												BORING NUMBER: IVF-P3-4
6						R		NG)G		SHEET NUMBER: of3
Ba	PROJE	H-					(CC	ontinue	ed)			PROJECT NUMBER: 185615A
PRO	JECT:	B&	РТ	un	ne	l Replacen	nent P	roject				CONTRACTOR: E2CR, Inc.
LOC	ATION:	Bal	ltin	or	e, I	MD						DRILLER: S. Lyons
CLIE	NT: A	мті	RA	K								INSPECTOR A. Danivarov
	(J)				SA	MPLE		SOIL	. (Blows/	6 in.)		
H (feet)	IC LO(ows/ft)	Γ			et)	0/6	6/12	12/18	18/24	REC. (in.)	
DEPTH	RAPH	NG (BI		BER	30L	ГН (fee			CORING	ì		FIELD CLASSIFICATION AND REMARKS
	U	CASI	ТҮРЕ	NUM	SYMI	DEP1	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	
-												
-												
_												24.0
-			S	4		24.0 - 26.0	8	6	2	12	11	24.5' 24.5' 161 Y 24.00'-24.50': Tan and light brown coarse to fine 161 Y Quartz GRAVEL, little coarse to fine Sand, trace
- 25												Silt, loose, wet (GP) 24.50'-24.92': Light orange-brown and white coarse
-												to fine SAND, little Silty Clay, trace coarse to fine Gravel, loose, dry (SC, Residual Soil)
-												
-		-	S	5		29.0 - 31.0	9	10	8	7	24	157.1' Orange and green-white, tan and yellow Clayey SILT_trace coarse to fine Gravel (mica and quartz)
~ 30												trace Sand, very stiff, dry, slightly micaceous (ML, Residual Soil); $PP = 2.0 \text{ tsf}$
3/16/2												
RY.GLB												
- LIBRA			S	6		34.0 - 36.0	5	6	7	7	24	34.0' 152.1' White, gray and yellow-brown Silty CLAY, and
ш— 35												(CL, Residual Soil); $PP = 2.0$ tsf
J B&P T												
PH3.GP												
			s	7		39.0 - 41.0	6	7	7	9	24	Light gray-white Silty CLAY, little coarse to fine
^L d ⁹⁸ / ₈₈ – 40												Sand, stiff, dry (CL, Residual Soil); PP = 3.5 tsf
(FINAL)												
IG LOG												
P BORIN			s	8		44.0 - 46.0	10	18	20	36	24	44.0' 142 1' Dark green and light green-gray medium to fine
B&F												SAND, and Silt, dense, dry, relict foliation observed

SHEET NUMBER: 3 of 3 PROJECT: B&P Tunnel Replacement Project CONTRACTOR: E2CR, Inc. LOCATION: Baltimore, MD CLIENT: AMTRAK INSPECTOR: A. Daniyarov Image: transmission of the state of the s	Γ														BORING NUMBER: IVF-P3-4
Some Continued PROJECT NUMBER: 185615A PROJECT: B&P Tunnel Replacement Project CONTRACTOR: E2CR, Iac. LOCATION: Baltimore, MD DRILLER: S. Lyons CUIENT: AMTRAK INSPECTOR: A. Daniyarov Image: Solid Stream St		2						R		NG)G			SHEET NUMBER: <u>3</u> of <u>3</u>
PROJECT: B&P Tunnel Replacement Project CONTRACTOR: E2CR, Inc. LOCATION: Baltimore, MD DRILLER: S. Lyons CLIENT: AMTRAK INSPECTOR: A. Daniyarov		B&P	TUNNI	Et .					(CC	ontinue	ed)				PROJECT NUMBER: 185615A
LOCATION: Baltimore, MD DRILLER: S. Lyons CLIENT: AMTRAK INSPECTOR: A. Daniyarov Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Field CLASSIFICATION AND REMARKS Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Field CLASSIFICATION AND REMARKS Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Field CLASSIFICATION AND REMARKS Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Field CLASSIFICATION AND REMARKS Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.) Image: Solut (Blows/6 in.)<		PROJE	ECT:	B&	РT	un	ne	l Replacen	nent P	roject					CONTRACTOR: E2CR, Inc.
CLIENT: AMTRAK INSPECTOR: A. Daniyarov Image: Display the second se		LOCAT	TION:	Bal	ltin	or	e, I	MD							DRILLER: S. Lyons
Image: Problem 1 SAMPLE SOL (Blows6 in.) Image: Problem 2 Image: P		CLIEN	T: A	MTI	RA	K									INSPECTOR: A. Daniyarov
Image: Sec of the sec	ſ		(1)				SAI	MPLE		SOIL	. (Blows/	6 in.)			•
Line Bit of the second sec		l (feet)	IC LO(ows/ft)	Γ			et)	0/6	6/12	12/18	18/24	REC. (in.)		
Image: Second		DEPTH	RAPH	NG (BI		BER	30L	TH (fee			CORING	6			FIELD CLASSIFICATION AND REMARKS
(SM, Decomposed Rock)			Ū	CASII	TYPE	NUM	SYME	DEP1	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
-50 -40.0" -40.0" -50 -50 -50 -55 -55 -55 -55 -60 -50 -60 -50 -51 -50 -55 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 -50 <	ſ														(SM, Decomposed Rock)
-50 -49.0 49.0 -50 -50 -50 -55 -55 -55 -55 -55 -60 -55 -65 -55 -65 -55 -65 -55 -65 -55 -65 -55	╞														
55 - </td <td>╞</td> <td></td>	╞														
	┢				S	9		49.0 - 49.0	-100/0" -				0	49.0' 137.1	No recovery, spoon refusal.
	┟	- 50													(Spoon rerusal at 49 ft bgs, see Coring Log)
	ŀ														-
															-
	╞	- 55													_
	5/22														
	LB 3/16														-
	ARY.G														-
	LIBR														-
	TUNNE	- 60													-
	B&P.														
	H3.GP,														-
	NNEL P														-
	3&P TU	- 65													-
	NAL) E														-
	L0G (F.														
	DRING														-
	B&P B(1										

													BORING	NUMBER	R: JFW-1	[
2						R			: 1 C				SHEET I	NUMBER	: 1	of	2
Re P	TUNNE	Ļ															
DO	PROJEC	л											PROJEC	T NUMB	ER: 1	85615A	
PROJE	ECT: I	B&P	T	unn	nel	Replacem	ent Pr	oject					LOCATIO	ON: AMTH	RAK 1800	Falls Road;	om
	TION:	Balt	tim	ore	e, N	AD .							COORD	· N. storag	eshed	x, 020 W II 7 · 1 /18 8	0111 33 1
			AK Fî		2	Inc							SURFAC	CE EL EV	003.0 I 75.8 fe	5: 1,410,0 et	55.1
	FR	Hil	1		\ ,	IIIC.							DATUM:	Horizont	al: NAD	83/91	
INSPE	CTOR	: A.	ו Da	ani	vai	ov								Vertical:	NAVD 8	8	
DRILL	ING M	ETH	10): I	Hol	low Stem Au	gers; Di	amond	Coring.				START [DATE: 8/1	1/17 T	IME: 12:	30 pm
RIG T	YPE: (CMF	2-75	5, 1	[ru	ick Mount	ed, Au	tomat	ic Ham	mer			FINISH [DATE: 8/2	2/17 T	IME: 11:	38 am
			Au	ger		Split Spoon	Casi	ng	Pitcher	Grat	o Co	re Barrel		GROU	NDWATER	DATA	
Type/S	Symbo		HS	SA		S	NV	V	L	G]	C			Water Depth	Casing Depth	Hole Depth
I.D.			3.2	25"		1.375"	n/a		n/a	3.25	"	n/a	Date	Time	(ft)	(ft)	(ft)
O.D.			6.6	25"		2"	n/a	l	n/a	3.375	ш	n/a	8/2/17	9:36 am	27.4	29.0	30.0
Length	i		60	0"		24"	n/a		n/a	6"		n/a					
Hamm	er Wt.		n	/a		140lbs	D	rill Rod S	Size		Α						
Hamm	er Fal	I	n	/a		30"		I.D. (O.E	D.)	1	.219" (1	.75")					
	0				SA	MPLE		SOI	_ (Blows/	6 in.)							
(feet)	CLOC	ws/ft)				(0/6	6/12	12/18	18/24	REC.	1					
FTH	APHIC	G (Blo		R	Ы	H (feet			CORING		()	1	FIELD CL	ASSIFICAT	'ION AND F	REMARKS	
Ö	GR	CASIN	TYPE	NUMB	SYMB(DEPTH	RUN (in.)	REC.	REC.	L>4" (in.)	RQD	0.0'					
	÷	-	È				()	()	70	()	70	0.0	Note: Hand	excavated fo	r utility clea	arance, depth	ı
-													0.0'-7.5'				-
-			G	1		2.0 - 2.5	G	R	Α	В	6		DI I	C CD		c.	
L	**				ŕ								Sand, little S	e to fine GR Silt, dry (GM	AVEL, and I, Fill)	coarse to fir	le
										10772017							
-	***		G	2	\ge	4.0 - 4.5	G	R	A	В	6		Black, coars	e to fine SAl	ND, some c	oarse to fine	-
- 5	₩												Gravel, little	Silt, moist (SM, Fill)		_
3-			G	3		6.0 - 6.5	G	R	Α	В	6		DI I I.		C CLIP	11	
3/14/2			G	1	\frown	70 75	G	D		D	6		fine Gravel,	in, coarse to little Silt, mo	bist (SM, Fi	, little coarse ll)	to
LB LB	₩ <u>∧</u>			4	\bowtie	7.0 - 7.5	U	К	A	D	0		Black and ta	in, coarse to	fine SAND	, little coarse	to
			S	1		8.0 - 10.0	4	1	2	2	8		Black, gray,	and light gra	ay, coarse to	o fine GRAV	'EL,
-	\$ ₩0 45												little coarse (GP, Fill)	to fine Sand,	trace Silt,	very loose, di	ry _
- 	4.												(,)				_
148	*		1														-
	ж. т.																-
12 12 12	. ▲. ↔ ™		S	2		13.0 - 15.0	7	2	1	5	12		Light gray r	nedium to fi	ne GRAVE	I and coars	e to
													fine Sand, tr	ace Silt, root	fragments,	very loose,	dry _
	-A⊒ -4 												(GP, Fill)				
			1														_
L AAL)	***		1														-
	 1. ₩																-
			S	3		18.0 - 20.0	2	1	1	1	16						_
	*			5		10.0 20.0	-				10		Black and grave	ray, coarse to	o fine SANI very loose.	D, little medi dry (SP-SM	um
	SHOD.		1										Fill)	., ont,			· _
ñ			1														

PR LOI			B& Bal	P T tim	`un 10re K	nel e, N	B(I Replacen	ORI (co	ING ontinue roject	d))G			BORING NUMBER: JFW-1 SHEET NUMBER: 2 of 2 PROJECT NUMBER: 185615A CONTRACTOR: E2CR, Inc. DRILLER: E. Hill INSPECTOR: A. Daniyarov			
		(J)				SAI	MPLE		SOIL	. (Blows/	'6 in.)						
(foot)	l (leet)	IC LO	(tf/swc	Γ			it)	0/6	6/12	12/18	18/24	REC. (in.)					
		RAPH	IG (BI		3ER	SOL	H (fee			CORING	6			FIELD CLASSIFICATION AND REMARKS			
		ß	CASIN	TYPE	NUME	SYME	DEPT	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %					
- - - - - - -	5			- S - S - S	4 5 6		23.0 - 24.8 25.0 - 27.0 28.0 - 28.0	8 5 50/0"	5	5	50/3" 24	21 14 0	27.5' H 48.3'	S-4A: 23.0'-24.4': Black and brown, coarse to fine SAND, little Clayey Silt, little medium to fine Gravel, loose to medium dense, moist (SM, Fill) S-4B: 24.4'-24.8': Brown, gray, and white, coarse to fine GRAVEL, little coarse to fine Sand, trace Silt, loose to medium dense, moist (GP, Fill) S-5: Gray, coarse to fine GRAVEL, some coarse to fine Sand, trace Clayey Silt, medium dense, wet (GP, Fill) No Recovery. Spoon refusal at 28' bgs.; start coring at 29' bgs. (Spoon refusal at 29 ft bgs, see Coring Log)			
36 - 31472 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	0 5																
				-										-			

													BORING	NUMBER	R: JFW-2	2	
2						R		NG)C			SHEET I	NUMBER	:1	of	2
ReP	TUNNE	Ļ								G							
LCa	PROJEC	.1											PROJEC	T NUMB	ER: 1	85615A	
PROJE	ECT: E	3&P	Tı	ınn	el	Replacem	ent Pr	oject					LOCATIO	ON: AMTI	RAK 1800	Falls Road; - 103' E fro	m
	TON:	Balt		ore	, N	/ID							COORD	· N. \$58789	e shed	R, 105 E H F• 1 419 7	02 3
CONT	RACT	OR.	E2	CF	2.1	nc							SURFAC	E E E E E V.	: 69.9 fe	et	02.5
DRILLI	ER: E.	Hil			•	inc.							DATUM:	Horizont	al: NAD	83/91	
INSPE	CTOR	: A.	Da	niy	ar	OV								Vertical:	NAVD 8	8	
DRILLI	ING M	ETH): I	Ioll	low Stem Au	gers; Di	amond	Coring.				START I	DATE: 8/2	2/17 T	IME: 12:	17 pm
RIG T	(PE: C	CME	-75	5, T	ru	ick Mount	ed, Au	tomati	ic Ham	mer			FINISHL	DATE: 8/.	3/17 1	IME: 9:14	4 am
		. –	Au	ger	_	Split Spoon	Casi	ng	Pitcher	Grat		re Barrel		GROU		DATA	Holo
Type/S	Symbol		HS	SA	_	S	NV	V		G	<u> </u>	C	_		Depth	Depth	Depth
I.D.			3.2	.5"		1.375"	n/a		n/a	3.25	"	n/a	Date	Time	(ft)	(ft)	(ft)
O.D.			6.6	25"		2"	n/a		n/a	3.375	5"	n/a	8/3/17	8:45 am	19.9	30.0	50.0
Length			60)" /-	_	24"	n/a		n/a	6"		n/a					
Hamm	er vvt.		n	'a /-	_	140lbs	D	rill Rod S	Size	-	A	7510					
Hamm	er Fall		n/	a		30"		I.D. (O.L).)		.219" (1	.75")					
	U	0			SAI	MPLE		SOIL	_ (Blows/	6 in.)							
(feet	СГО	ws/ft				t)	0/6	6/12	12/18	18/24	REC. (in.)						
EPTH	APHI	G (Blo		ER	oL	H (feei			CORING		()	1	FIELD CL	ASSIFICAT	'ION AND F	REMARKS	
	В	CASIN	TYPE	NUMB	SYMB	DEPTI	RUN (in.)	REC.	REC.	L>4" (in.)	RQD	0.0'					
	÷												Note: Hand	excavated fo	or utility clea	arance, deptl	1
-													0.0'-10.0'.				-
-			G	1	$\overline{\mathbf{X}}$	2.0 - 2.5	G	R	Α	В	6		Brown tan	gray coarse	to fine SAT	VD some Sil	lt –
-	*												little coarse	to fine Grave	el, moist (Sl	M, Fill)	-
_			G	2		40-45	G	R	Δ	в	6						_
-				2	X	1.0 1.5	0	, K		Б			Tan, brown, Sand, dry (C	yellow, Silt	y CLAY, so	me coarse to	o fine
- 5	₩ •												, , , , , ,				_
4/22	1⊉4 1		G	3	\ge	6.0 - 6.5	G	R	Α	В	6		Tan, brown	and orange,	coarse to fi	ne SAND, so	ome -
- 3/1	4 O⊡-}												coarse to fin	e Gravel, litt	le Silty Cla	y, dry (SC, F	fill) _
1	₽		G	4		8.0 - 8.5	G	R	Α	В	6		Dia da accorr	- 4- E E A I			-
AKAK	\$ ₩ 0				\cap								Gravel, trace	e Silt, dry, ro	ot fragment	ts (SP-SM, F	Fill)
	40		G	5	X	9.5 - 10.0	G	R	A	B	6	10.0'	Black, coars	e to fine SA	ND. and coa	arse to fine	
	000		0	1		10.0 - 12.0	8	9	10	15	10	59.9'	Gravel, trace	e Silt, dry, ro	ot fragment	ts (SP-SM, F	Fill)
1 – 1 ×	200												little coarse	vn and gray, to fine Sand,	trace Silty	ne GRAVEI Clay, mediu	_, _ m
	000											12.5'	dense, dry, s	lightly mica	ceous (GP,	Residual Soi	il) _
H3.G			S	2		13.0 - 15.0	4	8	7	6	14	57.4'	0 1		C CAN		-
													Orange brov fine Gravel,	vn, coarse to little Silt, me	edium dense	, little medit e, dry, slight	im to ly _
													micaceous (S	SM, Residua	ıl Soil)		200
15 19																	_
NAL)												16.5'					
لـــــ 19	000											53.4'					-
<u> 6</u> LO	Pool		S	3		18.0 - 20.0	3	9	3	9	17		o .		C 07.5		_
	000												Orange brov to fine Sand.	vn, coarse to , trace Silty (Tine GRAV Clay, mediu	EL, and coa	urse bist,
а Хар В	001												slightly mica	aceous (GP,)	Residual Sc	oil)	_
	nVI		í					I	L								

PROJ LOCA CLIEN	VECT: ATION: NT: A	B& Bal	P T Itim	`un Ioro K	nel e, I	B(Replacen VID	ORI (co	ING ontinue roject	d))G		BORING NUMBER: JFW-2 SHEET NUMBER: <u>2</u> of _ PROJECT NUMBER: 185615A CONTRACTOR: E2CR, Inc. DRILLER: E. Hill INSPECTOR: A. Daniyarov	2
	ŋ		L		SA	MPLE		SOIL	. (Blows/	6 in.)			
H (feet	IIC LO	lows/ft				et)	0/6	6/12	12/18	18/24	REC. (in.)	FIELD CLASSIFICATION AND REMARKS	
DEPTI	RAPH	NG (B		BER	BOL	TH (fe			CORING	6			
	G	CASI	ТҮРЕ	NUM	SYM	DEP1	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
- - - - 25 -			S	4		23.0 - 25.0	4	9	13	28	24	Dark brown and gray, GRAVEL, little coarse t Sand, trace Silt, medium dense, wet, slightly micaceous (GP, Decomposed Rock)	- to fine - - -
_			3	5		20.0 - 20.5	50/0				0	Dark brown and gray, GRAVEL, little coarse t Sand, trace Silt, very dense, dry, slightly micac	to fine ceous
-30-	°00		s	-6		30.0 - 30.0	-50/0"				0	30.0'	_
NG LOG (FINAL) B&P IUNNEL PH3.GPJ B&P IUNNEL - LIBKAKY.GLB 3/14/22												(Spoon refusal at 30 ft bgs, see Coring Log)	- - - - - - - - - - - - - - - - - - -
о 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2													-

													BORING	NUMBER	R: JFW-	3	
2						R			: 1 0)G			SHEET N	NUMBER	:1	of	2
BaP	TUNNE	1															
LOG	PROJEC	.1											PROJEC	T NUMB	ER: 1	85615A	
PROJE	ECT: I	B&P	T	inn	el	Replacem	ent Pr	oject					LOCATIO	ON: AMTI	RAK 1800	Falls Road;	F
	FION:	Balt	im	ore	, N	1 D							COORD	· N. abutm	ent of Nor	th Avenue b	ridge
			AN Fû		2 1	ne							SURFAC	CE FL EV	· 64.4 fe	L. 1,417,0 et	40.0
	FR· E	Hil			` , I								DATUM:	Horizont	al: NAD	83/91	
INSPE	CTOR	R: B .	G	odfi	ev									Vertical:	NAVD 8	8	
DRILLI	NG M	ETH): I	Ioll	ow Stem Au	gers; Di	amond	Coring.				START [DATE: 8/4	4/17 T	IME: 1:0	0 pm
RIG TY	/PE: (CME	2-75	5, T	ru	ck Mount	ed, Au	tomat	ic Ham	mer			FINISH D	DATE: 8/	10/17 T	IME: 12:	15 pm
			Au	ger		Split Spoon	Casir	ng	Pitcher	Grat	o Co	re Barrel		GROU	NDWATER	DATA	
Type/S	ymbo		HS	SA		S	NV	V	L	G]	C	_		Water Depth	Casing Depth	Hole Depth
I.D.			3.2	.5"		1.375"	n/a	ι	n/a	3.25	"	n/a	Date	Time	(ft)	(ft)	(ft)
O.D.			6.6	25"		2"	n/a	l I	n/a	3.375	;"	n/a					
Length			60)"		24"	n/a	l I	n/a	6"		n/a					
Hamm	er Wt.		n	′a		140lbs	D	rill Rod S	Size		Α						
Hamm	er Fal		n	/a		30"]	I.D. (O.E	D.)	1	.219" (1	.75")					
				}	SAN	MPLE		SOI	L (Blows/6	6 in.)							
eet)	L00	s/ft)					0/6	6/12	12/10	10/24	REC.	1					
TH (f	НС	Blow				eet)	0/0	0/12	12/10	10/24	(in.)		FIELD CL	ASSIFICAT	TON AND F	REMARKS	
EPI	AP	NG (F		BER	SOL	H (fe			CORING								
	Ū	ASIN	γPE	IUM	YME	EPT	RUN	REC.	REC.	L>4"	RQD	1					
<u> </u>	- 4 4 .	0	⊢	z	S		(in.)	(in.)	%	(in.)	%	0.0'	Note: Hand	excavated fo	r utility cle	arance denti	1
-													0.0'-8.0'		i atility elec	aranee, aepa	
			G	1		20-25	G	P	Δ	в	6						_
	"_db"		ľ	1	${ imes}$	2.0 - 2.5	U	K	Λ	D			Black, coars	e to fine SA	ND, and co	arse to fine	
F	Ku .												Graver (enia	er), nuie Sh	, moist (bit	i, i iii <i>)</i>	-
	*2		G	2	\times	4.0 - 4.5	G	R	Α	В	6		Gray brown	and gray, co	parse to fine	SAND, little	- e
- 5													medium to fi	ine Gravel, l	ittle Silty C	lay, moist (S	С, _
u —			G	3		60-65	G	R	Δ	в	6		rm)				-
	**			5	X	0.0 - 0.5	U	K	11	D			Brown and o medium to fi	orange, coars	se to fine SA	AND, some)
2	***		G	4		7.5 - 8.0	G	R	A	В	6		D				· -
-			S	1	\land	8.0 - 8.3	50/3"				2		Brown, coar Gravel, little	se to fine SA Silt, moist (ND, little r SM, Fill)	nedium to fir	ie _
-	*												Gray, coarse	to fine GRA	AVEL (boul	lder fragmen	ts), _
10	140. 1*₩												Note: Rig ch	attering at ~	8.0'-9.0'.	y (011, 1 m)	_
2			1														_
-	¥ 0.																-
-	A 43		S	2		13.0 - 15.0	4	2	1	1	8		Brown bloo	CLAV 14	tle coarse t	o fine Sand	race
													fine Gravel,	soft, moist (CL, Fill)	o mie odnu,	
15	40 . 4 ₩∧ 0																
15			1														_
	*											16.5'					-
												47.9'					-
			S	3		18.0 - 20.0	4	7	5	5	6		-	a			-
						20.0				-			Tan, coarse moist (SM, I	to fine SAN Residual Soi	D, and Silt, l)	medium den	se,
8													× -)-				_
	1.1.1.1.1		1	l				L	1		1	1					

