

AET JO	OB NO:	01-05	697						LC	G OF	BO	RING N	10	1192	2 ST	' (p.	<b>1 of</b> 2	1)
PROJE	CT:	Southw	vest Ligh	t Rail Ti	ransit Pr	oject,	PEC I	East; I	lopl	kins	to ]	Minn	eapo	lis				
SURFA	CE ELEV	ATION:	922.3	]	Hennepin (	Co. Coo	rdinates	: <u>N</u>	1	4810	1		<u>E -</u>	49543	8			
DEPTH IN		M	ATERIAL Í	DESCRIPTIC	)N		GEOI	.0GY	N	MC	SĄ	MPLE	REC	FIELI	) & L/	ABORA	TORY	TESTS
FEET	FILL	mostly ala	vov cond i	with organ	a finan a		FILI					1112	11N.	WC	DEN		PL	%-#200
1 -	little p	lastic, trac	e roots, da	ark brown,	frozen		TILL			F	ł			12				
2 -	$\frac{(A-2-6)}{FILL}$	b) mostly gra	velly silty	sand, trac	e roots						ß							
3 -	brown	, frozen (A	-1-b)		• • • • • • • • •					F	ţ							
4 -	LEAN	CLAY, b	rown, a lit	tle dark bro	own, firm		FINE				Ł					¢		
5 -	(CL) (	(A-6)					ALLU	VIUM	7	Μ	М	SS	8	26				
7 -	GRAV	VELLY SA	ND, fine	to medium	grained.		COAR	SE			ł							
. 8 -	light b	orown, moi	st, mediun	n dense, la	minations		ALLU	VIUM	24	M	М	SS	14					
. 9 -	GRAN		ND fine	to medium	argined		•				रि							
10 -	- light g	rayish bro	wn, moist,	, medium c	lense (SP)		•		28	М	$\square$	SS	13					
11 -	(A-1-1	) 					•				मि							
12 -	- SANL brown	) WITH G 1, moist, me	RAVEL, r edium den	nedium gra se (SP) (A	ained, ligh <sup>.</sup> -1-b)	t i	•		23	м	M	22	11					
13 -							•		25	11/1	Д	00	11					
14 -	SANE	OWITH G	RAVEL, r moist, mea	nedium to	fine (SP)		•		1.0		R	00	10					
16 -	(A-1-1	o)			(51)		• • •		16	. <b>M</b>	Å	88	10					
. 17 -	CLAY	EY SANE	), a little g	ravel, brow	vn, very		TILL				Į.							
18 -		lammation	n or siny s	and (SC) (	A-0)				19	M	Щ	SS	16	12				
19 -	SANE	DY LEAN	CLAY, a l	little grave	l, gray and					Ţ	I							
20 -	brown silty s	1 mottled, v and and sai	ery stiff, l ndv silt (C	aminations (A-6)	s of sand,				18	M/W	X	SS	17	17				
21 -	END	OF BORI	NG															
11/14																		
DT 3/1																		
ELL.G																		
V+T40																		
AET+(		· .																
CGPJ																		
-0269			(ETUOD						<u></u>									
o DEI	rin: 1	JKILLING M	1ETHOD		mn co	SAMPI		EL MEA	CAV	EMEN E-IN	1 <u>5</u> 12	RILLP	NG	WATE		NOTE:	REFE	R TO
AND 0-1	91/21 3	8.25" HSA		DATE	TIME	DEPT	ΤΗ̈́ Ď	ÊPTH	DE	PTH'	FĹ	UIDLE	VEL	LÉVE	<u>EL</u>	THE A	TTAC	HED
1-COO				3/3/14	12:47	21.0		19.5 10 =	20	).9				20.7		SHEE.	IS FOR	N OF
≤ BORIN	NG NG ETED.	3/3/11		3/3/14	12:33	41.0		17.3	2(	.0				19.3	<u>-</u> 1	ERMIN	10LOC	Y ON
DR: T	TA LG:	<b>SG</b> Rig:	85C		<u> </u>											TH	IS LOC	3



AET JO	)B NO:	01-05	697					LC	OG OF	BO	RING N	JO	1193	B ST	<b>(p.</b> )	l of	1)
PROJE	CT:	South	vest Ligh	t Rail Tr	ansit Pro	oject,	PEC East;	Нор	kins	to	Minn	eapo	lis				
SURFA	CE ELEV	ATION:	922.1	I	Iennepin C	o. Coo	rdinates:	<u>N 1</u>	4791	5		<u>E</u>	49501	5			
DEPTH IN FEET		М	ATERIAL D	ESCRIPTIO	N		GEOLOGY	N	MC	SĄ	MPLE TYPE	REC IN.	FIELI	D&LA	BORA	FORY	TESTS
1	FILL, grave	mostly sil	ty sand wit ts, dark bro	th organic f own (A-4)	fines and		FILL		F	Ł							
2	FILL,	mostly sa	nd with silt	and grave	l, dark		-										
3 - 4 -	GRA	$\frac{1}{\sqrt{1}}$	A-1-b)	um to fine	arained		COARSE	_	F.								
5-	brown	n, moist, m	iedium den	se (SP) (A-	-1-b)		ALLUVIUM	15	M		SS	6					
7 — 8 —	SANI fine g (SP-S	D WITH S rained, bro M) (A-1-b	ILT AND ( wn, moist,	GRAVEL, medium d	medium to ense	)		13	М		SS	8					
9 — 10 —	CLAY dense	YEY SAN , laminatic	D, a little g	ravel, brov (SC/SM) (	vn, mediun A-2-4)	n	TILL	15	M	XXX	SS	16	7				
11 - 12 - 13 - 13 - 13 - 13 - 13 - 13 -	<ul> <li>11 –</li> <li>12 – CLAYEY SAND, a little gravel, br</li> <li>light brown, medium dense, lamina</li> <li>lenses of sand (SC/SM) (A-2-4)</li> <li>14 –</li> </ul>							14	M		SS	12	10				
14 15	CLAY	YEY SAN	$\overline{\mathbf{D}}$ a little g	ravel brov	vn medium	n		24	M	ET X	SS	0					
16 17	<ul> <li>15 CLAYEY SAND, a little gravel, brown, me</li> <li>16 dense to loose, laminations of sand (SC/SM</li> <li>17 - (A-2-4)</li> </ul>							10			SS	17	12				
18	SILT	Y SAND, 4)	a little grav	el, brown,	loose (SM	)	· · ·	10		ET	90	177					
21 -	END	OF BOR	ING				•	10	M/ W	Ά		17					
41/11/4																	
1E1+CF1+WELL.GU1、					•		•						· · ·				
1001/001/																	
DEI	PTH:	DRILLING	METHOD			WAT	ER LEVEL M	EASUR	EMEN	TS			-		NOTE:	REFF	ER TO
0-1	91/2'	3.25" HSA	4	DATE	TIME	SAMP DEP	LED CASING	G CA DI	VE-IN EPTH	FL	DRILLI JUID LI	NG EVEL	WATI LEVI	ER	THE A	TTAC	CHED R AN
				3/3/14	11:10	21.	0 19.5		1.0				19.0	J 1	EXPLA	NATI	ON OF
	NG	2/2/4 4		3/3/14	11:51	<u> </u>	U 19.5		0.3				10,4	•	TERMIN	VOLO	GY ON
$\frac{COMP}{\Psi}$ DR: <b>T</b>	<u>'leted:</u> [ <b>A</b> LG	5/5/14 : SB Ri	g: <b>85C</b>					-							TH	IS LO	G

03/2011



AET JO	OB NO: 01-05	697						LC	G OF	BO	RING N	10	1194	ST	<b>(p.</b> 1	lof	l)
PROJE	ECT: South	west Ligh	t Rail Tr	ansit Pro	oject,	PEC	C East; I	Iopl	cins 1	to ]	Minn	eapo	lis				
SURFA	ACE ELEVATION:	922.5	I	Iennepin C	o. Cooi	rdinat	es: <u>N</u>	1	47674	1		E ·	49436	5			
DEPTH IN	M	IATERIAL D	ESCRIPTIO	N		GE	OLOGY	N	MC	SĄ	MPLE	REC	FIELI	) & LA	BORAT	FORY '	rests
FEET	EII I mostly of	aver cond u	with organi	a finas a		FILI						111,	WC	DEN		PL.	<b>%-</b> #200
1 -	<ul> <li>HLL, mostry er</li> <li>little gravel, trac</li> <li>(A-2-6)</li> </ul>	e roots, dar	k brown, f	rozen			_		F				9	-			:
3 -	FILL, mostly cl roots, dark brov	ayey sand, a /n (A-2-6)	a little grav	el, trace					F				8				
4 - 5 - 6 -	FILL, mostly cl little gravel and brown, a little b	ayey sand v clayey sand rown (A-2-	vith organie d, trace roo 6)	c fines, a ts, dark				9	М		SS	10	12				
7 - 8 -	SAND, a little g light brown, mc	gravel, fine t ist, medium	to medium 1 dense (SF	grained, ?) (A-3)		COA ALL	ARSE .UVIUM	27	М		SS	7		-			
9 - 10 - 11 -	GRAVELLY S - light brown, mc	AND, fine t ist, mediun	to medium 1 dense (SF	grained, P) (A-1-b)		*		22	M		SS	9					
12 -	CLAYEY SAN little light brow (SC) (A-6)	D WITH G n, very stiff	RAVEL, b , a laminat	rown, a ion of sand	1	TILI	L	19	M		SS	6	10				
14 - 15 - 16 -	SILTY SAND, dense, a lens of	a little grav sandy lean	el, brown, clay (SP-S	medium M) (A-2-4	)			15	M		SS	14	-				
17 - 18 -	CLAYEY SAN light brown, ver (A-2-6)	D, a little g y stiff, a lai	ravel, brow mination of	vn, a little f sand (SC				16	М		SS	11	10				
19 - 20 -	CLAYEY SAN (SC) (A-6)	D, a little g	ravel, brov	vn, stiff				12	·M		SS	16	12				
21 -	END OF BOR	ING		······································		-					 -				-		
ELL.GDT 3/11/14																	
AET+CPT+W																	
5697.GPJ				•													
DE	EPTH: DRILLING	METHOD			WAT	ER LI	EVEL MEA	SUR	EMEN	TS					NOTE:	REFE	ER TO
-0 INATE:	19½' 3.25" HS	<b>A</b> .	DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	CA' DE	VE-IN PTH	FI	DRILLI JUID LI	NG EVEL	WAT LEVI	ER EL	THE A	TTAC	HED
OORD			3/3/14	10:20	21.	.0	19.5	2	0.8				Non	ie	SHEE	TS FOI	R AN
Ň N	DIQ							ļ						]	EXPLA	NATIO	ON OF
BORI COM	ING PLETED: <b>3/3/14</b>													]]	ERMI		JY ON C
」 DR: '	TA LG: SG R	g: 85C													11	ns lo	U



