAND	SAND	gravel and sand		SOILS	SOILS				▼	STATIC	WATER LEVEL AFTER 24	HOURS			SIGNIFI	ICANT PORTIONS	OF ROCK SHOW DIS	COLORATION AND WEATHERING EFFECTS	
GEN. RATING											PERCHEI	D WATER, SATURATED ZONE, C	OR WATER BE	(MOD.)				ULL AND DISCOLORED,SOME SHOW CLA HOWS SIGNIFICANT LOSS OF STRENGTH		
AS SUBGRADE			SUBGROUP IS ≤ L	- 20 - 6	1 DE A-7-6						SPRING	OR SEEP					RESH ROCK.			
										<u> </u>	MI	SCELLANEOUS SYME	BOLS		MODERATELY SEVERE				STAINED, IN GRANITOID ROCKS, ALL F AOLINIZATION. ROCK SHOWS SEVERE L	
		COMP	ACTNESS OR		ANGE OF S			NGE OF UNC				25 (225			(MOD. SEV.)			D WITH A GEOLOGIS LD SPT REFUSAL	T'S PICK. ROCK GIVES 'CLUNK' SOUND '	
PRIMARY SI	UIL TYPE		ISISTENCY	PENE	N-VAL	RESISTENCE		PRESSIVE S (TONS/FT		L ROADWAY EMB			RUCTURES		SEVERE				STAINED. ROCK FABRIC CLEAR AND E	
GENERAL	LY		RY LOOSE		< 4					SOIL SYMBOL				, SLOPE INDICATOR	(SEV.)				N GRANITOID ROCKS ALL FELDSPARS 4 RONG ROCK USUALLY REMAIN.	
GRANULA MATERIA		MED	LOOSE IUM DENSE		4 TO 10 TO	30		N/A			TLL (AF) 0.			CONE PENETROMETER				LD SPT N VALUES >		
(NON-COF			DENSE RY DENSE		30 TO > 5					THAN ROADWAY			ve 🖸	TEST	VERY SEVERE				STAINED. ROCK FABRIC ELEMENTS AF OIL STATUS, WITH ONLY FRAGMENTS O	
		VE	RY SOFT		< 2			< 0.25		INFERRED SOI	IL BOUNDAF	RY CORE BORING	s •	SOUNDING ROD		REMAIN	ING. SAPROLITE	IS AN EXAMPLE OF	ROCK WEATHERED TO A DEGREE THAT	
GENERAL SILT-CL4		MED	SOFT IUM STIFF		2 TO 4 TO			0.25 TO 1 0.5 TO 1		INFERRED ROC	CK LINE		WELL -	TEST BORING	COMPLETE				IN. IF TESTED, WOULD YIELD SPT N V DISCERNIBLE, OR DISCERNIBLE ONLY	
MATERIA (COHESIV	L		STIFF RY STIFF		8 TO 15 TO			1 TO 2 2 TO 4		_			Y	WITH CORE		SCATTE	RED CONCENTRA		BE PRESENT AS DIKES OR STRINGERS	
(CONESTV			HARD		> 3			> 4		TTTTT ALLUVIAL SOI	L BUUNDAR	INSTALLATIO	N C	)— SPT N-VALUE		HL 50 F	AN EXAMPLE.		ARDNESS	
			TEXTURE	OR	RAIN	SIZE					REC	COMMENDATION SYM	BOLS		VERY HARD	CANNO <sup>1</sup>	BE SCRATCHED		P PICK. BREAKING OF HAND SPECIMEN	
U.S. STD. SIE OPENING (MM			4 10 4.76 2.0			60 200 .25 0.07						ASSIFIED EXCAVATION - ITABLE WASTE		SSIFIED EXCAVATION - TABLE,BUT NOT TO BE		SEVERA	AL HARD BLOWS	OF THE GEOLOGIST'	5 PICK.	
					ARSE	.25 0.07						ASSIFIED EXCAVATION - PTABLE DEGRADABLE ROCK		IN THE TOP 3 FEET OF KMENT OR BACKFILL			E SCRATCHED BY ACH HAND SPEC		Y WITH DIFFICULTY. HARD HAMMER B	
BOULDER (BLDR.)		BBLE	GRAVEL (GR.)		AND . SD.)	SAN (F S		SILT (SL.)	CLAY (CL.)			ABBREVIATIONS							UGES OR GROOVES TO 0.25 INCHES DE	
GRAIN MM	305	75	2.0			.25	0.05	0.005		AR - AUGER REFUSAL		MED MEDIUM	VST	- VANE SHEAR TEST			DERATE BLOWS.	LUW OF A GEULUGI	T'S PICK. HAND SPECIMENS CAN BE D	
SIZE IN.	12	3								BT - BORING TERMINATED	Ъ	MICA MICACEOUS MOD MODERATELY		WEATHERED UNIT WEIGHT					DEEP BY FIRM PRESSURE OF KNIFE O EICES 1 INCH MAXIMUM SIZE BY HARD	
			DISTURE -			ON OF	TERMS	5		CPT - CONE PENETRATION	N TEST	NP - NON PLASTIC	$\gamma_{a}$	DRY UNIT WEIGHT			OF A GEOLOGIS		LICES I INCH MHAIMUM SIZE BI HHRU	
	MOISTURE ERBERG LIM		FIELD	MOISTUR RIPTION		JUIDE FOR	FIELD MO	ISTURE DES	CRIPTION	CSE COARSE DMT - DILATOMETER TES	зт	ORG ORGANIC PMT - PRESSUREMETER	TEST S	AMPLE ABBREVIATIONS					NIFE OR PICK. CAN BE EXCAVATED IN BY MODERATE BLOWS OF A PICK POIN	
			- SATU					Y WET, USU		DPT - DYNAMIC PENETRA e - VOID RATIO			s -	BULK				N BY FINGER PRESS		
			(SA					ROUND WATE		F - FINE		SL SILT. SILTY		- SPLIT SPOON - SHELBY TUBE					WATED READILY WITH POINT OF PICK. Y FINGER PRESSURE. CAN BE SCRATCH	
PLASTIC		LIMIT			c		PEOUTPES	DRYING TO		FOSS FOSSILIFEROUS FRAC FRACTURED, FRAC	TURES	SLI SLIGHTLY TCR - TRICONE REFUSAL		- ROCK - RECOMPACTED TRIAXIAL		FINGER		o chit be broken b		
RANGE <			- WET	- (W)		ATTAIN OP				FRAGS FRAGMENTS		w - MOISTURE CONTENT		- CALIFORNIA BEARING		RACT	URE SPAC		BEDDING	
PLL.	PLASTI	C LIMIT								HI HIGHLY		V - VERY		RATIO	VERY WIDE			PACING HAN 10 FEET	TERM VERY THICKLY BEDDED	
ОМ .		M MOISTUR	κE	F - (M)	S	OLID; AT (	OR NEAR C	OPTIMUM MO	ISTURE	DRILL UNITS:	T	ING TOOLS:	HAMMER	-	WIDE MODERATEL			) 10 FEET ) 3 FEET	THICKLY BEDDED 1 THINLY BEDDED 0.1	
SL .	- SHRINK	AGE LIMIT								CME-45C	CL	LAY BITS	X AL	JTOMATIC MANUAL	CLOSE		Ø <b>.</b> 16	TO 1 FOOT	VERY THINLY BEDDED 0.0	
			- DRY	- (D)		ATTAIN OPT		L WATER TO ISTURE	J	CME-55	6.	CONTINUOUS FLIGHT AUGER	CORE S	IZE:	VERY CLOS	ιE	LESS TH	AN 0.16 FEET	THICKLY LAMINATED 0.00 THINLY LAMINATED <	
	I		PL	ASTI	CITY						8.	HOLLOW AUGERS	в	н				INDUR	ATION	
			PLAS	TICITY	INDEX (P)	1)	[	DRY STRENG		Х СМЕ-550	H¢	ARD FACED FINGER BITS	□-N .		FOR SEDIMEN	JARY R	OCKS, INDURATI		ING OF MATERIAL BY CEMENTING, HE	
	PLASTIC	STIC		Ø-5 6-1				VERY LOW SLIGHT		VANE SHEAR TEST		JNGCARBIDE INSERTS	HAND T		FRIABL	E			FINGER FREES NUMEROUS GRAINS; BY HAMMER DISINTEGRATES SAMPLE.	
MODE	MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH								ASING W/ ADVANCER	PC	DST HOLE DIGGER	MODER		INDURATED		SEPARATED FROM SAMPLE WITH ST				
HIGHLY PLASTIC 26 OR MORE HIGH							PORTABLE HOIST		RICONE STEEL TEET		AND AUGER	MODERA		LIJUINIEU		WHEN HIT WITH HAMMER.				
							1 🗆		RICONE 2-7/8 TUNGCARB.		DUNDING ROD	INDURA	TED			FICULT TO SEPARATE WITH STEEL BREAK WITH HAMMER.				
	DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GR MODIFIERS SUCH AS LIGHT, DARK, STREAKED, FTC, ARE USED TO DESCRIBE APPEARANCE.											DRE BIT	"	INE SHEAR TEST	FXTREN	4FIΥ ™	DURATED		BLOWS REQUIRED TO BREAK SAMPLE	
	MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.										🗆 –		-   🖵 -			.ee ( Ir	CONTICU	SAMPLE BREAKS	ACROSS GRAINS.	

# PROJECT REFERENCE NO.

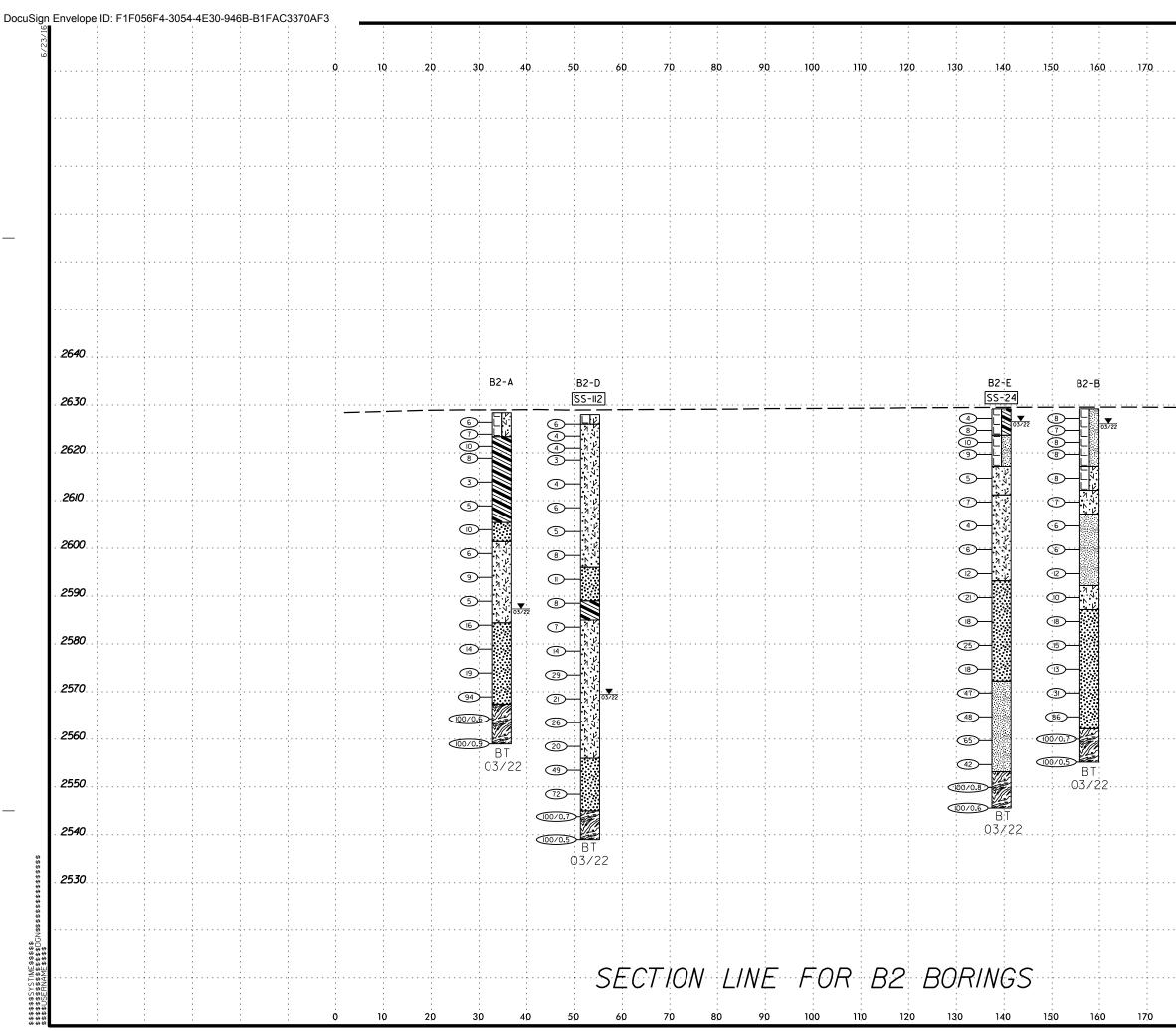


	TERMS AND DEFINITIONS
ED. AN INFERRED ) SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
1 FOOT PER 60	AQUIFER - A WATER BEARING FORMATION OR STRATA.
IS OFTEN	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING
T N VALUES >	A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
DCK THAT	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND
CLUDES GRANITE,	SURFACE.
AL PLAIN	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
IF TESTED.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
C. 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	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
COATINGS IF OPEN.	HORIZONTAL.
AMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE
	LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
DCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
AL FELDSPAR R BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
S. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
AY. ROCK HAS	<u>FLUAT</u> - RUCK FRAUMENTS ON SURFACE NEAR THEIR URIGINAL POSITION AND DISLUDGED FROM PARENT MATERIAL.
h as compared	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
FELDSPARS DULL	FIELD.
OSS OF STRENGTH WHEN STRUCK.	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
EVIDENT BUT	ITS LATERAL EXTENT.
ARE KAOLINIZED	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS
RE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
F STRONG ROCK	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE
T ONLY MINOR	OF AN INTERVENING IMPERVIOUS STRATUM.
VALUES < 100 BPF	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
IN SMALL AND S. SAPROLITE IS	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
5. SHENULITE IS	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
IS REQUIRES	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
BLOWS REQUIRED	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO
	THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
EEP CAN BE	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT
DETACHED	OR SLIP PLANE.
	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
OR PICK POINT. BLOWS OF THE	A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF I FOUT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL
510110 0. THE	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
FRAGMENTS	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY
NT. SMALL, THIN	TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
0/5050	<u>STRATA ROCK QUALITY DESIGNATION (SRQD)</u> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY
. PIECES I INCH HED READILY BY	THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
LES NERVIET DI	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
THICKNESS	BENCH MARK: BYI-24 N: 678544 E: 848241
4 FEET	ELEVATION: 2626.10 FEET
1.5 - 4 FEET .16 - 1.5 FEET	
03 - 0.16 FEET	NOTES:
08 - 0.03 FEET	FIAD: FILLED IMMEDIATLEY AFTER DRILLING
(0.008 FEET	
EAT, PRESSURE, ETC.	
•	
TEEL PROBE;	
PROBE;	
E;	



	0 10 20	30 40 50 40 70	ap op 100 110	170 170 170 170	160 170 180
				120 130 140 150	180 170 180
	·····				
2640.					
0070		BI-A BI-D [SS-150] [SS-137]		BI-E	BI-B
2630	·····				
2620.					
2610					>
				( <b>1</b> )	
2600.					
2590				3-	
2580					
2570	·····			3)	
2560		54		39-02	
2.300.				00/0.8	
2550.	·····	00/0.5 53 - ···		€ BT 03/22 03/22	0.7
		BI 03/22		03722	0.8
2540.		03/22			BI 03/22
2530.					
		SFCT	ION LINE FOR	RIBORINGS	

			Q	5 10	PROLE	EFERENCE NO	o Is⊦	SHEET NO.		
					HE	3-0003		4		
: 16	0 17	0 180	UNITS	= FEET						
			 			· · · · · · · · · · ·				
				:	:	:				
			 	; ;	; ;	 :				
;			 	; ;	; ;	; ;				
;			 	,	,	,				
		· · · · · · · · · · · · · · · · · · ·	 		, , ,			2640		
	BI-B									
								. 2630		
<b>B</b>								2000		
6		2								
Ģ			 					2620		
5										
- (T)		· · · · · · · · · · · · · · · · · · ·	 							
5										
5			 					2600		
8										
		· · · · · · · · · · · · · · · · · · ·	 	; ;	; ;	: :		2590		
18	<u>ب</u> ۱									
	N V							2580		
14			 	;	; ;	;				
39										
8			 					257.0		
29				:	:	:				
94			 							
45								0775		
100/0.7			 	; ;	; ;			2550		
100/0.8										
;	BT 03/22		 					2540		
:										
		,	 	,		, , , ,				
;		· · · · · · · · · · · · · · · · · · ·	 							
16	0 17	0 180		:	:	:				
10	- //		1							



: :	Q 5 10	PROJ. REFERENCE NO.	SHEET NO.
	UNITS = FEET	HB-0003	SHEET NO. 5
180			
	f f		
	; ;		
	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	
		· · · · ·	
	• • • • • • • • • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	
	<u>.</u>	<u>.</u>	
	· · · · · · · · · · · · · · · · · · ·		
		· · · · · ·	
	· · · · · · · · · · · · · · · · · · ·		
		· · · · ·	
	; ;	; 	
	<u>.</u>		
· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	,	
		· · · · ·	
	;;		
	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	
180	· · ·	· · · · · ·	
IQU ,	1 I	i i i	1. C.

## GEOTECHNICAL BORING REPORT BORE LOG

WBS         55041.1.1         TIP         HB-0003         CC					COUN	DUNTY HAYWOOD GEOLOGIST Moloney, C.							WBS         55041.1.1         TIP         HB-0003         COUNTY         HAYWOOD         GEOLOGIST         Moloney, C.							y, C.									
S	TE D	ESCRIP	PTION	BRID	DGE N	O. 239	ON -L- (I-4	10) OVER	R SR 1550	(INCINERA	TOR RD)				GROUN	ID WTR (ft)	SITE	E DESCR	RIPTION	BRIDGE	E NO. 239	9 ON -L- (I-40)	OVER SR 1550	) (INCINERAT	OR RD)			GR	OUND WTR (ft)
		g no.				ST	ATION N	I/A		OFFSET	N/A		ALIGI	MENT N/A	0 HR.	N/A	BOR	ring no.	B1-A		s	TATION N/A		OFFSET			ALIGNMENT N/A	01	HR. N/A
		R ELE				_	TAL DEPT			NORTHIN				<b>ING</b> 848,359	24 HR.	4.4	COLLAR ELEV. 2,628.3 ft DRILL RIG/HAMMER EFF/DATE SMEE			OTAL DEPTH		NORTHING			<b>EASTING</b> 848,359	24 I			
				f./dati	E SME		ME-550X 82					METHOD Mud Rotary			HAMMER TYPE Automatic				<b>JATE</b> S						NETHOD				
		R Litt								COMP. D				ACE WATER DE	EPTH N/A			LLER Li						COMP. DA			SURFACE WATER DE	PTH N/A	
EL	+\   -		DEPTH (ft)	BLC	0.5ft		0	BLOWS 25	S PER FOO 50	DT 7 <u>5</u> 10			0		ROCK DESCRIPTION		ELEV (ft)		DEPTH (ft)	BLOW C			BLOWS PER FO 50	OT 75 100	SAMP.	/   0		OCK DESCRIP	TION
-	-/	(ft)	()	0.51	0.51	0.511		20			0 NO.	/мо	I G ELEV. (ft	)		DEPTH (ft)	(,	(ft)	(,	0.511 0.5	511 0.511			15 100	NO.	/MOI G			
26	30	-+											- 2,628.3	GROU	JND SURFACE	0.0	2550	2.549.8	78.5	00/0.5		╪┝╾╾╾┮	Match Line	100/0.5			2,549.3		
	2	627.3	1.0	2	2	3						1		ROADWA	AY EMBANKMENT			-	‡ Γ					100/010			Boring Terminate WEATHERI	ED ROCK (SCH	IIST)
26	25 2		3.5	2	2		•5					M	2,625.3	CLAY	BROWN, SANDY AN YEY SILT, A-5	3.0			±								-		
		+		3	4	5	· • • • • •								O STIFF, BROWN AN ANDY SILT, A-4	ND			±								-		
		622.3T		1	1	3	<b>4</b>				SS-15	0 26%						-	±								-		
26	<u>20</u> 2,	619.8	8.5	2	3	4	<u> </u>	+ • • •	<u> </u>			м							±								-		
		ŧ					j′∷ :									10.0		-	± I								-		
26	15 2	614.8	13 5										2,616.3	R	RESIDUAL	<u> 12.0</u>		-	±Ι								-		
		Ī	10.0	2	1	3	<b>•</b> 4 · · ·			· · · · ·		м		MED. STIFF, TA	AN AND BROWN, CL A-7-6	AY,		-	± I								_		
		Ŧ																-	ΞI								-		
26	<u>10</u> 2,	609.8	18.5	2	2	3	+	+ • • •				м							Ŧ										
		Ŧ		_	_	Ũ												-	Ŧ										
26	05	604.8	22.5															-	Ŧ										
			20.0	2	3	5						м	N					-	ŦI								-		
		Ŧ											2,601.3			27.0		-	Ŧ								-		
26	00 2,	599.8	28.5	2	3	5		+ • • •						MED. STIFF, E CLAYEY SIL	BROWN, SANDY AN T, MICACEOUS, A-5	D			Ŧ								-		
		Ŧ		2	5	5	. • 8			· · · · · ·		M						-	Ŧ I								-		
25	95	594.8-																-	‡								-		
	2	594.8 <del>-</del> T	33.5	2	3	4	• • •					м							Ŧ								-		
		Ŧ								· · · · · ·								-	‡								-		
25	90 2,	589.8	38.5	2	2	2			· · · · ·		_							-	‡								-		
		Ŧ		2	2	2	<b>4</b>					M	2,587.3			41.0		-	‡								-		
25	85	- 584.8-	40.5											MED. DENSE,	BROWN, SILTY SAN A-2-4	ID, — — — —		-	‡								-		
	2	<u>-584.8</u> 1	43.5	7	10	13		23				м						-	Ŧ								-		
		Ŧ											2,581.3			47.0		-	‡								-		
22/25	80 2,	579.8	48.5	5	8	15	 							VERY STIFF, BR	ROWN, SANDY SILT,	A-4		-	‡								F		
DT 9/		‡		5		15				·   · · · ·		M	F					-	Ŧ								-		
10.1 10.1 25	75	574.8	50 F				::: <i>i</i>						2,576.3	MED. DENSE TO	VERY DENSE, BRO	WN, <u>52.0</u>		-	Ŧ								-		
		<u>5/4.8+</u> +	53.5	5	7	10	· · · •	,			11	м		SILTY	Y SAND, A-2-4			-	Ŧ								-		
Ň		‡							•   • • •	·   · · · · ·								-	‡								-		
5.25	70 2,	569.8	58.5	7	10	11	ļį				_		-						‡								-		
G023		‡			10	11		21		· · · · · ·		M	-					-	‡								-		
	65	‡											-					-	‡								-		
	2	564.8 <u>-</u>	63.5	11	21	33		· · · ·	- 54 -			м						-	‡								-		
003		‡							/	·   · · · · ·								-	‡								F F		
별 25	60 2		68.5	10			· · · ·	· · /	·   · · ·		_								‡								F F		
BLE		‡		10	13	18	· · · ·	<b>∮</b> 31	·   · · · ·   · · ·	·   · · · · ·		M						-	‡								F F		
	55	‡						4 · ·	·   · · · ·   · · ·				2 555 3			73.0		-	‡								- -		
30RE	2,	554.8 -	73.5	100/0.5			· · · ·			100/0.	<b>−</b> 5 <b>●</b>		2,000.0	WEAT	HERED ROCK (SCHIST)			-	‡								⊢ -		
DOTE		‡							·   · · · ·   · · ·					(				-	‡								- -		
D 25	50	+							.									-	+								+		