PROJE	ECT:	E B&	РТ	ſun	ne	B (ORI (co	ING ontinue roject	BORING NUMBER: JFW-3 SHEET NUMBER: 2 of 2 PROJECT NUMBER: 185615A CONTRACTOR: E2CR, Inc.			
LOCA	TION:	Bal	tin	ore	e, I	MD						DRILLER: E. Hill
CLIEN	T: A	МТІ	RA	K								INSPECTOR: B. Godfrey
f	DG	t)	L		SAI	MPLE		SOIL	. (Blows/	6 in.)		
H (fee	HIC LC	3lows/f				set)	0/6	6/12	12/18	18/24	REC. (in.)	FIELD CLASSIFICATION AND REMARKS
DEPT	GRAPI	sing (E	ш	ABER	ABOL	отн (fe			CORING			_
		CAS	ТҮР	NUN	SYN	DEF	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %)
- - - 25 - - - - 30			S S	4		23.0 - 23.9 26.5 - 26.7	15 50/2"	50/5"			2	Tan, coarse to fine SAND, some Silt, very dense, moist (SM, Residual Soil) 25.2' 39.2' 26.7' 37.7 Light gray, tan, coarse to fine GRAVEL, little coarse to fine Sand, little Silt, very dense, moist (GM, Decomposed Rock) (Spoon refusal at 26.67 ft bgs, see Coring Log)

													BORING		R: JFW-4	4	
2						R				C			SHEET	NUMBER:	1	of	2
D.D	TUNNE					D		NC		G							
Dor	PROJEC	π											PROJEC	T NUMB	ER: 1	85615A	
PROJE	ECT: I	B&P	• Tı	unr	ıel	Replacem	ent Pr	oject					LOCATIO	ON: AMTH	RAK 1800	Falls Road;	
LOCAT	FION:	Bal	tim	ore	e, I	MD								Charle	es Interloci d down stra	k; in front o ucture	f
CLIEN	T: AN	ITR	Ak			T								.: N: 598,9	992.3	£: 1,419,7	25.2
CONTI		OR:	E	2CI	R , .	Inc.								Horizont	64.0 Ie	et 83/01	
	ER: E	. Hill	l Da	ni	VOI	2017							DATON.	Vertical:	NAVD 8	8	
				amı ⊃∙ı	ya. Hol	l UV low Stem Au	gers: Di	amond	Coring				START	DATE: 8/3	3/17 т	IME: 10:	30 am
RIGTY	PE: I)-50	. T	ruc	k	Mounted.	Autom	atic H	ammer				FINISH [DATE: 8/3	3/17 T	IME: 2:3	0 pm
			Au	ger		Split Spoon	Casir	ng	Pitcher	Grat	o Co	re Barrel		GROUI	NDWATER	DATA	
Type/S	Symbo	ı 🗖	HS	SA		S	NV	V	L	G	1	C			Water	Casing	Hole
I.D.			3.2	25"		1.375"	n/a		n/a	3.25		n/a	Date	Time	Depth (ft)	Depth (ft)	Depth (ft)
O.D.			6.6	25"		2"	n/a		n/a	3.375	5"	n/a	8/3/17	11:00 am	13.3	13.0	13.0
Lenath			6	0"		24"	n/a		n/a	6"		n/a					
Hamm	er Wt		n	/a		140lbs	D	rill Rod S	Size		A	upper en 1931					
Hamm	er Fal	ì⊢	n	/a		30"		Ι.D. (О Г).)	1	.219" (1	.75")	1				
Tidinini			Τ			50		I.D. (0.E	.,		.215 (1						
	U	(L		SA	MPLE		SOI	_ (Blows/6	5 in.)							
(feet	2	vs/ft					0/6	6/12	12/18	18/24	REC.						
Ξ	¥	(Blo		~		feet)					(in.)		FIELD CI	LASSIFICAT	ION AND F	REMARKS	
DEP	RAF	NG		BEF	BOL	TH (CORING								
	0	SASI	γPI	NUM	NΛ	DEP.	RUN	REC.	REC.	L>4"	RQD	0.01					
	4. ⊲	0	F	~	0,		(111.)	(111.)	70	(111.)	70	0.0	Note: Hand	excavated fo	r utility clea	arance, depth	1
-													0.0'-6.0'		,	, I	-
L	*		G	1		20.25	G	D	Δ	р	6						
	°-∂-		ľ	1	X	2.0 - 2.5	U	K	Α	D	0		Tan, brown,	black, coars	e to fine Gl	RAVEL, and	
-	×⊡ .2												coarse to mi	e Band, intre	Sin, moist	(0141, 1111)	-
-	₩₽		G	2		4.0 - 4.5	G	R	Α	В	6		Tan, light bi	own, red. co	arse to fine	SAND. little	- Silt.
- 5													little coarse	to fine round	led to subro	unded Grave	el, _
			G	3		5.5 - 6.0	G	R	A	В	6		Note: Assun	ned boulder f	from 4.5' to	6.0' below	
14/22			2	1		0.0 - 8.0	9	0	9	0	10		ground surfa	ace; difficult	to drill.	little coarse	-
р Д	41 4												fine Gravel,	moist (SM, I	Fill)	, intre coarse	-
- -			S	2		8.0 - 10.0	2	4	5	5	0		Orange and to fine Sand	tan, coarse to trace Silt. n	o fine GRA 1edium den	VEL, and co se. drv (GP.	arse Fill) -
RAP	\$												No Recovery	y		, ., (,	
	40																
⊒ <u>⊢</u> 10	* 3		1														
2-	- Rod											11.5'					-
												52.5'					_
3.GP				-		12.0 12.0		50/5"				12-21					
			S	3		13.0 - 13.9	20	50/5"				13.3	S-3A: 13.0'-	13.3': Orange	e brown and	d gray, coars	e to
												50.7	fine SAND, Gravel, very	dense, dry (Silt, trace c SM, Residu	oarse to fine al Soil)	/ -
15													S-3B: 13.3'-	13.9': Gray, o	coarse to fin	e Silty CLA	Y, _
-) B&													and coarse t Soil)	o fine Sand,	nard, wet (L, Residua	
INAL													/				-
- 90																	=
			S	4		18.0 - 20.0	2	2	3	4	10		Grav and be	own coarse	to fine Silts	CLAV and	-
NOKI													coarse to fin	e Sand, trace	e medium to	fine Gravel	, _
2 XX L													medium stif	t, wet (CL, R	lesidual Soi	1)	
	11111		<u> </u>	l													

														BORING NUMBER: JFW-4
6		2					R		NG)G			SHEET NUMBER: of
B	8PH	INNE	4						ontinue	ed)				105/15
										,				PROJECT NUMBER: 183015A
PR	OJEC	T:	B&	РT	un	ne	l Replacen	nent P	roject					CONTRACTOR: E2CR, Inc.
LO	CATIC	ON:	Bal	tim	ore	e, I	MD							DRILLER: E. Hill
CLI	ENT:	A	MTF	RAI	K									INSPECTOR: A. Daniyarov
		с	_			SA	MPLE		SOIL	. (Blows/	6 in.)			
(fact		CLO	ws/ft)	Γ			t)	0/6	6/12	12/18	18/24	REC.		
HTO		HHH	3 (Blo		R	Ы	(feel			CORING	<u> </u>	()		FIELD CLASSIFICATION AND REMARKS
	5	GR	SINC	ΡE	JMBE	MBC	EPTH	RUN	REC.	REC.	L>4"	RQD	{	
			CA	Ţ	N	Sγ	DE	(in.)	(in.)	%	(in.)	%		
-														-
-		$\langle \rangle$												-
_				s	5		23.0 - 25.0	8	13	18	31	22	23.2'	
-							Paradane Shures, K. Korasane						40.8	S-5A: 23.0-23.2": Gray and brown, coarse to fine Silty CLAY, and coarse to fine Sand, hard, wet (CL,
21	5													Residual Soil) // S-5B: 23.2'-24.8': Light gray and gray, coarse to fine
													5	SAND, little Silt, trace medium to fine Gravel, dense, dry, micaceous (SM, Decomposed Rock)
_					(28.0. 28.0	20	50/5"					-
-				2	6		28.0 - 28.9	20	50/5"			11		Yellow gray and light gray, coarse to fine SAND, little Silt, trace fine Gravel, very dense, dry,
				1									1	micaceous (SM, Decomposed Rock)
- 30)			1										-
14/22				1										-
– ° ГР °														-
AKT.G				S	7		33.0 - 33.8	33	50/3"			9		Yellow gray, light gray, and orange, coarse to fine
				S	8		33.8 - 33.8	30/0"				0	- 1	SAND, little Sult, trace line Gravel, very dense, dry, micaceous (SM, Decomposed Rock)
- 3ť	5													(Spoon refusal at 34.3 ft bgs, see Coring Log)
л Т														-
-														-
- 13.														-
														-
- 	5	-												-
														-
- -														-
		-												-
P P		-												-
Noto:														

													BORING	NUMBER	R: SA-P3	-1	
62	-					B							SHEET N	UMBER	: 1	of	2
R.D	TUNN	EL.				D		NG		JG							
DO	PROJE	ст											PROJEC	T NUMB	ER: 1	85615A	
PROJE	ECT:	B&P	T	unn	el	Replacem	ent Pr	oject					LOCATIO	DN: SW co	rner of Mo	osher St. an	d N.
LOCAT		Bal	tim	ore	e, N	1D							COOPD	• N. 504	0300 T	. 1 411 4	70 7
CLIEN			AK E			[no							SURFAC	1N: 594, E EL EV	939.0 E 158.6 f	L: 1,411,4 Cot	/0./
		UR.			κ, Ι	Inc.								Horizont	al: NAD	83/91	
INSPE		R Lyu	Ds Ds	aniv	var	ov							D/ (I OIN.	Vertical:	NAVD 8	8	
DRILLI	ING N	1ETH	10	D: 1	Holl	ow Stem Au	gers; Di	amond (Coring.				START [DATE: 8/2	21/17 т	IME: 1:4	5 pm
RIG TY	PE:	CMF	2-55	5, T	ru	ck Mount	ed, Au	tomati	c Ham	mer			FINISH D	DATE: 8/2	22/17 T	IME: 4:10	6 pm
			Au	ger		Split Spoon	Casir	ng	Pitcher	Grab	o Co	re Barrel		GROU	NDWATER	DATA	
Type/S	Symbo	bl	HS	SA		S	N۷	V	L	G]	C			Water	Casing	Hole Dopth
I.D.			3.2	25"		1.375"	3.0	u.	n/a	3.25	"	n/a	Date	Time	(ft)	(ft)	(ft)
O.D.			6.6	25"		2"	3.5		n/a	3.375	pu -	n/a	8/23/17	7:15 am	9.9	37.5	66.0
Length			60	0"		24"	60'		n/a	6"		n/a					
Hamm	er Wt		n	/a		140lbs	D	rill Rod S	Size		Α		1				
Hamm	er Fa	II 🗌	n	/a		30")	I.D. (O.D	.)	1	.219" (1	.75")					
			Γ		SAI			SOIL	(Blows/	6 in)				1			
et)	bo	ft)	┝							0 111.)	DEO						
l (fee	CL	/swc				et)	0/6	6/12	12/18	18/24	(in.)						
PTH	HI	BIG (BIG		К	۲	(fee			CORING			1	FIELD CL	ASSIFICAT	ION AND F	REMARKS	
В	GR/	NIS	Ш	MBE	MBC	РТН	DUN	DEC		1 > 4"	DOD	4					
		CAS	T	NN	SΥΙ	DEI	(in.)	(in.)	8EC. %	L>4 (in.)	RQD %	0.0'					
												1.0'	4" Asphalt; 8	3" Concrete			
-1	Å.		1									157.6'	Note: Hand	excavated fo	r utility clea	rance, depth	1
-	0⊡		G	1	\times	2.0 - 2.5	G	R	Α	В	6		0.0'-10.0' Dark grav co	arse to fine	GRAVEL	little coarse t	-
-	*				\square								fine Sand, tra	ace Silty Cla	iy, moist (G	P, Fill)	-
	°		G	2		10 15	G	р	٨	D	6						
				2	X	4.0 - 4.5	U	K	A	D	0		Black and da	ark gray coa	rse to fine S	AND, trace	
- 5	*/		1										moist (SM, H	Fill)	nne Sin, ioc	n naginents.	· _
- 53	₩		G	3	\times	6.0 - 6.5	G	R	Α	В	6		Brown and 1	ight grav Sil	tv CLAY s	ome coarse	to _
3/14	4 4	<u> </u>											fine Sand, lit	tle medium	to fine Grav	vel, moist (C	L, _
GLB			C	1		00 05	C	р		р	6		Fill)				
ZARY	***		G	4	\boxtimes	0.0 - 8.3	U	K	A	D	0		Gray, light g	ray, red-bro	wn and blad	ck medium t	o
- IB			G	5		95-100	G	R	А	в	6		Clay (in pocl	kets), moist,	trace cinde	rs (GP, Fill)	.y _
ú 10	***	-	S	1	\times	10.0 - 12.0	2	3	2	2	17		Black and da	ark gray med Sand little	lium to fine	GRAVEL,	little
	134⊡. 143												plastic fragm	ents (GM, I	Fill)	uce emacrs,	_
В&Р													SAND, little	medium to	fine Gravel,	little Silty C	lay
GPJ	*		1										(in pockets),	trace wood	fragments,	very loose to	,
- H3.	Skin (S	2		13.0 - 15.0	1	WOH	WOH	1	18		Dark gray, li	ght gray and	d red-brown	coarse to fi	ne –
		ļ											GRAVEL, so	ome Clayey	Silt, little co	parse to fine	-
													Sand, very IC	Jose, wet (G	wi, i'iii)		
0 B&F	40.4																
			1									16.5'					
д (F												142.1'					-
- IC		1	S	3		18.0 - 20.0	WOH	WOH	WOH	WOH	18		C 1	1 1	OT AND POST	1.	_
ORIN													Gray and yel fine Sand, ve	llow-brown ery soft, moi	CLAY, little st (CL)	e medium to	
&P B			1										,				_
m	X/////	1	1	1													

PROJI LOCA CLIEN	ECT: TION: IT: A	B& Bal	P T tim RAI	`un 10r0 K	nel e, N	B Replacen MD	ORI (cc	ntinue	i LC	OG			BORING NUMBER: SA-P3-1 SHEET NUMBER: 2 of 2 PROJECT NUMBER: 185615A CONTRACTOR: E2CR, Inc. DRILLER: S. Lyons INSPECTOR: A. Daniyarov
	(1)				SA	MPLE		SOIL	. (Blows/	6 in.)			
H (feet)	IC LOG	ows/ft)				st)	0/6	6/12	12/18	18/24	REC. (in.)		
DEPTH	RAPH	NG (BI		BER	SOL	ГН (fee			CORING	6			FIELD CLASSIFICATION AND REMARKS
	ß	CASII	ТҮРЕ	MUN	SYME	DEP1	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
- - - - 25 -			S	4		23.0 - 25.0	11	13	13	10	14	21.5' 137.1' 26.5'	Dark gray and orange-brown coarse to fine GRAVEL (pure quartz), little medium to fine Sand, little Silt, medium dense, moist (GM)
- - - - 30			S	5		28.0 - 28.4	100/5"				5	132.1'	Gray and light gray with speckles of black medium to fine SAND, little Silt, very dense, moist (SM, Decomposed Rock)
901 B&P 100NEL - LIBRARY.GLB 301			S	6		33.0 - 33.1	100/1"				1	37.5'	Gray and light gray with speckles of black medium to fine SAND, little Silt, very dense, moist (SM, Decomposed Rock)
			-			37.3 - 37.5	-100/0"-				0	121.1	No recovery, spoon refusal. (Spoon refusal at 37.5 ft bgs, see Coring Log)

													BORING	NUMBER	R: SA-P3	-3	
2						B		NG		SHEET N	NUMBER	:1	of	2			
Ber	TUNNE	Ļ															
	PROJEC	.1											PROJEC	T NUMB	ER: 1	85615A	
PROJE	ECT: I	3&P	Tı	inn	el	Replacem	ent Pr	oject					LOCATIO	ON: Alley	of 1030 N. I	Payson Stre	et
	TON:	Bali ITD		ore	, IV	/ID							COORD	· N· 595	215 7 1	E• 1 411 5	24 5
CONT	RACT	OR.	E2	CF	2.1	nc							SURFAC	E ELEV.	: 160.0 f	eet	27.5
DRILL	ER: S.	Lvo	ons		•, •	inc.							DATUM:	Horizont	al: NAD	83/91	
INSPE	CTOR	: Ă.	Da	niy	ar	'OV								Vertical:	NAVD 8	8	
DRILL	ING M	ETH): H	Ioll	ow Stem Au	gers; Ro	otary W	ash; Dia	mond C	oring.		START [DATE: 1/	10/18 T	IME: 7:4	5 am
RIG T	YPE: (CME	2-55	5, T	ru	ck Mount	ed, Au	tomati	ic Ham	mer			FINISH	DATE: 1/	11/18 T	IME: 9:1:	5 am
			Au	ger		Split Spoon	Casir	ng	Pitcher	Grat		ore Barrel		GROU	NDWATER	DATA	
Type/S	Symbol		HS	SA		S	NV	V	L	G	1	C	4		Water Depth	Casing Depth	Hole Depth
I.D.			4.2	5"		1.375"	3.0	"	2.86	3.25	"	n/a	Date	Time	(ft)	(ft)	(ft)
O.D.			7.62	25"		2"	3.5	"	3	3.375	5"	n/a	1/11/18	7:45 am	10.3	31.0	60.0
Length	1		60)"		24"	60'	'	24	6"		n/a					
Hamm	er Wt.		n/	a		140lbs	D	rill Rod S	Size		Α						
Hamm	er Fal		n/	a		30")	I.D. (O.E	D.)	1	.219" (1	.75")					
	0			5	SAM	MPLE		SOIL	_ (Blows/	6 in.)							
(feet)	L LOC	vs/ft)				-	0/6	6/12	12/18	18/24	REC.						
PTH	APHIC	G (Blov		К	٦L	l (feet)			CORING		(11.)		FIELD CL	ASSIFICAT	TON AND F	REMARKS	
L H	GR	ASING	ΥPΕ	IUMB	YMBC	ЕРТН	RUN	REC.	REC.	L>4"	RQD						
 	- A	0	-	2	0		(in.)	(In.)	%	(In.)	%	0.0'	0' 2' Priale E	no ano onta			
-:													Note: Hand	excavated for	or utility clea	arance, depth	1 –
			G	1		20-25	G	R	Δ	в	6		0.0'-10'				-
			Ŭ	1	Х	2.0 - 2.5	U	K	Λ	D			Brown coars Gravel trace	e to fine SA Silty Clay	ND, some c	coarse to fine) D
Ē	vi .v												Fill)	c c		(), ary ().	-, _
-	**		G	2	X	4.0 - 4.5	G	R	Α	В	6		Note: Timbe Brown and 1	r fragments ight gray co	at 3.5' bgs. arse to fine	SAND, some	- e
- 5	10 k												coarse to fin	e Gravel, litt	le Silty Cla	y, brick	_
N-			G	3		60-65	G	R	А	в	6		fragments af	ia ciliacis, a	uy (SC, 111)	_
1/14/2				5	X	0.0 0.5	0	X	1	D			Brown and 1 coarse to fin	ight gray co e Gravel, litt	arse to fine le Silty Cla	SAND, some v. brick	e
- 3 -	\$2 <												fragments ar	nd cinders, n	noist (SC, F	ill)	-
LKY.G			G	4		8.0 - 8.5	G	R	Α	В	6		Brown, light	gray and bl	ack coarse	to fine SANI	D, -
- I	*												some coarse	to fine Grav	vel, little Silt	y Clay, brick	د _
	46.		S	1		10.0 - 12.0	3	1	2	2	11		nagments al	ia cinacis, li		ш)	_
				1		10.0 - 12.0	5	1	2	2			Dark gray and	nd black coa e Gravel litt	rse to fine Silty Clar	SAND, and	
1 L	× A		1										moist, brick,	cinder, and	glass fragn	nents (SC, Fi	, 11) –
																	-
H3.G																	-
	*		c	2		14.0 - 16.0	3	WOH	1	1	1						_
	44		3	2		10.0 - 10.0	5	won	1	1			Black and lig	ght gray med	dium to fine	GRAVEL, l	little
15 ¹			1										brick, cinder	, wood and	glass fragm	ents (GP, Fil	ll) —
	*																-
1 (EII																	-
																	_
ORING						10.0				_							
т – Т			S	3		19.0 - 21.0	WOH	1	3	1	1		Dark gray a	nd black coa	rse to fine S	SAND, little	-
B	1 1		1										medium to f	ne Gravel, l	ittle Silt, ver	ry loose, wet	,