#### AMERICAN ENGINEERING TESTING, INC.

AET JC	)B NO:	01-05	697						LO	G OF	BO	RING N	10.	1195	5 ST	(p. 1	lof	1)
PROJE	CŢ:	Southv	vest Ligh	t Rail Tr	ansit Pro	oject,	PEC	C East; I	Iopl	cins	to	Minn	eapol	lis				
SURFA	CE ELEV	ATION:	924.0	F	Iennepin C	o. Coo	rdinat	tes: <u>N</u>	1	47527	7		<u>E </u>	49394	8			
DEPTH IN		М	ATERIAL D	ESCRIPTIO	N ·		GE	OLOGY	N	MC	SĄ	MPLE	REC	FIELI	) & LA	BORAT	ORY	TESTS
FEET	FILI	mostly cl	wey sand y	with gravel	trace		FIL				म			we	DEN		PL	Yo-#200
1 -	roots,	dark brow	n, frozen (	A-1-b)	, 11000					F	ł	SU		15				-
2 -	, FILL	mostly gr	avel with s	ilt and sand	l, trace					F	ł	SU						
3 -	$\frac{1}{\text{FU}}$	dark brow	n, frozen (. ty sand a l	A-1-b) ittle gravel	trace	]				F	F	SU						
4	roots,	dark brow	n, frozen (	A-2-4)	, 1100			ARSE		F	E	SU						
6-	FILL,    browi	, mostly sa 1, frozen (A	nd with silt A-1-b)	t, a little gra	avel,		ALI	LUVIUM	29	M	Å	SS	12					
7	SAN	D WITH G	RAVEL, n	nedium to o	coarse		TIL	L			1							
8 -	(A-1-	b)		, meanum c					20	M	Х	SS	12	10				
9 -	CLA	YEY SAN 1. verv stif	D, a little g f (SC/SM)	ravel, light (A-2-4)	brown to						I							
10 -		-,,							23	M	X	SS	14	7				
11 -		$\overline{}$	marial fina	ta madium	aminad		CO	ADCE			सि							
12 -	light	brown, mo	ist, mediun	n dense, lai	ninations		ALI	LUVIUM	27	M	$\square$	SS	14					
13 -	ofcla	yey sand (	SP) (A-3)				•				सि							
15 -	SAN brow	D WITH S n. moist. m	ILT, a little ledium den	e gravel, fir se, lenses o	ne grained, of clayey				21	м	K		14					
16 -	sand	(SP-SM) (A	4-3)		5 5				21	11/1	A	20	14					
17 -	SAN	DY LEAN	CLAY, a l	ittle gravel	, brown,		TIL	L			논							
18 -		sun (CL) (	A-0)						21	M	Å	SS	6	12				
19 -	CLA	YEY SAN	D, a little g	ravel, brov	vn, stiff,						Į			-				
20 -	lense	s of sand a	nd silty san	ıd (SC) (A-	6, A-1-b)				14	Μ	Х	SS	12	11				
	END	OF BOR	NG				1											
												·						
1/14												- - -						
1 3/1					·					-								
ET+C																		
GPJ A																		
05697.				[											L			_
5 DEI	PTH:	DRILLING	METHOD			WAT	ERL	EVEL MEA	SURI	EMEN	TS	ייזייסס		117.4 (11)		NOTE:	REFI	ER TO
ILVII 0-1	19½'	3.25" HSA	<u> </u>	DATE	TIME	SAMP DEP	TH TH	DEPTH	DE	PTH	FÍ	UID LE	EVEL	LEVI	EK EL	THE A	TTAC	CHED
COOR				2/26/14	2:55	21.	0	19.5	2	0.7				Non	ie ,	SHEE'	IS FO	K AN
ĕ ₽ BORT	NG														т	FRMD		GY ON
Ö CŎMĒ	<u>PLETED:</u>	2/26/14	050												1	TH	ISLO	G
DR: <b>기</b>	l'A Le	i: TM Rig	g: 85C	<u> </u>														~



AET	JOB NO:	01-05697						LO	G OF	BO	RING N	10	1196	5 SS	<b>(p.</b> 1	l of I	l)
PROJ	ECT:	Southwest Ligh	nt Rail Tr	ansit Pro	oject,	PEC	C East; l	Hopl	cins	to ]	Minn	eapo	lis				
SURF	ACE ELE	VATION: <b>924.2</b>	H	Hennepin C	o. Coo	rdina	tes: <u>N</u>	1	4732	1	· _	<u>E '</u>	49338	2			
DEPTI	Ŧ	MATERIAL I	DESCRIPTIO	)N		GE	EOLOGY	N	мс	SĄ	MPLE	REC	FIELL	) & LA	BORA	FORY '	TESTS
FEET						TITLE						IIN.	WC	DEN	LL	PL	<b>%-</b> #20(
1	- FILL	, mostly gravelly silty n (A-1-b)	y sand, dark	t brown,		FILI	L		F	Ħ							
2	_									5							
3	_								F	ł							
4	FILI	mostly gravelly san	d with silt	light		-				ł							
5	- grayi	ish brown to brown (A	A-1-b)	ngin				55	М	$\square$	SS	12					
6	-									मि							
7	-							50/.4	М	K	SS	5					
8	-					1				R		_					
9	SAN	D WITH GRAVEL, 1	medium to	fine		CO	ARSE			E							
10	- grain	ed, light grayish brow t. medium dense to de	vn to light b ense (SP) (A	prown, A-1-b)		OR	JUVIUM FILL	27	M	Х	SS	12					
11	(poss	sible fill)		)						Ł							
12	-							50	M	$\square$	SS	12					
13				•						मि							
14	SILT	Y SAND, a little grav	vel, fine to i	medium			ARSE LUVIUM			R	~~						
16	claye	ey sand $(SM)$ (A-2-4)	dium dense	, 1011303 01				20		Å	SS	12					
17	SILT	TY SAND, a little grav	vel, brown,	medium		TIL	L	1		I							
18	dens	e, lenses of clayey sar	nd (SM) (A-	-2-4)				20	M	Х	SS	10					
19		VEV SAND a little	aravel brow	vn stiff						Ł							
20	- (SC/	SM) (A-2-4)	<u>,</u>	vii, stiii				14	M	$\square$	SS	12	10				
21	END	OF BORING				/											
14																	
3/17																	
E CD																	
THAT I																	
T+CP1																	
JAE	-																
597.Gt																	1
5 D	EPTH:	DRILLING METHOD			WAT	ER L	EVEL MEA	1 ASURI	i Emen	TS		.L		I	NOTE:	REFE	I
ATES	101//		DATE	TIME	SAMP	LED	CASING	CAL	/E-IN	LI I	<u>PRILLI</u>	NG	WATI	ER	THE A	TTAC	HED
	-19½'	<u>5.25'' HSA</u>	3/7/14	9.50	21	0	19.5	) )	1.0			VEL	Non	<u>е</u>	SHEE	rs foi	R AN
20				7.50	<i>μ</i> , μ,	•	* 7+2	<u> </u>							EXPLA	NATIO	ON OF
AN BOR	ING IPI ETED	3/7/14												1	TERMIN	1010(	GY ON
DR:	TA L	G: JMMRig: 1C			<u> </u>			1							TH	IS LO	G
<				L	·			1		1							