## GEOTECHNICAL BORING REPORT BORE LOG

								SORE L	<u>.0G</u>															
				COUNT	Y HAYWO	OD			GEOL	OGIST Moloney, C.	_	WBS 55041.1.1						P HB-0	COUNT	ί <b>Υ</b> Η				
SITE	DESCR	RIPTION	BRI	DGE N	0. 23	9 ON -L- (I-40) OVER	SR 1550	(INCINERAT	OR RD)					GROUND WTR (ft)	SITE DESCRIPTION BRIDGE NO.			IO. 239	ON -L-	(I-40) OVEF	R SR 1550	(INC		
BOR	ing no.	. B1-B			5	STATION N/A		OFFSET	N/A			ALIGN	IMENT N/A	0 HR. N/A	BOF	BORING NO. B1-B			S	TATION	N/A		OF	
COL	LAR EL	<b>EV.</b> 2,6	629.5	ft	1	OTAL DEPTH 84.8	ft	NORTHING	<b>G</b> 678,3	18		EAST	<b>NG</b> 848,441	<b>24 HR.</b> 4.4	COL	LAR EL	. <b>EV.</b> 2,	629.5 1	ft	т	OTAL D	<b>EPTH</b> 84.8	ft	NO
DRILL	RIG/HAN	MIMER EF	F./DA	TE SM	E6573	CME-550X 82% 5/11/20	22		DRILL	VIETHO	DM	ud Rotary	HAMM	ER TYPE Automatic	DRIL	l rig/ha	MMER EI	F./DAT	E SM	E6573 (	CME-550)	K 82% 5/11/20	)22	
DRIL	LER L	ittle, J.			S	START DATE 03/14/	22	COMP. DA	<b>TE</b> 03/	14/22		SURF	ACE WATER DEPTH N//	A	DRII	LLER L	-			S	FART D	<b>ATE</b> 03/14	/22	CC
ELEV	DRIVE	DEPTH	BL	ow co	UNT	BLOWS	PER FOO	Ť	SAMP	· 🔨/			SOIL AND ROCK DES	CRIPTION	ELEV	/ DRIVE ELEV	DEPTH	BLC	w co	UNT		BLOW	6 PER FOO	)T
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 25	50	75 100	NO.	Имо		ELEV. (ft)		DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
2630		Ļ										- 2,629.5	GROUND SURF	ACE 0.0	2550	4	<u>+</u>		└──			<u>Ma</u>	tch Line	
	2,628.5	i <del>t</del> 1.0 T	3	3	5	_   • • • •   • • • •    • <b>⊾</b> ₀ • •   • • • •				м		+	ROADWAY EMBANE MED. STIFF, BROWN, SAN	IDY CLAY, A-6			‡							
2625	2,626.0	3.5	3	3	3	$\left  \left  \begin{array}{c} \cdot T \\ \cdot T \\ \cdot \end{array} \right  $		· · · · · ·				- <u>2,626.5</u>	MED. STIFF TO STIFF, B		2545	2,546.0	83.5	27	44	56/0.3				
2020	2,623.5	6.0				• • • · · · · · · · · · · · · · ·			1		Ľ	-	TAN, SANDY AND CLA MICACEOUS, A	.YEY SILT, A-5			+	21		00,0.0			• • • • •	<u> </u>
	2.621.0	+ I 8.5	3	6		<b>1</b> 3		· · · · · ·		м	L V	-					Ŧ							
2620	- 2,021.0	+ 0.5	3	4	5				+	м	L''	-					ŧ							
		ŧ						· · · · · ·			L.v.	-					Ŧ							
2615	2,616.0	13.5	12	2	3	_   <i>`</i>  ```` `````				м	L.v.	-					Ŧ							
2010		ŧ		-	ľ	$ \begin{bmatrix} \bullet 5 & \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet & \bullet & \bullet \\ \bullet & \bullet &$			1		L''	-					Ŧ							
	2.611.0	+ 						· · · · · ·				- - <u>2,611.5</u>					Ŧ							
2610		+	2	2	3				$\left\{ \right\}$	м		- 	MED. STIFF, BROWN AN SANDY CLAY, A				Ŧ							
		Ŧ										- 2 <u>,607.5</u>		22.0			Ŧ							
2605	2,606.0	23.5	3	2	3	$  _{\mathbf{L}_{2}}$				м		-	MED. STIFF, TAN AND GI	RAY, SANDY			Ŧ							
		Ŧ							<b>1</b>				CLAY, A-6				Ŧ							
	2,601.0	T 28.5						· · · · · ·			~~~~	- <u>2,602.5</u> -	RESIDUAL	27.0			Ŧ							
2600		+	3	2	3	<b>-</b>			$\left\{ \right\}$	м		-	MED. STIFF TO STIFF, BROWN, SANDY AND CLA				Ŧ							
		Ŧ						· · · · · ·				-					Ŧ							
2595	2,596.0	33.5	2	3	5					м		F					Ŧ							
		Ŧ							Ţ								Ŧ							
	2.591.0	T 38.5										Ē					Ŧ							
2590	-	+	2	4	6				$\left\{ \right\}$	м							Ŧ							
		ł										- - 2,586.5		43.0			Ŧ							
2585	2,586.0	43.5	4	7	11					м			MED. DENSE, GRAY, SILT		•		1							
		Ŧ				<b>T</b>						- - 2,582.5		47.0			Ŧ							
	2,581.0	48.5				_   · · <i>i</i> ·   · · · ·					N 1		STIFF, BROWN, SANDY A SILT, A-5				Ŧ							
2580	-	ŧ	3	5	9	14			$\left\{ \right\}$	м		_	SILT, A-5			· ·	Ŧ							
		ł										- - 2,576.5		53.0			Ŧ							
2575	2,576.0	53.5	10	20	19					м			DENSE, BROWN AND G SAND, A-2-4	RAY, SILTY			±							
1		ŧ										- 2,572.5	SAND, A-2-4	57.0			ŧ							
	2,571.0	58.5			_						N 1		MED. STIFF, BROWN, S CLAYEY SILT, A	ANDY AND			ŧ							
2570	-	ŧ	3	3	5				+	м		-	OLATET OLT, P				ŧ							
2570		ŧ									N V	- 2 <u>,567.5</u>	MED. DENSE TO VERY DE				ŧ							
2565	2,566.0	63.5	6	11	18					м		-	AND GRAY, SILTY SA				Ŧ							
		ŧ										-					±							
2560	2,561.0	68.5	07		- 50							-					‡							
	-	‡	27	41	53				4	M		  -				·	‡							
		‡					   <i>.</i> /					-					‡							
2555	2,556.0	73.5	11	19	26		45	.   -	<b>   </b>	м		- 				.	‡							
		‡										-					‡							
2550	2,551.0	78.5		- FA	E0/2						471	<u>- 2,551.5</u>		<u>78.0</u>			‡							
2550	I	1	24	50	50/0.3	∠			i I	1	2/2					1		I	I	I				

NT	Y HAYWOC	D			GEOLOGIST	Moloney, C.					
50 (	INCINERATO	DR RD)					GROUND V	VTR (ft)			
	OFFSET N				ALIGNMENT	N/A	0 HR. N/A				
	NORTHING		18		EASTING 84		24 HR.	4.4			
		DRILL N		) Mur			ERTYPE Aut				
				- 17100							
	COMP. DAT	-	14/22	L	SURFACE W	ATER DEPTH N/	A				
רסכ	Г 75 100	SAMP.	/	0	SC	IL AND ROCK DES	CRIPTION				
	100	NO.	/моі	G							
	100/0.7	, <b>-</b>	<u> </u>	30172		WEATHERED RO	<u></u>				
· ·						(SCHIST) (contin					
: :											
	100/0.8	4			2,544.7 Boring T	Ferminated at Elevati	ion 2 544 7 ft I	84.8			
				F	boring I W	EATHERED ROCK	(SCHIST)	N			
				-							
				F							
				E							
				-							
				F							
				E							
				F							
				E							
				F							
				E							
				F							
				ļĘ							
				F							
				ļĘ							
				E							
				F							
				-							
				Ŀ							
				F							
				ļĘ							
				Ľ							
				F							
				E							
				F							
				-							

## GEOTECHNICAL BORING REPORT BORE LOG

									SORE L	.00																
WBS	55041	1.1.1			Т	<b>IP</b> HB-000	)3	COUNT	Y HAYWO	OD			GEOL	OGIST Moloney, C.			WBS	55041	.1.1			Tľ	P HB-00	03	COUNT	ГҮ Н
SITE	DESCR	IPTION	BRID	DGE N	0. 239	9 ON -L- (I-	40) OVER	SR 1550	(INCINERAT	OR RD)					GROL	JND WTR (ft)	SITE	DESCR	IPTION	BRI	DGE N	O. 239	) ON -L- (I	-40) OVER 3	SR 1550	(INCI
BOR	ing no.	B1-D			S	TATION N	N/A		OFFSET	N/A			ALIGI	MENT N/A	0 HR	. N/A	BOR	ing no.	B1-D			ST	TATION	N/A		OF
COL	LAR ELI	<b>EV.</b> 2,6	628.3 f	ťt	Т	OTAL DEP	<b>TH</b> 84.3	ft	NORTHING	<b>G</b> 678,4	04		EAST	<b>ING</b> 848,369	24 HR	. 2.7	COL	LAR EL	<b>EV.</b> 2,	628.3	ft	т	OTAL DEF	<b>PTH</b> 84.3 f	t	NO
DRILL	RIG/HAN	VIMER EF	F./DATI	E SME	6573	CME-550X 8	2% 5/11/20	22		DRILL	VIETHO	D Mu	ud Rotary	HAN	<b>IMER TYPE</b>	Automatic	DRILL	RIG/HAN	/IMER EF	-F./DAT	E SM	=6573 (	CME-550X 8	82% 5/11/202	2	
DRIL	LER L				S	TART DAT	<b>E</b> 03/17/2	22	COMP. DA	TE 03/	17/22		SURF	ACE WATER DEPTH	N/A		DRIL	LER L	,			ST	TART DAT	<b>FE</b> 03/17/2	22	СО
ELEV	DRIVE ELEV	DEPTH		W CO				PER FOO		SAMP.	▼∕			SOIL AND ROCK DE	ESCRIPTIC	N	ELEV	DRIVE ELEV	DEPTH		ow co				PER FOC	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75 100	NO.	Имо		ELEV. (f			DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
2630		Ļ											_				2550	2,549.8	<del>\</del> 78.5					Mato	h Line	
1	2,627.3	$\frac{1}{10}$				+	· · · · ·		• • • • • •				2,628.3	GROUND SUF ROADWAY EMBA		0.0			+	80	14/0.1				· · ·   · · ·	
	· ·	Ŧ	3	2	3	<b>│                                    </b>			· · · · · ·				-	MED. STIFF TO STIFF, E AND CLAYEY S	BROWN, S	ANDY	2545		‡					·   · · · · ·		
	2,624.8	<u>- 3.5</u> -	3	4	6	- 10					м	Ŀ	-	/			2010	2,544.8	- 83.5	41	59/0.3					
1	2,622.3	6.0	2	2	4				· · · · · ·		м		-						ŧ							
2620	2,619.8	8.5				↓ <del> </del>	+ • • • •		· · · · · ·			L	-					-	ŧ							
		‡	2	3	4	<b>₩</b> 7 : :					M	Li	-						ŧ							
2615		‡											2,616.3	RESIDUA		<u> </u>			ŧ							
2010	2,614.8	<u>- 13.5</u> -	8	3	6	- <b> </b>			 		м	/./.	-	LOOSE TO MED. DENS ORANGE, CLAYEY	E, BROWN			-	ŧ							
		ŧ				:[::			· · · · · ·			$\langle / \rangle /$	-		0, 110, 712	-0			ŧ							
2610	2,609.8	18.5										$\langle / \cdot /$	-					-	ŧ							
	· ·	ŧ	4	6	6				· · · · · ·		M	$\langle / \rangle \langle$	-						ŧ							
2605		ŧ				::!::							2,606.3	MED. DENSE, BROWN		<u>22.0</u>			ŧ							
2005	2,604.8	<u>- 23.5</u> -	3	5	9						м		-	A-2-4	, 012110/	<b>.</b> ,		-	ŧ							
		‡							· · · · · ·				-						ŧ							
2600	2,599.8	- 28.5							· · · · · ·				2,600.3	MED. STIFF, BROWN		<u>28.0</u>		-	ŧ							
		‡	2	2	3	<b>●</b> <sup>5</sup>			· · · · · ·		M		-	CLAYEY SILT					ŧ							
0505		‡											-						ŧ							
2595	2,594.8	<u> </u>	2	2	2					SS-137	35%		-					-	ŧ							
		‡				<u> </u>					1		- 2,591.3			37.0			ŧ							
2590	2,589.8	38.5					· · · ·		·   · · · ·					MED. DENSE TO VE ORANGE, BROWN AND		E,		-	ŧ							
		‡	3	6	9	15			· · · · · ·		M		-	SAND, A-2					ŧ							
0505		ŧ											-						ŧ							
2585	2,584.8	- 43.5 -	3	5	8	13.					м		-					-	ŧ							
		‡							· · · · · ·				-						ŧ							
2580	2,579.8	48.5					<u>`\</u>						-					-	‡							
		‡	10	14	20		•34		· · · · · ·		M		-						‡							
2575		‡					:::::		·   · · · · ·				-						‡							
2575	2,574.8	- <u>53.5</u>	10	13	22						м		-					-	ŧ							
		ŧ							· · · · · ·				-						ŧ							
2570 2565	2.569.8	- 58.5					/						-						ŧ							
		1	7	6	7						м		-						ŧ							
		ŧ				· · · <b>`</b>							-						ŧ							
2565	2,564.8	63.5	10	18	18						м							-	ŧ							
		ŧ											-						ŧ							
2560	2.559.8	- 68.5						<u> </u>					-						Ł							
	-2,000.0	1	17	24	32			<b>\$</b> 56			м		-					-	ŧ							
		£											-						f							
2555	2,554.8	73.5	12	20	33		+ • • • •				N4		-					-	É							
2550		I									M		2,552.3			76.0			Í							
	.	Ŧ											-	WEATHERED (SCHIST	NOCK				ļ.							

TY HAYWOOD	<b>GEOLOGIST</b> Moloney, C.	
) (INCINERATOR RD)		GROUND WTR (ft)
OFFSET N/A	ALIGNMENT N/A	0 HR. N/A
NORTHING 678,404	EASTING 848,369	<b>24 HR.</b> 2.7
DRILL METHOD Mud		ERTYPE Automatic
COMP. DATE 03/17/22	SURFACE WATER DEPTH N/A	
		<b>`</b>
75 100 NO. MOI G	SOIL AND ROCK DESC	CRIPTION
· · 100/0.6	WEATHERED RO	
	(SCHIST) (continu	ied)
100/0.8	2,544.0 Boring Terminated at Elevativ	84.3
	Boring Terminated at Elevation WEATHERED ROCK (	SCHIST)
F		
F		
<del> </del>		

## GEOTECHNICAL BORING REPORT BORE LOG

					_			1																
<u> </u>		55041.1.1         TIP         HB-0003           DESCRIPTION         BRIDGE NO. 239 ON -L- (I-40) C           IG NO.         B1-E							Y HAYWO	-			GEOLOGIST Moloney, C.			5504					• HB-000		COUNTY	
L				DGE N			,	SR 1550	1	,			1	GROUND WTR (ft)					GE NO	_		40) OVER	SR 1550 (	
BORI	NG NC	<b>).</b> B1-E			ST	TATION N	/A		OFFSET	-			ALIGNMENT N/A	0 HR. N/A	BOR	ING NO	. B1-E			ST	ATION N	N/A		OF
		L <b>EV.</b> 2,				DTAL DEP			NORTHING				EASTING 848,424	<b>24 HR.</b> 2.4			<b>EV.</b> 2,					<b>TH</b> 74.4 f		NO
DRILL	. RIG/HA	AMMER EI	FF./DAT	E SME		ME-550X 82				DRILL	VIETHO	D M.	Id Rotary HAMM	ER TYPE Automatic				F./DATE	SME	573 C	ME-550X 8	2% 5/11/202	2	
		Little, J.							COMP. DA				SURFACE WATER DEPTH N/	Ά	DRIL	LER L		1			ART DAT	E 03/10/2		со
ELEV (ft)								PER FOO		SAMP.			SOIL AND ROCK DES	CRIPTION	ELEV		DEPTH				0		PER FOOT	
(11)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75 100	NO.	мо	I G	ELEV. (ft)	DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
2630		+											_		<u>255</u> 0		+	<b> </b> ∔		+		Mate	h Line	
	2 627 (	0 1.0				+							2,628.0 GROUND SURF ROADWAY EMBAN				‡							
2625		+	2	2	3	• · · · ·							MED. STIFF TO STIFF, BR				‡							
2025	2,624.	5 <del>+</del> 3.5	2	3	4	· <b>1</b> · · ·				†	м		CLAY, A-6			-	ŧ							
	2,622.0	0 6.0				· · · · · ·			·   · · · · ·								‡							
2620	2 610	+ 5+ 8.5	3	3	6	- •9					М			8.0		-	ŧ							
	2,013.	<u> </u>	3	4	7						м		MED. STIFF TO STIFF, BR AND CLAYEY SIL	ROWN, SANDY T, A-5			t							
		ŧ				· į · · ·						LNLV					Ŧ							
2615	2,614.	5 13.5	2	2	4		<u> </u>			$\frac{1}{2}$		LV				-	Ŧ							
		Ŧ		2	4	<b>9</b> 6					M	Lv Lv	•				Ŧ							
2610		Ŧ				<u> </u>								- <u> </u>			Ŧ							
	2,609.	5 <del>+</del> 18.5 +	WOH	WOH	2					†	м		SOFT, TAN, CLAY	′, A-7-6		-	Ŧ							
		Ŧ				<u>.</u>			· · · · · ·								Ŧ							
2605	2.604.	5 23.5				1			.   - <del> </del>	-			• •			-	‡							
		‡	WOH	2	2	•4 · · · ·			·   · · · · ·		М			<u>25</u> .0			‡							
0000		‡				1:::			·   · · · · ·			N V	MED. STIFF, BROWN A	ND WHITE,			‡							
2600	2,599.	<u>5 28.5</u>	2	3	4	1	<u> </u>			+	м		_ SANDY AND CLAYEY	ŚILT, A-5		-	ŧ							
		ł			-						IVI	N N V					Ŧ							
2595	0.504													ROWN, SANDY 32.0			ł							
	2,594.5	<u>5+ 33.5</u> +	3	3	5					Ť	м		CLAY, Á-6	- ,		-	Ŧ							
		Ŧ				· ŀ · ·							•				Ŧ							
2590	2,589.	5 38.5		_	_					+			_			-	Ŧ							
		Ŧ	3	5	7	<b>Q</b> 12	· · · · ·				M						Ŧ							
2585		Ŧ															Ŧ							
2303	2,584.	<u>5+ 43.5</u>	5	10	10	· · · · · ·	+			†	м		TRACE ROCK FRAGME			-	ŧ							
		‡	1						·   · · · · ·								‡							
2580	2 579	+ 5+ 48.5	1			· · ·/·				11			_			-	‡							
		+	3	6	9	<b>4</b> 15			·   · · · · ·		м						‡							
0575		<b>‡</b>	1				: : : :							<u> </u>			<u>‡</u>							
2575	2,574.	5 53.5	7	12	17	· · · · ·	<u> </u>	· · · · ·		+			VERY STIFF, BROWN, SA	NDY SILT, A-4		-	ŧ							
		t	'	, <sup>,</sup> 2	.,		•29 •				M						t							
2570	0 500	±	1											/HITE, SILTY 57.0			Ŧ							
	2,569.	<u>5+ 58.5</u> T	9	13	18		<b>3</b> 1				м		SAND, A-2-4	1 <sup>.</sup>		-	Ŧ							
		Ŧ	1				· <u> </u> · · · ·										Ŧ							
2565	2,564.	5 63.5					<u>  . /</u>			+			_			-	Ŧ							
		‡	7	13	26		<b>•</b> 39		·   · · · · ·		М						‡							
2560		‡	1										2.560.0				‡							
2560	2,559.	<u>5 68.5</u>	34	66/0.3			<u> </u>							о <del>ск</del> <u><sup>68.0</sup></u>		-	‡							
		<b>‡</b>	1							TI			. (SCHIST)				‡							
2555	2 551	5 5 73.5	1							<b>!</b>			_			-	±							
	2,004.	- 13.5 	30	70/0.4					100/0.9	⊷		-	- 2,553.6 - Boring Terminated at Elevat	74.4			ŧ							
		+	1						,				WEATHERED ROCK	(SCHIST)			+							
		1	1								1						<u>†</u>							