0	-												BORING NUMBER: SA-P3-3
2						B	ORI	NG	LC)G			SHEET NUMBER: 2 of 2
B&P	PROJEC						(co	ontinue	ed)				PROJECT NUMBER: 185615A
PROJE	ECT:	B&	РТ	un	ne	l Replacen	nent Pi	roject					CONTRACTOR: E2CR, Inc.
LOCA	TION:	Bal	tin	ore	e, I	MD							DRILLER: S. Lyons
CLIEN	IT: A	MTH	RAJ	K									INSPECTOR: A. Daniyarov
	(J)				SAI	MPLE		SOIL	. (Blows/	6 in.)			
H (feet)	IC LOG	ows/ft)				et)	0/6	6/12	12/18	18/24	REC. (in.)	1	
EPTH	RAPH	NG (BI		3ER	SOL	H (fee			CORING	i		1	FIELD CLASSIFICATION AND REMARKS
	GF	CASIN	TYPE	NUME	SYME	DEPT	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	1	
- - - - 25	₩ ₩ ₩ ₩ ₩ ₩ ₩ ₩		- S	4		24.0 - 26.0	10	14	24	63	9	24.0' 136.0' (1 5	cinder and brick fragments (SM, Fill)
- - - - 30			S	5		29.0 - 29.2	100/2"				2	31.0'	Gray and light gray with speckles of black and dark red coarse to fine SAND, some coarse to fine Quartz Gravel, little Silt, very dense, wet, relict layering observed, slightly micaceous (SM, Decomposed
	30 5 6 31.0 -						100/0					129.0	Rock) No recovery, spoon refusal. (Spoon refusal at 31 ft bgs, see Coring Log)
40			-										-
8			1		1								

													BORING	NUMBER	R: S-P3- E	B12	
2	-					B		ING)G			SHEET N	UMBER	1	of	2
BeP	TUNNI	4														05(15)	
	TROOD												PROJEC	T NUMB	ER: I	85615A	
PROJE		B&F	? Tı tim	unn		Replacem	ent Pr	oject					LOCATIO	ON: Across	s from 227	N. Warwich	c Ave.
CLIEN	T: AN	Jai ATR	AK	C	, 1	μ							COORD.	: N: 591,	824.1 I	E: 1,409,6	41.0
CONT	RACT	OR	E	- 2CF	R , I	Inc.							SURFAC	E ELEV.:	113.5 f	eet	
DRILLE	ER: S	. Ly	ons										DATUM:	Horizont	al: NAD	83/91	
INSPE	CTOF	R: A	. Da	aniy	yar	OV	0-53%	8 10						Vertical:	NAVD 8	8 18.45 - 9.04	0 am
			10L 754]:Н т	loll 'ru	low Stem Au Ick Mount	gers; Di od Au	iamond (Coring. ic Ham	mor			FINISH	DATE: 9/2	21/17 T	IME: 12:	22 pm
	1		Au	aer	10	Split Spoon	Casi	na	Pitcher	Grat) Co	re Barrel		GROU	NDWATER	DATA	L
Type/S	ymbo		HS	SA		S	NV	V	L	GX]	C目			Water	Casing	Hole
I.D.			3.2	25"		1.375"	n/a		n/a	3.25	"	n/a	Date	Time	Depth (ft)	Depth (ft)	Depth (ft)
O.D.			6.6	25"		2"	n/a	L	n/a	3.375	22	n/a	9/21/17	8:30 am	14.0	14.0	14.0
Length			60	0"		24"	n/a	i i	n/a	6"		n/a					
Hamm	er Wt		n	/a		140lbs	D	rill Rod S	Size		Α						
Hamm	er Fa		n	/a		30"		I.D. (O.D).)	1	.219" (1	.75")					
	SAMPLE SOIL (Blows/6 in.) Image: Second se																
H (feet	OT OT<																
DEPTI														ASSIFICAT		EIVIARNO	
	du 0 10 H CORING U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U U																
												1.2'	7" Asphalt; 7	" Concrete			
	Å.											112.3	Note: Hand	excavated fo	r utility clea	arance, deptl	1 / T
F	£⊡. ⊐D		G	1	\ge	2.0 - 2.5	G	R	Α	В	6		Tan, green a	nd orange co	parse to fine	SAND, son	ne
F			G	2		35-40	G	R	Δ	в	6	3.3'	Silt, trace co	arse to fine (Gravel, mois	st (SM, Fill)	_
-,			S	1	\times	4.0 - 6.0	8	5	5	6	12	110.5	Brown and b little coarse t	lack, coarse to fine Grave	to fine SAl el (rock frag	ND, some Si ments), moi	lt, _ st
- 5													(SM, Residu	al Soil)	at 4 0' bos	- nossible	_
v –													bedrock enco	ountered		possiole	-
7141													fine SAND,	little coarse	to fine Grav	ray coarse to rel (rock frag	,-
													ments), little relict layerin	Silt, loose to g observed (o medium d SM, Residu	ense, dry, al Soil)	-
			1													<i>.</i>	-
			S	2		9.0 - 11.0	4	5	6	7	10		Light orange	-brown, tan	and light g	ray coarse to	, –
- 10		<u> </u>											fine SAND, 1	Silt medium	to fine Grav	el (rock frag	; r-
-													ing observed	(SM, Resid	ual Soil)	, rener laye	. –
																	_
			1														-
			S	3		14.0 - 16.0	1	1	1	1	24		Brown and c	lark brown o	coarse to fin	e SAND, litt	tle –
- 15													Silt, trace me (SM, Residu	edium to fine al Soil)	e Gravel, ve	ry loose, wet	t _
														,			-
												17 5'					-
												96.0'					
						10.0 21.0		-		2	24						
-			S	4		19.0 - 21.0	1	1,	2	2	24		Dark gray Si	lty CLAY, s	oft, dry (CI	L, Residual S	Soil)
	X/////		1					L				1					

PROJ	ECT:	B& Bal	P 1 Itim	`un 10r	nel e, N	B(I Replacen WD	OR (cr	ING ontinue roject			BORING NUMBER: S-P3-B12 SHEET NUMBER: 2 of 2 PROJECT NUMBER: 185615A CONTRACTOR: E2CR, Inc. DRILLER: S. Lyons		
CLIEN	11: A	MT	X A	K									INSPECTOR: A. Daniyarov
	G				SA	MPLE		SOIL	_ (Blows/	'6 in.)			
H (feet	IC LO	ows/ft)	Γ			et)	0/6	6/12	12/18	18/24	REC. (in.)		
EPT	HI H H H H H H H H H H H H H H H H H H												FIELD CLASSIFICATION AND REMARKS
	Image: Constraint of the state of the st												
			S S	5		24.0 - 24.8 - 26.5 - 26.5	21 -100/0"	100/4"			10	22.5' 91.0' 26.5' 87.0	Orange-brown and tan coarse to fine SAND, little Silt, trace fine Gravel, slightly micaceous, very dense, dry, relict layering observed (SM, Residual Soil) No recovery; spoon refusal; rock fragments in spoon tip (Spoon refusal at 26.5 ft bgs, see Coring Log)
35													
G (FINA													-
			-										-

													BORING	NUMBER	R: TA-P3	6-1	
5						B				SHEET N	NUMBER	: 1	of	2			
Re P	TUNN									G							
LOG	PROJE	CI											PROJEC	T NUMB	ER: 1	85615A	
PROJ	ECT:]	B&1	? Tı	unn	el	Replacem	ent Pr	oject					LOCATIO	ON: NE co	rner of 209	9 Mosher S	st.
	TION:	Bal	tim	ore	, N	1 D							COORD	· N• 505	0705 1	7.1 /11 3	63.0
			· F	CR		ne							SURFAC	: N. 393 ,	· 160 8 f	2. 1,411,3 Peet	03.0
	FR		. Ez		, 1	шс.							DATUM:	Horizont	al: NAD	83/91	
INSPE	CTOF	R: A	. Da	aniv	ar	·ov								Vertical:	NAVD 8	8	
DRILL	ING N	1ETH	10	D: Н	[o]]	ow Stem Au	gers; Ro	otary W	ash; Dia	mond C	oring.		START [DATE: 9/2	27/17 T	IME: 10:	15 am
RIG T	YPE:	CM	E-5:	5, T	ru	ck Mount	ed, Au	tomati	ic Ham	mer			FINISH D	DATE: 9/2	28/17 T	IME: 10:	25 am
			Au	ger		Split Spoon	Casir	ng	Pitcher	Grab	o Co	re Barrel		GROU	NDWATER	DATA	
Type/S	Symbo	bl	HS	SA		S	NV	V	L	G		C			Water Depth	Casing Depth	Hole Depth
I.D.			4.2	25"		1.375"	3.0	u	n/a	3.25		n/a	Date	Time	(ft)	(ft)	(ft)
O.D.			7.6	25"		2"	3.5		n/a	3.375	;"	n/a	9/28/17	8:09 am	10.2	30.5	50.0
Length	ı		6	0"		24"	60'	'	n/a	6"		n/a					
Hamm	ner Wt		n	/a		140lbs	D	rill Rod S	Size		A						
Hamm	ner Fa	II	n	/a		30"]	I.D. (O.D	D.)	1	.219" (1	.75")					
				S	SAN	MPLE		SOIL	_ (Blows/6	6 in.)							
eet)	POG	s/ft)					0/6	6/12	12/19	19/24	REC.	1					
TH (f													FIELD CL	ASSIFICAT	ION AND F	REMARKS	
DEP	L L L L L L L L L L L L L L L L L L L																
		CAS	ТҮР	NUN	SYN	DEP	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	0.0'					
	$\begin{array}{c c c c c c c c c c c c c c c c c c c $													rk gray and	light gray co fine Sand	barse to fine	V
-0	o⊔ ⊡(S ⊴¥k												(GM, Fill)			intre Sint, di	y _
-			G	1	\times	2.0 - 2.5	G	R	Α	В	6		utility cleara	nce, depth 0	0.0'-10.0'	id excavated	Ior _
-	**		-										Dark gray co Gravel (cind	parse to fine ers) little Si	SAND and lt_dry (SM	coarse to fin	ie _
			G	2		40-45	G	R	Δ	в	6		Gruver (ema	ers), nuie si	it, tily (Sivi,	1 111)	_
_			ľ	-	Х	1.0 1.5	U	K		D			Gray, black	and orange- e Sand, trace	brown Silty e medium to	CLAY and fine, moist.	
- 5	₩		1										slight organi	c odor (CL,	Fill)	,,	
-	. ۵ <u>۵</u> ۹. باد		G	3	\times	6.0 - 6.5	G	R	Α	В	6		6.0'-6.3': Dai	rk gray and	light gray S	ilty CLAY, s	- some
3/14	20⊡3		-										coarse to fine	e Sand, little	coarse to f	ine Gravel, d	lry _
.GLB			G	1		80 85	G	D	Δ	В	6		(CL, FIII); 6.3'-6.5': Wh	ite and light	t brown Silt	y CLAY, dry	/
SARY	Sk			7	X	8.0 - 8.5	U	K	A	Б			(CL, Fill) Beige, orang	e-brown and	l black Silty	CLAY, littl	e
- LIBI	45		G	5	\sim	9.5 - 10.0	G	R	A	в	6		coarse to fin	e Sand, dry	(CL, Fill)	,	-
<u>⊒</u> – 10	老马		-S	1	X	10.0 - 12.0	1	1	Ĩ	2	19		Brown coars coarse to fin	e to fine SA e Gravel, we	ND, little Si et (SC, Fill)	ilty Clay, tra	ce _
			-										10.0'-11.5': I	Black coarse	to fine SAN	ND, little Silt	, _
B&F													11.5'-12.0': H	Brown coars	e to fine SA	ND, little Si	lt,
(GPJ	* 0			[very loose, w	vet, relict lay	vering obser	ved (SM, Fil	1)
- Ha			1														-
	S 2 14.0 - 16.0 1 1 2 1 4												Black and w	hite coarse t	o fine GRA	VEL. little S	ilty
<u>-</u> - 15													Clay, little co	parse to fine	Sand, wood	fragments	and
B8													screw, very l	oose, wet (S	owi, f'iii)		
-INAL																	-
000	1 1 6																-
- NG L	8 4		-														-
- L			s	3		19.0 - 19.8	8	100/3"			9	19.2'	10 01 10 21 -		1.	C (7)	-
В&Р												141.6	little Silty Cl	slack and ward ward ward and ward and ward and a state of a state	nite coarse f rse to fine S	to fine GRA' Sand, very de	vEL, ense,

												BORING NUMBER: TA-P3-1
2						B	OR	NG	iLC)G		SHEET NUMBER: of
B8P	PROJEC	Et Ct					(C0	ontinue	ed)			
												PROJECT NUMBER. 1000101
PROJE	ECT:	B&	РT	un	ne	l Replacen	nent P	roject				CONTRACTOR: E2CR, Inc.
LOCA	TION:	Bal	tim	or	e, I	MD						DRILLER: S. Lyons
CLIEN	T: A	MTF	RAJ	K								INSPECTOR: A. Daniyarov
-	g	()		1	SAI	MPLE		SOIL	_ (Blows/	6 in.)	1	
H (feel	IC LC	ows/ff				et)	0/6	6/12	12/18	18/24	REC. (in.)	
EPTH												FIELD CLASSIFICATION AND REMARKS
	GR	ASIN	γPE	UMB	YMB	EPTI	RUN	REC.	RQD	1		
		0	⊢	z	S		(in.)	(in.)	dry (SM, Fill)			
-			-						19.2'-19.8': Gray and orange-brown coarse to fine SAND, little Silt, very dense, dry, relict layering observed (SM, Decomposed Rock)			
-			S	4		24.0 - 24.8	12	100/4"	7	Orange, light orange and light gray coarse to fine		
- 25 -			-									SAND, some Silt, little coarse to fine Gravel (rock fragments), very dense, dry, relict layering observed (SM, Decomposed Rock)
-			-									Gray with speckles of black coarse to fine SAND,
- 30			S	5		29.0 - 29.2	100/2"				2	some coarse to fine Gravel, little Silt, very dense, dry (SM, Decomposed Rock)
			s	6		30.5 - 30.5	-100/0" -				0	30.5' No recovery, spoon refusal. Material from the spoon 130.5' tip: Light gray, gray and white with speckles of black coarse to fine SAND and medium to fine Gravel, little silt, very dense, dry (SM, Decomposed Rock)
												(Spoon refusal at 30.5 ft bgs, see Coring Log)
- LIBK												-
d − 35												
												-
												-
– –												-
												-
40 - 40											-	
											-	
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ň												

													BORING	NUMBER	R: TA-P3	-3	
2	-					R				C			SHEET I	NUMBER:	1	of	1
ReP	TUNNE	1				D											
200	PROJEC	-1											PROJEC	T NUMB	ER: 1	85615A	
PROJE	ECT: I	B&P	T	unn	ıel	Replacem	ent Pr	oject					LOCATIO	ON: MTA Rail O	Maryland, nerations	Central Lig	ght
	TON:	Balt ATD	1m	ore	e, N	/ID							COORD	· N• 599	979.6 F	C· 1 418 3	98 4
CONT	RACT	OR:	E	2 2 2 1	R.]	Inc.							SURFAC	E ELEV.	100.7 f	eet	20.1
DRILLI	ER: S	. Lyc	ons										DATUM:	Horizont	al: NAD	83/91	
INSPE	CTOF	R: Å.	Da	aniy	yaı	OV							_	Vertical:	NAVD 8	8	
DRILLI	NG M	IETH	10): I	Hol	low Stem Au	igers; Ro	otary W	ash; Diai	mond C	oring.			DATE: 11	/27/17 T	IME: 8:00	0 am 40 am
RIGTY	PE: (-5:), I	ru	Celit Secon	ted, Au	tomat	Ditebor	mer		no Dorrol					to alli
Tupo/S	umbo	. -	Au				Casir NIV							GROUI	Water	Casing	Hole
	symbo	" -	4 3	5A		1 375"	3.0	v 	L	3.25	J		Data	Timo	Depth	Depth	Depth
			7.6	25"	-	2"	3.5	"	n/a	3 3 7 5		n/a	11/28/17	7:38 am	19.4	10.5	45.0
Length	Length 60" 24" 60" n/a 6" n/a													11:40 am	19.4	10.5	115.0
Hamm	Hammer Wt.n/a140lbsDrill Rod SizeA													11.40 am	17.4	10.5	115.0
Hamm	Hammer Fall n/a 30" I.D. (O.D.) 1.219" (1.75")																
				2017	CA												
at)	g	ft)	⊢		SA			501		5 m.)							
H (fee	IC L	/swo				at)	0/6										
DEPTH	RAPH	NG (BI		BER	30L	TH (fee]	FIELD CL	ASSIFICAT	ION AND F	EMARKS					
	Ū	CASII	ТҮРЕ	MUN	SYM	DEP1	RUN (in.)	0.0'									
													Note: Hand 0.0'-6.5'	excavated fo	r utility clea	rance, depth	1
Ē	-⊡ **		1														-
-	 □		G	1	\ge	2.0 - 2.5	G	R	A	В	6		Brown and t	an, coarse to	fine SANE), and coarse	e to
-	*		1										fine Gravel,	little Silt, mo	oist (SM, Fi	1)	-
-	*		G	1		4.0 - 4.5	G	R	Α	В	6		Note: utility	encountered	at 3' bgs; o	ffset boring	-
- 5					F								Tan and ora	nge, coarse t	o fine SAN	D, little coar	se to
N-			G	2		6.0 - 6.5	G	R	А	В	6		line Gravel,	intie Sin, inc	JIST (SIVI, FI		-
3/14/2			c	1	\succ	70.82	40	22	100/4"		16	6.8'	Tan and oran to fine Grave	nge, coarse t el, little Silt,	o fine SAN moist (SM,	D, some coa Fill)	rse
Ble			^s	1		7.0 - 8.5	40	52	100/4		10	94.0	Note: Soft di	ig terminated	l at 6.5' bos	due to dens	e. /]
ARY.G			1										natural, mat	erial encount	tered.		
LIBR	- V		S	2	-	9.0 - 9.0	100/0"				0	91.7	medium to f	ine SAND, li	ittle Silt, tra	ce fine Grav	el,
ú⊒ — 10	p f		1									10.5'	very dense, o Decomposed	dry, relict lay l Rock)	ering obser	ved (SM,	/ –
												90.2	Note: rig cha	attering at ~7	7.5-9.0'.	from the tim	
B&P													Brown, whit	e and gray c	oarse to fin	e GRAVEL,	little/
S.GPJ													fragments (C	ine Sand, litt GM, Decomp	le Silt, very oosed Rock)	dense, dry,	rock
L PH			1										Note: advand	ce casing to	10.5' bgs.	aring I ==)	1
													(Casing relu	sai at 10.5 li	l bgs, see C	oring Log)	-
⊑ 15			ł														_
			1														-
L																	_
TOG																	5
- I I I I I I I I I I I I I I I I I I I			1														-
			1														-
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													BORING	NUMBER	R: T-P3- 1	1	
2	-					R				SHEET N	NUMBER	: 1	of	2			
Re P	TUNNI									G							
LOG	PROJE	-1											PROJEC	T NUMB	ER: 1	85615A	
PROJE	ECT:]	B&P	T	unn	el	Replacem	ent Pr	oject					LOCATIO	ON: Riggs	Avenue an	d N. Payson	
		Bal	tim	ore	, N	/ID							COORD	· N. 505	1387 1	F• 1 411 5	11.8
			AN F1		2 1	[nc							SURFAC	CE FL FV	- 162.3 f	2. 1, 4 11,3 [.] eet	41.0
	FR	Hi			\ , 1	inc.							DATUM:	Horizont	al: NAD	83/91	
INSPE	CTOF	R: B .	G	odfi	rev	,								Vertical:	NAVD 8	8	
DRILL	ING N	IETH	10	D: I	Ioll	low Stem Au	gers; Ro	otary W	ash; Dia	mond C	oring.		START [DATE: 2/	8/18 T	IME: 8:30) am
RIG T	(PE: I	D-50	, T	ruc	k I	Mounted,	Autom	atic H	ammer	•			FINISH	DATE: 2/	8/18 T	IME: 2:40) pm
			Au	ger		Split Spoon	Casir	ng	Pitcher	Grab	Co	re Barrel		GROU	NDWATER	DATA	
Type/S	Symbo		HS	SA		S	NV	V	L	G]	C	4		Water Depth	Casing Depth	Hole Depth
I.D.			4.2	25"		1.375"	3.0	"	n/a	3.25	'	n/a	Date	Time	(ft)	(ft)	(ft)
O.D.			7.6	25"		2"	3.5	"	n/a	3.375	"	n/a	2/9/18	8:00 am	13.1	33.0	85.0
Length	l .		6	0"		24"	60'	'	n/a	6"		n/a					
Hamm	er Wt	:	n	/a		140lbs	D	rill Rod S	Size		Α						
Hamm	er Fa		n	/a		30")	I.D. (O.E	D.)	1	.219" (1	.75")					
	(D				SA	MPLE		SOIL	_ (Blows/	6 in.)							
(feet)	Top O I E 0/6 6/12 12/18 18/24 REC. (in.)																
PTH	HL da by correction (in.)													ASSIFICAT	'ION AND F	REMARKS	
B	A HIGH AND																
		0	⊢	z	S		(in.)	(in.)	%	(in.)	%	0.0'	Note: Hand	excavated fo	r utility clea	arance denth	1
													0.0'-8.5'		r utility cici	aunee, aepu	
	***		G	1		20-25	G	P	Δ	в	6						_
	∎.đ⊟		Γ	1	X	2.0 - 2.5	U	K	A	Б	0		Black, white	, tan, coarse	to fine SAN	ND, some Sil	ty
-	K⊓ .		1										Ciay, trace i		lie Gravel, I	lioist (Bivi, 1	
-	*/		G	2	\times	4.0 - 4.5	G	R	Α	В	6		Black, white	, tan, coarse	to fine SAI	ND, some Sil	ty –
- 5	₩.												Clay, little co	parse to fine	Gravel, mo	ist (SM, Fill)	-
N-	4.4		G	3		6.0 - 6.5	G	R	А	в	6						_
3/14/2					X		_						Orange-tan, coarse to fin	brown, coar e Gravel, litt	se to fine S. le Silty Clav	AND, some y, moist (SM	ļ
	\$₹		G	4		7.5 - 8.0	G	R	A	в	6		Fill)	,			· -
	₽Q		S	1	\land	8.0 - 10.0	2	2	1	2	0		coarse to fin	e Gravel, litt	le Silty Clay	y, trace glass	-
1947	*												fragments, n No recovery	nosit (SM, F	ill) ivel and gla	ss in spoon t	in –
- 	。 "来"。												(Fill)	, p 8.	Bur	oo in op oon t	т —
	*																-
	₩ 0		1														-
12 12 12	.∆		s	2		13.0 - 15.0	1	1	1	2	13		Brown coar	se to fine SA	ND and Si	ilty Clay, tra	-
													coarse to fin	e Gravel, ver	ry loose, we	t, trace roots	_
																	_
L AAL)																	-
																	-
	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		S	3		18.0 - 20.0	4	4	7	6	15		1				_
	*		ľ	5		2010 2010				~	10		Brown, black to fine Grave	k, red, coars el, little Silt.	e to fine SA medium de	ND, some conse, wet (SM	oarse I,
й –			1										Fill)	., ont,			-
ñ	12 4																