AET JC	)B NO:	01-05697						LO	G OF	BO	RING N	10	1197	7 SS	(p. 1	of	1)
PROJE	CT:	Southwest Ligh	t Rail Tr	ansit Pro	ject,	PEC	East; H	Iopl	cins	to ]	Minn	eapol	lis				
SURFA	CE ELE	VATION: <u>924.1</u>	H	Iennepin Co	o. Cooi	rdinate	s: <u>N</u>	1	47234	4		<u>E '</u>	49314	6			
DEPTH IN		MATERIAL D	ESCRIPTIO	N .		GEO	LOGY	N	MC	SĄ	MPLE	REC	FIELI	) & LA	BORAT	FORY	TESTS
FEET	EIL L			a littla		EILI						11.1.	WC	DEN	LL	PL	<b>%-</b> #200
1 - 2 -	silty s	and, pieces of concre ark brown, frozen (A-	te, trace ro $(2-4)$	ots, brown					F		SU		10				
3 -	FILL	, mostly gravel with s	ilt and sand	l, brown,		4			F	Į	SU						
4	FILL	, mostly silty sand with $(A-1-b)$	h gravel, d	ark brown,		_			F	E	SU						
5 - 6 -	FILL	, mostly sand with silt y sand, trace roots, bro	, a little gra own (A-1-l	avel and				10	M	Å	SS ·	4		-	-		
7	GRA light	VELLY SAND, medi brown, moist, dense (	um to fine SP) (A-1-b	grained, )		COAI	RSE JVIUM	35	М		SS	12					a
9	SAN grain (A-1-	D WITH GRAVEL, n ed, light brown, moist b)	nedium to o , medium o	coarse lense (SP)				27	М		SS	12					
11 - 12 - 13 -	SAN brow	D, a little gravel, med n, moist, medium den	ium graine se (SP) (A·	d, light -1-b)		· · · · ·		11	М		SŞ	12			-		
14	CLA light (A-2-	YEY SAND, a little g brown, very stiff, a le 4)	ravel, brov ns of sand	vn, a little (SC/SM)		TILL		16	М		SS	14	8				
17 -	CLA light (SC/S	YEY SAND, a little g brown, very stiff, lam SM) (A-2-4)	ravel, brov inations of	vn, a little sand				23	M		SS	14	8				
19 -	CLA lamir	YEY SAND, a little g nations of sand with si	ravel, brov lt (SC) (A-	vn, hard, 6)				37	М		SS	14	10				
21 -	GRA medi (A-1-	VELLY SAND WITH um grained, light brow b)	H SILT, fir wn, dense (	ne to SP-SM)		COA	RSE *										
	END	OF BORING															
LL.GUI 3/11/14		٨	·														
AET+CP1+WE																	
597.GPJ						-											
B DE	_1 PTH:	DRILLING METHOD			WAT	TER LE	VEL MEA	SURI	EMEN	ITS	l	ł	1	-1	NOTE:	REFI	ER TO
	101/1	3 25" 115 4	DATE	TIME	SAMP DEP	LED ( TH	CASING DEPTH	CAV	VE-IN PTH	FI	DRILLI JUID LI	NG EVEL	WAT LEVI	ER EL	THE A	TTAC	CHED
	17/2	<i>J.4J</i> HJA	2/26/14	1:45	21.	.0	19.5	2	1.0				Non	ie	SHEE	ГS FO	R AN
00 M										1				I	EXPLA	NATI	ON OF
BORI	BORING COMPLETED: 2/26/14													Γ	ERMI	IOLO	GY ON
DR: 1	ra lo	F: TM Rig: 85C												-	TH	IIS LO	G



AET JC	OB NO:	01-05697					LC	GOF	BO	RING N	0.	1198	B ST	<b>(p.</b> ]	lof	1)
PROJE	CT:	Southwest Lig	ht Rail Tr	ansit Pro	oject,	PEC East; ]	Hopl	kins (	to ]	Minn	eapo	lis				
SURFA	CE ELEV	ATION: 920.7	ŀ	Hennepin Co	o. Cooi	dinates: <u>N</u>	1	47082	2		<u>E</u> '	49272	9			
DEPTH IN FEET		MATERIAL I	DESCRIPTIO	N		GEOLOGY	N	MC	SA J	MPLE YPE	REC IN.	FIELI WC	D & LA	BORAT	PL	TESTS 1/0-#200
IN FEET 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	FILL, gravel FILL, frozen FILL, cinder GRA fine g very c SANI browr CLA light t (SC/S SILT browr (SM)	MATERIAL I mostly sand with or , trace roots, dark br mostly silty sand wi (A-2-4) mostly gravelly san s/ash, dark brown, f VELLY SAND WIT rained, light brown, lense (SP-SM) (A-1- D WITH GRAVEL, h, moist, medium der (A-2-4) Y SAND, a little gra h, moist, medium der (A-2-4)	ganic fines, own (A-6) ith gravel, b d with silt, a rozen (A-1- H SILT, me moist, froze -b) medium gra nse (SP) (A- gravel, brown ninations of vel, brown, nse, lenses o	a little rown, a little b) edium to on to 5' ther ined, light -1-b) vn, a little sand a little ligh of sand	t	FILL COARSE ALLUVIUM	N 52 25 22 20 16 21	MC F F F/M M M M M		SU SU SU SS SS SS SS SS SS	IN. 12 12 12 12 12 12 12 12 12 12	WC 22	DEN		PL	%-#200
18 - 19 - 20 - 21 -	SILT brown (SM/S	Y SAND, a little gra n, medium dense, lar SC) (A-2-4) OF BORING	vel, brown, ninations of	a little ligh f sand	it	· · · ·	19	М		SS	14					
AET+CPT+WELL GDT 3/11/14					,											
05697.GPJ		· .														
ATES DE	PTH:	DRILLING METHOD	DATE	TIME	WAT SAMP	ER LEVEL ME	ASUR CA	EMEN	TS FT		NG	WAT	ER	NOTE: THE A	REFI	ER TO
NDN N 0-]	1972	<u>5.25'' HSA</u>	2/26/14	12:20	21	0 19.5	2	1.0				Non	ne	SHEE	IS FO	R AN
V-CO							<u> </u>		$\square$					EXPLA	NATI	ON OF
BORI	NG	2/26/14					1		$\uparrow$				1	TERMI	10LO	GY ON
DR: 1	<b>FA</b> LG	: TM Rig: 85C					1							TH	IIS LO	G



AET JO	OB NO: 01-0	)5697	, ,					LO	G OF	BOI	RING N	0	1199	) ST	(p. 1	of	l)
PROJEC	CT: Sout	hwest Ligh	t Rail Tr	ansit Pro	ject,	PEC	C East; I	Iopl	<b>cins</b>	to I	Minn	eapo	lis				
SURFA	CE ELEVATION:	916.1	F	Iennepin C	o. Coo	rdina	tes: <u>N</u>	1	46897	7		E é	49221	4.			,
DEPTH IN		MATERIAL D	ESCRIPTIO	N		GE	EOLOGY	N	мс	SĄ	MPLE	REC	FIELI	) & LA	BORAT	ORY	TESTS
FEET		1		······································		TH	r				1115	119.	WC	DEN	LL	PL	%-#200
1 - 2 - 3 - 3 - 3	bituminous, tr frozen (A-6) FILL, mostly FILL, mostly	concrete, light silty sand with	k brown ar t brown h gravel, a	little	/				F		SU SS	12					
4 5 6	FILL, mostly trace roots, da	clayey sand v rk brown, fro	with organio zen (A-6)	c fines,					F		SS	12	19				
7	LEAN CLAY (A-6)	, trace roots,	brown, fro	zen (CL)		FIN ALI	E LUVIUM		F	H K K	SS	6	12				
10	SAND WITH medium grain (SP-SM) (A-	l SILT, a little led, brown, m l-b)	e gravel, fin oist, mediu	ne to um dense			ARSE LUVIUM	11	М		SS	12					
12	SAND WITH fine to mediu dense (SP-SN	I SILT AND m grained, br 1) (A-1-b)	GRAVEL, own, moist	trace roots , medium	,			19	M	H R	SS	6					
15 16	SAND WITH grained, light (A-1-b)	I GRAVEL, f brown, moist	ine to medi , medium c	ium lense (SP)		•••••		25	М	R	SS	6					
17	SAND, a littl brown, moist CLAYEY SA	e gravel, med , medium den ND, a little g	ium graine se (SP) (A- ravel, brov	d, light -1-b) vn, very		TIL	,L	17	M	H H H	SS	12	9				
19 - 20 - 21 -	Stiff (SC) (A- CLAYEY SA stiff (SC/SM)	ND, a little g $(A-2-4)$	ravel, brov	vn, very				27	М	K	SS	14	9				
	END OF BO	KING															
1+WELL.GD1 3/1//14			<i>.</i>														•
5697.GPJ AET+UP											,						
5 DEI	PTH: DRILLIN	IG METHOD			WAI	ER L	EVEL MEA	SUR	EMEN	TS		T			NOTE:	REFE	R TO
U-1	9½' 3.25" F	[SA	DATE	TIME	SAMP DEP	'LED TH	CASING DEPTH	CA' DE	VE-IN PTH	I  FL	ORILLI UID LI	NG EVEL	WAT LEVI	ER EL	THE A	TTAC	HED
			2/26/14	11:00	21.	.0	19.5	2	1.0				Nor	ie	SHEE	IS FOI	R AN
Ŭ Ă														] I	EXPLA	NATIO	ON OF
を BORIN S COMP	NG PLETED: <b>2/26</b> /1	4												۲ ۱	ERMIN	10LO	GY ON
DR: T	A LG: TM	Rig: 85C													TH	us lo	G