T١	1 HAY	woo	D			GEOLOGIST Moloney, (	C		
) (	INCINE	RATO	R RD)					GROUN	ID WTR (ft)
	OFFS	ET N	I/A			ALIGNMENT N/A		0 HR.	N/A
	NORT	HING	678,3			EASTING 848,424		24 HR.	2.4
			DRILL N	<b>IETHOD</b>	Mud	Rotary	HAMM	ER TYPE	Automatic
	COMP	. DAT	<b>E</b> 03/	10/22		SURFACE WATER DEPT		4	
тс			SAMP.		L O	SOIL AND ROC			
	75	100	NO.	моі	G				
_			L	$\lfloor - \rfloor$					
					E	*ST pushed in offs	set hole	5' southea	ast
					E	<u>Other Samples:</u> ST-1 (18.5 - 20.0)			
					E				
					F				
					F				
					F				
					F				
					F				
					ļ				
					ļ				
					F				
					E				
					Ŀ				
					E				
					Ŀ				
					E				
					F				
					F				
					F				
					F				
					F				
					F				
					F				
					F				
					F				
					F				
					Ŀ				
					E				
					E				
					E				
					F				
-									

## GEOTECHNICAL BORING REPORT BORE LOG

									1	SORE										·									
	5504					IP HB-0			1	TY HAY					GEOL	OGIST	Moloney,				5504					IP HB-00			DUNTY
			BRI	DGE N			. ,		SR 1550			,							GROUND WTR (ft)				BRID	GE N		) ON -L- (l	,	ER SR 1	<u> </u>
		. B2-A				TATION				OFFSE					_	NMENT			<b>0 HR.</b> N/A		ing no					TATION			O
		<b>.EV.</b> 2,6				OTAL DE				NORTH		,				<b>ING</b> 848	3,388		<b>24 HR.</b> 41.1		LAR EL					OTAL DEF			NO
			f./Dat	ESM		CME-550X									id Rotary			HAMME	RTYPE Automatic				f./Date	E SM		CME-550X 8			
DRIL	LER					TART DA				COMP.	DAT	-		<u> </u>	SURF	ACE WA	TER DEP	TH N/A	A	DRIL	LER L		T			TART DAT			C
ELEV	ELEV				1				PER FOC		100	SAMP.	17			SOIL	L AND ROO	CK DESC	RIPTION	ELEV (ft)			<u> </u>	W CO	1			NS PER	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25		50	75 I	100	NO.	Имо	I G	ELEV. (f	t)			DEPTH (ft)		(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	75
2630		+													_					2630		+							
I	2.627.4	+ 1 1.0					•		· · · ·	•   • • •	•				· 2,628.4		OADWAY		MENT		2,628.2	1.0	2	3	5				
2625	2,624.9	†	4	3	3	•6 <u></u>	:	· · · · ·		·   · · · ·	•		м			MED.		OWN, SA Y SILT, A	ANDY AND	2625	2,625.7	3.5					·   · · · ·   · · ·	· ·   ·	
2020	2,624.9	<del>1 3.5</del> +	2	3	4	<b>1</b>			· · ·				м	LV LV	- 2,623.4				5.0		2.623.2	+ - 60	3	3	4	•			
	2,622.4	1 <u>† 6.0</u>	3	5	5	· · /· ·	:	· · · · ·		·   · · · ·	:		м		- <b></b> -	SOFT TC	D STIFF. O	SIDUAL RANGE	— — — — — — — — – AND BROWN,		ĺ ĺ	I	3	3	5		· · · · ·	· ·   ·	
2620	2,619.9	8.5							· · ·		•				_			CLAY, A		2620	2,620.7	- 8.5 -	3	4	4			· ·   ·	
		‡	3	3	5	: <b>∳</b> 8 :	:	· · · · · · · ·	· · · ·		•		M									‡				. <b>T</b> 	:		
0045		‡				/	:	· · · · ·		· · · · ·	:									0045	2,615.7	+ 13.5					· · · · ·	· ·   ·	· · ·
2015	2,614.9	13.5	1	2	1				<u> </u>				м		-					2615	- ´ -	ŧ	2	4	4				
		t				<b> </b> • • • •	:	· · · ·	· · ·		:											ŧ							
2610	2,609.9	18.5		_			•				•				_					2610	2,610.7	18.5	2	3	4				
		±	2	2	3	•5· ·	:	· · · ·		·   · · ·			м									ŧ					·   · · · ·   · · ·		
		ŧ				<u>`\</u> : :	:			·   · · ·	:				2,605.4				23.0		2,605.7	- 23.5					· · · · ·		
2605	2,604.9	23.5	3	4	6								М			MED. D		ROWN, S	ILTY SAND,	2605		+	2	2	4	6			
		ł							· · ·	· · · · ·	•				2,601.4		F	<b>∖-∠-</b> 4	27.0			ŧ							
2600	2 599 9	28.5					•				•			N 1					<u></u>	2600	2,600.7	28.5	2	2	4				
		Ŧ	2	2	4	•6 <sup></sup>	•			· · · ·	•		м				AND CLAY	YEY SILI	, A-5			Ŧ		-		•6			
		Ŧ				.					-				•						2,595.7	- 33.5							
2595	2,594.9	33.5	2	4	5				+ • • •				м	NV	-					2595	- 2,595.7	- <u>33.5</u>	4	4	8	12			
		Ŧ			-	· •									•							Ŧ						.	
2590	2 580 0	38.5				.;								N V	-					2590	2,590.7	38.5	3	4	6			.	
	2,003.3	<del>-</del>	2	2	3	•5					•		м	7 V V							1.	Ŧ		4	0				
1		Ŧ				·\` .	-	· · · · ·			-			- 1 V							0 505 7	Ŧ						.	
2585	2,584.9	43.5	5	8	8	<u>· · ·</u>	-		· · ·					N V	- 2,584.4				44.0	2585	2,585.7	+ 43.5 +	6	8	10		018	-	
		Ŧ		ľ	ľ		•	· · · · ·					M		•		DENSE TO D GRAY, S		ENSE, TAN ND, A-2-4			ŧ							
2580	2 570 0	+ 24 48.5					:	· · · · ·							•					2580	2,580.7	48.5		6	9			.	
	2,079.8	<del>1 40.0</del>	3	5	9	•	14						м		-						1.	Ŧ	4	0	9		5		
		Ŧ				į : : j		· · · · ·		·   · · · ·	-				•							Ŧ					·   · · · ·   · · ·	.	
2575	2,574.9	<u>+</u> 53.5	5	7	12		1-													2575	2,575.7	<u>+ 53.5</u> +	5	5	8	13	 		· · · ·
		‡		'				· · · · ·			•		M		•							ŧ				$   \dots N$	·   · · · ·		
2570	0 500 6	+ <u>-</u> 								·   · · · ·	:									2570	2,570.7	58.5							
2010	2,569.9	<del>1 58.5</del> +	27	49	45				· · ·		●94		м		-					20/0		ŧ	5	11	20		•31	<u> </u>	
		‡						· · · · ·						40	2,567.4		WEATH	ERED RO	<u>ск                                    </u>	$\left  \right $		‡						: ``\``.	
2565	2,564.9	<u>+ 63.5</u>	00	10/0 1	4		-		· · ·	·   · · ·					-			CHIST)		2565	2,565.7	- 63.5 -	28	40	46		·   · · ·		·· <b>`</b>
		‡	82	18/0.1				· · · · · · · ·	· · ·   · · ·	100					•							‡							· · · ·
2560		‡																		2560	2,560.7	68.5					·   · · · .		
	2,559.9	68.5	36	64/0.4			-				/0.9				2,559.0	Decis T			69.4	2560	-	‡	58	42/0.2	2				
		‡								100						Boring Te WE	ATHERED	ROCK (	on 2,559.0 ft IN SCHIST)			‡					· · · · ·		· · · ·
	.	‡																			2,555.7	- 73.5	100/0.5					· ·   ·	
1		‡																				‡				1			
		<b>‡</b>																				‡				1			
i	I		I	1	1	I						I	1								I	<u> </u>			I	Ĺ			

HAYWOO	D		GEOLOGIST Moloney,	C.		
NCINERATO	R RD)				GROUN	D WTR (ft)
OFFSET N	I/A		ALIGNMENT N/A		0 HR.	N/A
NORTHING	678,331		EASTING 848,476		24 HR.	3.1
	DRILL METHOD	Muc	d Rotary	HAMME	R TYPE	Automatic
COMP. DAT	E 03/08/22		SURFACE WATER DEP	TH N/A	4	
		L				
75 100	NO. MOI	O G	SOIL AND RO	CK DESC	RIPTION	
		<u> </u>				
		_	2,629.2 GROUN			0.0
			ROADWAY MED. STIFF, BROV			νітн
		- Ø		MÍCA, A		
	M					
	м					
	M	- 85	-			
						<u> </u>
	м	ļ	CLAYEY SILT WI			
••••			_ <u>2,612.2</u>			_ <u> 17.0</u>
	м	1.jF	MED. STIFF, GRA AND CLA	AY AND 1 YEY SILT	TAN, SAN	DY
			2,607.2		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	22.0
		Ø.		SIDUAL		
	м	8 -	MED. STIFF TO ORANGE, S			,
		<b>*</b>				
		SF.				
	M		•			
	м	81				
			STIFF, GRAY AND	WHITE.	SANDY	AND 37.0
	м			Y SILT, Á		
			2,587.2			42.0
			MED. DENSE TO			N,
	м	-	BROWN AND WHI	IE, SILT	Y SAND, A	4-2-4
		-				
		F				
	м	-	-			
	м	Ŀ				
		-				
		F				
	м	_				
		Ţ				
		Ē				
86	м					
		F	2,562.2			67.0
		14	WEATHE	E <b>RED RC</b> CHIST)	CK	
100/0.7						
		1				
100/0		-	2,555.2			74.0
100/0.5		F	Boring Terminated a WEATHERED	at Elevation ROCK (	on 2,555.2 SCHIST)	2 tt IN
		F		(	. ,	
		-				

## GEOTECHNICAL BORING REPORT BORE LOG

							<b>L</b>		.00			_													
	5504					P HB-0003		TY HAYWOO				GEOLO	OGIST Moloney, C.	1			55041					P HB-0003		COUNT	
SITE	DESC	RIPTION	BRI	DGE NO	D. 239	0 ON -L- (I-40) O	VER SR 1550	(INCINERAT	OR RD)					GROUND W	/TR (ft)	SITE	DESCR	IPTION	BRID	DGE N	O. 239	ON -L- (I-4	0) OVER	SR 1550 (	INCI
BOR	NG NC	). B2-D			S	TATION N/A		OFFSET	N/A			ALIGN	MENT N/A	0 HR.	N/A	BORI	ing no.	B2-D			S	TATION N	/A		OF
COL	LAR EL	<b>.EV.</b> 2,6	628.0	ft	Т	OTAL DEPTH 8	9.0 ft	NORTHING	678,4	15		EASTI	NG 848,398	24 HR.	58.5	COLI	LAR ELE	<b>EV.</b> 2,	628.01	ft	т	OTAL DEPT	<b>H</b> 89.0 f	t	NO
DRILL	. Rig/Ha	MMER EF	F./DAT	E SME	6573	CME-550X 82% 5/*	1/2022		DRILL	VIETHO	D M.	ud Rotary	Hammi	ERTYPE Auto	omatic	DRILL	RIG/HAN	IMER EF	F./DAT	E SM	E6573 (	CME-550X 82	% 5/11/202	2	
DRIL		_ittle, J.			S	TART DATE 03	/15/22	COMP. DA	<b>TE</b> 03/	15/22		SURFA	CE WATER DEPTH N//	A		DRIL	<b>LER</b> Li	ttle, J.			S	FART DATE	03/15/2	2	со
ELEV	DRIVE ELEV	DEPTH		ow col		4	OWS PER FOO		SAMP.	. 🔨			SOIL AND ROCK DESC	CRIPTION		ELEV	DRIVE ELEV	DEPTH	·	w co	-			PER FOOT	
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 25	50	75 100	NO.		G	ELEV. (ft)			DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	25	50	75 I
2630		+														2550	2,549.5	78.5		<u> </u>		_	Mate	h Line	
	2 627 (	+ 10										2,628.0	GROUND SURFA		0.0		-	-	23	32	40			1113	P <sup>72</sup>
2625	2,627.0	0 <u>1.0</u>	3	3	3	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		· · · · · ·		м	Ļ	2,626.0	MED. STIFF, BROWN, S	ANDY AND		2545	-	÷							<u> </u>   :
2025	2,624.	5 <del>+</del> 3.5	2	2	2					м		- '	CLAYEY SILT, MICACE	<u>-008, A-5</u>	1	2040	2,544.5	83.5	55	45/0.2					4-
	2,622.0	0 6.0						· · · · ·				-	SOFT TO MED. STIFF, CLAYEY SILT, A				-	ł							
2620	2 610 4	- 5 8.5	2	2	2	•4 ·				M		-				2540	2,539.5	88.5							-
	2,010.0	<u> </u>	2	1	2			· · · · ·	SS-112	2 32%		-					2,000.0		100/0.5					1	
		Ţ						· · · · ·			N N V	-					-	Ł							
2615	2,614.	5 13.5	1	2	2			<u> </u>			N N V	-					-	Ł							
		ł			2	$\mathbf{P}^4$ · · · · · ·		· · · · ·		M	N, V	-					-	Ł							
2610		Ŧ									Ň	-					-	F							
	2,609.5	5 <del>1</del> 18.5	1	3	3					м	N N	-					-	F							
		Ŧ						· · · · · ·				-					-	F							
2605	2,604.	5 <u>23.5</u>	_								N	-					-	F							
		Ŧ	2	2	3	<b>•</b> 5		· · · · · ·		M	N N	-					-	ŧ							
2600		‡						· · · · · ·			N N N	-					-	ŧ							
2000	2,599.	5 <del>+</del> 28.5	2	3	5					м		-						ŧ.							
		‡						· · · · · ·			. N . V	-					-	ŧ.							
2595	2 501	- 5 33.5									<u> </u>	2,596.0	MED. DENSE, BROWN A		<u> 32.0</u>		-	Ł							
	2,004.0	<u> </u>	2	4	7			· · · · ·		М		-	SILTY SAND, A-	2-4			-	Ł							
		ł				:[:: ::		· · · · ·				-					-	Ł							
2590	2,589.5	5 38.5	2	3	5							2,589.0			39.0		-	F							
		$\frac{1}{2}$	2		5	. • 8				M		-	MED. STIFF, TAN, SAND	Y CLAY, A-6			-	F							
2585		Ŧ										2,585.0			43.0		-	F							
	2,584.5	5 <u>+</u> 43.5 +	2	3	4					м			MED. STIFF TO VERY ST AND WHITE, SANDY AND					F							
		Ŧ				$\left  \left  \begin{array}{c} \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \end{array} \right  \cdot \right $		· · · · · ·				-	AND WHITE, SANDTAND A-5				-	F							
2580	2,579.5	+ 5 48.5			_			· · · · ·				-					-	ŧ							
		‡	3	5	9	<b>1</b> 4		· · · · · ·		М		-					-	ŧ							
2575		‡						· · · · · ·				-					-	ŧ							
2010	2,574.	5 53.5	5	11	18					м	. 1 V	-					-	F.							
		‡				· · · ·   <del> </del> 29	· · ·   · · ·	· · · · ·			, N N N	-						ŧ							
2570	2 569	- 5 58.5										-					-	ŧ							
	2,003.0		5	7	14			· · · · · ·		M		-					-	ţ							
		Ŧ				: : : :\  : :					1, V 1, V	-					-	Ł							
2565	2,564.	<u>5 63.5</u>	5	10	16							-					-	Ł							
		Ŧ	5		10	26				M		-					-	F							
2560	0	<b>. .</b>				/		· · · · · ·				-					-	F							
	2,559.	<u>5 68.5</u> T	5	8	12					м		-					-	F							
		Ŧ				· · · · · · · · · · · · · · · · · ·		· · · · ·				- 2,556.0			72.0		-	ŧ							
2555	2,554.5	+ 5 73.5					<u>,  </u>	· · · · · ·					DENSE TO VERY DENS	E, BROWN,			-	ŧ							
		‡	11	18	31		49	·   · · · · ·		М		-	SILIT SAND, A-	<b>Z-4</b>			-	ŧ							
0550		‡					:::: ` <u>N</u> ::	· · · · · ·				-					-	ţ							
2550							`			1							I		1	1					

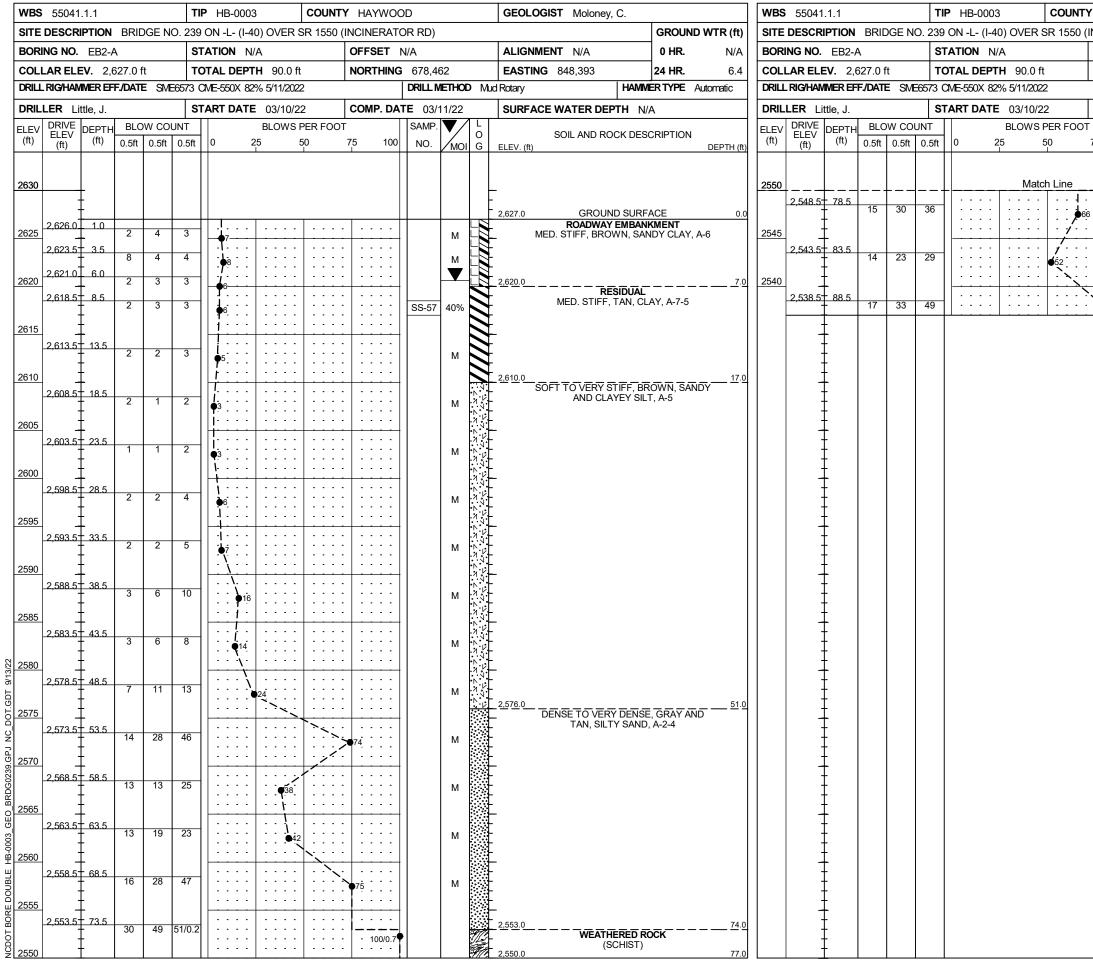
NT۱	HAYWOC	D			GEOLOGI	ST Moloney,	С.		
50 (	INCINERATO	DR RD)						GROUN	ID WTR (ft)
	OFFSET N	N/A			ALIGNME	NT N/A		0 HR.	N/A
_	NORTHING		15		EASTING			24 HR.	58.5
		DRILL N		) Mud		,000	HAMIME		Automatic
	COMP. DA				-	WATER DEP			
тос		SAMP.	/ /	L	JUNFAUE	WATER DEP	IN/A	٦	
	75 100	NO.		0		SOIL AND ROO	CK DESC	RIPTION	
		110.	/моі	G					
7		+				ENSE TO VER		E, BROW	<u> </u>
3	72		м	F		SILTY SAND,	A-2-4 (co	ontinued)	,
				F	2,545.0				83.0
	100/0.7					WEATHE	RED RC HIST)	CK	
· ·						(00	, 1101 )		
					2,539.0				20.0
	100/0.5	·		-		ng Terminated a	t Elevati	on 2,539.0	89.0 0 ft IN
						WEATHERED	ROCK (	SCHIST)	
				F					
				F					
				-					
				Ŀ					
				-					
				F					
				Ŀ					
				Ŀ					
				-					
				F					
				Ŀ					
				F					
				-					
				-					
				-					
				E					
				Ŀ					
				F					
				-					