PROJ LOCA CLIEN	VECT: ATION: NT: A	B& Bal MTH	P T tim RAI	Tun nord K	nel e, I	B(I Replacen	ORI (cc	ntinue	d)	DG			BORING NUMBER: T-P3-1 SHEET NUMBER: 2 of 2 PROJECT NUMBER: 185615A CONTRACTOR: E2CR, Inc. DRILLER: E. Hill INSPECTOR: B. Godfrey
	ŋ	0			SA	MPLE		SOIL	. (Blows/	6 in.)			
H (feet		lows/ft				et)	0/6	6/12	12/18	18/24	REC. (in.)		
DEPTI													FIELD CLASSIFICATION AND REMARKS
	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$												
- - - - - - - - - - - - - - - - - - -			s	4		23.0 - 25.0 28.0 - 30.0	5	3	5	6	14	23.0' 139.3' 28.0' 134.3'	Red-brown, gray, SILT, some medium to fine Sand, medium stiff, moist, relict layering (MH, Residual Soil)
35 BOKING LOG (LINAR) B&R TUNNEL LIDIOLO B&R TUNNEL - TOTAL TOTAL				6		33.0 - 33.0	100/0.5"						Data gray, steaks of rating, motified in the of it (b), and Clayey Silt, very dense, mosit, relict layering (SM, Decomposed Rock) (Spoon refusal at 33.1 ft bgs, see Coring Log)

												BORING		R: SA-P4	-01		
2	TUNNE	2				B	DRI	NG	G LC	G			SHEET	NUMBER	:1	of	2
B8P	PROJEC	Ť											PROJEC	T NUMB	ER: 1	85615A	
PROJE	ECT: I	3&P	T	unr	ıel	Replacen	nent P	roject					LOCATI	ON: 2020 N	Aosher St		
LOCAT	FION:	Balt	tim	or	e, I	MD								N. 504	050 7 1		10.0
CLIEN	I: AM			()CI		Ino							SURFAC	.: IN: 394, SE ELEV	950./ I · 161.0 f	L: 1,411,2 Coot	19.8
		UR.			Ν, Ι	Inc.								Horizont	al: NAD	83/91	
INSPE	CTOF	R: Å.	F	, rag	oso)								Vertical:	NAVD 8	88	
DRILLI	ING M	ETH	10	D:I	Iol	low Stem Au	gers; Ro	otary W	/ash; Diai	nond C	oring.		START I	DATE: 7/1	19/18 T	IME: 10:	30 am
RIG TY	/PE: 🛙)-50											FINISH	DATE: 7/2	23/18 T	IME: 3:0	0 pm
			Au	ger		Split Spoon	Casir	ng	Pitcher	Grat		re Barrel		GROUN	NDWATER	DATA	II.I.
Type/S	Symbo		H	SA		S			L	GX		C			vvater Depth	Depth	Hole Depth
I.D.			3.	25		1.375"	3.0'		2.86	3.25		n/a	Date	Time	(ft)	(ft)	(ft)
O.D.			6.6	525	_	2"	3.5		3	3.375	,"	n/a	7/18/18	1:45 pm	9.6	0.0	10.0
Length		-	6	0	_	24"	60"	ill De d	24	6"		n/a	7/20/18	7:30 am	9.4	25.5	45.5
Hamm	er VVť.	\vdash	n	/d /2		1401bs	Dr		Size	1	"A"	75")	//23/18	/:48 am	1.2	-	86.0
Паппп				/a		30*		.D. (U.I	J.)		.219 (1	.75)					
et)	\widehat{f}_{2}																
rH (fe	(j) (j) (j) (j) (j) (j) (j) (j) H_L H_L H_L (j) (j) (j) (j) (j)													ASSIFICAT	ION AND F	REMARKS	
DEP1																	
		CAS	TYP	NUN	SYN	DEF	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	0.0'					
			T									0.8'	9" asphalt				
-	Å Å											161.2'					-
-			G	1	\times	2.0 - 2.5	G	R	Α	В	6		Orange, brow	wn coarse to	fine SAND	, and Silty C	lay,
17/0/	**														.,	, i iii)	_
2 - 19 2 -			G	2	\ge	4.0 - 4.5	G	R	A	В	6		Red-brown o	coarse to fine	SAND, an	d Silty Clay,	-
- 5													trace coarse	to fine Grave	el, moist (So	., F111)	_
- LIBK	<u>55</u>		G	3	\times	6.0 - 6.5	G	R	Α	В	6	6.0' 155 9'	Orange, ligh	t brown, and	white coar	se to fine SA	ND.
												155.5	some Silt & (SM)	Clay, trace c	oarse to fin	e Gravel, mo	oist,
			G	4		8.0 - 8.5	G	R	Α	В	6		Green-grav.	and tan med	ium to fine	SAND, and	-
			G	5	$\left[\right]$	9.0 - 9.5	G	R	Α	В	6		Clayey Silt,	moist (SM)	fine SAM) some Silt	& -
g 10			s	1	\square	10.0 - 12.0	7	4	7	8	17	10.0'	Clay, trace c	oarse to fine	Gravel, mo	ist (SM)	
												151.9'		- 200			
													Brown, oran some Silty C	ge, gray, wh lay, little coa	ite coarse to arse to fine	fine SAND Gravel, medi	, ium
4 V V													dense, moist	(SC, Residu	ual)		
			1									14.0'					_
			S	2		14.0 - 16.0	7	11	9	10	19	147.9'	Note: falling	head test at	14'		
- 15													14'-15': Orar SAND, and	ige, white an Clayey Silt,	little coarse	Gravel, med	lium —
AL) E			1										dense, moist 15'-16': Brov	(SM, Reside	ual) oarse to fine	e SAND, sor	ne –
			1										Clayey Silt,	medium den	se, moist (S	M, Residual) _
Ŭ -			1														_
			ç	2		100 210	5	5	12	15	24						
H A A A A A A A A A A A A A A A A A A A			l s	3		19.0 - 21.0	5	5	15	15	24		Green-gray of medium den	coarse to fine	SAND, so	me Clayey S A. Residual)	ilt,
Note:			•					•				•	uu				

	PROJE LOCAT	ECT: FION: T: A	B& Bal MTF	P T ttim	`un 10r K	ne e, 1	B(I Replace MD	DRI (cc	Project	d)	DG			BORING NUMBER: SA-P4-01 SHEET NUMBER: 2 of 2 PROJECT NUMBER: 185615A CONTRACTOR: E2CR, Inc. DRILLER: S. Lyons INSPECTOR: A. Fragoso
	et)	OG	ft)		3	SAN	MPLE		SOIL	. (Blows/	'6 in.)	DEC		
	TH (fe	HIC L	Blows/				feet)	0/6	6/12	12/18	18/24	(in.)		FIELD CLASSIFICATION AND REMARKS
	Line CORING Handler Handler Handler Handler Handler CORING Handler Handler Handler Handler Handler CORING Handler Handler Handler CORING Handler Handler Handler Handler <td< td=""><td>POD</td><td></td><td></td></td<>											POD		
		5. K-15.7	CAS	TΥI	NN	SΥI	DE	(in.)	(in.)	%	L>4 (in.)	% %		
B&P TUNNEL - LIBRARY.GLB 4/6/22	- 25			- S	4		24.0 - 24.1	75/1"				1	25.5'	Note: falling head test at 24' Gray and white coarse to fine SAND, and Clayey Silt, little fine Gravel, very dense, moist (SM, Decomposed Rock) (Spoon refusal at 25.5 ft bgs, see Coring Log)
	- 35			-										-
	- 40													-

										BORING		R:SA-P4	-02				
2	2					B	NRI	NG)G			SHEET	NUMBER	: 1	of	2
B&PTU	INNE	L.														05(15)	
	- 1				1	D 1	(D	• ,					PROJEC	CT NUMB	ER: I	85615A	
	; I : I ЭМ-	3&P Rah	11 im	unn		Replacen	ient Pi	roject					LOCATIO	ON: Inside (NE co	2020 Mosh orner)	er St prope	erty
CLIENT:	AN	ITR	Ak		-9 1								COORD	.: N: 595,	176.0 H	E: 1,411,3	47.8
CONTRA	ACT	OR:	E2	2CI	R , 1	Inc.							SURFAC	CE ELEV.	: 160.6 f	eet	
DRILLER	R: S .	Lyo	ons										DATUM:	Horizont	al: NAD	83/91	
INSPECT	TOF	R: A.	Fr	ag	osc)								vertical:	NAVD 8 06/18 т	58 1845 - 8.00	0 am
	GN F·T	1E1F)_50	10	D:I	loll	ow Stem Au	gers; Ro	otary W	ash; Dia	mond C	oring.		FINISH	DATE: 7/2 DATE: 7/2	20/18 T	IME: 1:3	0 am 0 pm
			Au	ger		Split Spoon	Casir	ng	Pitcher	Grat	Co	re Barrel		GROUN	DWATER	DATA	•
Type/Syr	nbo		HS	SA		S		-	L	GX]	C目			Water	Casing	Hole
I.D.			3.2	25		1.375"	3.0'		2.86	3.25	'	n/a	Date	Time	Depth (ft)	Depth (ft)	Depth (ft)
O.D.			6.6	25		2"	3.5'		3	3.375	ш	n/a	7/27/18	10:00 am	7.8	-	65.8
Length			6	0		24"	60"	,	24	6"		n/a	7/30/18	7:30 am	7.7	-	86.1
Hammer	Wt.		n	'a		140lbs	Dr	ill Rod S	Size		"A"		7/31/18	7:50 am	7.4	-	86.1
Hammer	Fal	1	n	'a		30"	I	.D. (O.D).)	1	.219" (1	.75")					
	SAMPLE SOIL (Blows/6 in.)																
eet)	Image: Constraint of the state of																
TH (I	(j) (j) <td>ASSIFICAT</td> <td>ION AND F</td> <td>REMARKS</td> <td></td>													ASSIFICAT	ION AND F	REMARKS	
DEP	Hd B B CORING B B CORING Hd B B C CORING																
	Ham OR Ham CORNING Bar OR Ham RUN REC. L V3 V3 V4 V4 RUN REC. L V3 V4 V4 V4 V4 RUN REC. L V4 V4 V4 V4 V4 V4 RUN V4																
-	⊡D K																-
- 4	s 4≱ A⊒		G	1	\ge	2.0 - 2.5	G	R	Α	В	6		Brown, tan,	and beige co	arse to fine	SAND, and	-
/22 • • •													Clayey Silt, glass (SM, F	some coarse Fill)	to fine Grav	el, moist, tra	ace _
B 4/6	k⊿ [□]		G	2	\times	4.0 - 4.5	G	R	Α	В	6		Brown blac	k tan coarse	to fine SAN	JD and med	- lium
ອ5													to fine Grave	el, some Clay	vey Silt, wet	, trace glass	
			G	3		6.0 - 6.5	G	R	А	в	6		(314, 111)				-
EL-L	K E				X		_			_			Brown, tan, Sand, little c	orange Claye oarse to fine	ey SILT, son Gravel, wet	ne coarse to t (SM, Fill)	fine
							_			_							
	⊔ ¤₿		G	4	X	8.0 - 8.5	G	R	A	В	6		Brown, black	k Clayey SII	T, some fin	e to coarse S	Sand,
	0 45 A		S	1		9.0 - 11.0	2	7	7	3	18		Fill)	coarse Grave	ei, wet, trace	orangics (S	IVI, _
ଞ୍ଚ <mark>ୁ 10</mark> 🕴	k R												Dark brown, fine Sand, lit	, black, tan C ttle coarse to	Clayey SILT fine Gravel	, some coars , stiff, wet ()	ML. —
	₽ D¤ ¹												Fill)			, , 、	, _
																	_
M M	K D.																
	RØA [-
			S	2		14.0 - 16.0	WOH	WOH	WOH	WOH	7		Tan Clayey S	SILT, little c	oarse to fine	e Sand, very	soft,
⊑ – 15 j ^a														11)			_
TL) BY																	_
	45																_
DRING								100000				19.0'					-
ар ВС			S	3		19.0 - 21.0	6	11	40	53	19	141.6'					
ă 👘			1														

6						_							BORING NUMBER: SA-P4-02
	DTUNN	EL				B	DRI	NG)G			SHEET NUMBER. 2 OI 2
Dö	PROJE	CT					(CC	ontinue	ea)				PROJECT NUMBER: 185615A
PRO	JECT:	B&	РT	un	ne	l Replace	ment F	Project					CONTRACTOR: E2CR, Inc.
LOC	ATION	: Ba	ltin	ıor	e,]	MD							DRILLER: S. Lyons
CLIE	NT: A	MT	RA	K									INSPECTOR: A. Fragoso
	(7)			3	SAI	MPLE		SOIL	. (Blows/	′6 in.)			
l (feet)	IC LO(ows/ft)				et)	0/6	6/12	12/18	18/24	REC. (in.)		
EPTH	HAPH	NG (BI		BER	30L	TH (fee			CORING	6		1	FIELD CLASSIFICATION AND REMARKS
	19	CASIN	ТҮРЕ	NUM	SYME	DEPT	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
- - -		B B B B B B B B B B B B B B B B B B B					100/2"				2	24.0' 136.6'	Brown, orange, gray coarse to fine SAND, some Silt & Clay, little fine Gravel, very dense, wet (SM, Residual) - Gray, black, tan coarse to fine GRAVEL, little
- 25 - - -	S = 4 = 24.0 -						100/2"				2	20.81	Gray coarse to fine GRAVEL, little coarse to fine
												130.8	Sand, trace Clayey Silt, very dense, wet (GM, Decomposed rock) (Spoon refusal at 29.8 ft bgs, see Coring Log)
			-										
			-										-

													BORING	NUMBE	R: <mark>S-P4-</mark> ()1	
2	-					B		NG	: 10)G			SHEET	NUMBER	:1	of	2
ReP	TUNNE	L.															
Loca	PRUJEC												PROJEC	CT NUMB	ER: 1	85615A	
PROJE	ECT: E	3&P	Tı	unn	el	Replacen	ient Pi	roject					LOCATI	ON: N. Pul	aski St		
	TON:	Balt	1m	ore	e, I	MD							COORD	· N· 594	537.2 1	F• 1 411 2	20.9
CONT	RACT		E2	A CF	2.1	Inc							SURFAC	CE ELEV.	: 155.1 f	eet	20.9
DRILL	ER: E.	Hil	1		•, 1	inc.							DATUM	Horizont	al: NAD	83/91	
INSPE	CTOR	R: B.	G	odfi	rey	y								Vertical:	NAVD	88	
DRILL	ING M	ETH	10	D:H	Ioll	low Stem Au	gers; Ro	otary W	ash; Diar	mond C	oring.		START	DATE: 8/1	14/18 T	IME: 8:0	0 am
RIG T	PE: C	CME	2-5	5, T	ru	ıck							FINISH	DATE: 8/1	14/18 T	IME: 12:	15 pm
			Au	ger	_	Split Spoon	Casir	ng	Pitcher	Grat		re Barrel		GROUN		DATA	Usta
Type/S	Symbo	L	HS	SA		S			L	GX		C			Vvater Depth	Depth	Hole Depth
I.D.			3.2	25	_	1.375"	3.0'	"	2.86	3.25	"	n/a	Date	Time	(ft)	(ft)	(ft)
O.D.			6.6	25		2"	3.5'	"	3	3.375	<u>, </u>	n/a	8/14/18	10:38 am	20.6	24.0	24.0
Length	Length 60 24" 24 6" n/a											n/a					
Hamm	Hammer Wt. n/a 140lbs Drill Rod Size "A"																
Hamm	Hammer Fall n/a 30" I.D. (O.D.) 1.219" (1.75")																
	SAMPLE SOIL (Blows/6 in.)																
feet)	LO	/ft)					0/6	6/12	12/18	18/24	REC.	1					
TH (FIELD CL	ASSIFICAT	ION AND I	REMARKS	
DEP																	
		CAS	ТҮР	NUN	SYN	DEF	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	0.0'					
	Å A																
-																	-
-			G	1	\times	2.0 - 2.5	G	R	Α	В	6		Orange, broy	wn coarse to	fine SAND	, and Clayey	Silt,
8	*												trace coarse	to fine Grave	el, moist (Sl	M, FILL)	-
4/6/			G	2		4.0 - 4.5	G	R	A	в	6						
L. CLB					X								Orange, brow	wn coarse to to fine Grave	fine SAND el, moist (Sl), and Clayey M, FILL)	7 Silt,
C C																	
- LIB	1 <u>4</u> 1 3 3 4 4 4		G	3	\times	6.0 - 6.5	G	R	Α	В	6		Orange, brow	wn coarse to	fine SAND	, and Clayey	v Silt,
													trace coarse	to fine Grave	el, moist (Sl	M, FILL)	-
	<u></u> ∦∧ t		G	3		8.0 - 8.5	G	R	Α	В	6	8.0'	C	1			
U B&			c	1		90 110	3	2	6	12	24	147.1' 9.0'	Clayey Silt,	iy, brown coa trace coarse	arse to fine to fine Grav	SAND, and vel, moist (SI	(I)
S.GP			З	I		9.0 - 11.0	3	5	U	12	24	146.1'	Tan orange-	brown coarse	e to fine SA	ND, little G	avel
pr 10													(quartz piece	cs), some Cla	1y, 100se, m	oist (SC)	_
HEA -																	-
																	-
4 A A																	
HZ -																	-
			S	2		14.0 - 16.0	5	6	8	11	24		Bands of tan	and orange	medium to	fine SAND,	-
<u>_</u> 15													some Silty C	lay, medium	dense, mo	ist (SC)	-
- F																	-
(FINA																	
100																	_
												10.01					-
	<u> </u>		S	3		19.0 - 21.0	32	57	27	39	24	19.0	Tan, red-bro	wn orange n	nedium to fi	ine SAND, li	ittle
N N N N N N N N N N N N N N N N N N N													Silt & Clay,	very dense, 1	moist, relict	layering,	

PROJE LOCA ⁻ CLIEN	ECT: TION: T: A	B& Bal MTH	P T tim RA1	`un 10r K	ne e,]	B (I Replace MD	ORI (cc	ING ontinue Project	GLC	DG		BORING NUMBER: S-P4-01 SHEET NUMBER: 2 of 2 PROJECT NUMBER: 185615A CONTRACTOR: E2CR, Inc. DRILLER: E. Hill INSPECTOR: B. Godfrey	2
Ŧ	Image: Sample Soll (Blows/6 in.) Image: Sample 0/6 6/12 12/18 18/24												
H (fee		lows/ft				et)	0/6	6/12	12/18	18/24	REC. (in.)	EIELD CLASSIFICATION AND REMARKS	
DEPTI	RAPH	NG (B		BER	BOL	TH (fe			CORING	9			
	Ū	CASI	ТҮРЕ	NUM	SYMI	DEP-	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
- - - - - 25 - -			- S	4		24.0 - 24.4	100/5"				5	micaceous (SM, decomposed rock) 24.5' Brown, gray, and red coarse to fine SAND, little 130.7 Gravel (rock fragments), very dense, dry (SM, decomposed rock) (Spoon refusal at 24.4 ft bgs, see Coring Log)	- - - - - - - - - - -
													-
			-										-
ם גא מ													