AET JO	DB NO: 01-05697					LO	G OF I	BORING 1	NO	1200	SW	′ <b>(p.</b>	1 of	2)
PROJE	CT: Southwest Lig	ht Rail Tr	ansit Pro	ject, PE	C East; I	Iopl	cins t	o Minn	leapo	lis	21			
SURFA	CE ELEVATION: 921.9	I	Hennepin C	o. Coordina	ites: <u>N</u>	1	48374		E	49602:	5			
DEPTH	MATERIAL	DESCRIPTIC	N	GI	EOLOGY	N	мс	SAMPLE	REC	FIELD	) & LA	BORAT	FORY '	TESTS
FÊET					<b>.</b>					WC 20	DEN		PL_	%-#200
1 -	FILL, mostly sandy lean c	lay, a little	gravel,	/ FIL	.L	18	М	ss	16	20				
2 -	FILL, mostly gravelly san	d with silt,	a little					()						
3 -	Clayey sand, grayish brow	n, a little bl	ack (A-1-b	)/		7	M	X ss	12					
4 -	brown and black (A-2-4)	fittie asil/ei	110015,					मि						
<sup>5</sup> 5 -	FILL, mostly sand with gr	avel, light b	brown and			16	м	SS SS	12					
6 -	- 010wil (A-1-0)					10		Д И	12					
7 -	-													
8 -	-					16	Μ	X ss	14					
9 -	FILL mixture of sand wit	h silt_clave	v sand and					ł						
10 -	lean clay, brown and light	gray (A-3,	A-6)			13	M	$\bigvee$ ss	16	18				
11 -								प्त						
12 -	- CLAYEY SAND, a little	gravel, dark	brownish	TIL	Ľ	-				1.7				
13 -						5	M	X ss	8	17				
14 -	GRAVELLY SAND WIT	TH SILT, m	edium to		ARSE			Į.						
15 -	fine grained, brownish gra	ay to brown	, moist to $(A + 1 - b)$		LUVIUM	19	M/W	$\propto$ ss	8					
16 -		1130 (51-514)	) (A-1-0)					र्स						
17 -	-					11	W		6					
18 -	-					11	vv							
19 -	SAND WITH SILT, a litt	le gravel, fi	ne to					Į.						
20 -	medium grained, grayish medium dense (SP-SM) (	brown, wate A-3)	erbearing,			21	W	X ss	1					
21 -	CLAVEY SAND a little	aravel brox	vn a little		<u>.</u>			ß						
22 -	light brown, very stiff, a l	ens of sand	(SC/SM)			21	M/W	$\bigvee$ ss	12	11				
23 -	(A-2-4)							प्ति						
-+ 25 -	CLAYEY SAND, a little	gravel, gray	$\frac{1}{6}$ to brown,											
25 -		A) (JC) unu	-01			23	M	$\bigvee$ ss	14	17				
20 27 -	SILTY SAND, a little gra	vel, fine to	medium		ARSE	-		1						
	grained, brown, a little lig	ht brown, v	vet, mediur	n AL	LUVIUM	18	Μ	X ss	16					
1 29 -	(A-2-4)	10115 01 50110						रि						
- 30 -		1				16	м		R					
GD: 31 -	- stiff to soft, a lens of water	gravel, gray	nd with		لل د		IVI		0					
-0269	gravel at $45\frac{1}{2}$ (SC/SM) (	A-2-4)						[]] TS			<u> </u>			
5 DE	PTH: DRILLING METHOD		1	WATER I	CASING			12		W/AT	FR	NOTE:	REFE	ER TO
UTATIO 0-4	44½' 3.25" HSA	DATE	TIME	DEPTH	DEPTH	DE	PTH	FLUIDL	ËVEL	LEVI	Ĩ	THE A	ATTAC	CHED
00R		5/8/14	9:25	18.5	17.0	1	7.0			16.	0	SHEE	IS FO	K AN
	NO	5/8/14	9:35	18.5	17.0	1	7.0			15.	0	EXPLA	NATI(	JN OF
S COM	PLETED: 5/8/14	5/8/14	10:30	46.0	44.5	4	4.5			36.	0			GY ON
DR: S	SG LG: CD Rig: 91C											11.		U

- `

-

۲



AET JO	B NO: <b>01-05697</b>			LO	G OF	BO	RING N	01	200	SW	(p. 2	2 of	2)
PROJEC	T: Southwest Light Rail Transit Project,	;, P	EC East; H	lopk	kins	to	Minn	eapol	is				
	Hennepin Co. Coo	ord	inates: <u>N</u>	14	48374	1		E 4	19602:	5			
DEPTH IN	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SĄ	MPLE	REC	FIELD	) & LAE	BORAT	ORY	TESTS
FEET		20 7						119.	WC	DEN	LL	PL	<b>%-</b> #200
33 -	CLAYEY SAND, a little gravel, grayish brown, stiff to soft, a lens of waterbearing sand with		(continued)	4	Μ	Х	SS	18	12			· .	
34 —	gravel at 45 <sup>1</sup> / <sub>2</sub> ' (SC/SM) (A-2-4) (continued)					ম্র							
35				4	м	$\nabla$	SS	18	12				
36 -						A							
37 —						붬							
38 -				9	M	М	SS	18	11				
39 —						Ľ					:		
40 -				5	M	Ņ	SS	18	12				
41 -						R							
42 -				~	M	M	aa	10	10				
43 -				Э	IVI	Д	22	18	12				
44 -						1							
45 -				8	M/W	ΊX	SS	18	11				
46 -	END OF BORING					ſ							
						•							
					ł	,							
	· · · · · · · · · · · · · · · · · · ·												
						1							
						ľ							
5						ľ		:					
						'							
5													
						,							
						,							
						ľ							
d										1			



AET JO	OB NO: <b>0</b>	1-05697					I	.OG OF	7 BO	RING N	0	1211	SB	(p. 1	of	3)
PROJE	CT: So	uthwest Ligh	nt Rail Tr	ansit Pro	oject, I	PEC East	; Hoj	pkins	to	Minn	eapol	lis				
SURFA	CE ELEVATIO	N: <b>888.1</b>	I	Iennepin Co.	. Coordin	ates:	N	15209	3		E :	50404	8			
DEPTH		MATERIAL I	DESCRIPTIO	IN		GEOLOGY	N		sĄ	MPLE	REC	FIELI	) & LAI	30RA]	'ORY '	FESTS
FËÈT										1 Y PE	11N.	WC	DEN	LL	PL	%-#200
1 -	14.5" Conc	crete Pavement				FILL			Ŧ	SU		15				
2 -	4" Void								R	SU		-				
3 -	FILL, mos	tly sand with sil	t, a little gra ay (A-1-b)	avel and			5	M	N	SS	14					
4 -		, 0	• • • •						Ĥ							
5 -	-						12	$\frac{1}{w}$	$\overline{\mathbf{N}}$	SS	16					
6 -	4								A	55						
7 -	ORGANIC	CLAY, trace s	hells and ro	oots, dark	<u>- 2.2.7</u> - 2.2.7	SWAMP DEPOSIT			Ł							
8 -	of sapric p	eat (OH) (A-8)	inses and la	minations	<u>ter</u>		1		Å	- SS	18	180				
9 -									Ĭ							
10 -	-						2	M	$\mathbb{N}$	SS	18	175				
11 -					. <u></u>				R							
12 -							w		$\mathbb{V}$	66	10	201				
13 -	-				<u>==</u> =		vv.		A	00	10	201				
14 -					<u>ter</u> <u>ter</u>				EL.							-
15 -							2	M	X	SS	18	103				
16 -	-				<u>==</u> =				E							
17 -							3	M	$\mathbf{N}$	SS	18	137				
10 -									R							
20 -					<b>3.2.5</b>				K	00	10	170				
20							3		Å	SS	18	172				
22 -	ORGANIC	C CLAY, trace s	shells and ro	oots, dark	100				1							
23 -	brown to b	lack, a little bro	wn and ligh d hemic new	nt gray, at (OH)	<u>ter</u>		4	M	X	SS	10	165				
24 -	(A-8)		a nonne per	<i>m</i> (011)					R							
<u>₹</u> 25 -	-				<u>ler</u> Ler		4	∣м	$\square$	SS	18	220				
26 -	_				<u></u>				H	5.5	10					
27 -	-				<u>te</u>	÷			ł							
19 - 28 -							2	2 M	X	SS	14	184				
년 29 -					<u>337</u>				I							
⊒¥ 30 -					ter ter		3	M	$\mathbb{N}$	SS	18	269				
- 31 - - 26	-				<u>==</u>				R							-
8 5 DE	PTH: DRIL	LING METHOD			WATE	R LEVEL M	EASU	REMEN	VTS	I	1	1	·	NOTE:	REFF	ER TO
ATES.			DATE	TIME	SAMPL	ED CASIN	G C	AVE-IN	1 LT	DRILLI	NG	WAT	ER	THE A	TTAC	CHED
	<u>J-46' 4.25'</u>	<u>' HSA</u>	5/6/14	11:33	60			4.2				4.5		SHEET	IS FO	R AN
40- 2	/4.5 KDF	W/DIVI	5/6/14	1:43	41.0	42.0		32.0				16.0	5 E	XPLA	NATIO	ON OF
BORI		/14	5/6/14	2:00	41.0	42.0		29.1				13.2	2 T	ERMIN	IOLO	GY ON
	SG LG CD	Rig: 91C												TH	IS LO	G
۹ <u>ــــــــــــ</u> ـه	C			J	1											