## GEOTECHNICAL BORING REPORT BORE LOG

																	ı ——									
WBS 5						• HB-00				HAYWO	-			GEOL	OGIST Moloney, C.	1		<b>5</b> 504					• HB-0003		COUNT	
SITE DE	ESCRIP	PTION	BRID	GE N	0. 239	ON -L- (I	-40) OVE	R SR	1550 (I	NCINERAT	OR RD)					GROUND WTR (ft)	SITE	DESC	RIPTION	BRI	DGE N	0. 239	ON -L- (I-40	0) OVER S	SR 1550	INCI
BORING	S NO.	B2-E			ST	ATION	N/A			OFFSET	N/A			ALIGN	IMENT N/A	0 HR. N/A	BOR	ING NO	. B2-Е				ATION N/			OF
COLLA						TAL DEF				NORTHING					,	<b>24 HR.</b> 2.6	COL	LAR EL	<b>.EV</b> . 2	,629.2	ft	ТО	TAL DEPT	H 83.6 ft		NO
DRILL RI	g/Hamin	/IER EFI	F./DATE	SME	6573 C	ME-550X	82% 5/11/	2022			DRILL	VIETHC	DO	Aud Rotary	HAMME	ER TYPE Automatic	DRIL	l Rig/Ha	MMER E	FF./DAT	E SM	E6573 C	ME-550X 829	% 5/11/2022	2	
DRILLE	R Littl	le, J.			ST	ART DAT	<b>FE</b> 03/0	9/22		COMP. DA	TE 03/	09/22	2	SURF	ACE WATER DEPTH N/A	Α	DRIL	LER [	ittle, J.			ST	ART DATE	03/09/22	2	со
ELEV D	RIVE LEV	DEPTH		w co			BLOV	VS PE	R FOOT		SAMP.				SOIL AND ROCK DESC	CRIPTION	ELEV	DRIVE	DEPTH	H BLO	ow co			BLOWS	PER FOO	r
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50		75 100	NO.	Имс				DEPTH (ft)	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0 2	5 5	50	75 I
2630														-2,629.2	GROUND SURF	ACE 0.0	2550	↓	<u> </u>		4 20 3			Matc	h Line	
2,	628.2	1.0	3	2	2										ROADWAY EMBAN	KMENT			ŧ	58	42/0.3			· · · · ·		
2.	625.7	3.5	5	2	2	<b>∮</b> <sup>4</sup> : :	-   -		· · · ·						MED. STIFF, ORANGE, SAN	NDT CLAT, A-0		2,546.	7 <u>+ 82.5</u> +	26	68	32/0.1		· · · ·	· · ·	
2025	+		2	4	4							М		2,623.7		5.5			+							
2,	623.2	6.0	3	4	6							м		E	STIFF, BROWN AND TAN, A-4	SANDY SILT,			ł							
2620 2,	620.7-	8.5	3	4	5			•••				м							Ŧ							
	-		Ũ		Ũ	. <b>9</b> .9													Ŧ							
		12 E												2,617.2		<u>12.0</u>			Ŧ							
2615	615.7-	13.5	2	2	3	<b>4</b> 5					$\left\{ \right\}$	м		F	MED. STIFF, GRAY, SANDY ROOTS, A-4				Ŧ							
	Ŧ						• • • •							\$ <b>F</b>	· ,				Ŧ							
2610 2,	610.7	18.5	2	· ·		1								2,611.2	RESIDUAL	<u> </u>			Ŧ							
2010	1		2	3	4	• <u>·</u> ···	• • • •				İ I	M	N. 1		MED. STIFF TO STIFF, BRO AND CLAYEY SILT				Ŧ							
	‡					į : :	•   • • •						N. 1			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			ŧ							
2605 2,	605.7-	23.5	2	2	2						SS-24	32%							‡							
	‡					Trees of the second sec	• • • •		· · · · · · · ·			1	N.1						‡							
2600 2,	600.7	28.5				i : :	-   -	::	· · · · ·				N N						‡							
2600	+		2	3	3	•6						M	N 1						‡							
	1								· · · ·				N 1						ŧ							
2595 2,	595.7-	33.5	2	4	8	$\left  \cdot \right $						м	N 1						Ŧ							
	±				-								· ^ · ·	2,593.2		36.0			Ŧ							
2	590.7-	38.5					•   • • •		• • • •						MED. DENSE, BROWN, S MICACEOUS, A-	SILTY SAND, -2-4			Ŧ							
2590 2,		30.5	6	10	11		21					м							Ŧ							
	Ŧ							••											Ŧ							
2585 2,	585.7	43.5	6	8	10	j													Ŧ							
	Ŧ		0	0	10	9	18				İ I	M							Ŧ							
	‡	40.5					\  : : : -\  : : :		· · · · ·										Ŧ							
2580 2,	-1.080	48.5	7	10	15							м		-					Ŧ							
	‡						./		· · · · ·										‡							
2575 2,	575.7	53.5	_	_			/   · · ·   /   · · ·												‡							
<u>2575</u> 2,	‡		5	9	9	· · · ·	18				11	M		-					‡							
	‡					· · · ·			· · · · ·					2,572.2	HARD, BROWN AND WH	11TE SANDY 57.0			‡							
2570 2,	570.7-	58.5	11	21	26	· · ·	· · · · ·					м		F	SILT, A-4				‡							
	‡					· · ·	•   • • •	· · <b>T</b>	· · · ·					t.					‡							
2570 2. 2565 2.	565.7-	63.5					-							÷					‡							
2565 2,			9	19	29	 		48	3		+	м		F					Ŧ							
	Ī							· · [\	X					Ł					Ŧ							
2560 2,	560.7	68.5	10	28	37		.							Ē					Ŧ							
	Ŧ		10	20	51							M		F					Ŧ							
	‡	70 5							<u>/</u>					F					Ŧ							
2555 2,	555.7-	73.5	7	16	26			<b>4</b> 2	· · · · ·			м		÷					‡							
2555 2,	‡					 		ï÷⊢	· · · · ·	+			IT	2,553.2	WEATHERED RO	<u>рск – – – – <sup>76.0</sup></u>			‡							
2550 2.	550.7-	78.5					-   -		· · · · ·						(SCHIST)				‡							
2000						L				1		1	N//-	й				1		1	1					

T۱	HAYWO	DD				GEOLOG	SIST	Moloney,	C.		
) (	INCINERAT	OR	RD)							GROUN	ID WTR (ft)
	OFFSET	N//	4			ALIGNM	ENT	N/A		0 HR.	N/A
	NORTHING			5		EASTING				24 HR.	2.6
					) Mud	Rotary			HAMIM		Automatic
	COMP. DA						E WA	TER DEP			
от		_	SAMP.	/	L						
	75 100		NO.	моі	O G		SO	IL AND ROO	CK DESC	CRIPTION	l
	1	T		,							
_	100/0.8	•+	· — —		70-			WEATHE	RED RC	DCK	
								(SCHIST	) (continu	ued)	
	100/0.6	4				2,545.6 Bo	ring T	erminated a	t Flouret	on 2 545 4	83.6
	100/0.0				-	BO	WI	erminated a	ROCK (	(SCHIST)	סונווא
					E						
					-						
					-						
					E						
					F						
					F						
					F						
					-						
					-						
					-						
					-						
					l E						
					-						
					-						
					E						
					F						
					-						
					E						
					F						
					-						
					-						
					-						

## GEOTECHNICAL BORING REPORT BORE LOG

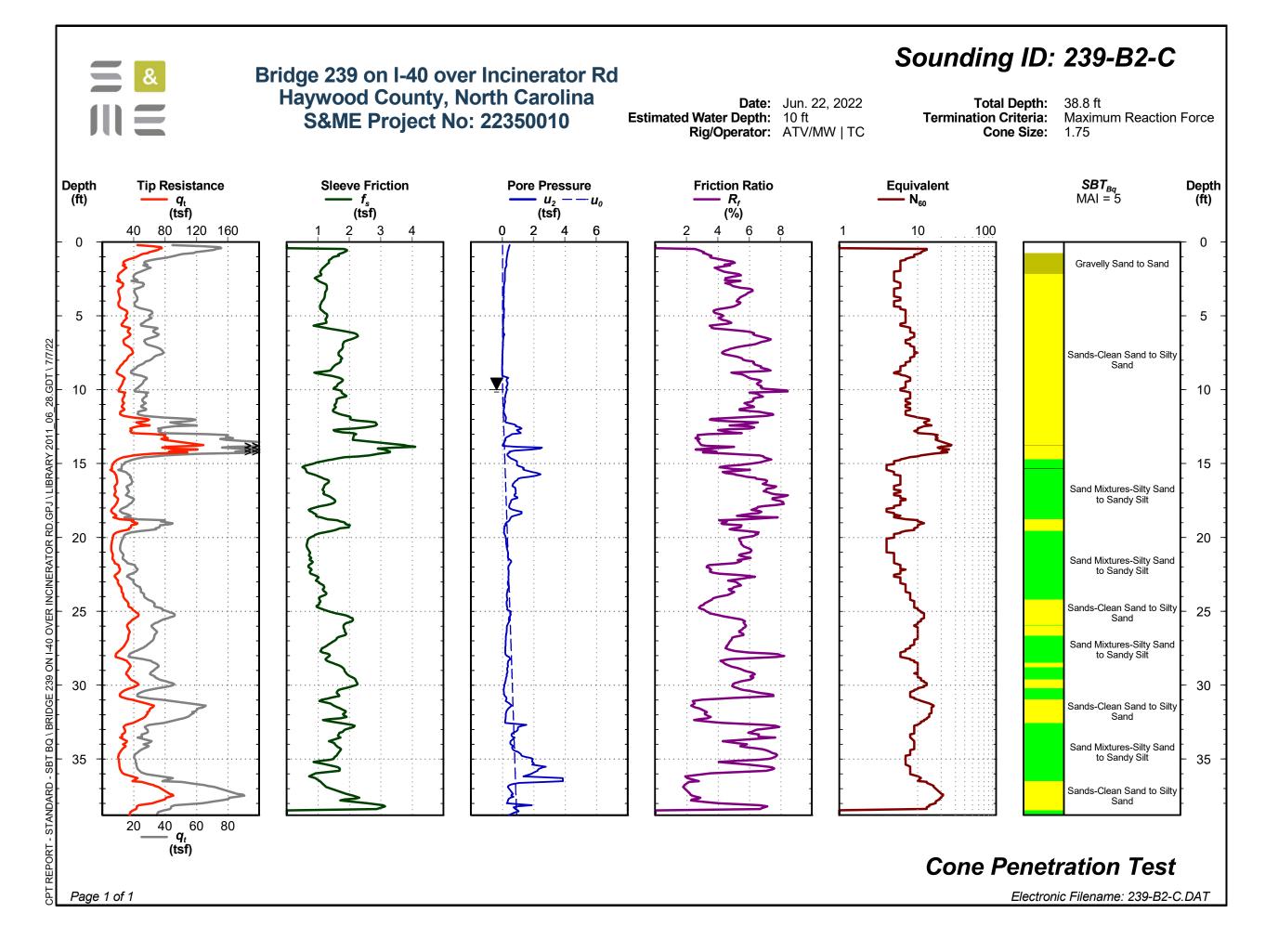


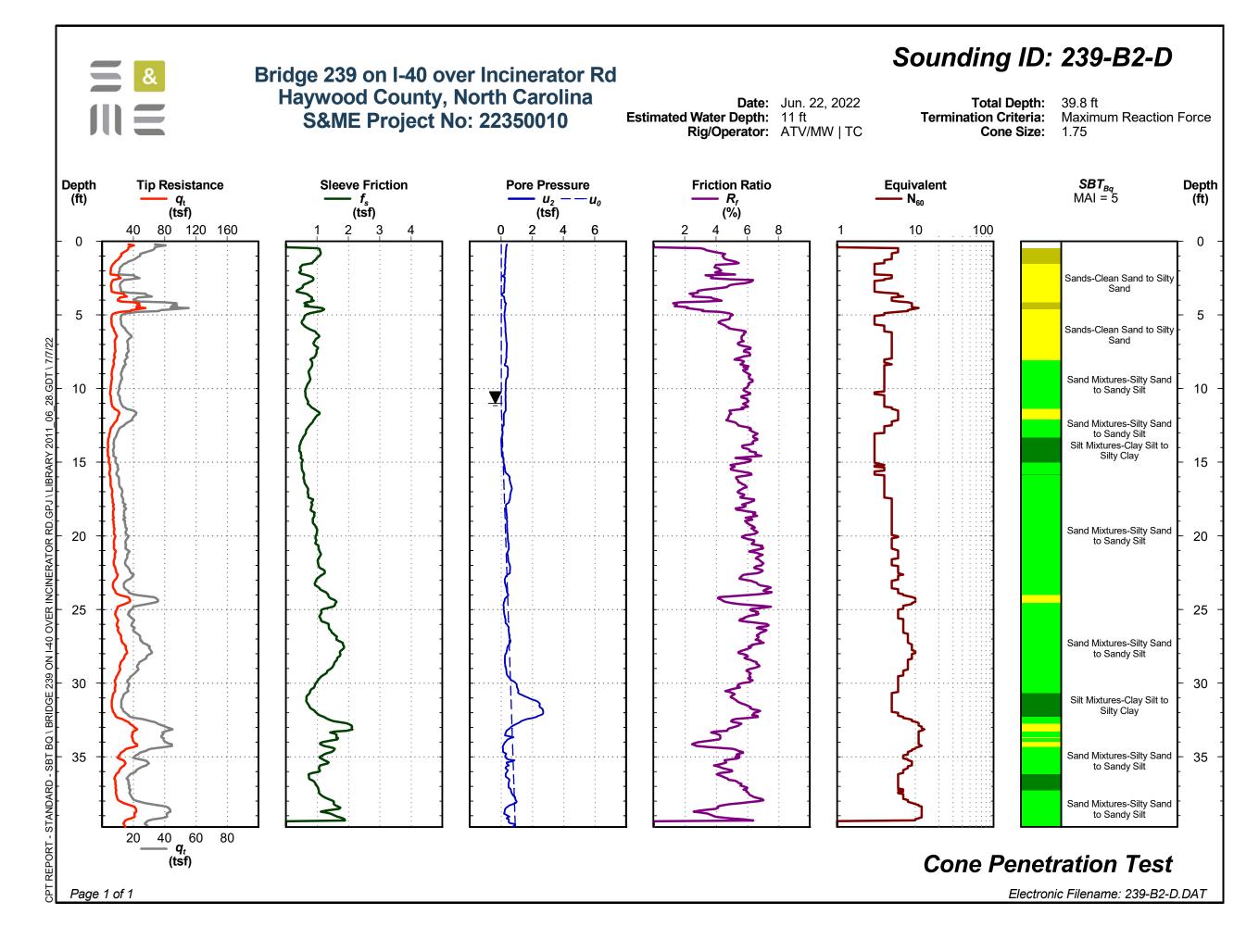
HAYWOOD			GEOLOGIST Moloney, O	С.		
NCINERATOR F	RD)				GROUN	D WTR (ft)
OFFSET N/A			ALIGNMENT N/A		0 HR.	N/A
NORTHING 67			EASTING 848,393		24 HR.	6.4
DRI	ILL METHOD	Mud	Rotary	HAMIME	RTYPE	Automatic
COMP. DATE			SURFACE WATER DEPT	TH N/A	4	
	MP.	L O	SOIL AND ROC	K DESC	RIPTION	
75 100 N	10. MOI	G				
┭━━━┥┟╴				IDUAL		
	м		VERY DENSE, BI SILTY S/	ROWN A AND, A-2	AND GRA 2-4	Y,
		L				
	м	Ē				
		Ļ				
		-				
82	м		2,537.0 Boring Terminated a		on 0 507 (	90.0
		F	Boring Terminated a VERY DENSE SILT	Y SAND	) (RESIDU	JAL)
		F				
		F				
		F				
		E				
		E				
		F				
		F				
		-				
		F				
		F				
		F				
		F				
		-				
		F				
		F				
		F				
		E				
		E				
		E				
		F				
		F				
		F				
		F				
		F				
		F				
		-				
		F				
		F				
		F				
		-				