								BORING	NUM	BER	S-P4-()3		
6		2			C			SHEET I	NUMB	ER:	1	0	of	1
	DT	INNEL	<		L	K	ING LUG			_				
D	P	OJECT						PROJEC	T NU	MBE	R: 1850	515A		
PR	OJEC	T: B	&P Tunnel I	Replac	eme	nt Pi	roject	LOCATIO	ON: In	front	of 2124 I	Edmon	son Av	ve
LOC	CATIO	DN: E	Baltimore, M	D				COOPD	· N. 5	03 22	62 1	7.14	10.00	1 1
	ENT:	AM						SURFAC	:: IN: 3 :E EL I	93,44 =\/ 14	5.8 fe	5: 1,4 st	10,99	1.4
			rrol	uc.					Horiz	ontal	: NAD	83/9	1	
INS	PEC		B. Godfrev						Verti	cal: N	AVD	88	-	
DR		G ME	ETHOD: Hollo	w Stem	Auge	rs; Ro	otary Wash; Diamond Coring.	START I	DATE:	7/31	/ 18 T	IME:	8:45	am
RIG	TYP	E : C]	ME-55, Truc	ck Mo	unte	d, A1	utomatic Hammer	FINISH [DATE:	7/31/	18 T	IME:	3:50	pm
CO	RE B	ARRE	EL DATA:		NO	TES:			GR	OUND	WATER	DATA		
TYF	PE: D	ouble	Tube/ Swivel		Struc	ture b	poring, discontinuity data is not obtained				Water Depth	Cas	ing	Hole
								Date	Time	Э	(ft)	(ft)	(ft)
CO	RE S	IZE:	NQ2					7/31/18	11:13	am	26.7	-		51.0
O.D	.: 2.	980												
I.D.	1.87	5												
AUC	SER S	SIZE I	.D. (O.D.): 3.2:	5 (6.625	i) (CASI	NG SIZE I.D. (O.D.): 3.0" (3.5")				_			
		in/ft)			<u> </u>						DISC	ONTI	NUITY	DATA
set)	00	mi)	€	r (in	%) /	(DNI	표	a			t)
H (fe	IIC L	ATE	NL	ER	ERY	%) (DESCRIPTION AND REMARK	S uring	ΤĒR	NG	(deg			(feet
Ē	APF	GR	DEF	NOC	NO	RQL	Weathering, Strength, Structure	e)	ATH	TRE	μ	Ŀ	Ja	Η
B	GR	RIN	ND	REC	REC				ME	S.	ANG			DEP
	12 511111	00	Ûď							-				
							51.00'-51.70': Assume recovery loss 51.70'-54.60': Light gray, gray, white, tan wit	h speckles	<u>,</u> 11/111	R3				
-							of black amphibole GNEISS; medium to fine amphibole, quartz, feldspar, minor mica and	e grains of I garnet:						-
			C-1	35	80	72	close to extremely close fracture spacing; sl	ightly to						
-			51.0 - 54.6				~20-25°	ang ups						-
														-
101							57.001.57.001.4	- Collector						
-55		2.7					57.30'-57.80': Assume recovery loss; compl weathered; extremely weak	etely	11/111	R3				-
							Light gray, gray, white, tan with speckles of amphibole GNEISS: medium to fine grains of	black of						
		2.7					amphibole, quartz, feldspar, minor mica and	garnet;						-
-		27	C-2	54	00	30	moderately weathered; medium strong; ban	ding dips						-
		2.1	54.6 - 59.6	54	30	52	~20-25 [°] Few feldspar bands less than 0.5" thick							
-		2.7							V	R0				-
Ó														
		2.7												-
-60		27	<u></u>				60.67'-61.0': Assume recovery loss; comple	tely	<mark> / </mark>	R3	1			_
		2.1	59.6 - 61.0	13	76	0	Light gray, gray, white, tan with speckles of	black						
-	5000						amphibole GNEISS; medium to fine grains o ∫ amphibole, quartz, feldspar, and minor mica	ot i; close to	V	R0	┨ │			
							extremely close fracture spacing; slightly to weathered; medium strong; banding dins ~2	moderately						
							End of Boring at 61 ft bgs.							-
2 1 - 1														-
8-														-
0-														
-65														-
Š														
Note:	foliatio	n ioint					Dor		C D4	02	Chao	1	- 5	1

													BORING	NUMBE	R:S-P4-()4	
2						B	DRI	NG	; I C)G			SHEET	NUMBER	: 1	of	2
B8P	TUNNE	L L													1	05(15)	
					-1	Denlesen							PROJEC		ER: 1	83015A	
LOCA		Bal	tim	ore	iei e. N	керіасен ИD	ient P	roject					LUCATIO	JN: In Irol	nt of 2135 I	Lamonson A	ive
CLIEN	T: AN	ITR	Ak	Č.	- , -								COORD	: N: 593,	173.6 I	E: 1,410,9	97.0
CONT	RACT	OR:	E	2CI	R , 1	Inc.							SURFAC	E ELEV.	: 166.1 f	eet	
	ER: S.	Lyo	ons Fr	900	060								DATUM	Horizoni Vertical:	AI: NAD	83/91 88	
DRILL	ING M		10	ag D:I	Ioll	ow Stem Au	gers; Ro	otary W	ash; Dia	mond C	oring.		START I	DATE: 7/1	17/18 T	IME: 2:0	0 pm
RIG T	YPE: I)-50					0 ,						FINISH [DATE: 7/1	18/18 T	IME: 11:	53 am
			Au	ger		Split Spoon	Casi	ng	Pitcher	Grat	o Co	re Barrel		GROUN	NDWATER	DATA	
Type/S	Symbo		HS	SA		S			L	G]	C			Water Depth	Casing Depth	Hole Depth
I.D.			3.	25	_	1.375"	3.0	"	2.86	3.25	'	n/a	Date	Time	(ft)	(ft)	(ft)
O.D.			6.6	25	_	2"	3.5		3	3.375		n/a	7/18/18	8:45 am	36.0	-	45.0
Hamm	ا ۵۲ ۱۸/+	\vdash	0 p	0 /a	+	24" 1401bs	יח	rill Rod 9	24 Size	6.	"^"	n/a					
Hamm	er Fal	;	n	a /a	+	30"	וט))	1	.219" (1	.75")					
Tianini			T					SOII	(Ployed	Gin)	.217 (1	.,,,,					
et)	90	ft)						301		0 111.)	DEO						
H (fe	ICL	/smo				et)	0/6	6/12	12/18	18/24	(in.)						
EPTI	RAPH	NG (BI		BER	30L	ГН (fe			CORING	ì				ASSILICAT			
	U	CASI	TYPE	NUM	SYM	DEP	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	0.0'					
												0.8'	9" Asphalt				
-												165.3'					-
-	\$₩		G	1	X	2.0 - 2.5	G	R	Α	В	6		Brown, black	k, tan, coarse	e to fine SA	ND, some co	oarse
122													to fine Grave	el, little Clay	ey Silt, moi	st (SM, Fill)	-
B 4/6			G	2	X	4.0 - 4.5	G	R	Α	В	6		Brown CLA	Y & SILT. s	ome coarse	to fine Sand	- I.
[™] – 5	₩₽ ⁷												little coarse t	o fine Grave	el, moist, tra	ce brick	_
- IBKA	₩ c.		G	3		6.0 - 6.5	G	R	Α	В	6		naginents (C	, , , , , , , , , , , , , , , , , , ,			
					\wedge								& Silt, trace	white, coarse coarse to fin	e to fine SA ie Gravel, m	ND, some C loist (SC, Fil	lay
TUN			C	4		00 0 <i>5</i>	C	п		р	6						
B&P	₩^ I			4	X	0.0 - 8.3	G	ĸ	A	в	0		Brown, tan, & Silt_trace	white, coarse coarse to fin	e to fine SA	ND, some C	Clay D
S.GPJ	×€		S	1		9.0 - 11.0	2	WOH	1	1	16		End soft dig	at 8.5'	E trace fire	to medium	-/ -
ĭvi no 10			1										Sand, trace c	oarse Grave	l, very soft,	moist (ML,	Fill) —
- REA																	-
MELL	<i>¥</i> ∆ ^d																-
H4 M																	-
			S	2		14.0 - 16.0	1	2	2	2	13						
	**			2		14.0 - 10.0	1	2	2	2	15		Brown coras coarse to fine	e to fine SA e Gravel, mo	ND, some (bist, soft, litt	Clayey Silt, t le brick	race
													fragments (N	1L, Fill)	,,		_
			1														-
- 00 (F																	-
																	-
- BOK	R A ₩∆		s	3		19.0 - 21.0	1	2	2	2	14		Brown, grav	Clayev SIL	L. some coa	rse to fine S	and.
B&F	t_ 1												some coarse	to fine Grav	el, soft, mo	ist, little bric	k į

6	-											BORING NUMBER: S-P4-04
2		2				B	ORI	NG	i LC)G		SHEET NUMBER: 2 of 2
Ba	PROJE	EL C					(co	ontinue	ed)			PROJECT NUMBER: 185615A
PROJ LOCA CLIEN	ECT: TION: NT: A	B& Bal MTI	P T Itin RA	Tun 10r K	ne e,]	l Replace MD	ment I	Project	;			CONTRACTOR: E2CR, Inc. DRILLER: S. Lyons INSPECTOR: A. Fragoso
			Г		SAI	MPI F		SOIL	(Blows/	'6 in)		
eet)	LOG	s/ft)	┝				0/6	6/12	12/19	10/04	REC.	4
TH (f	HIC	(Blow:		r		(feet)	0/6	0/12	12/10	10/24	(in.)	FIELD CLASSIFICATION AND REMARKS
DEP	GRAF	SING	Ш	MBE	MBOI	PTH (DUN	PEC		; _/"	POD	-
		CA	Σ	N	SΥ	DE	(in.)	(in.)	% %	(in.)	%	
-												(ML, Fill)
- - - 25 -			- S	4		24.0 - 26.0	2	1	2	3	20	Black, gray coarse to fine SAND, some Silt, little coarse to fine Gravel, soft, moist, trace burnt fragments (SM, Fill)
			- S	5		29.0 - 31.0	2	2	2	2	23	Brown, gray Clayey SILT, some coarse to fine Sand, little coarse Gravel, soft, moist, trace burnt fragments (ML, Fill)
	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$		- S	6		34.0 - 36.0	WOH	WOH	WOH	29	20	34.0' 132.1' Brown Silty CLAY, trace fine Sand, very soft, moist (CL)
			S	7		39.8 - 40.5	6	50/3"			9	39.0' 127.1' Brown, orange, gray coarse to fine SAND, little Clayey Silt, little coarse to fine Gravel, very dense, moist (SM, decomposed rock)
			S	8		44.0 - 44.3	50/4"				4	45.0' Brown, orange, gray coarse to fine SAND, little Clayey Silt, little coarse to fine Gravel, very dense, moist (SM, decomposed rock)
Note:												(Auger refusal at 45 ft bgs, see Coring Log) Boring No. <u>S-P4-04</u> Sheet <u>2</u> of <u>2</u>

													BORING	NUMBE	R:S-P4-()5a	
2	-					B							SHEET	NUMBER	: <u>1</u>	of	1
ReP	TUNN	EL.															
DOG	PROJE	CI											PROJEC	T NUMB	ER: 1	85615A	
PROJE	CT:	B &	PΤ	un	nel	Replacen	nent P	rojec	t				LOCATI	ON: MAR	C West Bal	timore Trai lin St	nsfer
		Ba	ltin	10r	e, I	MD							COORD	· N. 502	706 1 I		13 1
			· F	х 2С	R	Inc							SURFAC	CE EL EV	· 125.1 f	2. 1,410,0 eet	43.4
			. <u>E</u> .	40	κ,	IIIC.							DATUM:	Horizon	tal: NAD	83/91	
INSPE	СТО	R: A	. Fi	rag	OS	D							The second	Vertical	NAVD	88	
DRILLI	NG N	MET	HO	D:	Hol	low Stem Au	gers; R	otary V	Vash; Dia	mond C	oring.		START I	DATE: 8/	17/18 T	IME: 12:	30 pm
RIG TY	PE:	CM	E-7	'5, '	Tr	uck Moun	ted, A	utom	atic Haı	nmer			FINISH	DATE: 8/	20/18 T	IME: 11:	22 am
			Au	iger		Split Spoon	Casi	ng	Pitcher	Grat	o Co	re Barrel		GROU	NDWATER	DATA	
Type/S	ymbo	ol 🗌	Η	SA		S			L	G]	C	-		Water Depth	Casing Depth	Hole Depth
I.D.	D. 3.25 1.375" 3.0" 2.86 3.25" n/a												Date	Time	(ft)	(ft)	(ft)
O.D.	D.D. 6.625 2" 3.5" 3 3.375" n/a												8/20/18	9:45 am	3.5	-	20.4
Length	ength 60 24" 24 6" n/a																
Hamm	Hammer Wt. n/a 140lbs Drill Rod Size "A"																
Hamm	lammer Fall n/a 30" I.D. (O.D.) 1.219" (1.75")																
	SAMPLE SOIL (Blows/6 in.)																
H (feet)	(j) (j) <td></td> <td></td> <td></td> <td></td>																
EPTF	RAPH	NG (BI		BER	SOL	TH (fee			1	FIELD CL	ASSIFICAT	ION AND I	KEMARKS				
	U	CASI	ТҮРЕ	NUM	SYMI	DEP'	RUN (in.)	REC (in.)	. REC. %	L>4" (in.)	RQD %	0.0'					
												0.4'	5" Asphalt; 8	3" concrete			
-												124.0'					-
F		<u> </u>	G	1	\times	2.0 - 2.5	G	R	Α	В	6		Brown, gray	Clayey SIL	T, and coars	se to fine Sar	nd, –
8-			-										trace coarse	to fine Grav	el (ML)		-
410																	-
C – D													Very dense 1	naterial, beg	in rock cori	ng at 7.1 fee	t.
																	÷
			╇	_	_							7.1'	(Auger refus	al at 7.1 ft b	gs, see Cori	ng log)	
5												118.0'	(Tuger Terus		55, 500 0011	ing 105)	-
50																	-
<u> </u>			1														_
		\vdash	+														-
		<u> </u>	-														-
* -																	_
			1														-
_ 15		⊢	1														_
		<u> </u>	-														-
																	_
			1														-
																	-
6																	

													BORING	NUMBE	R: S-P4- ()6 OW	
2	-					B	NRI	NG)G			SHEET	NUMBER	: 1	of	2
BsP	TUNNI	H-														05(15)	
	FROJE												PROJEC	CT NUMB	ER: 1	85615A	
PROJE	ECT:	B&I	? T	unn	lel	Replacen	ient P	roject					LOCATI	ON: MARO W Fra	C southbou nklin St	nd entrance	e, on
CLIEN	T' AN	ATR	RAK	lore K	; I	nD							COORD	.: N: 592,	692.0 I	E: 1,410,4	02.9
CONT	RACT	OR	: E2	2 CF	२ , 1	nc.							SURFAC	CE ELEV.	: 128.8 f	eet	
DRILL	ER: E	. Hi	11										DATUM	Horizont	al: NAD	83/91	
INSPE	CTO	R: B	. G	odf	rey	7								Vertical:		88 11.45 0.0	0
			HO F5	D:F	Ioll Tru	ow Stem Au	gers; Ro tod	otary W	/ash; Dia	mond C	oring.		FINISH	DATE: 8/.	1/18 1/18 T	IME: 9:0	0 am 30 nm
RIG H	IFE.		с-э Ан	oer		Split Spoon	Casi	na	Pitcher	Grat		re Barrel		GROUN			e o pin
Type/S	Symbo	ы –	H	SA	-	S	ouon	-ig		GX	1	C 目			Water	Casing	Hole
I.D.	- ynnoe	- -	3.	25		1.375"	3.0'	"	2.86	3.25	<u>''</u>	n/a	Date	Time	Depth (ft)	Depth (ft)	Depth (ft)
O D			6.6	525		2"	3.5		3	3.375		n/a	8/1/18	10:45 am	8.9	-	23.0
Lenath	1	\vdash	6	0	+	24"	60"	,	24	6"		n/a					
Hamm	er Wt	t. -	n	/a		140lbs	Dr	rill Rod	Size		"A"						
Hamm	er Fa	11	n	/a		30"	I	.D. (O.I	D.)	1	.219" (1	.75")					
	SAMPLE SOIL (Blows/																
set)	DOG	s/ft)	⊢				0/0	0/40		,	REC.	1					
TH (fe	HICI	Blows				eet)	0/6	6/12	12/18	18/24	(in.)		FIELD CL	ASSIFICAT	ION AND F	REMARKS	
DEP1	RAPI	NG (F		BER	BOL	TH (f			CORING	ì							
	U	CASI	TYPE	NUM	SYM	DEP.	RUN (in.)	REC.	REC. %	L>4" (in.)	RQD %	0.0'					
			t				<u> </u>			()		0.8'	9" asphalt; 9	" concrete			
-												128.0'					_
-	Å Å		G	1	X	2.0 - 2.5	G	R	Α	В	6	127.3'	Dark oray co	parse to fine	SAND son	he coarse to	- fine
~ -	N⊓ ⊡∆ S¥												Gravel, little	Clayey Silt,	moist (SM,	FILL)	-
4/6/2			G	2		40-45	G	R	Δ	B	6	4.0'					
			Γ	2	X	4.0 - 4.5	U	R		Б		124.8'	Tan, orange, Clayey Silt,	and brown moist (SM)	coarse to fir	ne SAND, so	ome
C - C			G	3		5.5 - 6.0	G	R	Α	В	6		Tan aranga	and become		AV some of	
- [18			1										to fine Sand	, wet (ML)	SILT & CL	AT, some et	
													Note: Termi	nate soft dig	at 6'		-
2 L L 2			S	1		8.0 - 10.0	9	7	9	9	19		Note: Water Tan. brown.	on spoon at and red coar	8' se to fine S	AND, some	-
8 7 -													Clayey Silt,	little coarse t	o fine Grav	el, médium	-
⁰ ²⁰ ²⁰ – 10													dense, moist	(5141)			_
			1														-
																	_
PH4 -				2		12.5 15.0	25	20	24		10						-
			- 5	2		13.5 - 15.0	25	32	34		18		Tan, orange,	and red coa	rse to fine S	AND, and	raliat -
5 — 15													layering (SN	I, Residual)	uvei, very u	ense, moist,	
FINAL																	_
000			1														-
			s	3		185-198	74	69	100/4"		16						-
				5		10.5 - 17.0	ит		100/-				Tan, orange, Clayey Silt,	and red coa	rse to fine S noist, relict	AND, some layering,	, _
R			S	4		19.8 - 20.1	100/3"				3		micaceous (SM, Decomp	osed Rock)	, ₆ ,	

PROJE LOCA ^T CLIEN	ECT: TION: T: A	B&: Bal MTH	P T Itim	`un 10r(K	ne e, 1	B I Replace MD	ORI (cc	Project	G LC	DG			BORING NUMBER: S-P4-06 OW SHEET NUMBER: 2 of 2 PROJECT NUMBER: 185615A CONTRACTOR: E2CR, Inc. DRILLER: E. Hill INSPECTOR: B. Godfrey
et)	OG	ft)		3	SAN	MPLE		SOIL	. (Blows/	6 in.)	550		
H (fee	HIC LO	3lows/1				eet)	0/6	6/12	12/18	18/24	REC. (in.)		FIELD CLASSIFICATION AND REMARKS
DEPT	C C C C C C C C C C C C C C C C C C C												
		CAS	ТҮР	NUN	SYN	DEP	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
			-									23.5' 105.3'	Gray and tan coarse to fine SAND, and coarse to fine Gravel (rock fragments), little Clayey Silt, very dense, dry (SM, Decomposed Rock) (Spoon refusal at 23.5 ft bgs, see Coring Log)
- 25			-										-
			-										-
			-										-
- 40 - 40 			-										-
H K H													