AET JO	B NO: <b>01-05697</b>			LO	GOF	BOI	RING N	0	1211	SB	(p. 2	2 of .	3)
PROJEC	CT: Southwest Light Rail Transit Project	ct, ]	PEC East; H	lopk	cins (	to I	Minn	eapol	lis				
	Hennepin Co. Coo	ordin	ates: <u>N</u>	15	52093	;		E :	50404	8			
DEPTH	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA	MPLE	REC	FIELI	) & LAI	BORAT	ORY	TESTS
FEET	WATENAL DESCRIPTION		GLOLOGI	14	wie	1	YPE	IN.	WC	DEN	LL	PL	%-#200
33 _	ORGANIC CLAY, trace shells and roots, dark			3	М	М	SS	10	276				
34 -	soft, laminations of silt and hemic peat (OH)	<u></u>				सि							
35	(A-8) (continued)			2	м	M	66	10	125				
36 —		LEF		3	IVI	A	55	10	125	-			
37 —	ORGANIC CLAY, pieces of wood around 37.5',					Ľ							
38 —	dark brownish gray, very soft (OH) (A-8)	LEE		1	М	X	SS	18	68				
39	$\perp$ EAN CLAV brownish grow stiff (CL) (A.6)		FINE			Z							1
40	LEAN CLAT, brownish gray, suit (CL) (A-0)		ALLUVIUM	9	М.	M	SS	18	26				
41 -				-		मि							
42 -	No sample taken at 42' due to blow up in hole					벐							
43 —	(left advanced HSA in ground overnight)					Ł							
44 —	GRAVELLY SAND, medium grained, brownish		COARSE			ł							
45 —	gray, waterbearing, medium dense to loose (SP)		ALLUVIUM			Ħ							
46 —	(A-1-0)			12	w	M	00	2					
47 —				12	W	Д	22						
48 -				11	W	Х	SS	4					
49 —						Þ							
50 -				7	W	Х	SS	6					
51 -						$\sum$							
52						$\left \right\rangle$							
53 -	GRAVELLY SAND, medium to coarse grained,					$\left \right\rangle$							
54	brownish gray, waterbearing, loose (SP) (A-1-0)					$\mathbb{H}$							
55 -				9	W	Д	SS	10					
57 -						2							
58 -						$\left \right\rangle$							
59 -	CLAYEY SAND, a little gravel, grayish brown, very stiff (SC) (A-6)		TILL			$\left \right\rangle$							
				10	w	$\forall$	cc	6	11				
+ 61 -				10	, vv	Д	66						
E 62 -						$ \langle \langle$							
63 -						$\langle \langle$							
64 -						R							
5 2 65 -				25	M	$\mathbf{N}$	SS	4	15				
66 -				-		$\beta$							
1100 67 -						$\left \left\langle \right\rangle \right $							
ບ ≽ 68 –	LIMESTONE, weathered. grav		PLATTEVILLI	Ē		$\langle \langle$							
<del>Y</del> OS 69 -	,,,,,,,	, , , , ,	FORMATION			$\langle$							
	4	·· /·/	1			r	1				1		

03/2011



AET JC	DB NO: <b>01-05697</b>				LO	G OF I	BORING N	0.	1211	SB	(p. 3	of 3	3)
PROJE	CT: Southwest Light Rail	Transit Pro	oject, ]	PEC East; I	Iopl	kins t	to Minn	eapol	lis				
		Hennepin Co.	Coordin	aates: <u>N</u>	1	52093	j <u> </u>	E <b>:</b>	50404	8			
DEPTH IN	MATERIAL DESCRIP	TION		GEOLOGY	N	МС	SAMPLE	REC	FIELD	) & L'AI	BORAT	ORY	TESTS
FEET			-142					ШΝ.	WC	DEN	LL	PL	%-#200
	LIMESTONE, weathered, gray (co	ontinued)		FORMATION	-j *	M	X ss	6					
72 -				(continued)			$\langle \langle$						
73 -							21						
74							21						
75 -					200/.7	М	🗙 ss	1					-
	END OF BORING												
	*23/.5 + 50/.5 + 100/.4				÷.,			-					
	,					-							
								:					
									2				
5													
5													
5								· ·					
2.1000													
5													
										· .			
										1			



#### AMERICAN ENGINEERING TESTING, INC.

.

#### SUBSURFACE BORING LOG

AET JO	B NO: <b>01-0</b>	5697						LO	G OF I	BOR	INGN	)	1213	SB	(p. 1	of 3	<u>)</u>
PROJEC	CT: South	west Light	t Rail Tra	nsit Pro	ject, ]	PEC	East; I	Iopk	ins t	to I	Ainne	eapol	is				
SURFAC	CE ELEVATION:	888.8	He	nnepin Co.	Coordin	ates:	N	1:	52126	5		3 5	504117	7			
DEPTH	l	MATERIAL DI	ESCRIPTION	ſ		GEO	OLOGY	N	МС	SĄ	MPLE	REC	FIELD	& LAI	BORAT	ORY T	ESTS
FEET											TPE	11N.	WC	DEN	LL	PL	qu
1	FILL, mostly c sandy lean clay black $(A-1-b)$	layey sand w , trace roots,	ith gravel, a dark browr	n little n and		FILL		9	M	M	SS	16	12				
2 3	FILL, mostly s sandy lean clay	and with silt , brown, a lit	and gravel, ttle black (A	a little A-1-b)				23	М	X	SS	12					
4	••••							4	м		66	2					
6-						GWIA	N/D	4	M	A 73	22	2					
7	ORGANIC CI brownish gray lenses of hemi	AY, trace ro dark brown c and sapric p	ots and she and black, s peat (OH) (A	lls, soft, A-8)		DEP	OSIT	2	М	A	SS	16	177				
9 10					<u></u>						TW	24	204 190	25 26			1010 Cons.
11								2		Ł	55	18	200				
13 -								2	IVI	Ą	66	10	200				
14 -					1	-				₽ ₽	66	10	100				
15 -								2	M	Å	88	18	182				
17 -	-				- 23					1							
18 -	_							2	M	Å	SS	18	108				
19 -					<u>7.33</u> 7.33	t.				H	and the second sec	10	76	54			675
20 -	SAPRIC PEA	T, black, a lit	ttle dark bro	ownish	<u></u>					K	IW	10					
21 -	$\int \operatorname{gray}\left(\mathbf{P} \right) \left(\mathbf{A}^{-1}\right)$	3)			<u>1.5.</u>	Ē				1							
23 -					<u></u>	Ľ		4	M	X	SS	18	251				
24 -	ORGANIC C	LAY, trace ro	oots, black t	to		R				Į							
25 -	brownish gray	r, soft (CL) (4	A-8)					2	M	X	SS	18	261			-	
20 -						lini lini				Į							
	-				12.	38 11		2	M	X	SS	18	51				
29 -	4					3h			M/V	v	TW	18					
- 30 -					<u> ₽₽</u>		ARSE LUVIUM	-		F							
31-			· · · · · · · · · · · · · · · · · · ·							5	٩			<u> </u>		_	
DE	PTH: DRILLIN	G METHOD	 		WA	FER L	EVEL ME	ASUR	EMEN	VTS			***		NOTE	: REF	ER TO
NAIE	)-29' <u>3.25''</u> H	SA	DATE	TIME	SAMF DEP	YLED TH	CASING DEPTH		VE-IN EPTH	F	LUID L	EVEL	LEV	EL	THE	ATTA(	CHED
29	9-85' RDF w/	DM	5/1/14	10:15	30	.5	29.0	2	7.6				12.	1	SHEE	15 FU	
Ŭ N															EAPL! TEDM	NOI O	ON OF
BORI COM	NG PLETED: <b>5/1/14</b>							_		_					TIVIJ TI	HISLO	)G
DR: S	SG LG: SB	Rig: 1C															



AMERICAN ENGINEERING TESTING, INC.

## SUBSURFACE BORING LOG

AET JO	B NO:	01-05697			LO	GOF	BOI	RINGN	0.	1213	SB	(p. 2	2 of 3	3)
PROJE	CT:	Southwest Light Rail Transit Proj	ect,	PEC East; l	Hopł	cins 1	to I	Minn	eapol	is				
		Hennepin Co. C	oordii	nates: <u>N</u>	1:	52120	5		E É	50411	7			
DEPTH		MATERIAL DESCRIPTION		GEOLOGY	N	мс	SA	MPLE	REC	FIELI	) & LAI	BORAT	FORY 1	TESTS
FEET								YPE	LIN.	WC	DEN	LL	PL	qu
33 - 34 -	SANI mediu dense	WITH GRAVEL, possible cobbles, m grained, gray, waterbearing, medium to loose, lenses of sand with silt (SP)		COARSE ALLUVIUM (continued)	9	w	X	SS	0					-
35 -	(A-1-	(continued)			5	w	$\square$	SS	0					
36 -	4					, vv	А	, oo						
37				•			Ю							
38 -	-			•	14	W	Х	SS	3					
39 -	-			•			$[\mathcal{I}]$							
40 -				•	7	w	$\square$	SS	7					
41 -					'		Ą	55	ĺ					
42 -	-						4							
43 -	_				6	W	X	SS	7					
44 -				•			Д							
45 -	SAN	D WITH GRAVEL, medium to coarse					$\square$	aa	10					
46 -	grain	ed, gray, waterbearing, loose (SP) (A-1-b)		•	6	W	Ŵ	88	10					
47 -			-		_		$\Sigma$							
48 -	SAN   stiff (	CL) (A-6)			18	M	X	SS	16	14				
49 -	_						Ą							
50 -	GRA	VEL WITH SAND, apparent cobbles,		COARSE			Ń							
51 -	brow	n, waterbearing, medium dense (GP)		ALLUVIUM	25	W	Ň	55	2					
52 -	(A-1-						$\sum$							
53 -							$\left \right\rangle$	]						
54 -	SAN	D, a little gravel, medium grained, brownish waterbearing, medium dense (SP) (A-1-b)					$\left \right\rangle$							
55 -		(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					Ń							
56 -	_					W	Ň	SS	16					
± 57 -	_						$\sum$							
58 -														
59 -	GRA brow	n, waterbearing, medium dense (SP)					$\left \right\rangle$							
60 -	(A-1-	-b)					Ń		10					
+ 61 -					20	W	Ň	55	12					
± ₩ 62 -	SAN   brow	D WITH SIL1, a little gravel, fine grained, n, waterbearing, dense, a lens of sand					$\sum$	]						
G3 -	(SP-	SM) (A-3)					$\rangle$	Ì						
64	_						$\left \right\rangle$	Y						
5 65							Ŕ	1	10					
Ŭ 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					37	W	Ň		19					
10x0 67							$\sum$	1						
Ŏ 2 68								ľ						
69 GKP		VEL WITH CLAY AND SAND, brown, rhearing, very dense (GP-GC) (A-1-b)	# <sup>   </sup>				$ \rangle$	9						
о Б				-			_×	₹						
<∟													01.1	JUD (