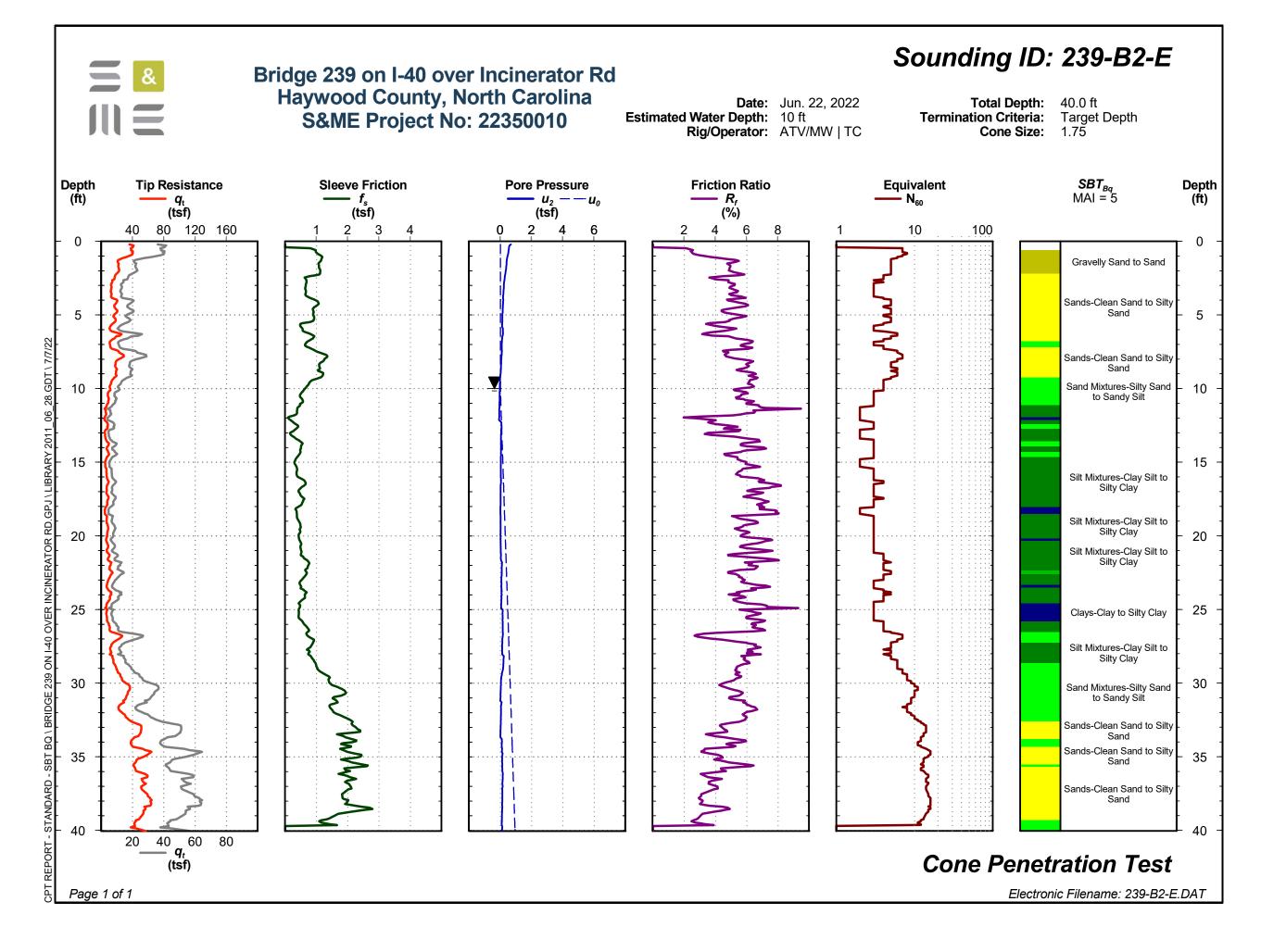
## GEOTECHNICAL BORING REPORT BORE LOG

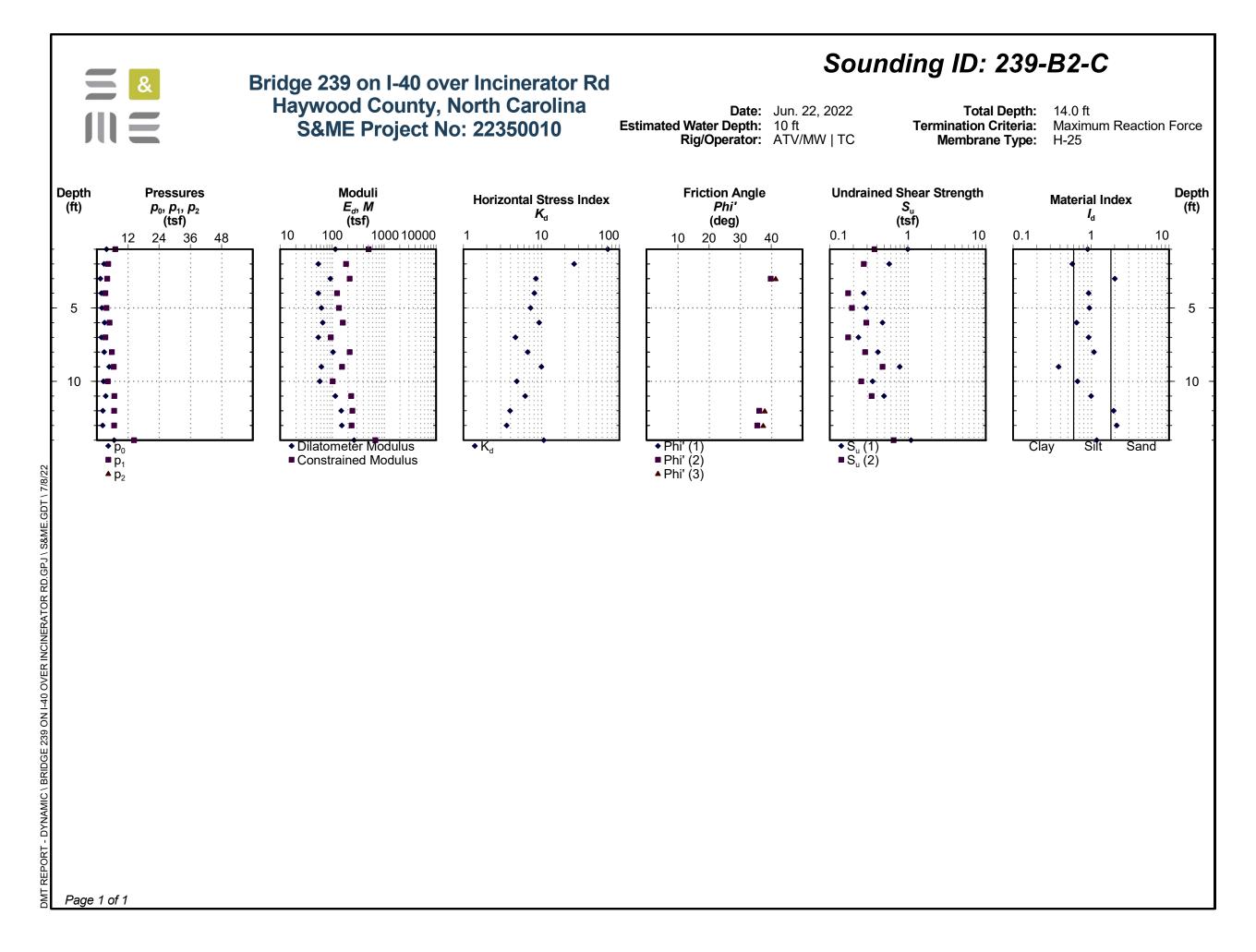
																		ı —										
	5504					<b>P</b> HB-0				Y HAYWO	-			GEOLO	OGIST Moloney	, C.	r		<b>5</b> 504					IP HB-0			COUNT	
<u> </u>				DGE N				OVER S	SR 1550 (								GROUND WTR (ft)					DGE N				OVER SF	R 1550 (I	
BORI	NG NO.	EB2-I	В		S	TATION	N/A			OFFSET	N/A			ALIGN	MENT N/A		0 HR. N/A	BOR	ing no	. EB2-	В		S	TATION	N/A			OF
		<b>EV.</b> 2,				OTAL DI				NORTHING					<b>IG</b> 848,555		24 HR. FIAD			<b>.EV.</b> 2,					EPTH 8			NO
DRILL	. RIG/HAI	MMER EF	F./DAT	E SME	6573	CME-550>	(82%5	5/11/2022	2		DRILL	/IETHC	DD N	lud Rotary		HAMME	ERTYPE Automatic	DRIL	l Rig/Ha	MMER EF	-F./DAT	E SM	E6573 (	CME-550)	X 82% 5/	/11/2022		
DRIL	LER L				S	TART D	ATE (	03/18/22	2	COMP. DA			2	SURFA	CE WATER DE	PTH N/A	4	DRIL	LER L				S	TART D	ATE 03	3/18/22		со
ELEV	DRIVE ELEV	DEPTH		W CO					PER FOOT		SAMP.	1.7			SOIL AND RO	CK DESC	CRIPTION	ELEV	DRIVE		' <u> </u>					LOWS PE		
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	5	50	75 100	NO.	/мс	DI G	ELEV. (ft)			DEPTH (ft	(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	)	75
1																												
2630		Ļ												2,628.9	CROUN	ID SURFA	ACE 0.0	2550		┿╌╌╴	- <u>39</u> -		41			Match	Line	
	2,627.9	1.0				<u>  .</u> .								2,020.9	ROADWAY	EMBANK	KMENT			‡	35	57	41			· · · ·	· · · · ·	T'
2625	2,625.4	+ 35	3	3	3		: :	· · · · · ·				M		2,625.9	MED. STIFF, TA		3.0	2545	2 545 4	+ 1 83.5							· · · · ·	' <u>-</u>
		İ	3	3	4	<b>•</b> 7					†	м		}!	MED. STIFF TO S Cl	11FF, OR/ .AY, A-6	ANGE, SANDY	2545		<u> </u>	100/0.4	1			.			-
	2,622.9	6.0	3	3	5			· · ·	 			м		+						ŧ							· · · ·	
2620	2,620.4	8.5	5	4	5	. T							E					2540	2,540.4	1 88.5	15	32	68/0.3					-
		Ŧ		4	5	· 🕫 ·						M		1						<u>+</u>	15	52	00/0.3					
		Ŧ				-								2,616.9	SOFT, BROWN,			$\left  \right $		Ŧ								
2615	2,615.4	<u>T 13.5</u>	3	1	3						$\left\{ \right\}$	м		F		CACEOUS				Ŧ								
		Ŧ												2,612.9			<u> </u>			Ŧ								
2610	2,610.4	18.5		-	-									F	SOFT, GRAY AN	ID TAN, S				Ŧ								
2010		ŧ	2	2	2	•4					†	M		₽ ₽-		OTS, A-6			-	Ŧ								
		ŧ				· · · ·				·   · · · · ·				2,606.9		SIDUAL	22.0			Ŧ								
2605	2,605.4	+ 23.5 +	2	1	2	· · · · ●3					l l	м		<u> </u>	VERY LOOSE 1	O LOOSE				‡								
		‡					: :								ORANGE, S	ILTY SAN	ID, A-2-5			‡								
2600	2,600.4	+ 28.5				· · ·       · · ·	: :							- -						‡								
2600	-2,000.4	+ 20.0	2	2	3	<b>6</b> 5					†	м		• •					-	ŧ								
		ŧ				::		· · ·	 											ŧ								
2595	2,595.4	33.5	3	3	3									<u>_</u>						ł								
		Ŧ		3	3	●6 <u></u>	• •					M								+								
		Ŧ				.								Ē						Ŧ								
2590	2,590.4	T 38.5	2	3	5					+ • • • •	ł	м	N I	2,589.9	MED. STIFF, B	ROWN. S	39.0 ANDY AND			Ŧ								
		Ŧ											к И И И И	T T		EY SILT, A				Ŧ								
2585	2,585.4	43.5			-			· · · · · ·					N V	2,585.9	MED. DENSE TO		ENSE TAN			Ŧ								
	-	Ŧ	3	5	6	- • • 1 <sup>-</sup>	1.				†	M		ι - Ι	BROWN AND WH				-	Ŧ								
		Ŧ				: : :		· · · · · ·						F.						Ŧ								
2580	2,580.4	<u>+ 48.5</u> +	3	5	8							м		<u>+</u>					.	‡								
		ŧ				♥ <sup>′</sup>    .	······································	· · · · · ·		.				<b> </b>						‡								
2575	2,575.4	+ 53 5				:: <b>;</b> :	:   :	· · · · · ·	· · · ·					<b> </b>						‡								
2575		+	3	4	7	. <b>●</b> 1	1.				†	м		<u>}</u>					· ·	‡								
		‡				\	X   1	· · ·	 					}- -						‡								
2570	2,570.4	58.5	9	13	16		<u>\</u>							1					.	±								
		ŧ			10		- i i	29		.		M								t								
	0 505	±					·   •	1												Ŧ								
2565	2,565.4	<u> </u>	8	16	18			34			+	м		•					.	£								
2560		Ŧ												F						Ŧ								
2560	2,560.4	68.5												F						Ŧ								
2000		‡	10	20	46		.   .		)•6	6	†	М							.	Ŧ								
		‡						· · · · · ·	:/: :	·   · · · · ·										‡								
2555	2,555.4	+ 73.5	20	23	26		-   -		/			м		<u> </u>					.	‡								
		‡						· · · ·	49					₩ ₩						‡								
	2,550.4	+					-   -	· · ·												<b>‡</b>								
2550	2,000.4	L /0.5	1			1			L	<b>`</b>				1					L	1	I		<u> </u>					

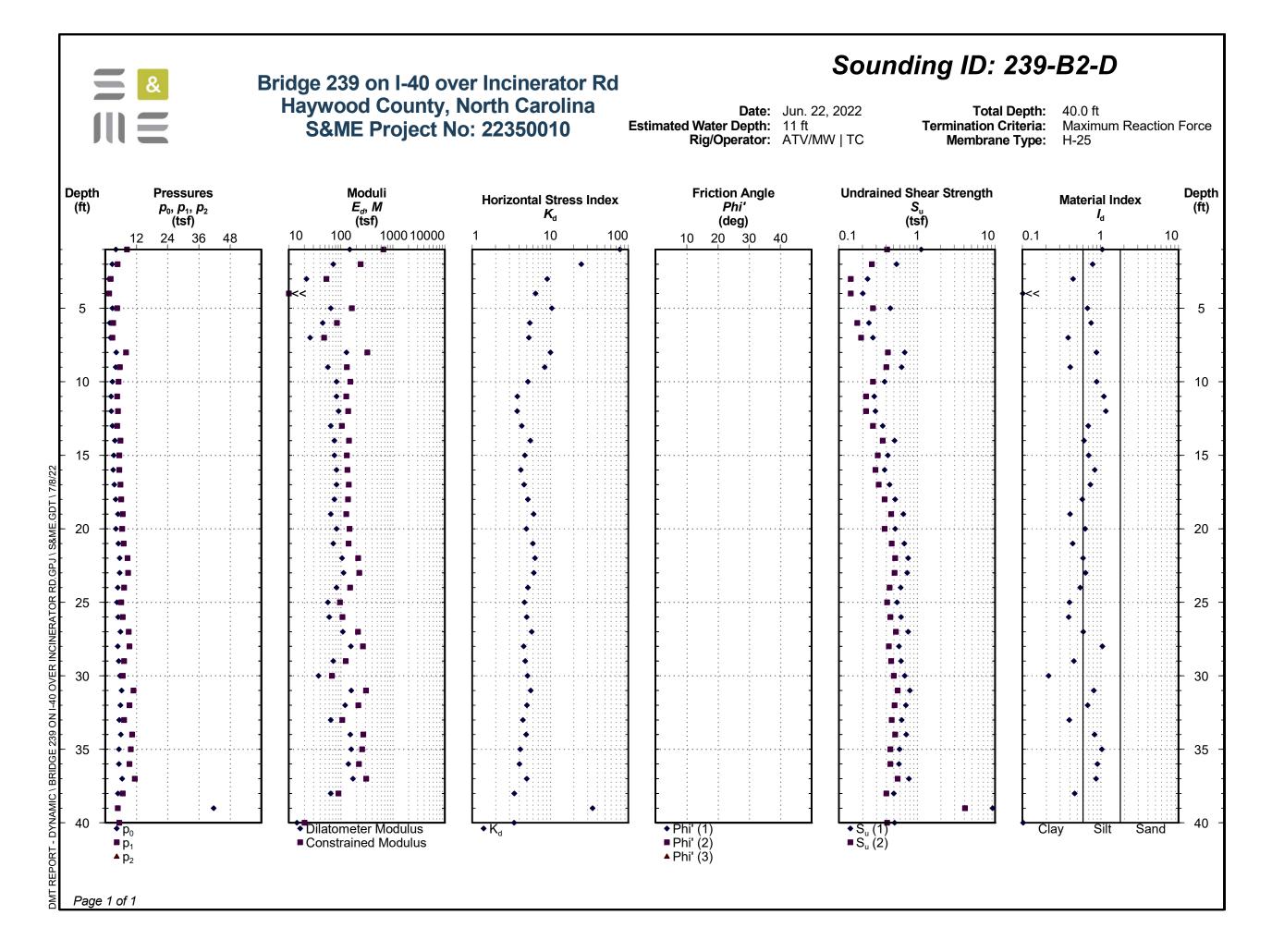
TY HAYWOOD	GEOLOGIST Moloney, C.		
) (INCINERATOR RD)		GROU	ND WTR (ft)
OFFSET N/A	ALIGNMENT N/A	0 HR.	N/A
<b>NORTHING</b> 678,296	EASTING 848,555	24 HR.	FIAD
DRILL METHOD Mud		/IMER TYPE	Automatic
COMP. DATE 03/18/22	SURFACE WATER DEPTH	N/A	
75 100 NO. MOI G	SOIL AND ROCK DE	SCRIPTION	N
• • • • • • • • • • • • • • • • • • •	MED. DENSE TO VER BROWN AND WHITE, S	Y DENSE, T. LTY SAND.	AN, A-2-4
	2,546.9 (continue WEATHERED	d)	⁄ <u>82.0</u>
100/0.4	(SCHIST	)	
· · · · · ·			
100/0.6	2,539.1 Boring Terminated at Elev WEATHERED ROC	ation 2,539.	89.8 1 ft IN
	WEATHERED ROC	K (SCHIST)	
F			
F			