													BORING	NUMBE	R:S-P4-0	07	
2						B	NRI	NG)G			SHEET	NUMBER	t: <u>1</u>	of	1
BeP	TUNNI	H-														05(15)	
					_	D 1		•					PROJEC	T NUMB	ER: I	85615A	
PROJ		B&I	? Ti tim	unn		Replacen	nent P	roject					LOCATIO	ON: On W of buil	. Franklin lding #2335	St, approx. 5	40 ft E
CLIEN	IT: AN	ATR	RAK	K	, I								COORD	: N: 592,	556.4 I	E: 1,410,2	211.1
CONT	RACT	OR	: E2	2CF	\ ,]	Inc.							SURFAC	E ELEV.	: 132.5 f	feet	
DRILL	ER: J	oey											DATUM:	Horizont	tal: NAD	83/91	
INSPE			Fi	age	DSC)	D		7 1 10.		•		START		ПАУД 15/18 т	00 'IM⊏+ 10+	30 am
	YPE:	/IE I CMI	но Е-7	D:E 5. 1	ion Tru	ow Stem Au Ick Moun	igers; Ro ted. A	otary M utoma	ash; Dia tic Har	mond C nmer	oring.		FINISH	DATE: 8/	15/18 T	IME: 2:4	0 pm
			Au	ger		Split Spoon	Casi	ng	Pitcher	Grat	o Co	re Barrel		GROU	NDWATER	DATA	-
Type/S	Symbo	ol 🗌	HS	SA		S			L	G]	C			Water	Casing	Hole
I.D.	I.D. 3.25 1.375" 3.0" 2.86 3.25" n/a											n/a	Date	Time	(ft)	(ft)	(ft)
O.D.	O.D. 6.625 2" 3.5" 3 3.375" n/a											n/a	8/15/18	1:00 pm	14.0	-	14.0
Length	Length 60 24" 60" 24 6" n/a											n/a					
Hamm	Hammer Wt. n/a 140lbs Drill Rod Size "A"																
Hamm	Hammer Fall n/a 30" I.D. (O.D.) 1.219" (1.75")																
tî	SAMPLE SOIL (Blows/6 in.)																
H (fee	eee H U U U U U U U U U U U U U U U U U U U												FIELD CL	ASSIFICAT		REMARKS	
DEPTI																	
	Image: Ward of the second s																
-	AR∂											0.3' 0362.2' 131.9'	4" Asphalt; 7	7" concrete			
-			G	1	\times	2.0 - 2.5	G	R	Α	В	6		Brown oran	oe orav and	white coars	se to fine SA	ND -
3			-										and Clayey S	Silt, trace fir	ne Gravel, n	noist (SM, F	ill)
B 4/6			G	2	\times	4.0 - 4.5	G	R	Α	В	6	4.0'	Grav green-	grav coarse 1	to fine SAN	D and Clav	'ev
		<u> </u>	-									128.5	Silt, trace co	arse to fine (Gravel, mois	st (SM)	-
- LIBKA			G	3	X	6.0 - 6.5	G	R	Α	В	6		Grav, green-	grav coarse	to fine SAN	D. and Clav	- ev
													Silt, trace co	arse to fine (Gravel, mois	st (SM)	-
			G	4	\times	8.0 - 8.5	G	R	Α	В	6		Dark, gray-g	reen coarse	to fine SAN	D, and Clay	/ey
			S	1		9.0 - 11.0	4	7	9	11	24	9.0' 123.5'	Silt, trace co	ase to fine C	dravel, mois	t (SM)	
													Green-gray (very stiff, me	Clayey SILT bist, micaced	, and coarse ous (ML, Re	e to fine Sand esidual)	1, — -
																	-
ЕL РН4 				~		140 160	12			()		14.0'					-
			S	2		14.0 - 16.0	13	25	33	60	20	118.5'	Green-gray c very dense, r	coarse to fine noist (SM, I	e SAND, lit Decomposed	tle Clayey Si l Rock)	ilt,
																	-
L (FINA												17.5'					-
ŏ -	1.1.1.1.1		╞									115.0'	(Auger refus	al at 17.5 ft	bgs, see Co	ring Log)	-
BOKIN																	-
ЧХР																	
201 12																	

Note:

													BORING	NUMBER	R: S-P4- 0	8 OW	
2	-					R			: I C				SHEET N	UMBER	: 1	of	1
Bep	TUNN	EL-								G							
LCa	PROJE	CI											PROJEC	T NUMB	ER: 1	85615A	
PROJE	ECT:	B &1	P T	uni	nel	Replacem	ent Pr	oject					LOCATIO	ON: NE sid	le of MAR	C/Amtrak b v St	ridge
	TON:	Bal	ltim A L	or(Z	e, N	AD							COORD	· N· 592	502.2 I	. st E• 1 410 4	84 7
CONT	RACI	OR	·E	2C]	R . 1	Inc.							SURFAC	E ELEV.	126.2 f	eet	04.7
DRILLI	ER: J	oev			.,								DATUM:	Horizont	al: NAD	83/91	
INSPE	СТО	R: A	. Fi	ag	oso									Vertical:	NAVD 8	8	
DRILLI	ING M	1ETI	-101	D: I	Hol	low Stem Au	gers; Ro	otary W	ash; Dia	mond C	oring.		START [DATE: 8/	16/18 T	IME: 9:0	0 am
RIG T	PE: (CM	E-7	5, 1	[ru	ick Mount	ed, Au	itomati	ic Ham	mer			FINISHL	DATE: 8/	16/18		0 pm
T 10		. –	Au	ger		Split Spoon	Casii	ng	Pitcher	Grat		re Barrel		GROU	NDWATER Water	DATA	Hole
Type/S	symbo		Н	SA		S	2.00			GX		C		_	Depth	Depth	Depth
I.D.	I.D. 3.25 1.3/5" 3.0" 2.86 3.25" n/a O.D. 6.625 2" 3.5" 3 3.375" n/a												Date	Time	(ft)	(ft)	(ft)
O.D.	O.D. 6.625 2" 3.5" 3 3.375" n/a Length 60 24" 24 6" n/a												8/16/18	1:35 pm	0.4	-	25.0
Length	Length 60 24" 24 6" n/a Hammer Wt n/a 140lbs Drill Rod Size "A"																
Hamm	Hammer Wt. n/a 140lbsDrill Rod Size"A"Hammer Fall n/a 30"LD (OD)1.219" (1.75")																
Паппп	Tammer Fall n/a 30" I.D. (O.D.) 1.219" (1.75")																
et)	Image: Same series Source Source Source Image: Same series Image: Same series Image: Same series Image: Same series																
H (fee	D E E 0/6 6/12 12/18 18/24 REC. (in.) H <													ASSIFICAT	ION AND F	REMARKS	
DEPT	SRAP	ING (F		1BER	IBOL	TH (fé											
	0	CAS	TYP	NUN	SYN	DEP	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	0.0'					
-		-										0.3' 02\$.8'	4" Asphalt; 1	0" concrete			
	- 米A 1日 - ラ		G	1		20.25	G	D		р	6	125.3					_
N	***		Γ	1	X	2.0 - 2.5	U	K	A	Б	0		Tan, gray, w fine Gravel,	hite coarse t some Clayey	o fine SAN Silt, moist	D, little coar (SM, Fill)	se to
4/0/2	°.∰ ***`D						G			D		4.0'					_
– ССГВ ССГВ			G	2	\ge	4.0 - 4.5	G	R	A	В	6	122.2'	Gray, white,	tan medium	to fine SA	ND, and Cla	yey
- 5 ₩			1										Soft dig term	ninated at 4.	5'	Sist (Sivi)	_
																	-
			4														-
												0.51					_
8 1 			s	1	-	8.5 - 8.5	100/0.5"				0.5	8.3 117. V	Brown, whit	e coarse to f	ine SAND,	and coarse t	• /
20												117.7	fine Gravel, decomposed	little Clayey rock)	Silt, very d	ense (SM,	
2 – 10													(Auger refus	al at 8.5 ft b	gs, see Cor	ing Log)	
		<u> </u>	+														-
		<u> </u>	-														-
4 1																	-
			1														_
15			1														_
																	-
			-														-
																	-
л Д]														-
	1				1												

													BORING	NUMBE	R:UT-02		
2						B	DRI	NG)G			SHEET	NUMBER	: 1	of	2
B8P	TUNNE	T													1	956154	
	TOT. D		T		-1	Denlesen							PROJEC		ER: I	83015A	1.1.
		S&P Rali	11 im	unn		Replacen	ient Pi	roject					LOCATI	JN: Behind	1 700 N. Pt	ilaski St bui	lding
CLIEN	T: AM	TR	Ak	K	, 1,								COORD	: N: 593,	774.1 I	E: 1,411,0	34.7
CONT	RACT	OR:	E2	2CR	k, 1	lnc.							SURFAC	CE ELEV.	: 153.1 f	feet	
DRILL	ER: S.	Lyo	ons										DATUM:	Horizont	al: NAD	83/91	
INSPE		<u>: A.</u>	Fr	ago	SO)	D	·	7 I D'	10	•		START	v er tical.	ЛАУДО 28/18 т	00 'IM⊏·12·	10 nm
RIG T	YPE: D	EIF	10	D:H	011	ow Stem Au	gers; Ro	otary w	asn; Diai	mona C	oring.		FINISH	DATE: 8/2	29/18 T	IME: 11:	33 am
			Au	ger		Split Spoon	Casir	ng	Pitcher	Gra	o Co	re Barrel		GROUN	DWATER	DATA	
Type/S	Symbo	I	HS	SA		S			L	G]	C			Water	Casing Depth	Hole Depth
I.D.			3.2	25		1.375"	3.0'		2.86	3.25	"	n/a	Date	Time	(ft)	(ft)	(ft)
O.D.			6.6	25		2"	3.5'		3	3.375	5"	n/a	8/29/18	8:45 am	13.6	÷	26.0
Length	Ì		6	0		24"			24	6"		n/a					
Hamm	er Wt.		n	'a		140lbs	Dr	ill Rod	Size		"A"						
Hamm	er Fall		n	/a		30"	I	.D. (O.I	D.)	1	.219" (1	.75")					
	U	-		S	SAN	MPLE		SOI	L (Blows/6	6 in.)							
(feet	CLO	ws/ft				t)	0/6	6/12	12/18	18/24	REC.						
HTH	APHIC	G (Blo		К	Ы	l (fee			CORING	1	()	1	FIELD CL	ASSIFICAT	ION AND I	REMARKS	
B	GR	SING	ΡE	IMBI	MB(EPTH	RUN	REC.	REC.	L>4"	RQD	•					
	· 4. · 4.	C	Ţ	ž	ŝ	DE	(in.)	(in.)	%	(in.)	%	0.0'					
_																	-
			G			20.25	G	D		D	6						
				2	X	2.0 - 2.3	U	K	Λ	Б			Brown coars Gravel, little	e to fine SA Clavey Silt.	ND, little co dry (SM, F	oarse to fine	
17/0/													,	,)	-
7 7 7	≉⊿⊐ ≉ ⊠ ≯		G		\times	4.0 - 4.5	G	R	Α	В	6		Brown coars	e to fine GR	AVEL, son	ne Clayey Sil	lt,
- 5 5	₩												little coarse t	to fine Sand,	dry (GM, F	fill)	_
2021 -													Increase in n	naterial dens	ity		-
													End soft dig	at 5.5 ft			-
	Å.r																_
DØ	Same _					0.0 11.0	2			-	11						
0.0L	4		S	1		9.0 - 11.0	2	4	2	1			Brown, gray	, black coars	e to fine SA	AND, and Cl	ayey
10	*												brick fragme	ents (SM, Fil	l)	, moist, trac	· _
- YEA	[™]			Γ													-
																	-
× −	*																_
			C	2		14.0 16.0	2	2		1	7	14.0'					
	.20		S	2		14.0 - 16.0	2	2	2	1		139.1'	Dark gray co	barse to fine	GRAVEL,	some Clayey	Silt,
15	Papp												nuie coarse l	o mie Gand,	, er y 100se,		_
	660																-
	[g]]																-
- C	660																-
	a Pi		S	3		19.0 - 21.0	2	2	3	4	2	19.0'					
				5		19.0 - 21.0	2	2	5	7	2	134.1'	Dark gray co coarse to fin	e Gravel. loo	SAND, and se, moist (S	l Clayey Silt, SM)	little
Neter			-									-				-,	

Boring No. <u>UT-02</u> Sheet <u>1</u> of <u>2</u>
PROJ LOCA CLIEN	ECT: TION: NT: A	B& Bal MTI	P T ltin RA	Tun 10r K	ne e,	B(I Replace MD	ORI (cc	ndinue Project	d)	DG		BORING NUMBER: UT-02 SHEET NUMBER: 2 of 2 PROJECT NUMBER: 185615A CONTRACTOR: E2CR, Inc. DRILLER: S. Lyons INSPECTOR: A. Fragoso
t)	DG	£	L	3	SA	MPLE						
H (fee	IIC LO	lows/f				set)	0/6	6/12	12/18	18/24	REC. (in.)	FIELD CLASSIFICATION AND REMARKS
DEPT	RAPI	ING (E	ш	ABER	IBOL	TH (fé			CORING	6		
		CAS	TΥΡ	NUN	SYN	DEF	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %	
- - - - 25			- S	4		24.0 - 26.0	3	6	7	7	14	24.0' 129.1' Tan, orange, coarse to fine SAND, and Clayey Silt, medium dense, moist (SM, Residual)
				-			10	21	100/48			Falling head test at 26 ft.
				5		29.0 - 30.3	10	54	100/4		14	Tan, orange, coarse to fine SAND, and Clayey Silt, very dense, moist (SM, Decomposed rock)
- 35 - 35 - 35 - 35 - 35 - 4			S	6		34.0 - 34.4	100/5"				4	Orange, brown, black coarse to fine SAND, little Clayey Silt, trace fine Gravel, very dense, dry (SM, Decomposed rock)
			S	7		39.0 - 39.1	100/1"				1	40.0' 113.1 Orange, brown, black coarse to fine SAND, little Clayey Silt, trace fine Gravel, very dense, dry (SM, Decomposed rock) (Auger refusal at 40 ft bgs, see Coring Log)

												BORING	NUMBE	R:UT-05	5		
62	-					R(: 1 C			SHEET	NUMBER	:1	of	2	
ReP	TUNNE																
LOG	PROJEC	-1											PROJEC	T NUMB	ER: 1	85615A	
PROJE	ECT: I	B&P	T	unn	lel	Replacen	ient P	roject					LOCATI	ON: NE Co	orner of Mo	osher and N	
	TION:	Balt	tim	ore	e, I	MD							COORD	· N· 595	0267 1	F• 1 411 5	03 4
			Ar Fî	N CF	2 1	Inc							SURFAC	CEFIFV	· 158.5 f	2. 1,411,3 Feet	JJ. 1
	FR·E	. Hil	1		•	inc.							DATUM	Horizont	al: NAD	83/91	
INSPE	CTOF	R: A.	Fr	age	DSC)								Vertical:	NAVD	88	
DRILL	ING M	1ETH	ю	D:I	Ioll	ow Stem Au	gers; Ro	otary W	ash; Dia	mond C	oring.		START	DATE: 8/1	15/18 т	IME: 11:	30 am
RIG T	YPE: (CMF	[-7 :	5, 1	rı	ick Moun	ted, A	utoma	tic Har	nmer			FINISH	DATE: 8/1	15/18 T	IME: 3:0	0 pm
	Auger Split Spoon Casing Pitcher Grab Core Barrel ype/Symbol HSA S L G C E													GROUN	NDWATER	DATA	1 I al an
Type/S	Symbo		HS	SA		S			L	G		C	4		Water Depth	Depth	Hole Depth
I.D.			3.	25		1.375"	3.0	"	2.86	3.25	"	n/a	Date	Time	(ft)	(ft)	(ft)
O.D.			6.6	25		2"	3.5		3	3.375	5"	n/a	8/15/18	10:00 am	10.1	-	26.0
Length			6	0		24"			24	6"		n/a					
Hamm	er Wt	. _	n	'a		140lbs	Dr	rill Rod S	Size		"A"						
Hamm	er Fal		n	a		30"		.D. (O.E	D.)	1	.219" (1	.75")					
	(7)			5	SAI	MPLE		SOIL	_ (Blows/	6 in.)							
feet)	LO	/s/ft)					0/6	6/12	12/18	18/24	REC.	1					
TH (HC	(Blow		~		feet)					(in.)	-	FIELD CL	ASSIFICAT	ION AND I	REMARKS	
СЕР	RAF	NG	ш	IBEF	BOL	TH (CORING	ì							
_	0	CASI	TYPI	NUN	SYM	DEP	RUN (in)	REC.	REC.	L>4" (in.)	RQD	0.0'					
	× 4	-	ľ.	_			()	()		()							
-,	1⊡ → □D																-
-			G	1		2.0 - 2.5	G	R	A	В	6		Ton ond have		fine SANT		-
	°₩ µ				\cap								fine Gravel,	little Clayey	Silt, dry (S	M, Fill)	-
4/6/2				2		10 15	C	Ъ		р							
GLB			G	2	X	4.0 - 4.5	G	ĸ	A	в	0		Tan and brow	wn coarse to	fine SANE	and coarse	to
- 5	₩												fille Glavel,	Inthe Clayey	Sill, dry (S	IVI, FIII)	-
- LIBR			G	3	\times	6.0 - 6.5	G	R	Α	В	6		Brown coars	e to fine SA	ND some o	coarse to fine	-
	A OB												Gravel, little	Clay & Silt,	dry, trace of	coal (SM, Fil	l) _
	₽																_
B&F	N □D						_										
S.GPJ			S	1		9.0 - 11.0	2	1	1	3	8.5		Orange, brow	vn, black co	arse to fine	SAND, som	e –
ğ – 10	** 3												coarse to find diameter), so	e Gravel (lar ome Clay &	ge brick fra Silt, very lo	gments, 1" ii ose, moist (S	n C, –
HEAL	Bord a												Fill)		-	•	-
/ELL																	_
× ×	* -4																
L PH	ten 5		1									14.0'					-
			S	2		14.0 - 16.0	WOH	WOH	2	2	16	144.5'	Light gray, c	range, dark	brown, darl	c gray Claye	<i>y</i>
<u> </u>													SILT, little S	and, very so	ft, moist (N	1L)	_
Б - Г																	_
(FINA																	
LOG																	
			1									19.0'					-
08 –			S	3		19.0 - 21.0	1	3	9	6	12	139.5'	Brown, oran	ge coarse to	fine SAND	, some coars	e to
Moto:	11/1												fine Gravel,	some Clay &	z Silt, medi	um dense, m	oist

		UNNE					В	ORI	NG)G			BORING NUMBER: UT-05 SHEET NUMBER: 2 of 2
	P	ROJEC	Π					(00	ontinue	ea)				PROJECT NUMBER: 185615A
PR	OJE	CT:	B&	РΊ	un	ne	l Replace	ment F	Project					CONTRACTOR: E2CR, Inc.
LO	CATI	ON:	Bal	tin	ıor	e,	MD							DRILLER: E. Hill
CL	IENT	: Al	MTI	RA	K									INSPECTOR: A. Fragoso
	SAMPLE SOIL (Blows/6 in.)													•
(100)	1 (Teet	IC LO	ows/ft)				et)	0/6	6/12	12/18	18/24	REC. (in.)		
Ē		RAPH	NG (BI		BER	BOL	ГН (fe			CORING	3			FIELD CLASSIFICATION AND REMARKS
		Ū	CASI	TYPE	NUM	SYM	DEP.	RUN (in.)	REC. (in.)	REC. %	L>4" (in.)	RQD %		
_														(SC)
$\left \right $														-
-													24.0'	-
	5			S	4		24.0 - 26.0	11	13	21	23	18	134.5'	Orange, light gray, tan coarse to fine SAND, some Silt, trace coarse to fine Gravel (quartz), dense, moist,
														relict layering (SM, Residual)
-														
16/22														-
C GLB 4	•			S	5		29.0 - 29.2	100/2"				2	30.0'	Light gray, brown, tan coarse to fine SAND, little Clayey Silt, little Gravel, very dense, moist (SM,
- IBRAR	0												128.5	Decomposed rock) (Spoon refusal at 30 ft bgs, see Coring Log)
														-
3&P TUN														-
S.GPJ F														-
	5													-
VELL R														-
PH4 W														-
														-
	0			1										-
(FINAL														-
NG LOG														-
														-
				1										

													BORING	NUMBE	R: IVF-P	5-6	
2						B				SHEET	NUMBER	:1	of	3			
Ber	TUNNE	Ļ															
	PROJEC	."											PROJEC	CT NUMB	ER: 1	85615A	
PROJE	ECT: I	B&P	Tı	inn	el	Replacem	ent Pr	oject					LOCATIO	ON: 2000 I	Linden Ave		
	TON:	Bali ITD		ore	, N	AD .							COORD	· N· 598	969.0 1	E• 1 416 1	12.7
CONT	RACT		AN E2	CF	2.1	Inc							SURFAC	CE ELEV.	: 176.3 f	eet	12.1
DRILL	FR: S.	Lv	ons		•	inc.							DATUM:	Horizont	al: NAD	83/91	
INSPE	CTOR	: G .	H	ang	er									Vertical:	NAVD 8	8	
DRILL	ING M	ETH): I	Iol	low Stem Au	gers; Ro	otary W	ash; Dia	mond C	oring.		START	DATE: 8/	6/19 T	IME: 12:	50 pm
RIG T	G TYPE: CME-75 FIN Auger Split Spoon Casing Pitcher Grab Core Barrel rpe/Symbol HSA S L G ⊠ C ≣														12/19	IME: 9:0	0 am
	Auger Split Spoon Casing Pitcher Grab Core Barrel /pe/Symbol HSA S L G C C 4 25 1 375" "3 0" 2 86 3 25" n/a													GROU		DATA	
Type/S	Symbo		HS	SA		S				GX		C			Depth	Depth	Depth
I.D.			4.2	25		1.375"	"3.0)"	2.86	3.25		n/a	Date	Time	(ft)	(ft)	(ft)
O.D.			7.6	25		2"	"3.5	<u>"</u>	3	3.375	5"	n/a	8/9/19	7:45 am	10.9	-	151.1
Length		\vdash	6	0		24"	-		24	6"		n/a	8/12/19	8:00 am	12.6	-	181.1
Hamm	ier vvt.	-	n	a /a		140lbs	D		SIZE	-	"A"	75!!)	8/13/19	7:45 am	12.6	-	181.1
Hamm		I	n/	a		30"	ļ	i.u. (U.l	J.)		.219" (1	./ɔ")					
	SAMPLE SOIL (Blows/6 in.) Image: Solid state 0/6 6/12 12/18 18/24 REC.																
(feet	L C	ws/ft				~	0/6	6/12	12/18	18/24	REC.						
HTH	APHIC	G (Blo		ER	Ы	H (feet			CORING		(11.)	1	FIELD CI	LASSIFICAT	Ton and F	REMARKS	
D	GR	CASIN	ΓΥΡΕ	NUMB	SYMB(DEPTH	RUN	REC.	REC.	L>4"	RQD	0.0'					
<u> </u>		0	F	2	0,		(111.)	(111.)	70	(111.)	70	0.0					
-																	-
_	***		G	1		2.0 - 2.5	G	R	А	в	6						
	°-∂- **		Ĩ	Ĩ	X					2			Brown, dark Sand, moist	t gray, and ta (ML, Fill)	an SILT & (CLAY, little	fine
Ē																	-
-	₩ <u>₽</u>		G	2	\ge	4.0 - 4.5	G	R	Α	В	6		Light brown	and orange	-brown med	lium to fine	-
_ 5	*												SAND, little	Silt, moist (SM, Fill)		_
1 3/16	4.49		G	3		6.0 - 6.5	G	R	Α	В	6		Light house	and over -	brown	lium to for	-
L. CELE					ŕ								SAND, trace	e Clayey Silt	, trace fine	Gravel, mois	t_
KAK	***						~	-		F	-		(SM, Fill)				
FI			G	4	\boxtimes	8.0 - 8.5	G	R	A	В	6		Orange-brow SAND, trace	vn, brown, a e Silt, trace f	ind gray me ine Gravel.	dium to fine moist (SM. l	- Fill)
	4		G	5	$\overline{\mathbf{x}}$	9.5 - 10.0	G	R	Α	в	6		Tan brown	and gray ma	dium to fire	SAND two	-
10	*		S	1	\cap	10.0 - 12.0	5	3	5	6	22		Silt, trace fir	ne Gravel, m	oist (SM, F	ill)	
	\$0,0 ⁴												Light brown little Silt, dr	, orange-bro y (SM, Fill)	wn, and tar	n fine SAND	
H9.0																	-
	*																-
H&H	4		1														-
15 – 15			S	2		15.0 - 17.0	5	7	7	8	24		Brown, light	t brown, gray	y, orange-bi	rown, and ta	n —
	*												coarse to fin	e SAND, tra	ce Silt, wet	(SM, Fill)	-
1 	1. 1. ₩																-
												18.0'					_
OKIN												158.3'					
а т х Г			1														-
m	. • . • . • . •		1					L	1		l	I					