03/2011



AET JO	B NO: <b>01-05697</b>			LO	G OF I	BOR	UNG N	о	1213	SB	(p. 3	of 3	5)
PROJEC	T: Southwest Light Rail Transit Proj	ect, ]	PEC East; H	lopk	cins t	o N	Ainne	eapol	is				
	Hennepin Co. C	oordin	ates: <u>N</u>	1:	52126	<u>,</u>	]	E 5	50411'	7	0.0.0.1.7		
DEPTH IN	MATERIAL DESCRIPTION		GEOLOGY	N	МС	SA T	MPLE YPE	REC IN.	FIELD	DEN	SORAT		ESTS
FEET	GRAVEL WITH CLAY AND SAND, brown,		COARSE	53	W	M	SS	3	WU	DEN	LL.	I'L	- <u>-</u>
71 -	(continued)		OR COLLUVIUM			$\mathfrak{H}$							
73 -			(continued)			$\rangle$							
74 —		1				$\left  \right\rangle$							
75 —		1 1 1 1 1		43	w	M	SS	6					
76 -		1) III III				$\mathbb{R}^{1}$							
78 -			CT DETED			$\left \right\rangle$							
79 -	SHALEY SANDSTONE, highly weathered to weathered, gray		FORMATION			$\left  \right\rangle$							
80				25	w	X	SS	24				2	
81 -						$\mathbb{H}$							
83 -	SANDSTONE fresh grav					$\left \right\rangle$			-				
84 -	SANDSTONE, Itesh, Eury					$\sum$	~~~						
85 -	END OF BORING			270/.5	W_	$\times$	SS	6					
20													
PL AE													
0.7200													
INALEX													
INNO													



AET	JOB NO:	01-05697					LO	G OF I	BOR	ING N	0	1214	SW	(p.	1 of	2)
PRO	JECT:	Southwest Ligh	t Rail Tr	ansit Pro	ject, Pl	EC East; I	Iopl	cins t	to N	/linn	eapol	lis				
SUR	FACE ELEV	VATION:889.9	<u>,</u> E	Iennepin Co.	Coordinat	es: <u>N</u>	1	52175	5		Е :	50427	9			
DEPT	H	MATERIAL D	ESCRIPTIO	N		GEOLOGY	N	MC	SAI T	MPLE YPE	REC IN.	FIELD	0 & LA	BORAT	ORY '	FESTS
TEE	6" FI	LL, mostly silty sand	with gravel	, brown	F	ILL			M	00	14					
	$\int \frac{(A-1-)}{FILL}$	b) , mostly gravelly silty	sand, a littl	le clayey			27	M	Д	55	14					
3	sand, brown	pieces of concrete and n, black and brownish	d bitumino gray (A-1-	us, dark ·b)			4	M	X	SS	6					
4	FILL	, mostly organic clay,	a little grav	vel, trace	_				<u>I</u>							
5	i - roots,	, black (A-8)					2	₩	X	SS	12	77				
7	HEM	IC PEAT, brown and	black (PT)	(A-8)	See r	WAMP			Į		-					
8	3 –					0.511	1	M	Å	SS	14	364				
9	)				335											
11	SAPI	RIC PEAT, black (PT)	) (A-8)		<u></u>		1	-	Å	SS	0					
12	2 —				<u></u>			M		00	12	120				
13	3 —						2	IV1	A	55		129				
12	ORG	ANIC CLAY, black, a nations of sand and lea	a little gray in clay (OH	y, very soft, I) (A-7-6)			2	м	H	22	14	41				
10	5		• •						स	55						
11	7 – CLA soft t	YEY SAND WITH G o firm, lenses and lam	RAVEL, g	ray, very		AIXED ALLUVIUM	1	TL.	$\square$	66	24	200				
	<sup>3</sup> water	bearing sand (SC) (A	-2-6)					W	Å	55	24	28				1
20	) –						1	w	$\square$	66	л	10				
2	1 -						1	vv	A	00						
22	2						6	w	$\sum_{i=1}^{n}$	SS	14	21				
24	4								H	00						
P1/P1 2:	5 – GRA grain	VELLY SAND WITH ed. grav. waterbearing	H SILT, me z. verv loos	edium e, a lens of	f Carlor A	COARSE ALLUVIUM	3	w	$\square$	SS	4					
100 20	6 - claye	y sand (SP-SM) (A-1-	-b)						R							
	SAN 8 - water	D WITH GRAVEL, r rbearing, loose to very	nedium gra / loose, a le	ined, gray, ns of			5	W	М	SS	6					
1d0+1 2	9 d claye	ey sand at $27\frac{1}{2}$ (SP) (A	A-1-b)						I							
3 YE	0 -						3	W	M	SS	6					
3 2697.G	1 -								P							
s 1	DEPTH:	DRILLING METHOD			WATER	R LEVEL MEA	SUR	EMEN'	TS					NOTE:	REFI	ER TO
DINATE	0-34½'	3.25" HSA	DATE	TIME	DEPTH	DEPTH	DE	PTH	FL	UID LE	EVEL	LEVI		THE A	TTAC	HED
NOO 341	2-64.4'	RDF w/DM	8/5/14	10:35	19.0	17.0	1	6.9	-			13.4	5	STIEE EXPLA	NATIO	ON OF
ਬੈ <mark>BO</mark>	RING	0/5/14	8/5/14	10:45	19.0	17.0		0,ð				0.2	r	ERMI	VOLO	GY ON
S CO	MPLETED: : DTS 1.0	8/5/14 F: TM Rig: 1C												TH	IIS LO	G



AET JO	)B NO:	<del>11 - 11 - 11 - 11 - 11 - 11 - 11 -</del>	LO	GOF	BOI	RING N	0]	1214	SW	(p. 2	2 of	2)			
PROJE	CT:	Southwest Light Rail	Transit Proje	ect, I	PEC East; H	Iopk	cins (	to I	Minn	eapol	lis				
			Hennepin Co. Co	oordir	nates: <u>N</u>	15	52175	5		E É	50427	9			
DEPTH		MATERIAL DESCRIP	LION		GEOLOGY	N	MC	SA	MPLE	REC	FIELD	& LAI	BORAT	ORY	TESTS
FEET		WATERAL DESCRIPT			GLODOGI	14	WIC	L 1	TYPE	IN.	WC	DEN	LL	PL	%-#200
33 -	SANI	O WITH SILT, a little gravel, bearing, very loose (SP-SM)	gray, (A-1-b)		COARSE ALLUVIUM (continued)	3	W	X	SS	12					
34 -	GRA	VEL, gray, waterbearing, very	y loose (GP)					붬							
36 -		~) 		1 1 1 1		4	W	М	SS	1					
37 -	SANI	WITH GRAVEL medium	to coarse	_				P							
38 -	graine	ed, a little black, waterbearing	g, loose, a lens			8	W	X	SS	6					
39	of san	d with silt (SP) (A-1-b)						ĥ							
40 -	GRA	VEL WITH SAND, gray, wa (GP) (A-1-a)	terbearing,			5	W	Ń	SS	3					
41 -	-							Д							
42 - 43 -	GRA gray,	VELLY SAND, medium to c waterbearing, loose (SP) (A-	oarse grained, 1-a)			8	W	Á	SS	6					
44								H							
45 -						11	W	Д	SS	6					
47								Ľ							
48 -	GRA' mediu	VEL WITH SAND, gray, wa 1m dense (GP) (A-1-a)	terbearing,			13	W	X	SS	6					
49 -								$\sum$							2 2
50 -	-					11	w	$\square$	SS	6					
51 -	-							Б							
52 -	-			<b>₩ ∥</b>				$\left \right\rangle$							
53	-							$\mathbb{S}$							
54 -	CLA	YEY SAND, a little gravel, b	rown, a little		TILL			$\square$							
55 -	dark g	gray, hard, laminations of fat bearing sand (SC) (A-6)	clay and			34	M/W	ľΧ	SS	14	14				
56								$\sum$							
57 -	1														
	SAN	D, a little gravel, fine to medi	um grained,		COARSE										
59 – 59 – EFF 60 –	grays	sn brown, medium dense (Sr	) (A-3)			07		$\mathbb{H}$	00	10					
	4					27	W	Å	SS	12					
	_							$\left \left\langle \right\rangle \right $							
63 -	4							$\left \right\rangle$							
64 -	GRA	VEL WITH SILT AND SAN	ID, grayish					$\left \right\rangle$							
65 –	$\int brown (A-1-$	n, waterbearing, very dense ( b)	GP-GM)		*	100/.2	W	Ď	SS	6					
COORDINATE	LIME END	STONE, weathered, light bro OF BORING	own		* PLATTEVILI FORMATION	E									
															1