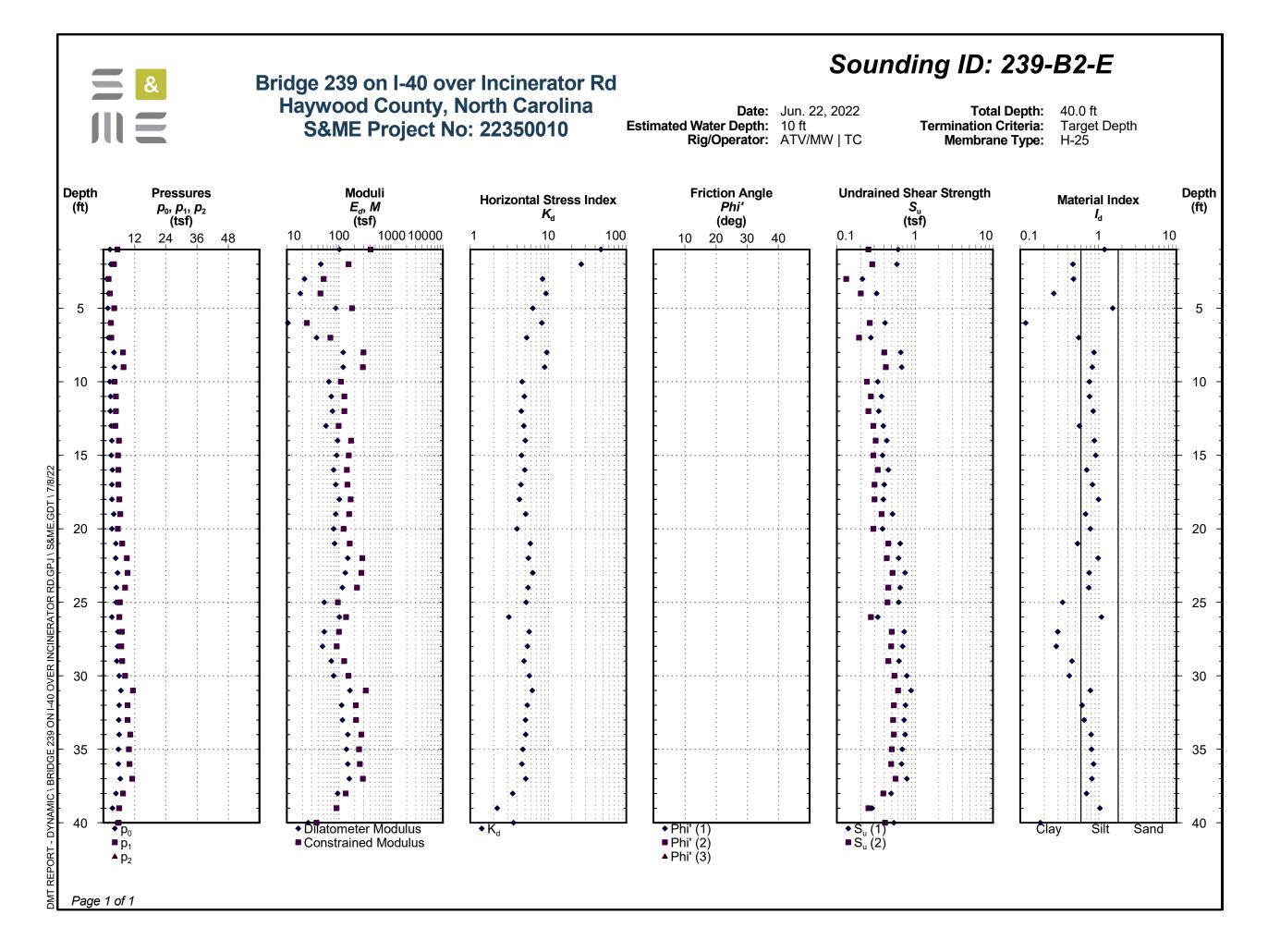












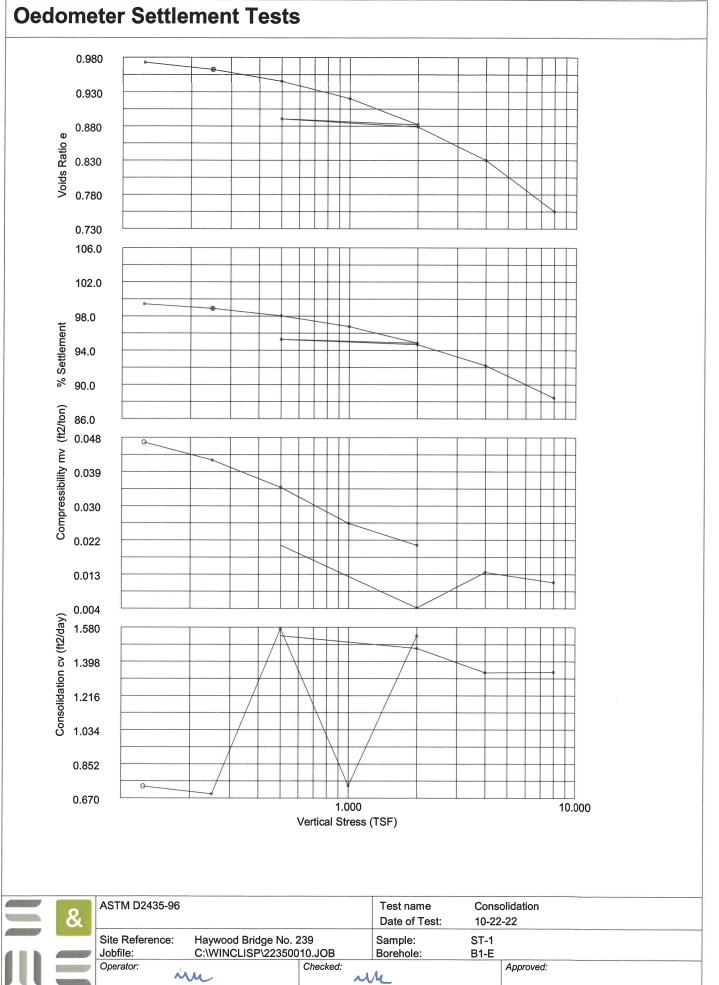
#### SUMMARY OF LABORATORY TEST DATA

Soil Classification and Gradation

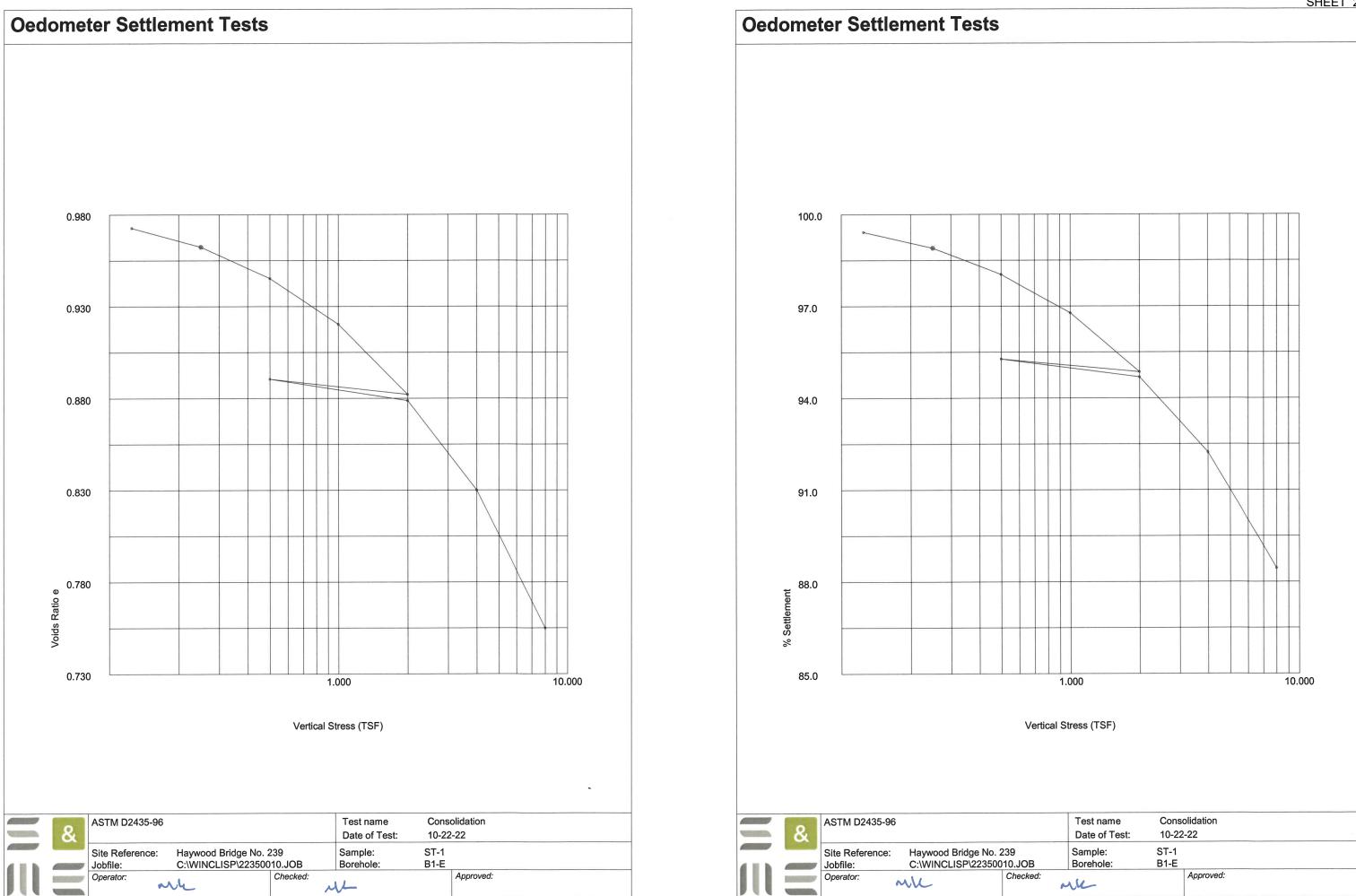
					S&ME, In	c. Raleigl	ו, 320 <sup>-</sup>	1 Spring	g Forest	Road, R	aleigh,	North Ca	arolina 2	27616						
S&ME Pi	<u> </u>	22350010														Report:		9/12	2/2022	
State Pro	ject No.:	55041.1.1								County	:	Haywoo	bd		Date <sup>-</sup>	Tested:	7/2	23/2022	2-9/06/2	022
Federal I	D No.:	N/A								TIP No.	•	HB-000	13							
Project N	lame:	Bridge No	o. 239 on	I-40 ov	er SR 1550	)														
Client Na	ame:	NCDOT G	EU							Client A	ddress:	Raleigh	, NC							
(J)				ent	Sample	AASH	ТО		Total %	Passing	ļ	Tota	Mortar	Fractio	n (%)				U.	%
nple	ing	tior	set	ŭ	Depth	Classific	ation		Siev	/e #		Coarse	Fine						jani	ist.
Sample No.	Boring No.	Station	Offset	Alignment	(ft)			10	40	60	200	Sand	Sand	Silt	Clay	LL	PL	PI	Organic	Moist.
SS-24	B2-E	-	-	-L-	23.5-25.0	A-5	(3)	99	99	88	56	11	40	38	11	41	34	7	-	32.2
SS-57	EB2-A	-	-	-L-	8.5-10.0	A-7-5	(16)	99	99	97	93	2	6	48	44	46	33	13	-	39.8
SS-112	B2-D	-	-	-L-	8.5-10.0	A-5	(5)	97	97	92	65	5	37	40	18	45	38	7	-	32.0
SS-137	B1-D	-	-	-L-	33.5-35.0	A-4	(3)	99	99	92	70	7	28	46	19	38	34	4	-	34.5
SS-150	B1-A	-	-	-L-	6.0-7.5	A-4	(6)	99	96	91	65	8	31	40	21	40	31	9	-	25.6
Reference	s / Comm	ents / Devia	tions:	1	ND=Not D	etemined.			1			1			1	1		1	1	1
		le Size Analy									AASHT	D T89: De	terminin	g the Lic	uid Limi	t of Soil	5			
		, mining the P										O T265: L		-	•			ntent of	Soils	
		Classificatio			,		for Hig	hway Co	onstructio	on Purpo				-						
								-		-										
	Ka	ren Warnei	<u>r</u>					<u>NC</u>	DOT 11	8-06-03	<u>805</u>		<u>Joey</u>	<u>Daily</u>			<u>Proj</u>	ect Ma	<u>nager</u>	
	Тес	hnician Name	2:		Si	gnature			Certific	ation #		Te	chnical Re	sponsibil	ity:		-	Positio	n	
					This report	shall not b	e repro	duced, ex	cept in fu	ll, without	the writt	en approv	al of S&N	IE, Inc.						



Sample details						
Sketch showing specimen location in original Sample	· ·	3.5-20.0 ft. an-Brown Coars	e to Fine Sandy C	layey SIL	-T (A-5) (7)	
	Type Height H <sub>0</sub> (in) Diameter D <sub>0</sub> (in) Weight W <sub>0</sub> (gr) Bulk Density $\rho$ (PCF) Particle Density $\rho_s$	Undisturbed 0.997 2.501 149.2 116.05 2.672 (measured)				
nitial Conditions						
inuar conditions						
Tettlement Channel Moisture Content $w_0$ % Mary Density $p_d$ (PCF) Voids Ratio $e_0$ Meg of Saturation S $_0$ % Welling Pressure Ss (TSF)	1001 38.1 84.03 0.9842 100.0 0.000					
inal Conditions						
loisture Content w <sub>f</sub> % ry Density <sub>ዖd</sub> (PCF) oids Ratio e <sub>f</sub> eg of Saturation S <sub>f</sub> %	32.9 95.01 0.7550 100.00 0.115					
loisture Content w <sub>f</sub> % ry Density ρ <sub>d</sub> (PCF) oids Ratio e <sub>f</sub> eg of Saturation S <sub>f</sub> % ettlement: (in)	95.01 0.7550					
loisture Content $w_f$ % ry Density $\rho_d$ (PCF) oids Ratio $e_f$ eg of Saturation $S_f$ % ettlement: (in) ompression Index $C_c$	95.01 0.7550 100.00 0.115 0.290	taken from the	mid portion of UD	tube.		
loisture Content $w_f$ % ry Density $\rho_d$ (PCF) oids Ratio $e_f$ eg of Saturation $S_f$ % ettlement: (in) ompression Index $C_c$	95.01 0.7550 100.00 0.115 0.290	taken from the	mid portion of UD	) tube.		
loisture Content $w_f$ % ry Density $\rho_d$ (PCF) oids Ratio $e_f$ eg of Saturation $S_f$ % ettlement: (in) ompression Index $C_c$	95.01 0.7550 100.00 0.115 0.290	taken from the	mid portion of UD	) tube.		
oisture Content $w_f$ % ry Density $\rho_d$ (PCF) oids Ratio $e_f$ eg of Saturation S <sub>f</sub> % ettlement: (in) ompression Index C <sub>c</sub>	95.01 0.7550 100.00 0.115 0.290	taken from the	mid portion of UD	) tube.		
oisture Content $w_f$ % ry Density $\rho_d$ (PCF) oids Ratio $e_f$ eg of Saturation S <sub>f</sub> % ettlement: (in) ompression Index C <sub>c</sub>	95.01 0.7550 100.00 0.115 0.290	taken from the	mid portion of UD	) tube.		
oisture Content $w_f$ % ry Density $\rho_d$ (PCF) oids Ratio $e_f$ eg of Saturation S <sub>f</sub> % ettlement: (in) ompression Index C <sub>c</sub>	95.01 0.7550 100.00 0.115 0.290	taken from the	mid portion of UD	tube.		
Inal Conditions Noisture Content w <sub>f</sub> % Iny Density p <sub>d</sub> (PCF) Oids Ratio e <sub>f</sub> teg of Saturation S <sub>f</sub> % ettlement: (in) Tompression Index C <sub>c</sub> Totes:	95.01 0.7550 100.00 0.115 0.290 Test specimer	taken from the	mid portion of UD		olidation	

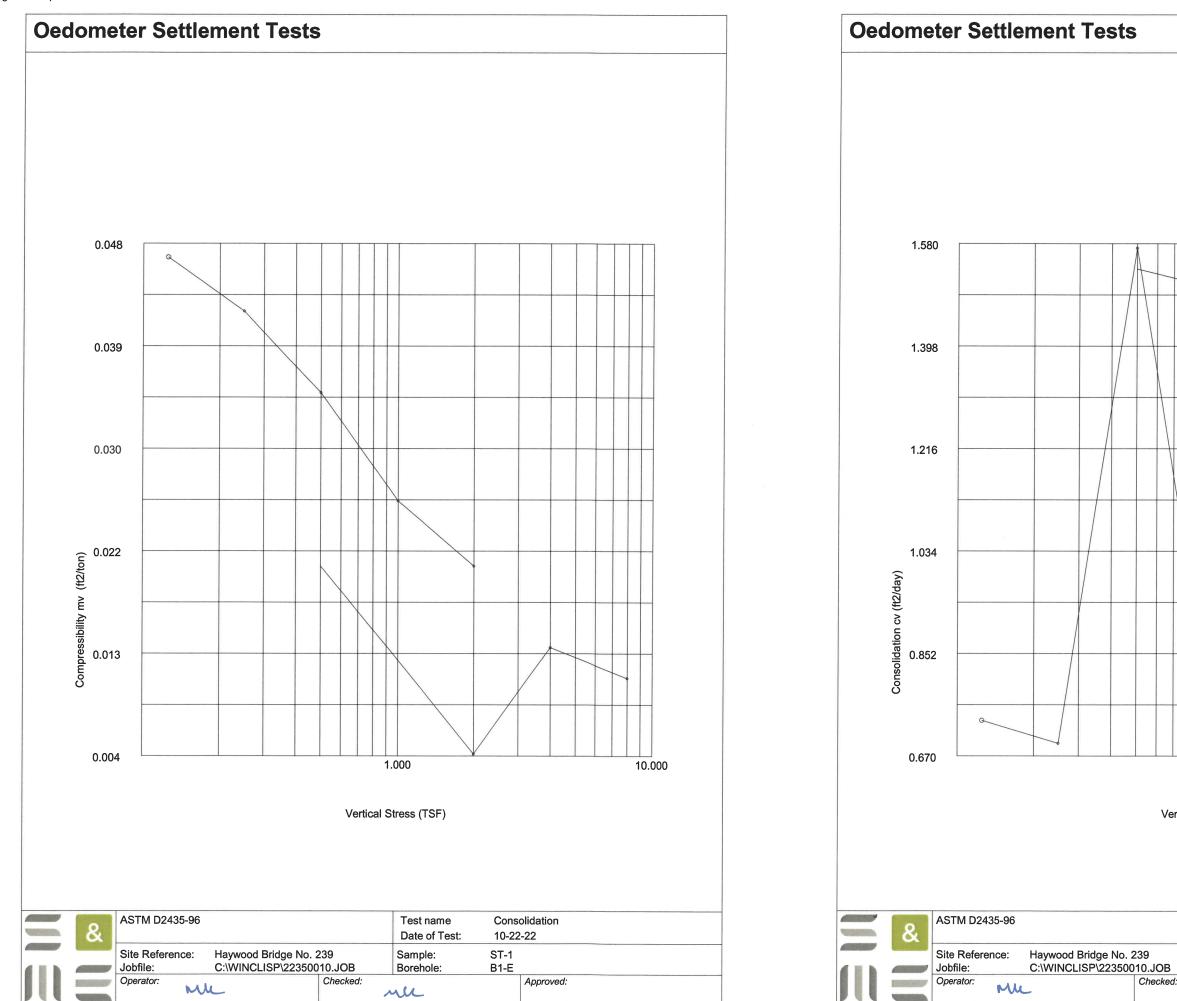


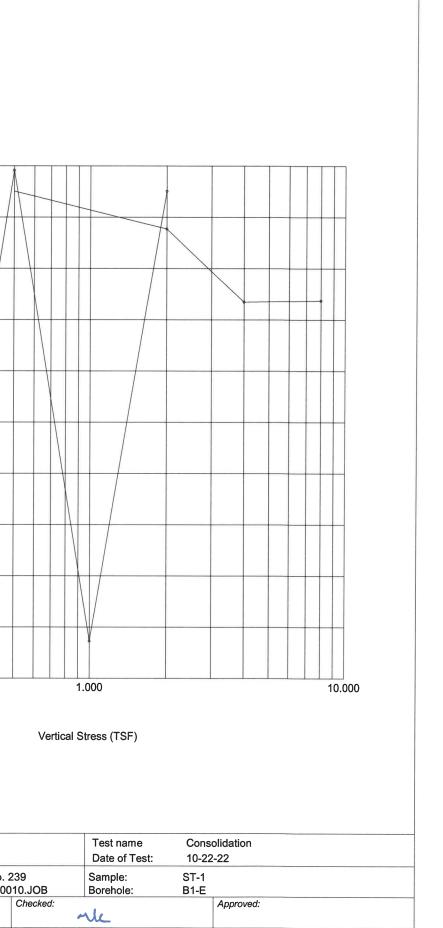
DocuSign Envelope ID: F1F056F4-3054-4E30-946B-B1FAC3370AF3



	Test name	Consolidation
	Date of Test:	10-22-22
239	Sample:	ST-1
10.JOB	Borehole:	B1-E
Checked:	mle	Approved:

DocuSign Envelope ID: F1F056F4-3054-4E30-946B-B1FAC3370AF3

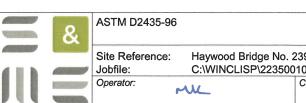




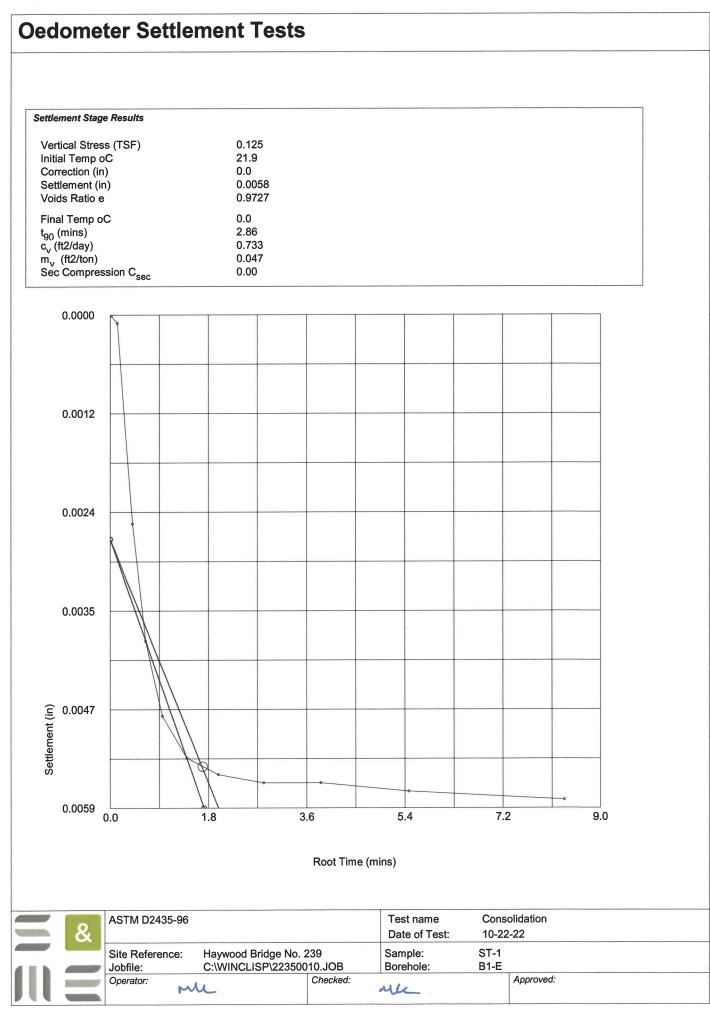
Stress (TSF)	Initial Temp. oC	Settlement Total (in)	Cal Corr.	Final Temp. oC	Voids Patio o	t <sub>ջն</sub> (mins)	Secondary	C <sub>v</sub> (#2/dov)	m <sub>v</sub>
(137)	Temp. 00	rotar (iii)	(in)	remp. oc	Ratio e <sub>f</sub>	(mns)	Compr C <sub>sec</sub>	(ft2/day)	(ft2/ton
0.125	21.9	0.0058	0.0	21.9	0.9727	2.858	0.00	0.733	0.047
0.250	21.9	0.0110	0.0	21.9	0.9623	2.992	0.00	0.693	0.042
0.500	21.9	0.0196	0.0	21.9	0.9452	1.300	0.00	1.572	0.035
1.000	21.9	0.0321	0.0	21.9	0.9203	2.716	0.00	0.736	0.026
2.000	21.9	0.0513	0.0	21.9	0.8821	1.260	0.00	1.535	0.020
0.500	21.9	0.0471	0.0	21.9	0.8905				0.003
2.000	21.9	0.0530	0.0	21.9	0.8787	1.295	0.00	1.468	0.004
4.000	21.9	0.0775	0.0	21.9	0.8300	1.375	0.00	1.338	0.013
8.000	21.9	0.1152	0.0	21.9	0.7550	1.282	0.00	1.341	0.011

	No.	Time (mins)	Displacement (divs)	Displacement (in)	Settlement (in)
	1	0.000	0	0.0000	0.0000
	2	0.017	1	0.0001	0.0001
	3	0.167	25	0.0025	0.0025
	4	0.417	39	0.0039	0.0039
	5	0.917	48	0.0048	0.0048
	6	1.970	53	0.0053	0.0053
	7	3.917	55	0.0055	0.0055
	8	7.917	56	0.0056	0.0056
	9	14.917	56	0.0056	0.0056
	10	29.917	57	0.0057	0.0057
	11	69.333	58	0.0058	0.0058
- 1					

		ASTM D2435-96			Test name	Cons	olidation	
State of the second second	× ×				Date of Test:	10-22	2-22	
		Site Reference:	Haywood Bridge No. 2	239	Sample:	ST-1		
4	Contraction of the	Jobfile:	C:\WINCLISP\223500	10.JOB	Borehole:	B1-E		
	and the second	Operator:		Checked:			Approved:	
			~		u			



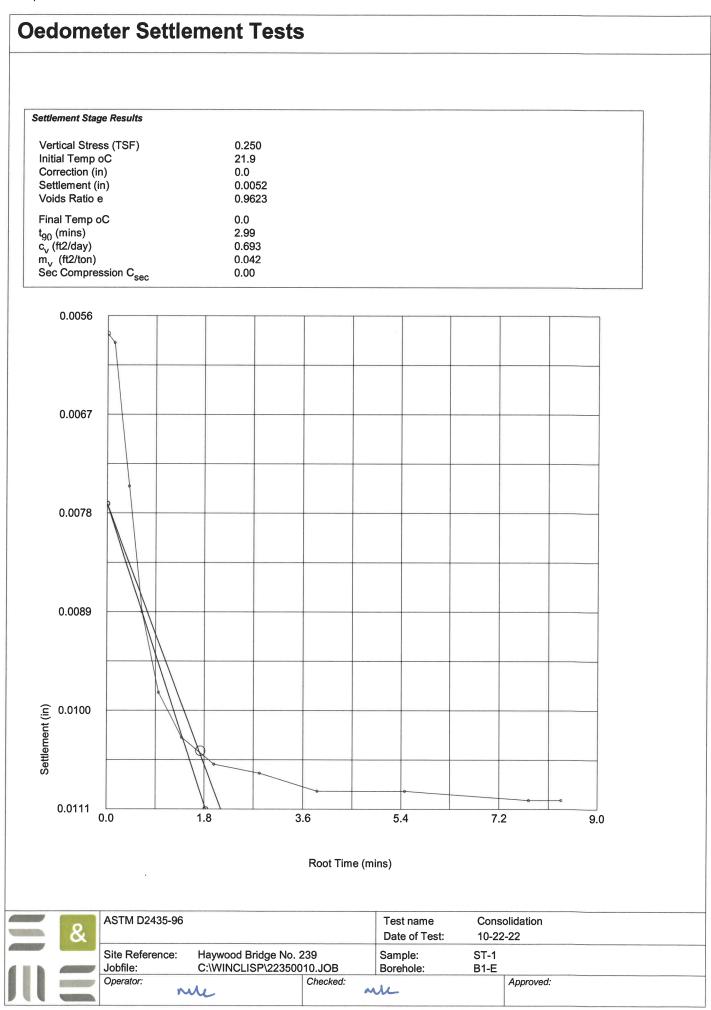
	Test name Date of Test:	Consolidation Load: 0.125 (TSF) 10-22-22
39 0.JOB	Sample: Borehole:	ST-1 B1-E
Checked:	nic	Approved:



No.	Time (mins)	Displacement (divs)	Displacement (in)	Settlement (in)
1	0.000	58	0.0058	0.0058
2	0.017	59	0.0059	0.0059
3	0.167	75	0.0075	0.0075
4	0.417	89	0.0089	0.0089
5	0.917	98	0.0098	0.0098
6	1.917	103	0.0103	0.0103
7	3.917	106	0.0106	0.0106
8	7.917	107	0.0107	0.0107
9	14.917	109	0.0109	0.0109
10	29.917	109	0.0109	0.0109
11	59.917	110	0.0110	0.0110
12	69.333	110	0.0110	0.0110

&	ASTM D2435-96		
	Site Reference: Jobfile:	Haywood Bridge No. 23 C:\WINCLISP\22350010	
	Operator:	un c	Che

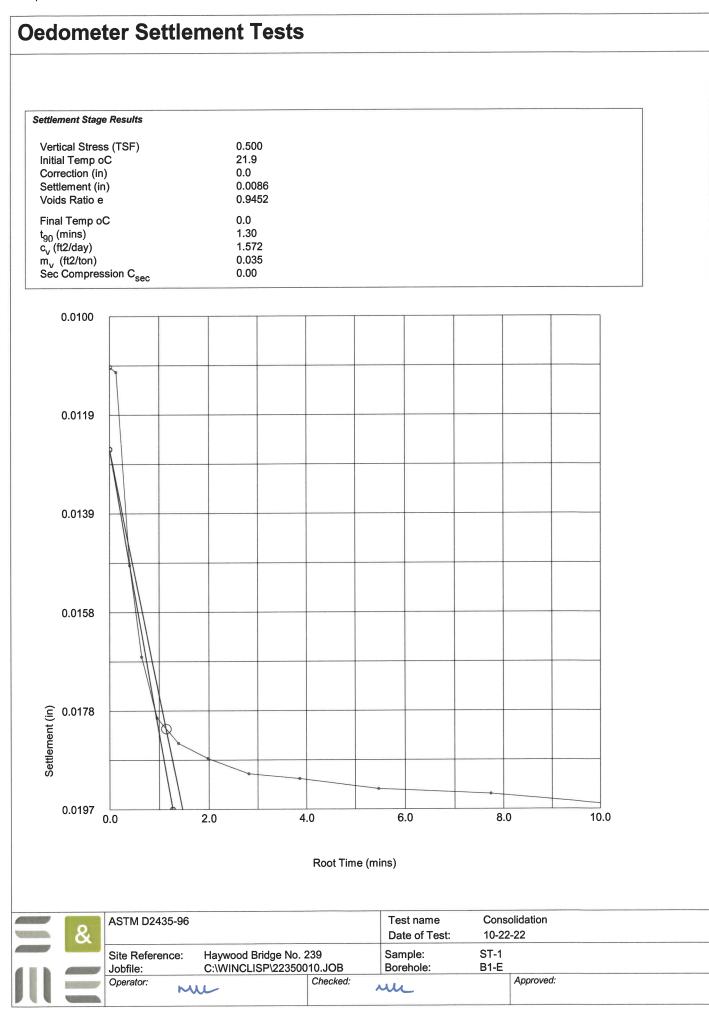
	Test name	Consolidation Load: 0.250 (TSF)
	Date of Test:	10-22-22
9	Sample:	ST-1
0.JOB	Borehole:	B1-E
Checked:		Approved:
	me	