													BORING NUMBER: IVF-P5-6
2						B	OR	ING)G			SHEET NUMBER: of
B8	PROJE	EL CT					(C	ontinue	ed)				PROJECT NUMBER: 185615A
PROJ	IECT:	B&	РТ	un	nel	Replacen	nent P	roject					CONTRACTOR: E2CR, Inc.
LOCA	TION:	Bal	tim	ore	e, N	MD							DRILLER: S. Lyons
CLIEN	NT: A	MTI	RAI	K									INSPECTOR: G. Hanger
	(1)				SA	MPLE		SOIL	. (Blows/	6 in.)			
H (feet)	IC LOG	ows/ft)				et)	0/6	6/12	12/18	18/24	REC. (in.)		
EPTH	APH	NG (BI		BER	30L	H (fee			CORING	6			FIELD CLASSIFICATION AND REMARKS
	5	CASIN	ТҮРЕ	NUME	SYME	DEPT	RUN (in.)	REC.	REC.	L>4" (in.)	RQD %	1	
-			S	3		20.0 - 22.0	6	4	4	5	22		Brown, light brown, tan, and dark gray coarse to fine SAND, and medium to fine Gravel, little Silt, wet (SW-SM)
t													-
													_
- 25			s	4		25.0 - 27.0	7	12	14	13	0		No recovery
-													
-													-
-													-
N - 30			s	5		30.0 - 32.0	5	7	8	5	24		-
3/16/2				5		50.0 - 52.0	5	,	0	5	24		Top 18": Brown, dark brown, tan, and gray medium to fine SAND, some medium to fine Gravel, some
RY.GLB		<u> </u>										32.5'	Bottom 6": White, tan, light brown with bands of yellow fine SAND and Clayey Silt, trace fine Gravel,
- LIBRA												143.8'	relict banding present, micaceous, moist (SM, residual)
I													-
- 35			S	6		35.0 - 37.0	16	15	11	9	24		Light gray, dark gray, interlayered with brown and orange-brown SILT, some fine Sand, relict banding
H5.GPJ												27.51	present, micaceous, moist (ML, residual)
												37.5' 138.8'	-
													-
40			S	7		40.0 - 42.0	22	19	18	24	16		Dark orange-brown, dark brown, and tan medium to
FINAL)													ine SAND, little Silt & Clay, trace fine Gravel, relict banding present, micaceous, moist (SM, residual)
1 9 TOG (42.5' 133.8'	-
												100.0	-
B&P		•											

Note:

Γ	6	-												BORING NUMBER: IVF-P5-6
	2		2				B	ORI	NG	LC)G			SHEET NUMBER: of
	B&P	PROJEC						(co	ontinue	ed)				PROJECT NUMBER: 185615A
		-CT·	R&	рт	un	no	Doplacor	nont P	roject					CONTRACTOR: F2CP Inc
ľ	NOJL	_01.	Da		un	nei	Replace		ojeci					CONTRACTOR: EZCK, III.
ľ		FION:	Bal	tin	ore	e, I	MD							DRILLER: S. Lyons
		T· AI	мтғ	RAI	K									INSPECTOR G Hanger
ſ		ŋ	()		ļ	SAI	MPLE		SOIL	. (Blows/	6 in.)	ł		
	H (feet	IC LO	ows/ft				et)	0/6	6/12	12/18	18/24	REC. (in.)		
	EPT	APH	NG (BI		BER	SOL	H (fee			CORING	6			FIELD CLASSIFICATION AND REMARKS
		5	CASIN	ТҮРЕ	NUME	SYME	DEPT	RUN (in.)	REC.	REC.	L>4" (in.)	RQD		
F				S	8		45.0 - 47.0	8	9	13	18	24		White and light blue-gray fine SAND, little Silt, micaceous, moist (SM, Residual)
Ē														
														-
														-
	- 50			s	9		50.0 - 52.0	9	12	14	20	24		Light green-gray white and green-gray fine SAND
-														little Silt, micaceous, moist (SM, Residual)
+														-
F														-
F														-
8/16/22	- 55			S	10		55.0 - 55.2	100/2"				2		Green-gray, light green-gray with speckles of black
.GLB 3														present, moist (SM, decomposed rock)
BRARY					11		58.0 58.1	100/1"				1	58.1'	
Ш- - ГІ				ľ	**			100/1					118.2'	Light green-gray, gray with speckles of black medium to fine SAND, trace Silt, moist (SM,
	- 60													(Spoon Refusal at 58.1 ft bgs, see Coring Log)
PJ B&I														-
PH5.G														-
UNNEL														-
B&P T														-
COPY	- 65													-
FINAL)														-
POG (-
BORING														-
B&P I														

													BORING		r: IVF-P	5-8A	
62						D					SHEET	NUMBER:	1	of	3		
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⊒⊢ 10			S	1		10.0 - 12.0	7	4	6	7	12	169.8	medium to f	ine Sand, mc	oist (ML)		
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B B B B B B B B B B B B B B B B B B B													medium den	se, moist (SI	(IV	,	-
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_ 25			S	4		25.0 - 27.0	6	7	7	9	10		
				7		23.0 - 27.0	Ū	,	,		10		Light brown, light gray, and dark gray coarse to fine SAND, some coarse to fine Gravel, trace Clayey Silt,
_													medium dense (SM)
-													-
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- 30			s	5		30.0 - 32.0	28	5	6	5	18		Top 10": Orange, light brown, light purple-gray, and
1													light gray coarse to fine SAND and coarse to fine Gravel, trace Silt, medium dense, wet (SM)
- B 3/16													Bottom 8": White and light orange fine SAND, little Silt, trace fine Gravel, micaceous, medium dense, wet
ARY.GI												33.5'	(SM, Residual Soil)
- LIBR												146.3'	-
- 35			S	6		35.0 - 37.0	5	6	9	9	18		Light gray, orange, black, red-brown, and dark gray
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				л£		10.0 - 12.0	10	10		50	2 - 1		Gray, light gray with streaks of orange-brown SILT, some fine Sand, micaceous, dense (CL, Residual
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-													F	and, highly micaceous, medium dense (CL,
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-	102-00			1									131.3'	-
- t	50			S	9		50.0 - 52.0	27	40	62	60	24	I	Dark green-gray to gray, light gray, tan, and black
-														SM, Decomposed Rock)
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	55				10		55.0 56.0	25	100/6"			12		
	55			, s	10		55.0 - 50.0	23	100/0			12	I SC 41 S	Dark green-gray, black, and silver fine SAND and Silt, micaceous, relict banding observed, very dense
3/16/22				$\left \right $									56.4' (123.4' (SM, Decomposed Rock) Spoon Refusal at 56.4 ft bgs, see Coring Log)
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Baltimore Maryland

APPENDIX C: GEOMORPHOLOGY WORK PLAN

Work Plan for Geomorphology Survey of the South Portal and Approach, Baltimore & Potomac Tunnel Replacement Program, Baltimore City, Maryland

Draft

Prepared For: AMTRAK

Prepared by:

WSP USA, Inc. 1 East Pratt Street, Suite 300 Baltimore, Maryland 21202

1. INTRODUCTION

On behalf of Amtrak, WSP USA Inc. (WSP) will conduct a geomorphology survey of the proposed Phase IB archaeological survey area of the South Portal and Approach for the Baltimore & Potomac Tunnel Replacement Program (Program) (Figure 1). As the result of a supplemental Phase IA survey for the program, a portions of the APE-Archaeology that include the South Portal and Approach were assessed as having a moderate-to-high sensitivity for the presence of pre-contact and early historic archaeological resources. Other areas within this portion of the APE-Archaeology were additionally assessed as having a moderate sensitivity for the presence of historic archaeological resources associated with the late nineteenth century occupation of the Monroe-Riggs neighborhood. The purpose of the study is to further characterize the subsurface conditions within the survey area in order to identify areas of disturbance as well as determine if buried undisturbed soils are present and have the potential to contain archaeological sites that may be eligible for listing on the National Register of Historic Places (NRHP). In the event that archaeological sites are identified that require additional investigation to evaluate their potential for inclusion the NRHP, WSP will conduct further Phase IB archaeological surveys of those locations after consultation with the Federal Railroad Administration (FRA), the Maryland Historical Trust (MHT) and the other consulting parties, in accordance with Stipulation IV.C.3 of the Programmatic Agreement (PA).

This investigation will assist FRA, as the lead federal agency, with its obligations under Section 106 of the National Historic Preservation Act, as amended (Section 106) and to resolve adverse effects on historic properties in accordance with the Section 106 implementing regulations (36 C.F.R. § 800) for the Program. The survey will also comply and be conducted consistent with Stipulations VI.B and VI.C.1 of the PA for the Program and the *Standards and Guidelines for Archaeological Investigations in Maryland* (Shaffer and Cole 1994).

2. PROJECT LOCATION AND DESCRIPTION

The proposed survey area consists of approximately 13 acres located between the existing railroad rightof-way and North Payson Street from Edmondson Avenue to Riggs Avenue (see Figure 1). The improved portions of the survey area contain a mix of late-nineteenth to early twentieth century rowhouses and midto-late twentieth century commercial and industrial buildings as well as paved parking lots, and vacant lots covered with a mix of manicured grass and trees.

The survey area is located within the Fall Zone region of the Upland Piedmont physiographic province. A transitional region between the Coastal Plain and the Piedmont, where the rolling terrain and hilltops formed from crystalline bedrock is sometimes overlain by unconsolidated sediments that are thicker toward the southeast. Historically, the survey area was undeveloped pastures and wood lots located on the floodplain and low uplands bordering the north branch of the Gwynns Run. In the early twentieth century, significant modifications were made to the landscape as the stream valley was filled with large quantities of transported soil which resulted in an increased surface elevation of upwards of 20 feet within the survey area. Currently, the survey area is situated on a relatively level landform consisting of imported soil situated approximately 180 feet above mean sea level (amsl). The soils within the survey area are mapped as Urban land, 0 to 15 percent slopes (44UC). Urban Land Association soils are located in nearly level to moderately sloping areas of urban settings where more than 80 percent of the surface is covered by asphalt, concrete, buildings, or other impervious surfaces. Typically the impervious surfaces are underlain by fill which may cover natural soils underneath.

3. HISTORICAL MAP REVIEW

A review of the historical mapping indicates that the survey area was slow to develop and did not begin in earnest until the second half of the nineteenth century. Prior to the 1850s, the survey area was situated in Baltimore County. At that time, development in Baltimore was concentrated around the Inner Harbor and was slowing expanding west and north. The area containing the survey area consisted of farms and estates surrounded by forests and pastures. The 1851 *Plan of the City of Baltimore, Maryland* illustrates the plan for the street grid to extend through the survey area (Sidney and Neff 1851); however, the developed portions of the city during that time remained south of Franklin Street and east of Freemont Avenue. Although not a comprehensive map of the development at the time, the 1851 map indicates the survey area was largely unimproved although several farm houses and outbuilding are depicted immediately to the east. J.C. Sidney's 1857 *Map of the city and county of Baltimore, Maryland* similarly depicts an absence of buildings within the survey area while the two nearby farm houses are identified as belonging to J.H. Kaufman and John Kirby (Sidney 1857).

A.D. Bache's 1865 *Approaches to Baltimore, Maryland* provides additional details about the improvements that occurred within the vicinity of the survey area during the mid-nineteenth century (Bache 1865). By that time, the survey area consisted of a mix of cleared terraces and wooded floodplains bordering the north branch of Gwynns Run. West Lafayette Avenue was established by this time and extended east to west through the survey area and the alignment of West Franklin Street is also depicted to the south. The map also depicts a cart road crossing the north branch of Gwynns Run to the south of present-day Lafayette Street as well as several fence lines extending through the survey. However, the nearest buildings are depicted to the east of the survey area in the vicinity of present-day North Fulton and McKean avenues.

Hopkins' 1876 *City Atlas of Baltimore, Maryland and Environs* reflects an increase in development within the vicinity of the survey area during this period (Hopkins 1876). The map depicts the proposed gridded street pattern that is similar to the present-day street pattern. However, the presence of houses and other buildings depicted within roads suggests not all of the proposed roadways depicted on the map were constructed by that time. The Baltimore and Potomac Railroad is depicted as extending along the west side of the survey area parallel to the north branch of Gwynns Run and extending through several large parcels owned by the Patterson, Keerl, Shipley, and Abell families. According to the 1876 map, the survey area appeared to be part of Thomas M. Keerl's estate, Woodley (Figure 2). While none of the estate's buildings are depicted within the survey area, the map shows the mansion house and other outbuilding to the east, north of Lafayette Avenue.

With the sale of much of the Keerl estate in the late nineteenth century, the city expanded west of Gilmor Street as the neighborhoods of Poppleton, Franklin Square, Harlem Park and Sandtown-Winchester were established. According to the 1897 *Atlas of the City of Baltimore*, most residential development did not extend as far as the survey area as the majority of houses depicted on the 1897 are situated east of Payson Street (Duncan 1897). With the exception of the Baltimore and Potomac Railroad and the city streets, the survey area remained largely undeveloped. No buildings are depicted within the survey area and the only development within the boundaries was an area designated as a city dump located south of Lanvale Street, between Payson and Pulaski Streets. The remainder consisted of cleared and undeveloped terraces overlooking the north branch of Gwynns Run.

Sanborn Fire Insurance maps provide additional details about the developmental history within the survey area during the first half of the twentieth century. The 1901 Sanborn maps indicate the majority of development within the survey area occurred along and to the south of Lafayette Avenue (Sanborn Map Company 1901). Two-story brick rowhouses are present on Lafayette Avenue, between Payson and Brice Streets, as well as on Lanvale Street, between Payson and Pulaski Streets. Additionally, the Lafayette Mill and Lumber Company is also present within the survey area (Figure 3). The mill occupied the 2100 block

of Lafayette Street and included one-story wood-frame office and storage buildings as well as several fenced areas on the lot for lumber storage.

The Sanborn maps from 1914 indicate additional two-story brick rowhouses were constructed along Payson Street, north of Lafayette Avenue (Figure 4) (Sanborn Map Company 1914). A large one-story brick warehouse and one-story wood-frame office was also constructed within the survey area on Mosher Street by that time. The block between Lafayette Avenue and Lanvale Street from Pulaski and Brice streets was also nearly fully developed by 1914. Two-story brick rowhouses lined Lanvale and Brice street with several other newly constructed houses erected on Lafayette Avenue. In addition, a one-story brick laundry facility was erected on Pulaski Street. The 1914 maps also indicate that some buildings that were first depicted in the 1901 maps were razed sometime in the subsequent 14 years. They included the rowhouses that were located within present-day Lafayette Payson Park. The lumber mill and rowhouses depicted on the north side of Lafayette Avenue were also razed by 1914.

Later Sanborn maps indicate the survey area remained unchanged through the first half of the twentieth century as there was no variation between the building depicted in the 1914 and 1951 Sanborn maps (Sanborn Map Company 1914, 1951). A review of historic aerial photographs after 1957 indicates little changed within the survey area until 1971 when a grocery store and parking lot was constructed on the north side of Lafayette Avenue at Pulaski Street with street access from Payson Street (Nationwide Environmental Title Research [NETR] 1957, 1971). In the decades that followed, some of the rowhouses on Lanvale Street, Harlem Avenue, and Rayner Avenue were razed; however, the majority of the houses remain.

4. ARCHAEOLOGICAL RESOURCE POTENTIAL

With the exception of the 2100 block of Lafayette Avenue, the remainder of the survey area lies within the NRHP-eligible Monroe Riggs Historic District/ Midtown Edmondson Historic District (B-5118), which was a small working class neighborhood that was established between 1890 and 1915. Prior to the 1900, the survey area consisted of floodplains and well-drained uplands extending along both sides of the north branch of Gwynns Run that were largely untouched by development since the arrival of Europeans. The floodplains and uplands were filled with transported soil in order to facilitate additional residential construction in west Baltimore and by 1914, the majority of the survey area was fully developed with rowhouses and commercial and industrial buildings located closer to the railroad tracks.

The portion of the survey area between Riggs Avenue and West Lanvale Street, west of North Payson Street possesses a moderate sensitivity for the presence of intact archaeological resources associated with the late nineteenth and early twentieth century occupation of extant and former rowhouses. The houses in this location were primarily constructed prior to 1914, with several having been built in the late 1890s. Although some of the lots that contained rowhouses within the survey area have since been razed, those areas are now paved lots and open green spaces. Likewise, in locations where the rowhouses are extant, the rear yards are largely undeveloped. As a result, there is the potential for the presence of structural features and other preserved cultural deposits associated with the early residents of the Monroe-Riggs neighborhood.

Additionally, there is the moderate to high sensitivity for the presence of deeply buried pre-contact and early historic archaeological sites located beneath the deep fill soils that cover the survey area. Based on the analysis completed for the supplemental Phase IA survey, significant modifications were made to the landscape as the stream valley of the north branch of Gwynns Run was filled with large quantities of transported soil which resulted in an increased surface elevation upwards to 16 feet in some parts of the survey area. Once the stream valley was filled, the first phase of residential and commercial development within this portion of the survey commenced. While ground disturbance occurred as a result of construction, the impacts were limited to the depth of existing fill and likely did not extend into the underlying buried ground surface. If a deeply buried ground surface is present, it has the potential to contain pre-contact and early historic period archaeological deposits.

5. RESEARCH GOALS AND METHODS

Archaeological tasks will be performed or overseen by qualified professionals as defined by the Secretary of the Interior (formerly 36CFR §61) and will be consistent with the principles and standards contained in *Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (1983), *Consulting About Archeology Under Section 106* (Advisory Council on Historic Preservation 1990).

5.1 Research Goals

The goal of the geomorphology survey is to evaluate the existing soil conditions so as to assess the extent of previous filling activities and to determine whether intact buried surfaces are present capable of containing pre-contact or historic cultural deposits. The following goals were set for the Phase IB investigation:

- Evaluate soil conditions between Riggs Avenue and West Lanvale Street, west of North Payson Street to determine whether there is potential for buried surfaces or features associated with the early development of the Monroe Riggs Historic District/ Midtown Edmondson Historic District.
- Evaluate soil conditions throughout the survey area to determine whether deeply buried surfaces are present that have the potential for containing pre-contact or early historic cultural deposits.
- Determine the need for additional Phase IB archaeological investigations and develop effective survey strategies to identify archaeological resources in the event intact buried surfaces are identified.

5.2 Research Methods

The Phase IB archaeological survey will include a geomorphology field survey, laboratory analysis, and reporting. A full health and safety plan (HASP) specific to the survey area and proposed field effort will be developed prior to the start of field investigations. This project-specific HASP will be developed to conform to Amtrak's current safety policies and procedures. All WSP personnel who are assigned to the field effort will be required to review, sign, and follow the procedures laid out in the HASP document. WSP will also conduct daily safety briefings ("tailgates") prior to the start of the fieldwork.

General site and survey area conditions, areas of interest, and crew activities will be documented by the WSP archaeology supervisor. A daily log will be maintained recording information about work progress, visitors to the site, safety issues, weather conditions and/or impediments to work, and general observations and results. Any identified archaeological resources will be recorded on project plans maps or aerial imagery, and further documented with hand drawn sketch maps. The fieldwork will be documented using digital photography.

Geomorphology Field Survey

Prior to the geomorphological survey, the survey team will request a utility mark-out by Miss Utility. All boring locations will be placed in area to avoid underground utilities. The fieldwork will be completed by one team and may require up to two weeks to complete, dependent on permissions by property owners.

The geoarchaeological assessment will be conducted by a qualified geoarchaeologist and will entail mechanized direct push geotechnical sampling at selected locations throughout the survey area. The boring locations will be selected by the geoarchaeologist and a quantity of boring will be sufficient to adequately characterized the depth of fill and the presence of intact buried surfaces throughout all portions of the survey area.

Mounted on a standard-sized pickup truck or small mechanized rig, the Geoprobe retrieves a continuous soil column that is approximately two inches in diameter, with minimal damage to the landscape. Each

probe is advanced in four-foot increments to the necessary depths. Given that natural soils in this area could have been floodplain or terrace remnant, the goal will be to reach depths of up to 20 feet below current grade in each test area. All borings holes will be filled topsoil, gravel or cement grout following the completion of testing.