	AET JO	B NO:	01-05	697						LO	GOF	BOR	LING N	0	1215	SW	(p. 1	1 of	2)
	PROJE	CT:	Southv	vest Ligh	t Rail Tr	ansit Pro	oject,	PEC	C East; H	Iopł	cins 1	to I	Ainn	eapo	lis				
	SURFA	CE ELI	EVATION:	890.6	I	Iennepin Co.	Coordin	nates:	<u>N</u>	1:	5225(	)		E :	50442	0			
I	DEPTH		М	IATERIAL E	ESCRIPTIO	N		GE	OLOGY	N	мс	SĄ	MPLE	REC	FIELI	) & LA	BORAT	ORY '	FESTS
	FÊÈT			<u> </u>		· · · · · · · · · · · · · · · · · · ·							YPE	IIN.	WC	DEN	LL	PL	%-#200
	1 —	∖3" F brov	ILL, mixtur vn and dark	e of silty sa brown (A-	ind with gr 1-b)	avel,		FILL		43	М	M	SS	16					
	2 —	FILI	, mostly cla	ayey sand,	a little grav	el and silty	/					$\mathbb{H}$							
	3 —	sand	, pieces of t	orick, black	and gray (	A-0)				19	M	Å	SS	8	15				
	4	FILI	, mostly cla	ayey sand,	a little grav	el, pieces													
	5	of co (A-6	oncrete and (petroleun	bituminous n-type odoi	, trace root	ts, black				10	M	Д	SS	8	12			-	
	0 – 7 –	HEN	AIC PEAT,	black and	ark brown	(PT)	TARA	SWA	AMP			I							
	8	(A-8	3)				<u>125</u> 125	DEP	OSIT	3	<u> </u>	М	SS	13	380				
	9 —	OR	JANIC CLA	Y WITH	SAND bla	ck to dark						ł							
	10 —	brov	vn, soft, lam	inations of	sand (OH)	) (A-8)				4	М	М	SS	16	79				
	11 -	CP	AVEL WITH	I SAND	max matar	anning		COA	RSE			Ł							
	12	med	ium dense (	GP) (A-1-a	(ray, water) ()	Jeanng,		ALL	UVIUM	11	W		SS	12					
	13											सि							
	15 —	SAN wate	ND, a little g erbearing, lo	ravel, med ose (SP) (/	ium graine A-1-b)	d, gray,				5	w	M	SS	6					
	16 -		0,							5		H	55						
	17 —	GRA	AVEL WITI	H SAND, p	ossible col	bbles, gray	, =			10	w	Ю	66	1					
	18 -	wate	erbearing, lo	ose to med	ium dense	(GP)				10	vv	А	33	1					
	19		(°u)									H	~~						
	20		•							13	-	Д	SS	0					
	22 -	-										4							
	23 -	-								5	W	X	SS	3					
	24 —		·							- 		E			-				
	25 -									10	-	M	SS	0					
3/14	26 27	-										Ш							
T 8/1:	28 -									7	W	М	SS	2					
ILL.GD	29 -											Ĥ							
T+WE	30 -	GR	AVELLY S	AND, poss	ible cobble	s, medium		•		6	w	$\square$	SS	5					
ET+C	31 —	(A-1	l-b)	u, gray, wa	ter bearing,	10030 (51)	/			Ŭ		Д	00						
GPJ A	32 -		VEVSAN	D WITH C	RAVEL	possible		: 	[.	9	М	M	SS	11	15				
)5697. T	- 53	cob	bles, brown,	stiff, a len	s of sand (	SC) (A-6)						Ю				 	No. of the local data of the l		
S 01-(	DEI	PTH:	DRILLING	METHOD			WAT	ER LI	EVEL MEA	SURE	EMEN	TS					NOTE:	REFE	ER TO
INATE	0-1	4½'	3.25" HSA	4	DATE	TIME	SAMPI DEP1	LED IH	CASING DEPTH	CA DE	/E-IN PTH	FL FL	UID LE	NG IVEL	WATI LEVE	ER EL	THE A	TTAC	HED
OORD	141/2-6	91/2'	RDF w/D	M	8/7/14	1:45	13.	5	12.0	1	1.5				7.9		SHEE	rs foi	R AN
P W-C	ם מערים														<i></i>	[	SXPLA TED MO	NATI(	UN OF
COR	COMP	LETEI	): <b>8/7/14</b>													1	EKIVIIY TH		G UN
Ē	DR: S	G L	G: SB Rig	g: 91C															-



AET JO	B NO: <b>01-05697</b>			LO	GOF	BOI	RINGN	o1	1215	SW	<b>(p.</b> )	2 of	2)
PROJEC	CT: Southwest Light Rail Transit Proj	ect,	PEC East; H	Iopł	cins 1	to I	Minne	eapol	is				
	Hennepin Co. C	Coordii	nates: <u>N</u>	1:	5225(	)		E É	50442	0			
DEPTH			CTROX OCT			SA	MPLE	REC	FIELD	) & LAI	30RA]	TORY "	FESTS
IN FEET	MATERIAL DESCRIPTION		GEOLOGY	N	MC	Î	YPE	IN.	WC	DEN	LL	PL	%-#20
35	GRAVELLY SILTY SAND, possible cobbles, fine to medium grained, grayish brown, wet,		COARSE ALLUVIUM	28	w	À	ŚS	4		-			
37 -	GRAVELLY SAND WITH SILT, possible cobbles, fine to medium grained, brown,			18	w	K	22	12		-			
39	waterbearing, medium dense (SP-SM) (A-1-b)			10	**	A	55	12					
40 - 41 - 42	fine grained, grayish brown and brown, waterbearing, medium dense, lenses of silty sand			27	W	Å	SS	16					
42	(31-314) (A-1-0)			37	-	M	SS	0					
44				16	w	$\mathbb{N}$	SS	12					
46	GRAVEL WITH SAND, brown, waterbearing,			*	w		SS	6					
48 - 49 -	very dense (GP) (A-1-a) 32/.5 + 64/.5 + 36/.2 SAND, a little gravel, brown, waterbearing, very					Ø							
50 51 52	dense (SP) (A-1-b)			100	W	Å	SS	24					
53 54 55	CLAYEY SAND, a little gravel, possible cobbles, brown, hard, laminations of waterbearing sand (SC) (A-2-6)		TILL	**	M/W		SS	14	10				
56 57 58	**18/.5 + 53/.5 + 100/.4												-
59 60 61				293	M/W	Å	SS	18	11				
62 63 64				-									
65 66	* **66/.5 + 148/.5 + 100/.05			***	M/W	X	SS	12	10				
67 68				7		$\langle \rangle$							
69	LIMESTONE, weathered, gray and light gray, a little brown END OF BORING		FORMATION	L 100/.05	s <mark>M∕W</mark>		WASH SS	1/2					



AET JO	OB NO:	01-05697					LO	G OF I	BOR	ING N	01	1219	SW	(p. 1	1 of	2)
PROJE	CT:	Southwest Light	t Rail Tra	ansit Pro	ject, PE	C East; I	Iopł	cins t	to N	Ainn	eapol	lis				
SURFA	CE ELEV	VATION:902.8	Н	ennepin Co.	Coordinates	s: <u>N</u>	1	52380	)		E :	50426	0			
DEPTH		MATERIAL D	ESCRIPTION	N	G	EOLOGY	N	мс	SA	MPLE	REC	FIELD	) & LA	BORAT	'ORY	FESTS
FÉÉT						<b>T</b>			ו וכד	SII	11N.	WC	OC	LL	PL	%-#200
1 -	3.75"	Bituminous pavement	t silt and or	ravel		J,	0	M M	$\square$	SU	12					
2 -	pieces	s of concrete, dark bro	wn (A-1-b	)			,	1.11	A	55	14					
3 -	∣ FILL, ∣ siltv s	mostly clayey sand w and, pieces of concret	vith gravel, te and bitur	a little ninous.			6	М	М	SS	4	17				
4 -	dark t	prown, a little brown a	nd light br	own					1							
5 -	- (A-2-	o, A-2-4)					2	М	M	SS	7	13				
6 -	4								स						-	
7 -	_						2	м	M	55	0					
8 -	-						2	IVI	A	55						
9 -	-								Į۲							
10 -							4	M	М	SS	12	13				
11 -	FILL	mostly sand with gra	vel. a little	clavev					I							
12 -	sand,	light brown (A-1-b)					9	M	M	SS	4					
14 -		·							सि							
15 -	FILL	, mostly lean clay with ic. a little sand. black	n gravel, sli , a little bro	ghtly wn (A-6)			22	M	$\square$	22	6	21	38			
16 -		· · · · · · · · · · · · · · · · · · ·							Д	55						
.17 -	_ FILL	, mostly sand with gra	vel, a little	clayey					뵍							
18 -	sand,	light brownish gray a b)	nd light bro	own			18	M	M	SS	6					
19 -	-							-	国							
20 -							18		X	SS	14					
21 -				<u>~</u>		ADOL	-		रि							
22 -	- SAN medi	D WITH SILT AND um grained, grayish bi	GRAVEL, rown, a littl	fine to le gray and	A	JARSE LLUVIUM	19	W	M	SS	6		-			
23 ·	- light	tan, waterbearing, me	dium dense	e, / (SP-SM)					A	55						-
24	(A-1)	-b)	iu icali olay						R	_						
25 26	GRA	VEL WITH SAND, g	grayish bro A-1-b)	wn,			8	W	Д	SS						
	SAN	D WITH GRAVEL, r	nedium gra	ined,					I							
	brow	nish gray, waterbearin	ng, medium	i dense, a			12	W	Х	SS	18					
+ 29				10001 04166		TT			Ł							
A 30	- (SC)	(A-6)	gravel, gray	, very suff			17	М	$\square$	SS	12	12				
GD 31	-								सि							
		DRILLING METHOD	1		WATER	LEVEL ME	ASUR	EMEN			1			NOTE		
	or 1 m.			TIME	SAMPLEI	CASING	CA	VE-IN	 	DRILLI	NG	WAT	ER	THE	, ксг. Атта <i>і</i>	CHED
	0-32'	3.25" HSA	DATE		DEPTH	DEPTH		EPTH	FL	JUID LI	EVEL	LEV		SHEF	TS FO	R AN
Boo 32-	-34½'	RDF w/DM	4/30/14	10:20	25.5	22.0		2.0	_			20.	1	EXPLA	NATI	ON OF
BOR	ING		4/30/14	10:30	23.3	22.0		2.0				20.	·	FERMI	NOLC	GY ON
S COM	IPLETED	: 4/30/14	·				+							TI	-IIS LC	)G
⊎∣ DR:	SG LC	J: SB Rig: IC	1										•			