No.	Time (mins)	Displacement (divs)	Displacement (in)	Settlement (in)
1	0.000	110	0.0110	0.0110
2	0.017	111	0.0111	0.0111
3	0.167	149	0.0149	0.0149
4	0.417	167	0.0167	0.0167
5	0.917	179	0.0179	0.0179
6	1.917	184	0.0184	0.0184
7	3.917	187	0.0187	0.0187
8	7.917	190	0.0190	0.0190
9	14.917	191	0.0191	0.0191
10	29.917	193	0.0193	0.0193
11	59.917	194	0.0194	0.0194
12	101.017	196	0.0196	0.0196
	1 2 3 4 5 6 7 8 9 10 11	(mins) 1 0.000 2 0.017 3 0.167 4 0.417 5 0.917 6 1.917 7 3.917 8 7.917 9 14.917 10 29.917 11 59.917	(mins)(divs)10.00011020.01711130.16714940.41716750.91717961.91718473.91718787.917190914.9171911029.9171931159.917194	(mins)(divs)(in)10.0001100.011020.0171110.011130.1671490.014940.4171670.016750.9171790.017961.9171840.018473.9171870.018787.9171900.0190914.9171910.01911029.9171930.01931159.9171940.0194

&	ASTM D2435-96	
	Site Reference: Jobfile:	Haywood Bridge No. 239 C:\WINCLISP\22350010
	Operator:	u c

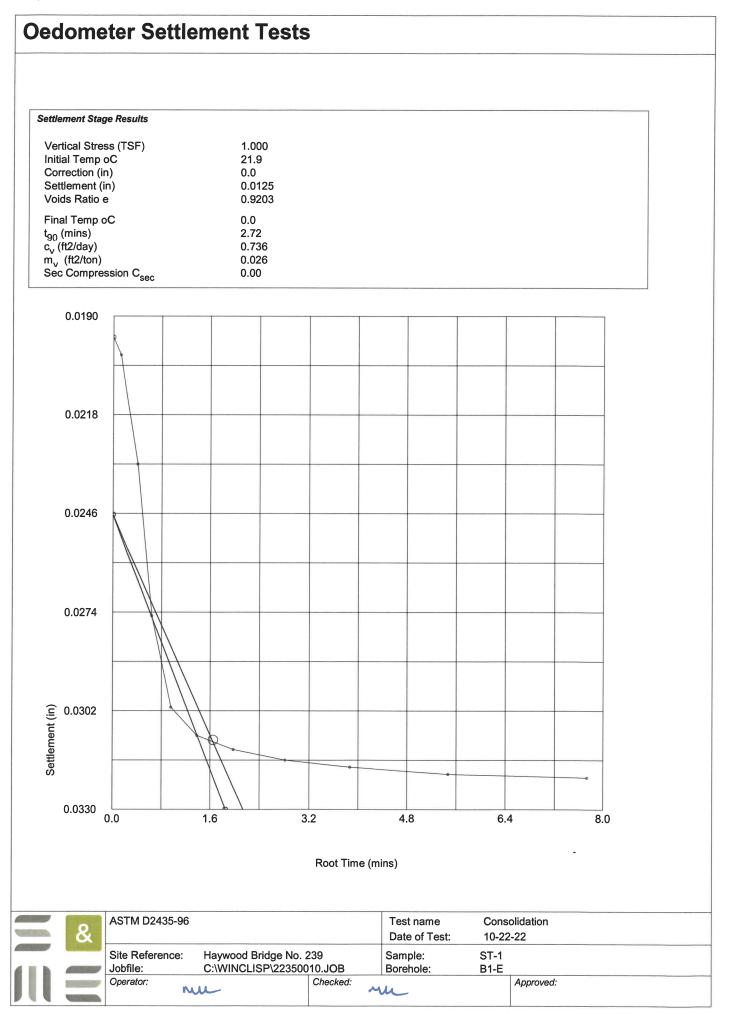
	Test name	Consolidation Load: 0.500 (TSF)
	Date of Test:	10-22-22
39 10.JOB	Sample: Borehole:	ST-1 B1-E
Checked:		Approved:



No.	Time (mins)	Displacement (divs)	Displacement (in)	Settlement (in)
1	0.000	196	0.0196	0.0196
2	0.017	201	0.0201	0.0201
3	0.167	232	0.0232	0.0232
4	0.417	275	0.0275	0.0275
5	0.917	301	0.0301	0.0301
6	1.917	309	0.0309	0.0309
7	3.917	313	0.0313	0.0313
8	7.917	316	0.0316	0.0316
9	14.917	318	0.0318	0.0318
10	29.917	320	0.0320	0.0320
11	59.917	321	0.0321	0.0321

&	ASTM D2435-96		
	Site Reference: Jobfile:	Haywood Bridge No. 2 C:\WINCLISP\223500	
	Operator:	w	Che

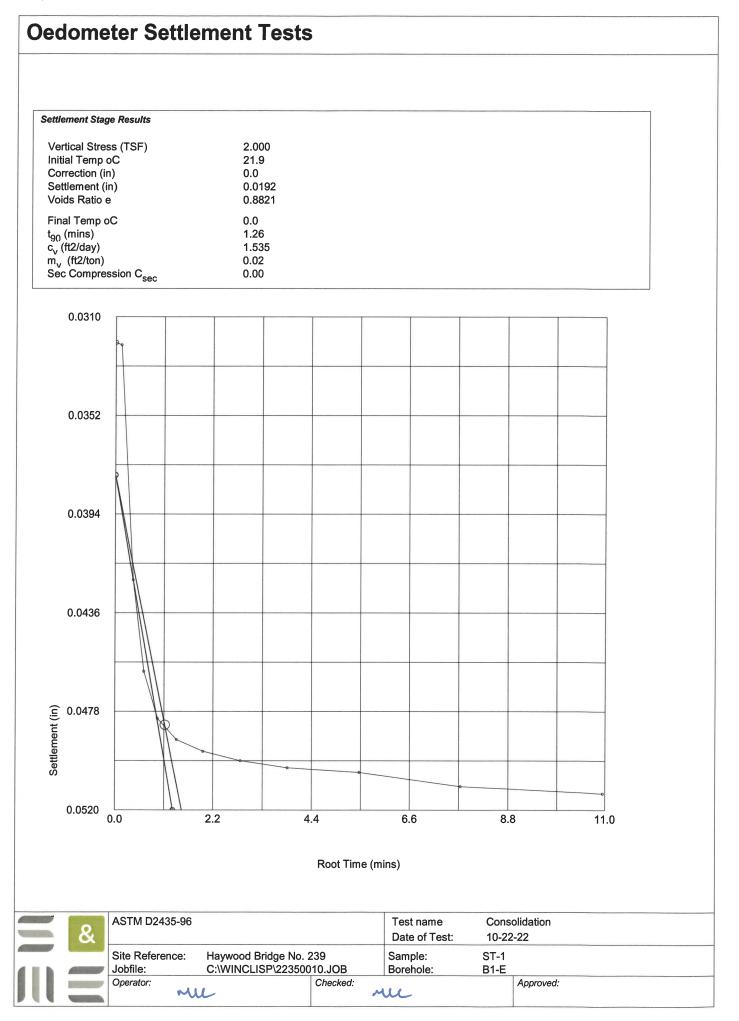
	Test name Date of Test:	Consolidation Load: 1.000 (TSF) 10-22-22
9 ).JOB	Sample: Borehole:	ST-1 B1-E
hecked:	me	Approved:



No.	Time (mins)	Disɒlacement (divs)	Displacement (in)	Settlement (in)
1	0.000	321	0.0321	0.0321
2	0.017	322	0.0322	0.0322
3	0.167	422	0.0422	0.0422
4	0.417	461	0.0461	0.0461
5	0.917	481	0.0481	0.0481
6	1.917	490	0.0490	0.0490
7	3.917	495	0.0495	0.0495
8	7.917	499	0.0499	0.0499
9	14.917	502	0.0502	0.0502
10	29.917	504	0.0504	0.0504
11	59.917	510	0.0510	0.0510
12	119.917	513	0.0513	0.0513

8	ASTM D2435-96	
	Site Reference: Jobfile:	Haywood Bridge No. 239 C:\WINCLISP\22350010.
	Operator: 📈	Che

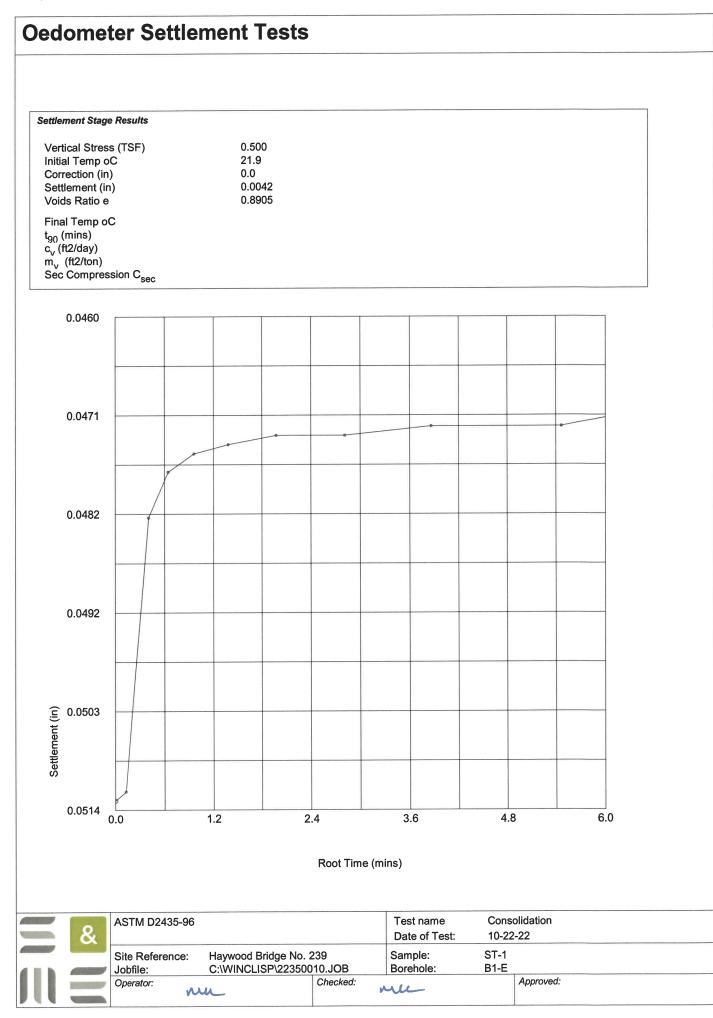
	Test name	Consolidation Load: 2.000 (TSF)
	Date of Test:	10-22-22
9	Sample:	ST-1
0.JOB	Borehole:	B1-E
Checked:		Approved:



	No.	Time (mins)	Displacement (divs)	Displacement (in)	Settlement (in)
	1	0.000	513	0.0513	0.0513
	2	0.017	512	0.0512	0.0512
	3	0.167	482	0.0482	0.0482
	4	0.417	477	0.0477	0.0477
	5	0.917	475	0.0475	0.0475
	6	1.917	474	0.0474	0.0474
	7	3.917	473	0.0473	0.0473
	8	7.917	473	0.0473	0.0473
	9	14.917	472	0.0472	0.0472
	10	29.917	472	0.0472	0.0472
	11	36.517	471	0.0471	0.0471
- 1					

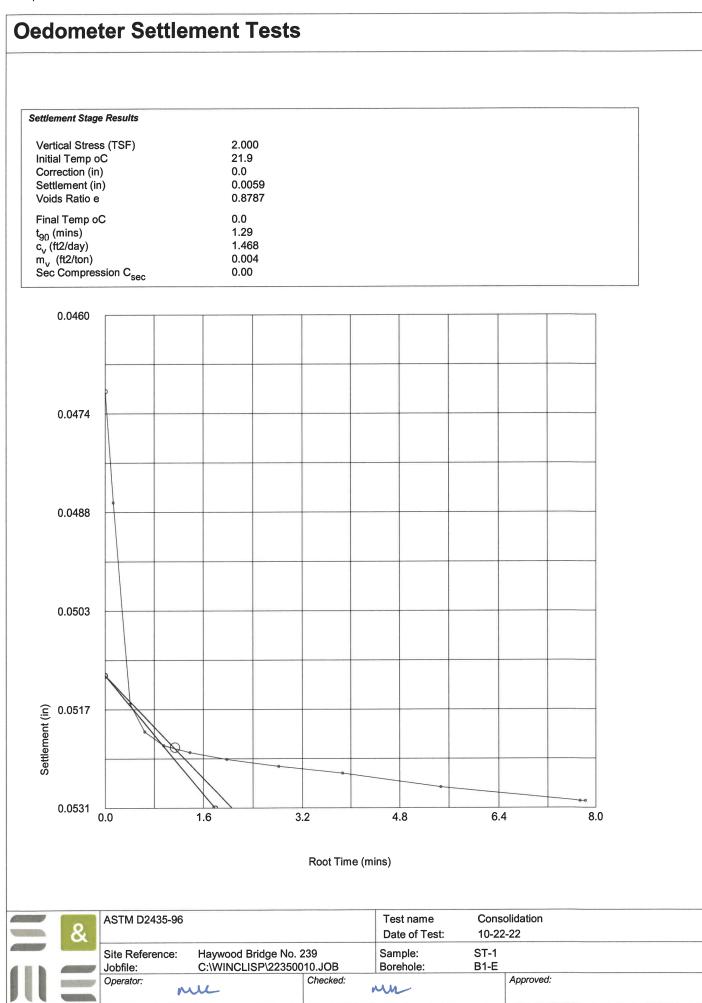
ASTM D2435-96		
Site Reference: Jobfile:	Haywood Bridge No. 2 C:\WINCLISP\223500	
Operator: 🙌	n	Che

	Test name	Consolidation Load: 0.500 (TSF)
	Date of Test:	10-22-22
9	Sample:	ST-1
0.JOB	Borehole:	B1-E
Checked:		Approved:
	Mh	



No.	Time (mins)	Displacement (divs)	Displacement (in)	Settlement (in)
1	0.000	471	0.0471	0.0471
2	0.017	487	0.0487	0.0487
3	0.167	516	0.0516	0.0516
4	0.417	520	0.0520	0.0520
5	0.917	522	0.0522	0.0522
6	1.917	523	0.0523	0.0523
7	3.917	524	0.0524	0.0524
8	7.917	525	0.0525	0.0525
9	14.917	526	0.0526	0.0526
10	29.917	528	0.0528	0.0528
11	59.917	530	0.0530	0.0530
12	61.333	530	0.0530	0.0530

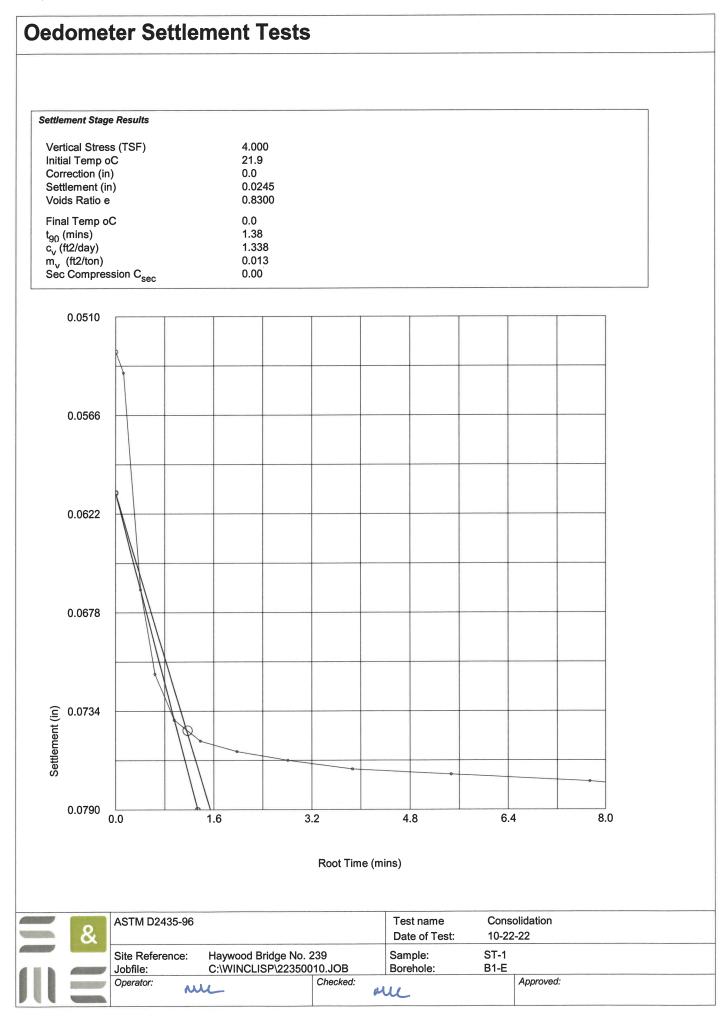
&	ASTM D2435-96			Test name Date of Test:	Consolidation Load: 2.000 (TSF) 10-22-22		
	Site Reference: Jobfile:	Haywood Bridge No. 2 C:\WINCLISP\223500		Sample: Borehole:	ST-1 B1-E		
	Operator:	n	Checked:	me		Approved:	



No.	Time (mins)	Displacement (divs)	Displacement (in)	Settlement (in)
1	0.000	530	0.0530	0.0530
2	0.017	542	0.0542	0.0542
3	0.167	665	0.0665	0.0665
4	0.417	713	0.0713	0.0713
5	0.917	739	0.0739	0.0739
6	1.917	751	0.0751	0.0751
7	3.917	757	0.0757	0.0757
8	7.917	762	0.0762	0.0762
9	14.917	767	0.0767	0.0767
10	29.917	770	0.0770	0.0770
11	59.917	774	0.0774	0.0774
12	65.117	775	0.0775	0.0775

&	ASTM D2435-96	
	Site Reference: Jobfile:	Haywood Bridge No. 239 C:\WINCLISP\22350010
	Operator:	L CI

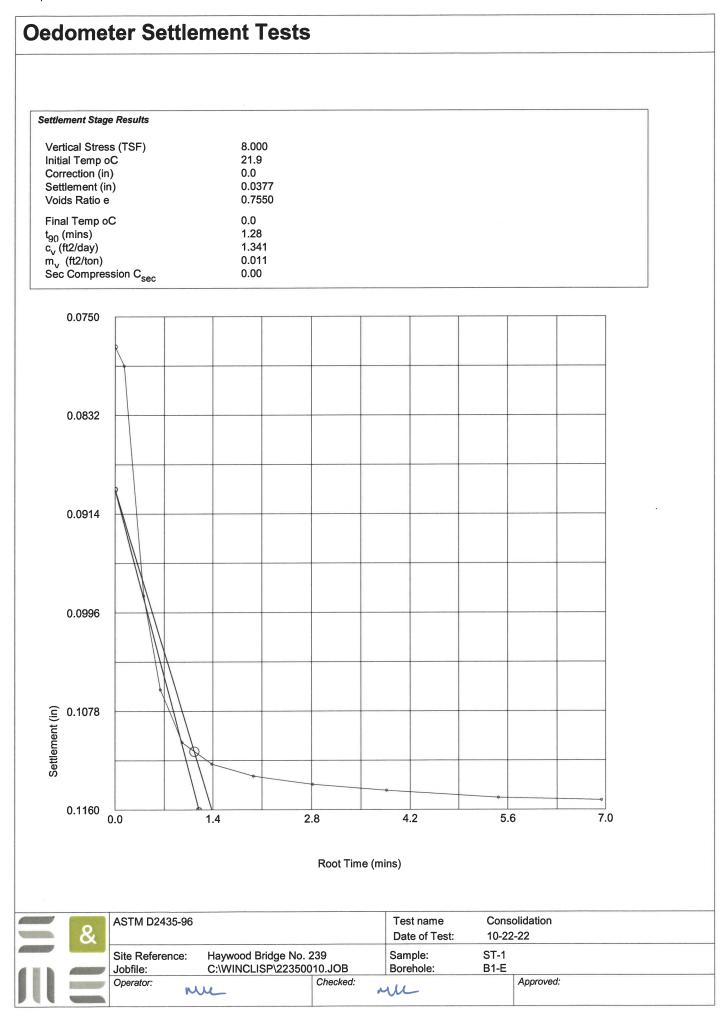
	Test name	Consolidation Load: 4.000 (TSF)
	Date of Test:	10-22-22
39 0.JOB	Sample: Borehole:	ST-1 B1-E
Checked:	ne	Approved:



	No.	Time (mins)	Displacement (divs)	Displacement (in)	Settlement (in)
	1	0.000	775	0.0775	0.0775
	2	0.017	791	0.0791	0.0791
	3	0.167	982	0.0982	0.0982
	4	0.417	1060	0.1060	0.1060
	5	0.917	1104	0.1104	0.1104
	6	1.917	1122	0.1122	0.1122
	7	3.917	1132	0.1132	0.1132
	8	7.917	1139	0.1139	0.1139
	9	14.917	1144	0.1144	0.1144
	10	29.917	1150	0.1150	0.1150
	11	48.217	1152	0.1152	0.1152
- 1					

&	ASTM D2435-96	)
	Site Reference: Jobfile:	Haywood Bridge No. 23 C:\WINCLISP\22350010
	Operator:	mu c

	Test name Date of Test:	Consolidation Load: 8.000 (TSF) 10-22-22
39 0.JOB	Sample: Borehole:	ST-1 B1-E
Checked:	me	Approved:



# SITE PHOTOGRAPH

Bridge No. 239 on -L- (I-40) over SR 1550 (Incinerator Rd.)