Laboratory Analysis

Recovered soil columns will be analyzed on-site at the time of their recovery or collected and transported to the laboratory for later analysis. Examined soil columns will be described employing standard pedological designations for soil horizons, as well as standard descriptive terminology such as Munsell color notations and USDA soil textural classes. Logs will be produced for each of the borings. Artifacts and other material recovered from the soil columns will be photographed, analyzed and a description and depth of the recovered material will be noted in the logs. The soil columns will be retained over the duration of the project and discarded following the acceptance of the report.

Reporting

A geomorphology survey report will be completed following the completion of the field investigation and laboratory analysis. The report will minimally consist of a description of the survey area and the results of the relevant background research which includes geology, hydrology, geomorphology, soils, and regional cultural context. The report will also include a description and results of the field investigation, field observations, laboratory analysis and result, and the evaluation of the investigation in terms of its goals, objectives and research topics. The report will also be illustrated with appropriate maps, photographs, charts and tables documenting the excavation and analysis. If intact buried ground surfaces are identified, the report will also provide recommendations for future studies as well as proposed testing strategies to complete Phase IB archaeological testing. The report will include appendices consisting of boring logs and other supporting information and data that will provide sufficient information to complete an accurate review of the study results and recommendations.

One digital copy of the draft report will be provided to Amtrak in both Microsoft Word and pdf format. Upon receipt of comments, a digital copy of the revised draft report will be submitted to Amtrak for delivery to the FRA for their review and comment. Upon the receipt of FRA comments, a final report will be delivered in electronic format (PDF) with two (2) hard copies for review by MHT and a digital copy of the redacted final report will also be provided to the consulting parties.

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Joseph Clemens, WSP USA – Mr. Clemens is an archaeologist with WSP and will serve as the field director for the Phase IB geomorphological survey. In addition to a BA in archaeology (Saint Mary's College, he also has a MA in Geology (University of Delaware) specializing in Geoarchaeology. Mr. Clemens has 11 years of experience conducting archaeological and geoarchaeological investigations in the Middle Atlantic region and meets the Secretary of the Interior's Professional Qualification Standards for Archaeology. He has participated in and supervised all levels of archaeological investigation and possesses a strong understanding of successful field methodologies applied in varied conditions. Mr. Clemens is well-versed in precontact and historic artifact analysis and interpretation, and has extensive experience conducting geomorphology studies in the Middle Atlantic region.

Daniel P. Wagner, Geo-Sci Consultants, LLC - Dr. Wagner has worked as a consulting pedologist throughout Eastern North America, Central America, and the Caribbean for more than 40 years. During this time he has either directed or contributed to some 1,200 projects applying soil-geomorphic principles to an array of land resource considerations. In recent years, Dr. Wagner has increasingly concentrated his efforts in pedoarchaeological (geoarchaeological) studies, and to date has contributed to over 430 such investigations. Most of these involved paleogeographic analyses of prehistoric sites emphasizing Holocene depositional and soil weathering sequences as well as evolving environmental conditions. He has also worked on a number of historic sites interpreting landscape modifications for settings ranging in diversity from eighteenth century tidewater plantations to the altered shorelines and core areas of major East Coast cities.



Boundaries of the Survey Area for the Geomorphology Study (ESRI World Street Map 2021) $$\rm C\mathchar`{C-1}$



Survey Area in 1876 (Hopkins 1876)

C-2



Survey Area in 1901 (ESRI World Street Map 2021) C-3



Survey Area in 1914 (Sanborn Map Company 1901, ESRI World Street Map 2021) $$\rm C\mathchar`{C-4}$

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Baltimore Maryland

APPENDIX D: PHASE IB/II ARCHAEOLOGICAL SURVEY WORK PLAN

Work Plan for Phase IB/II Archaeological Survey of the Intermediate Ventilation Facility, Baltimore & Potomac Tunnel Replacement Program, Baltimore City, Maryland

Draft

Prepared For: AMTRAK

Prepared by:

WSP USA, Inc. 1 East Pratt Street, Suite 300 Baltimore, Maryland 21202

1. INTRODUCTION

On behalf of Amtrak, WSP USA Inc. (WSP) will conduct a Phase IB/II archaeological survey of the proposed survey area of the Intermediate Ventilation Facility for the Baltimore & Potomac Tunnel Replacement Program (Program) (Figure 1). As the result of a supplemental Phase IA survey for the Program, a portion of the Intermediate Ventilation Facility was assessed as having a moderate-to-high sensitivity for the presence of historic archaeological resources. The proposed survey area encompasses approximately 0.6-acre located on Linden Avenue and includes all areas assessed with a moderate-to-high sensitivity within this portion of the Area of Potential Effects (APE)-Archaeology. The purpose of the study is to identify any archaeological sites in the survey area that might be eligible for listing on the National Register of Historic Places (NRHP). In the event that archaeological sites are identified that require additional investigation to evaluate their potential for inclusion the NRHP, WSP will conduct Phase II archaeological evaluations to evaluate the identified archaeological site(s) for inclusion in the National Register of Historic Places, in accordance with Stipulation IV.D of the Programmatic Agreement (PA).

This investigation will assist FRA, as the lead federal agency, with its obligations under Section 106 of the National Historic Preservation Act, as amended (Section 106) and to resolve adverse effects on historic properties in accordance with the Section 106 implementing regulations (36 C.F.R. § 800) for the Program. The survey will also comply and be conducted consistent with Stipulations VI.B and VI.C.1 of the PA for the Program and the *Standards and Guidelines for Archaeological Investigations in Maryland* (Shaffer and Cole 1994).

2. PROJECT LOCATION AND DESCRIPTION

The proposed Intermediate Ventilation Facility (IVF) encompasses approximately 3.91 acres located at 900-940 West North Avenue. It is bound by Linden Avenue to the east and Eutaw Place to the west. The survey area is located at approximately 2002-2012 Linden Avenue, and consists of an approximately 0.6-acre area located in the northeast corner of the APE-Archaeology for the IVF. Seven late nineteenth-century rowhouses occupied the survey area. The houses were demolished in the mid-twentieth century and the survey area was paved for use as a surface parking lot. Currently, the survey area continues to be utilized as a customer parking lot for the E-Z Laundromat located at 2000 Linden Avenue.

The survey area is located within the Fall Zone region of the Upland Piedmont physiographic province. A transitional region between the Coastal Plain and the Piedmont, where the rolling terrain and hilltops formed from crystalline bedrock are sometimes overlain by unconsolidated sediments that are thicker toward the southeast. Historically, the survey area was located on the toe slope of a hill adjacent to an unnamed tributary of the Jones Falls. By the late-nineteenth century, the ground surface was modified as the urban core of Baltimore expanded north. Currently, the survey area is situated on a relatively level landform located at approximately 200 feet above mean sea level (amsl). The soils within the survey area are mapped as Urban land, 0 to 15 percent slopes (44UC). Urban Land Association soils are located in nearly level to moderately sloping areas of urban settings where more than 80 percent of the surface is covered by asphalt, concrete, buildings, or other impervious surfaces. Typically the impervious surfaces are underlain by fill which may cover natural soils underneath.

3. HISTORICAL MAP REVIEW

A review of the historical mapping indicates that the survey area was slow to develop and did not begin in earnest until the second half of the nineteenth century. The 1801 *Plan of the City and Enviros of Baltimore* indicates several large estates were present in the vicinity of the survey area and the IVF by the turn of the

nineteenth century (Warner and Hanna 1801). At that time, development in Baltimore was concentrated around the Inner Harbor and extended as far north as New Street (present-day Franklin Street). Areas north of New Street consisted of farms and estates surrounded by forests and pastures. The 1801 map indicates the survey area was part of an unimproved wood lot. Although no farms or other buildings are depicted in the survey area, a meandering cart road is shown to the south.

By the 1850s, portions of Baltimore's street grid were extended as far north as North Avenue; however, the area in the vicinity of the survey area was still rural. J.C. Sidney's 1857 *Map of the City and County of Baltimore* depicts three farms located in close proximity to the survey area (Sidney 1857). The house belonging to a "Mrs. Horn" is the closest, situated to the west of the survey area near the intersection of present-day Madison and West North avenues. A.D. Bache's 1865 *Approaches to Baltimore, Maryland* provides additional details about the improvements that occurred within the vicinity of the survey area during the mid-nineteenth century (Bache 1865). By that time, the meandering cart road (present-day Bloom Street) depicted to the southeast of the survey area in the 1801 map was realigned and straightened as it extended along the southeast side of the survey area. The map also depicts one house situated on the north side of the road, just outside the survey area boundary.

Between 1860 and 1880, settlement increased on the city's undeveloped periphery as families began to leave the center city for new neighborhoods that were connected to the city by horse-drawn street cars. Hopkins' 1876 *City Atlas of Baltimore, Maryland and Environs* reflects the increased development north of the city's original core during this period (Hopkins 1876). By 1876, the vicinity of the proposed location of the IVF was part of the new and rapidly growing neighborhood of Reservoir Hill (Figure 2). The neighborhood was primarily populated by German and Eastern European Jewish families who immigrated to the city during the second half of the nineteenth century, becoming one of Baltimore's largest predominately Jewish neighborhoods. The part of Bloom Street that previously extended along the southeast side of the survey area was closed and replaced by a city block owned by E. Whitman. While the survey area was vacant during that period, the Hopkins map depicts a single wood frame building located to the west near the corner of Eutaw Street (present-day Eutaw Place) and North Avenue with several other buildings located to the north.

In 1897, the proposed location of the IVF was occupied by a series of rowhouses extending along North Avenue and along Eutaw Street (present-day Eutaw Place) and Linden Avenue (Figure 3). Within the survey area, the 1897 *Atlas of the City of Baltimore* depicts seven brick rowhouses fronting Linden Street with the North Avenue Baptist Church to the south and Jordan Street to the west (Duncan 1897). No sheds or other outbuildings are depicted in the yards of the seven houses on the 1897 map.

Sanborn Fire Insurance maps provide additional details about the developmental history within the survey area during the first half of the twentieth century. The 1901 Sanborn map indicates that the seven houses within the survey area were numbered 2000 to 2012 Linden Avenue (Sanborn Map Company 1901). At that time, all seven brick rowhouses were three-story dwellings with two-story brick additions extending into the backyards (Figure 4). In 1901, the house at 2008 Linden Avenue also had a narrow wood frame shed off the brick addition. The Sanborn map from 1915 indicates a wood frame shed was also constructed off the back of the house at 2006 Linden Avenue by that time (Sanborn Map Company 1915). Another wood frame shed was constructed off the rear of 2004 Linden Avenue by the time the 1928 Sanborn map was published (Sanborn Map Company 1928). The 1928 map also indicates the presence of one-story adobe outbuildings located in the rear yards of 2010 and 2012 Linden Avenue (Figure 5). By 1928, the one-story wood frame North Avenue Baptist Church had been constructed between Linden Avenue and Jordan Street north of North Avenue (Sanborn Map Company 1928). By 1950, the North Avenue Baptist Church had been razed and replaced with a commercial building and the Linden movie theater fronting North Avenue (Sanborn Map Company 1925); however, the map indicates the seven rowhouses within the survey area remained unchanged during the intervening years (Figure 6).

All seven rowhouses were razed by 1957 as an aerial photograph show the survey area contained a paved parking lot at that time (Nationwide Environmental Title Research [NETR] 1957). Subsequent aerial photographs indicate the movie theater located to the south was razed by 1971 (the Linden Theatre was in operation from the late 1930s through the mid-1960s: Kilduffs 2015) while the survey area continued to be utilized for automobile parking through the present day (NETR 1971).

4. ARCHAEOLOGICAL RESOURCE POTENTIAL

The survey area is located within the NRHP-listed Reservoir Hill Historic District (B-1379), which was a predominantly Jewish neighborhood that was founded in the 1870s with the earliest houses located along Madison Avenue. Prior to the 1890s, the survey area remained undeveloped as new houses and other buildings were constructed on the surrounding city blocks. By the 1890s, the location for the IVF was primarily occupied by a series of brick rowhouse with basements located along Linden Avenue, Eutaw Place, and West North Avenue. The North Avenue Baptist Church was also constructed on the corner of Linden Avenue and West North Avenue. By the mid-twentieth century, the majority of the location proposed for the IVF was extensively redeveloped. All the rowhouses were razed and the Madison Park Medical Center was constructed on the corner of Eutaw Place and West North Avenue along with a parking lot on Linden Avenue. The North Avenue Baptist Church was also torn down at that time and replaced with commercial retail buildings.

The mid-twentieth-century redevelopment along West North Avenue and Eutaw Place likely caused significant ground disturbance that diminishes the potential to identify intact pre-contact or historic archaeological resources. However, the approximately 0.6-acre survey area along Linden Avenue is assessed as possessing a moderate-to-high sensitivity for the presence of historic archaeological resources dating from the late nineteenth to early twentieth centuries. Prior to the mid-twentieth-century redevelopment, seven brick rowhouses were located within the survey area. By the 1950s, the houses were razed and replaced with a paved parking lot. Construction of the parking lot would not have required significant ground disturbance. Depending on the extent of the demolition associated with the razed houses, there is a likelihood that intact basements and other cultural deposits may be preserved intact underneath the extant parking lot that may contribute to the understanding of this significant Baltimore Jewish community during the late nineteenth and early twentieth centuries.

5. RESEARCH GOALS AND METHODS

Archaeological tasks will be performed or overseen by qualified professionals as defined by the Secretary of the Interior (formerly 36CFR §61) and will be consistent with the principles and standards contained in *Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* (1983), *Consulting About Archeology Under Section 106* (Advisory Council on Historic Preservation 1990).

5.1 Research Goals

The goal of the Phase IB/II archaeological survey is to locate and evaluate archaeological resources that may be eligible for listing in the NRHP. The following goals were set for the Phase IB/II investigation:

- Identify and inventory archaeological resources within the survey area that may be eligible for listing in the NRHP.
- Define the horizontal and vertical limits of identified archaeological sites and deposits within the survey area.
- Characterize, interpret, and assess the potential significance of identified archaeological resources;
- Assess the effect of the undertaking on the identified archaeological resources.
- Determine the need for additional archaeological investigations, as warranted.

5.2 Research Methods

The Phase IB/II archaeological survey will include additional documentary research of the survey area, followed by archaeological field survey, laboratory analysis of recovered artifacts, and reporting. A full health and safety plan (HASP) specific to the survey area and proposed field effort will be developed prior to the start of field investigations. This project-specific HASP will be developed to conform to Amtrak's current safety policies and procedures. All WSP personnel who are assigned to the field effort will be required to review, sign, and follow the procedures laid out in the HASP document. WSP will also conduct daily safety briefings ("tailgates") prior to the start of the fieldwork.

General site and survey area conditions, areas of interest, and crew activities will be documented by the WSP archaeology supervisor. A daily log will be maintained recording information about work progress, visitors to the site, safety issues, weather conditions and/or impediments to work, and general observations and results. Any identified archaeological resources will be recorded on project plans maps or aerial imagery, and further documented with hand drawn sketch maps. The fieldwork will be documented using digital photography.

Documentary Research

Additional background research will be conducted, specific to the occupation of the rowhouses that were located at 2000 to 2012 Linden Avenue. The research will allow for the development of a site-specific historic context and allow for the accurate characterization and interpretation of any archaeological resources or deposits that are identified during the investigation. The research will include the review of pertinent primary and secondary sources, including additional historical maps and atlases, land records, Baltimore City directories, wills, probate inventories, genealogical files, census records, and local histories. Several repositories will be consulted as part of the investigation including, the Maryland State Archives in Annapolis, the Baltimore City Archives in Baltimore, and the Maryland Center for History and Culture which is also located within the City of Baltimore.

Archaeological Field Survey

Because the survey area is located in an urban setting and covered by an impervious asphalt parking lot, the archaeological survey will be completed utilizing mechanically excavated trenches. The purpose of the survey is to ascertain the subsurface condition within the survey area and identify and record the presence of subsurface archaeological features and deposits. The excavation of the trenches is intended to collect information on the presence and character of the subsurface remains, rather than allow for intensive excavation or data recovery. As a result, the Phase IB/II survey will include the excavation of eight to 10 backhoe trenches excavated within the 0.62-acre survey area. Each trench will measure approximately 5 by 10 feet.

Prior to commencing field investigations, a ticket will be submitted to Miss Utility to identify and mark buried utilities within the survey area. Locations containing buried utilities will be avoided during the field investigation. All excavations will be directed by the archaeological field team, who will observe and record the excavation process. Rectangular cuts will be made into the asphalt parking lot within the proposed trench locations and a backhoe will be utilized to remove the broken asphalt and any underlying fill soils that may be present. Fill soils will not be screened for artifacts, but any manmade debris will be noted.

The mechanical excavation of the trenches will cease in the event that intact soils or archaeological features are identified and manual excavation within the trenches will commence. Excavations of trenches that extend deeper than five feet will require shoring or be expanded and benched before excavation can continue. Following excavation, the stratigraphy of each trench will be documented. Stratigraphic profile drawings will be prepared of at least one wall of each trench, and digital photographs will be taken. Plans

will be prepared of any foundations or other features uncovered. The location of each trench will be mapped by hand on paper site plans, and recorded using a sub-meter GPS device.

Test units will be excavated with shovels and trowels within trenches where intact soil or archaeological features are identified. Test units will generally measure 3 by 3 feet; however, the size and shape of the test units may be modified to maximize the excavation or sampling of identified features. Test units will be excavated by four-inch arbitrary levels within the natural soil stratigraphy. If a soil horizon interface is encountered within an arbitrary level, the level will be split into natural horizons, with the upper horizon removed down to the interface and screened as one provenience, and the lower horizon screened as a separate provenience down to the base of the level, with separate stratum/level forms completed for each horizon. This method allows the results to be analyzed by four-inch arbitrary levels as well as by natural soil horizon. All excavated soil matrix will be screened through 0.25-inch hardware mesh. The excavation will be documented on standard stratum/level test unit forms will be filled out for each level excavated. Data collected during the excavation will include depth measurements in each corner and in the center of the test unit, USDA soil texture, Munsell soil color, artifacts recovered, disturbances present, date, and excavator initials, as well as observations during excavation and preliminary archaeological interpretations. Artifacts collected during excavation will be bagged by level and stratum provenience. If diagnostic artifacts are encountered in situ, their precise horizontal and vertical location within the test unit will be mapped and recorded.

Because of the urban setting of the project, selective artifact retention and discard procedures will be employed during the Phase IB/II survey. Items with limited research potential such as coal, slag, brick, mortar, slate, building stone, plastic, rubber and other synthetic materials will be sampled in the field. A single artifact within these categories will be retained; the rest will be counted and discarded onsite. The test unit will be excavated a maximum of two levels into sterile subsoil, or until the OSHA-defined maximum excavation limits are reached. Hand augers will be utilized to confirm deeper soil profiles if sterile soil is not encountered before reaching OSHA defined depths. A soil profile will be drawn of at least one wall of each test unit, which will be supplemented by digital photographs of the same wall. Test units will be mapped on scale site plans and recorded using a sub-meter GPS unit.

If cultural features are encountered during test unit excavation, they will be treated as distinct analytical units. Foundations or other structural features identified during the investigation will be fully exposed within the trenches. Scale photographs and drawings will be made of the structural features and documented on standardized forms. Other subsurface cultural features encountered during the course of the investigation will be fully excavated within the trenches to determine function. Once the feature is uncovered, it will be mapped in plan view with elevations taken relative to the datum. Following initial documentation, the features will be bisected along their longest axis and one half will be excavated in 0.3-foot arbitrary levels. Following their bisection, feature profiles will be drawn to scale and photographed. Once documentation is complete, the second half of the feature will be excavated following the same protocols. Feature soils will be screened through 0.25-inch mesh in order to facilitate artifact recovery. Final mapping and photography will be completed after the excavation of the feature is complete. All feature locations will also be plotted on a scale map and recorded utilizing a sub-meter GPS unit.

Artifact Analysis and Curation

All artifacts recovered from the survey will be washed, cataloged, and prepared for curation by experienced archaeological laboratory staff. Artifacts will be separated by material class (bone, shell, metal, ceramic, etc.) and each class will be analyzed using appropriate typologies. Significant and/or diagnostic artifacts will be digitally photographed. An electronic artifact catalog will be prepared and included as an appendix to the technical report. The artifacts will be processed for curation following standard archaeological practices and the revised MHT guidelines (Morehouse et al. 2018). The work will also be conducted consistent with state standards and guidelines for archaeological survey (Shaffer and Cole 1994). All artifacts will be temporarily stored at WSP's archaeological laboratory in Kansas City, Missouri. Upon

acceptance of the final report, the artifact collection will be delivered for curation at the Maryland Archaeological Conservation Laboratory (MAC Lab) in St. Leonard, Maryland.

Reporting

A technical Phase IB/II archaeological survey report will be completed following the completion of the field investigation and artifact analysis in accordance with MHT's *Standard and Guidelines for Archeological Investigations in Maryland* (Shaffer and Cole 1994). The draft Phase IB/II archaeological survey report will minimally consist of a description of the survey area and the results of the relevant background research which includes geology, hydrology, geomorphology, soils, and regional cultural context. The report will also include a description and results of the field investigation, identified sites, field observations, laboratory analysis and result, and the evaluation of the investigation in terms of its goals, objectives and research topics. The report will also be illustrated with appropriate maps, photographs, charts and tables documenting the excavation and analysis. The report will include appendices consisting of inventories, catalogues, MHT site forms, and other supporting information and data that will provide sufficient information to complete an accurate review of the study results and recommendations.

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Baltimore Maryland





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Survey Area in 1928 (Sanborn Map Company 1928, ESRI World Street Map 2021)


Baltimore Maryland

Supplemental Phase IA Archaeological Study Baltimore & Potomac Tunnel Replacement Program

Survey Area in 1950 (Sanborn Map Company 1950, ESRI World Street Map 2021)

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