SHEET 35 55041.1.1 (HB-0003) Haywood Co.

#### **CONTENTS**

2

3

-5

SHEET NO. HB-0003REFERENCE

**DESCRIPTION** TITLE SHEET LEGEND (SOIL & ROCK) SITE PLAN CROSS SECTION BORE LOGS

## STATE OF NORTH CAROLINA

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

# **STRUCTURE** SUBSURFACE INVESTIGATION

COUNTY HAYWOOD

PROJECT DESCRIPTION REPLACE BRIDGE #239 **ON I-40 OVER SR 1550** 

SITE DESCRIPTION CULVERT EXTENSION -L- STA 188+00 - 189+00 OFFSET RT

# 5041 S PROJECT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HB-0003	1	5

#### CAUTION NOTICE

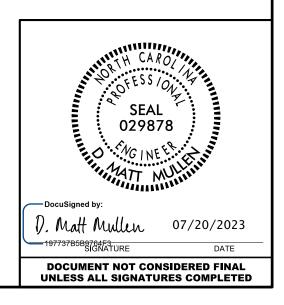
THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEICH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1991 707-6805. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

CENERAL 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 BORNIGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU UNI-FLACE)TEST DATA CAN BE RELIED ON ONLY TO THE DEOREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OSESTICATIONS ARE AS RECORDED AT THE TIME TO FTHE INVESTICATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE SOIL MOISTURE CONDITIONS MAY VARY. CONSIDERABLY WITH THE ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OF CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT, FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO PERFORM INDEPENDENT SUBSURFACE INVESTIGATIONS AND MAKE INTERPRETATIONS AS NECESSARY TO CONFIRM CONDITIONS ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FOM THE ACUAL CONDITIONS ENCOUNTERED AT THE SITE 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. 2.

TENJONNEL
CD JOHNSON
CE STEWMAN
CJ COFFEY
JD WORLEY
INVESTIGATED BY
DRAWN BY
CHECKED BY
SUBMITTED BY
DATE

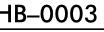


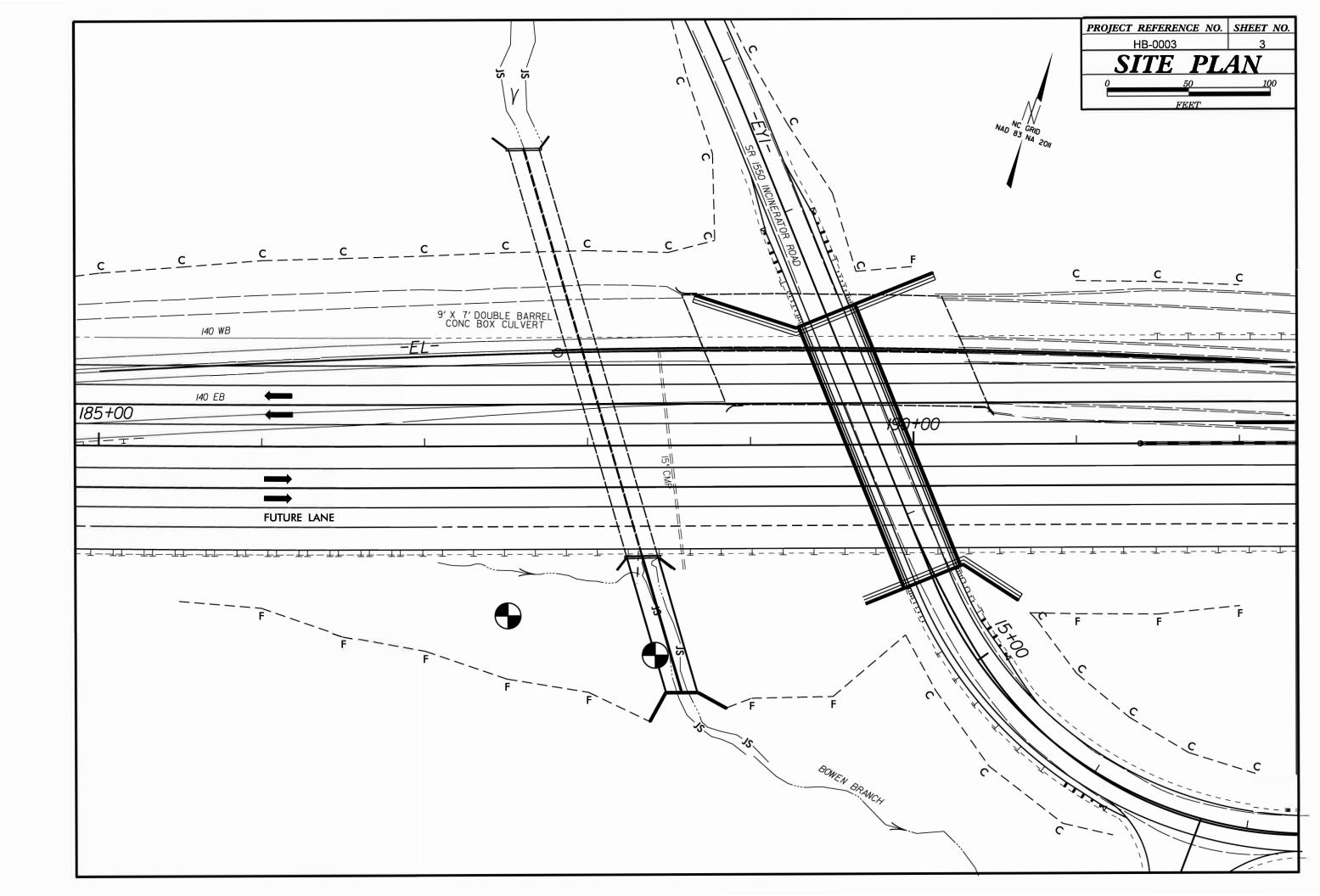
## NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

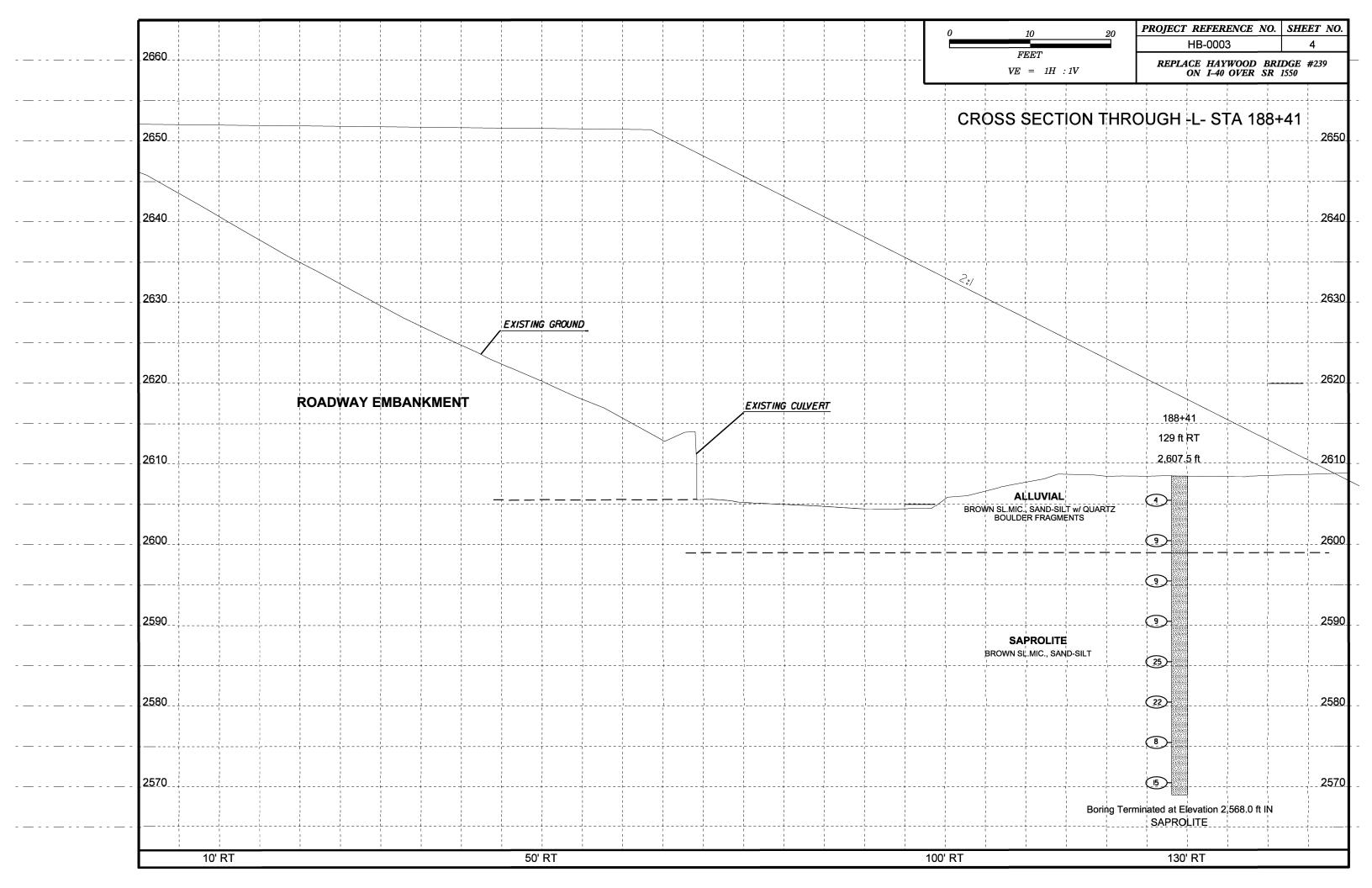
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

	CDADATION		
SOIL DESCRIPTION SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLICHT POWER AUGE AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM DIS66), SOIL CLASSIFICATION IS BASED ON THE AGSHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING; CONSISTENCY, COLOR, TEXTURE, MOISTURE, AGSHTO ULCASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	GRADATION           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	ROCK DESCRIPTION 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 EQUAL TO OR LESS THAN 0.1 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 DIVIDEO AS FOLLOWS:	TERMS AND DEFINITIONS <u>ALLUYIUM (ALLUY.)</u> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <u>AQUIFER</u> - A WATER BEARING FORMATION OR STRATA. <u>AREACEOUS</u> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6 SOLL LEGEND AND AASHTO CLASSIFICATION	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED. MINERALOGICAL COMPOSITION	WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.	<u>ARCILLACEOUS</u> - 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. <u>ARTESIAN</u> - 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
GENERAL CLASS.         GRANULAR MATERIALS ( ≤ 35% PASSING 2000)         SILT-CLAY MATERIALS ( > 35% PASSING 2000)         ORGANIC MATERIALS           GROUP CROUP         A-1         A-3         A-2         A-4         A-5         A-6         A-7         A-1, A-2         A-4, A-5           CLASS.         A-1-a         A-1-b         A-2-4         A-2-6         A-7         A-1, A-2         A-4, A-5	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE. COMPRESSIBILITY	CRYSTALLINE ROCK (CR) NON-CRYSTALLINE NON-CRYSTALLINE FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, COMEISS, GABBRO, SCHIST, ETC. NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SCHIMPTUREY ROCK THAT WOULD SPT REFUSAL IF TESTED	SURFACE. <u>CALCAREOUS (CALC.)</u> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <u>COLLUVIUM</u> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM
	SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	ROCK (NCR)	OF SLOPE. OF SLOPE. <u>CORE RECOVERY (REC.)</u> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
* 190 50 MX *10 50 MX 50 MX 51 MN *200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 36 MN	PERCENTAGE OF MATERIAL           ORGANIC MATERIAL         GRANULAR         SULT - CLAY           ORGANIC MATERIAL         SOILS         OTHER MATERIAL	(CP)         Image: CP         SHELL BEDS, ETC.           WEATHERING         WEATHERING           FRESH         ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER	<u>DIKE</u> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
MATERIAL PASSING *40 LL 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 50ILS WITH LL I 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 MN LITTLE OR	TRACE OF ORGANIC MATTER         2         - 3%         3         - 5%         TRACE         1         - 10%           LITTLE ORGANIC MATTER         3         - 5%         5         - 12%         LITTLE         10         - 20%           MODERATELY ORGANIC         5         - 10%         12         - 20%         SOME         20         - 35%           HIGHLY ORGANIC         > 10%         > 20%         HIGHLY         35%         AND ABOVE	HAMMER IF CRYSTALLINE. VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, (V SLI,) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR HAVE PERIAR PERIARS OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
PI         6         MX         NP         18         MX         11         MN         18         MX         18         MX         11         MN         11         MN </td <td>GROUND WATER</td> <td>OF A CRYSTALLINE NATURE. SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO (SLI,) I INCH, OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.</td> <td><math display="inline">\underline{FAULT}</math> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</td>	GROUND WATER	OF A CRYSTALLINE NATURE. SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO (SLI,) I INCH, OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	$\underline{FAULT}$ - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
UF NAJUK UKAVEL, KAU SAND GRAVEL AND SAND SOILS SOILS MATERIALS SAND GEN. RATING EVEL ENT TO COOD EALE TO DOOD FAIR TO DOOD INSULTA	▼ STATIC WATER LEVEL AFTER <u>24</u> HOURS ▼PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCULCINEL CHYSTALLINE HOLKS HING UNDER HAMMER BLOWS. MODEATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHENIG EFFECTS. IN 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	<u>FISSILE</u> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <u>FLOAT</u> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
AS SUBGRADE         LACLELER TO 0000         PHINTO FORM         POOR         FORM         OUSDING           PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ;PI OF A-7-6 SUBGROUP IS > LL - 30         CONSISTENCY OR DENSENESS         CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELOSPARS DULL SEVERE AND DISCOLORED AND A MAJORITY SHOW KAQLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH	<u>FLOOD PLAIN (FP)</u> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <u>FORMATION (FM.)</u> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY (N-VALUE) COMPRESSIVE STRENGTH (N-VALUE) COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )		(MOD. SEV.)       AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES 'CLUNK' SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> SEVER       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	<u>JOINT</u> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <u>LEDGE</u> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
GENERALLY         VERY LODSE         < 4           GRANULAR         LODSE         4 TO 10           MATERIAL         MEDIUM DENSE         10 TO 30         N/A           (NON-COHESIVE)         DENSE         30 TO 50         50	SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT AUGER BORING AUGER BOR	TO SOME EXTENT. SOME FRAGMENTS OF STRONG POLL IN GRANNING ROCK USUALLY REALDSHARS HAR KHOLINIZED IT SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <u>MOTTLED (MOT.)</u> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERT DENSE         2 50           VERY SOFT         < 2		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. <u>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</u>	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           MATERIAL         STIFF         8         TO         15         1         TO         2           (COHESIVE)         VERY         STIFF         15         TO         30         2         TO         4           HARD         >         30         >         4 <td>THETHER ROCK LINE MONITORING WELL TEST BOUNDARY A PIEZOMETER OF SPT N-VALUE</td> <td>COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS, QUARIZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS ALSO AN EXAMPLE.</td> <td>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.</td>	THETHER ROCK LINE MONITORING WELL TEST BOUNDARY A PIEZOMETER OF SPT N-VALUE	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS, QUARIZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS ALSO AN EXAMPLE.	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.
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS		SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	UNDERCUT UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE SHALLOW UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES 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.	$\underline{SILL}$ - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT. THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
BOULDER (BLDR.)         COBBLE (COB.)         GRAVEL (GR.)         COMOL SAND (GR.)         FML SAND (CSE. SD.)         SILT (F SD.)         CLAY (SL.)           GRAIN         MM         305         75         2.0         0.25         0.05         0.005	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	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.	<u>SLICKENSIDE</u> - 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
SIZE IN. 12 3 SOIL MOISTURE - CORRELATION OF TERMS	BT - BORING TERMINATED     MICA MICACEOUS     WEA WEATHERED       CL CLAY     MOD MODERATELY $\gamma$ - UNIT WEIGHT       CPT - CONE PENETRATION TEST     NP - NON PLASTIC $\gamma_d$ - DRY UNIT WEIGHT	MEDIUM HARD 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 I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.	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.
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTIO - SATURATED - USUALLY LIQUID; VERY WET, USUALLY	N         CSE - COARSE         ORG ORGANIC           DMT - DILATOMETER TEST         PMT - PRESSUREMETER TEST         SAMPLE ABBREVIATIONS           DPT - DYNAMIC PENETRATION TEST         SAP SAPROLITIC         S - BULK           e - vOID RATIO         SD SAND, SANDY         SS - SPLIT SPOON	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.	<u>STRATA CORE RECOVERY (SREC.)</u> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <u>STRATA ROCK QUALITY DESIGNATION (SROD)</u> - 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 _ LIOUID LIMIT (SAT.) FROM BELOW THE GROUND WATER TABLE	F - FINE         SL SLI.T.SILTY         ST - SHELBY TUBE           F0SS F0SSILIFEROUS         SLI SLIGHTLY         RS - ROCK           FRAC FRACTURED, FRACTURES         TCR - TRICOME REFUSAL         RT - RECOMPACTED TRIAXIAL	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.	THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
	FRAGS FRAGMENTS     W - MOISTURE     CONTENT     CBR - CALIFORNIA BEARING       HI HIGHLY     V - VERY     RATIO	FRACTURE         SPACING         BEDDING           TERM         SPACING         THICKNESS           VERY WIDE         MORE THAN 10 FEET         VERY THICKLY BEDDED         4 FEET	BENCH MARK: NA: ALL ELEVATIONS ARE DERIVED FROM DTM  ELEVATION: FEET
OMOPTIMUM_MOISTURE SLSHRINKAGE LIMIT	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: X CME-45C CLAY BITS X AUTOMATIC MANUAL	WIDE         3 TO 10 FEET         THICKLY BEDDED         1.5 - 4 FEET           MODERATELY CLOSE         1 TO 3 FEET         THINLY BEDDED         0.16 - 1.5 FEET           CLOSE         0.16 TO 1 FOOT         VERY THINLY BEDDED         0.08 - 0.016 FEET           VERY CLOSE         LESS THAN 0.16 FEET         THICKLY LAMINATED         0.008 - 0.03 FEET	NOTES:
	CME-55     CME-550     C	THINLY LAMINATED < 0.008 FEET INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
PLASTICITY_INDEX (PI)         DRY_STRENGTH           NON_PLASTIC         0-5         VERY_LOW           SLIGHTLY_PLASTIC         6-15         SLIGHT           MODERATELY_PLASTIC         16-25         WEDIUM	VANE SHEAR TEST     TUNGCARBIDE INSERTS       CASING     W/ ADVANCER	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
HIGHLY PLASTIC 26 OR MORE HIGH	PORTABLE HOIST     TRICONE     'STEEL TEETH     HAND AUGER     TUNGCARB.     SOUNDING ROD	MODERATELY INDURATED BRAKS EASILY WHEN HET STEEL FROME; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	CORE BIT	EXTREMELY INDURATED SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-14

## PROJECT REFERENCE NO. HB-0003







## GEOTECHNICAL BORING REPORT BORE LOG

							ORE L						
<b>VBS</b> 55041					P HB-0003	l	Y HAYWO			GEC	LOGIST Johnson		
					GE 239 ON I-40 OV	ER SR-15			-				UND WTR (f
BORING NO.	STA 1	88+41	1	ST	<b>ATION</b> 188+41		OFFSET			ALIC	GNMENT -L-	0 HF	<b>R.</b> 6.
OLLAR ELE					DTAL DEPTH 39.5 f		NORTHING				<b>TING</b> 848,373	24 HF	
RILL RIG/HAN	MMER EF	F./DAT	EAF	06744	CME - 45C 79% 04/11/20	)22		DRILL N	IETHOD	H.S. Auge	rs	HAMMER TYP	PE Automatic
DRILLER C	offey, Jr	., C.		ST	ART DATE 04/11/2	23	COMP. DA	<b>FE</b> 04/*	1/23	SUR	FACE WATER DEP	TH N/A	
EV DRIVE ELEV (ft)	DEPTH(ft)		N COU 0.5ft	JNT 0.5ft		PER FOOT 50	75 100	SAMP. NO.		L O <u>G</u> ELEV. (		CK DESCRIPTIO	ON DEPTH
<u>310</u>	-									- 2,607.5		D SURFACE	
605 2,604.5	- <u>3.0</u>	1	1	3	<ul> <li>↓ · · · · · · · · · · · · · · · · · · ·</li></ul>				M		BROWN SL.MIC., S	L <b>UVIAL</b> SAND-SILT w/ Q EFRAGMENTS	UARTZ
600 2,599.5	- - 8.0	4	4	5	······································				м	- - - - - - - - - - - - - - - - - - -			
595 2,594.5	13.0	6	3	6					M		SAP BROWN SL.I	ROLITE MIC., SAND-SIL	Т
590 2,589.5	- 18.0								М				
585		1	4	5					М				
- 2,584.5	23.0	8	11	14	••••••••••••••••••••••••••••••••••••••	· · · · ·			М	Ē			
580 2,579.5	28.0	5	10	12	22 · · · · · · · · · · · · · · · · · ·		· · · · · · · ·		М				
575 2,574.5	33.0	1	2	6	······································				м	E E			
570 2,569.5	38.0	7	8	7	• • • • • • • • • • • • • • • • • • •				М	2,568.0			0.0 ( 1)
											Boring Terminated a SAF	ROLITE	0.0 IC IIN