AET JO	B NO: <b>01-05697</b>			LOG OF	BORING NO	D. <u>121</u>	9 SW	(p. 2 d	of 2)
PROJEC	CT: Southwest Light Rail Transit P	Project, ]	PEC East; H	Iopkins	to Minne	apolis			
	Hennepin	Co. Coordir	nates: <u>N</u>	15238		<u>3 · 5042</u>	260		VTESTS
DEPTH IN FFFT	MATERIAL DESCRIPTION		GEOLOGY	N MC	SAMPLE TYPE	REC NO. WO			PL %-#200
33 -	SAND, medium to fine grained, gray, waterbearing, medium dense, a lens of clayey sand, laminations of sand with silt (SP)		COARSE ALLUVIUM (continued)	15 W	ss	16			
34	(A-1-b/A-2-4) (continued) SAND, a little gravel, medium grained, brown gray, waterbearing, loose (SP) (A-1-b)	nish		7 W	ss	4			
30 -	END OF BORING								
								-	
							jų.		,
± 000									
			•						
1-USOB/, GPU AE		-							
JORDINALES									



A	ET JOE	3 NO:	01-05	697						LO	GOF	BOF	RING N	0	1220	) SS	(p. 1	of	2)
PI	ROJEC	T:	Southv	vest Ligh	t Rail Tr	ansit Pro	oject,	PEC	C East; I	Iopł	cins 1	to I	Minn	eapo	lis				
SU	JRFAC	E ELE	VATION:	891.7	F	Iennepin Co	. Coordir	nates:	<u><u>N</u></u>	1:	52357	7		E t	50465	4			
DE	PTH N		м	ATERIAL D	ESCRIPTIO	N		GE	EOLOGY	N	MC	SĄ	MPLE	REC	FIELD	) & LA	BORAT	'ORY '	TESTS
FI	ΞĒΤ												YPE	IN.	WC	DEN	LL	PL	%-#200
	1 -	\FILL \brow	, mostly cru n (A-1-b)	ushed limes	tone base,	light	$\int$	FILI	L	35	М	M	SS	22	10				
	2 –	FILL	, mixture o	f clayey sar	nd and sand	ly lean						H						*	
	3 –	clay, brow	a little grav n and gray	vel, pieces c (A-6)	of concrete	, dark				10	M	М	SS	4	10				
	4 –											ß							
	5	FILL	, mostly or	ganic clay,	a little grav	vel, trace				2	-	M	SS	0					
	6 —	roots	, dark brow	m (A-8)	U	,						सि							
	7 -	GAD		11 1 (DTT)		·1.1. (*11)	-	CW	AMD	2	M	M	22	13	126				
	8 —	SAPI	RIC PEAT,	black (PT)	) (A-8) (po	ssible mi)		DEI	POSIT OR		Ţ	$\mathcal{A}$	55	15	120				
	9 -	LEA	N CLAY, s	lightly orga	anic, trace	roots,		(FIL) FIN	L/ E			꿤							
		black	c, soπ (CL)	(A-6)				ALI	LUVIUM	3	М	X	SS	17	17				
	12											Z							
	13 -	GRA	VELLY SA	AND WITH n to fine gra	H SILT, po ained. grav	ssible		CO/  ALI	ARSE LUVIUM	7	W	X	SS	6					
	14	water	rbearing, lo	ose (SP-SN	Л) (A-1-b)	,		-				रि							
	15 -	SAN	D WITH S les. mediun	ILT, a little	e gravel, po grav. waterl	ssible bearing.				3	w	$\square$	SS	7					
	16 —	very	loose (SP-S	SM) (A-1-b	)	8,						А	00						
	17 –	SAN	D WITH S	ILT, a little	e gravel, po	ssible						H							
	18 —	wate	rbearing, lo	ose (SP-SN	ained, gray A) (A-3)	,				7	W	Д	SS	1					
	19 —	GRA	VEL WITI	H SAND, p	ossible col	bbles, gray	, <u> </u>	-				Ц							
	20 -	wate	rbearing, lo	ose (GP) (1	A-1-a)					7	W	X	SS	3					
	21 -											[]							
	22 -									9	М	$\square$	SS	1					
	23 -											H							
	24									_	××7	$   \left\{    \right\} $	66						
114	26 -									1	W	Д	88						
F 8/14	27 -											Ц							
T.GD	28 -									8	W	X	SS	6					
T+WEI	29 -											$\square$							
1+CP	30 -	SAN	D WITH C	RAVEL, p	ossible col	bbles,				6	W	$\mathbb{N}$	SS	3					
2J AE	31 —	wate	rbearing, lo	ose (SP) (A	A-1-b)	11,		•				[f]							
397.GF	32 -											M							
01-05	DEP'	TH:	DRILLING	METHOD			WAT	ER L	EVEL MEA	SURI	EMEN	TS		L.	1		NOTE:	REF	ER TO
ATES					DATE	TIME	SAMP	LED	CASING	CAN	/E-IN	L I	<u>PRILLI</u>	NG	WAT	ER	THE A	TTAC	CHED
	0-14	1½'	3.25" HSA	4 M	8/7/14	9.05	13	5	12 0		1.0		UU LE	S V EL	LE VI 8.6		SHEE	IS FO	R AN
§ <mark>_1</mark>	41/2-65	1/2'	KDF W/D	VI	0///14	2,00	1.5.	5							0.0	·] ]	EXPLA	NATI	ON OF
NRP V	BORIN	G	. 8/7/1/				+									1	ERMI	10LO	GY ON
ŭ L T			- <b>SB</b> Rid	r: 91C								+					TH	IIS LO	G



AET JO	B NO: <b>01-05697</b>		LO	GOF	BO	RING N	0	1220	) SS	(p. 2	l of 2	2)	
PROJE	CT: Southwest Light Rail Transit Proje	ect, ]	PEC East; H	Iopl	cins 1	to ]	Minne	eapol	lis				
	Hennepin Co. Co	ordin	ates: <u>N</u>	1:	52357	7	· _ ]	E :	50465	4			
DEPTH IN	MATERIAL DESCRIPTION		GEOLOGY	N	мс	SĄ	MPLE	REC	FIELD	) & LAI	BORAT	ORY '	TESTS
FEET			COADCE		-w-		- 99	шч. 	WC	DEN	LL	PL ·	%-#200
34 —	to medium grained, gravish brown, waterbearing,		ALLUVIUM	0		Ą	20	т					
35 —	loose (SP) (A-1-b) (continued)		(continued)	6		Ń	00	10					
36 —	sand, a little gravel, fine to medium grained, grayish brown to brownish gray (SP) (A-3)			6	W	$\mathbb{N}$	88	12					
37 —						P							
38 —				6	W	X	SS	12					
39 —						БĴ							
40 —				7	w	M	SS	13					
41						Д							
42 -	SAND, a little gravel, medium grained, grayish			•		Ń	~~	10					
43 -	brown, waterbearing, medium dense (SP) (A-1-b)			9	W	Ŵ	SS	13					
44						P							
45	CLAYEY SAND, a little gravel, possible		TILL	13	W/M	X	SS	8	10				
40	coboles, grayish brown (SC) (A-0)					Ы							
48	SAND, a little gravel, possible cobbles, medium		COARSE ALLUVIUM	14	W	M	SS	5					
49 -	medium dense (SP) (A-1-b)					Д							
50	SAND WITH GRAVEL, possible cobbles,					Ń		_					
51 -	medium grained, grayish brown, waterbearing,			10	W	Ň	SS	2					
52						$\sum$							
53 -	GRAVEL WITH SAND possible cobbles					$\left \right\rangle$							
54 -	grayish brown, waterbearing, medium dense					$\sum$							
55	(GP) (A-1-a)			12	w	$\mathbb{N}$	SS	2					
56 -				12		Д	55						
57 -						$\langle \langle$							
58	CLAYEY SAND WITH GRAVEL, brown, hard		TILL			$\mathcal{R}$							
59 -	(SC) (A-6)					Þ							
60 -				34	M/W	'X	SS	16	11				
62 -						6							
63 -						$\left \left\langle \cdot\right\rangle \right $							
64 -						$\langle \langle$							
65 -	GRAVEL WITH CLAY AND SAND, possible cobbles, gray, a little brown, waterbearing, very		TILL OR COLLUVIUM	*	w	$\bigtriangledown$	SS	14					
66 -	dense, laminations of sand (GP-GC) (A-1-a)					$\mathcal{F}$	00						
67						$\left \right\rangle$							
68 -	*140/.5 + 150/.5 + 84/.2	<b>*</b>				$\left \left\langle \left\langle \right\rangle \right\rangle \right $							
69 -			to the second	100/0	W	(	WASH						
	LIMESTONE, weathered, gray and light gray		** **PLATTEVII	LE			1101						
	END OF DORING		FORMATION										
201 201													



AET JO	B NO:	01-056	597						LO	G OF	BOI	RING N	10	1221	SU	( <b>p.</b> 1	lof	3)
PROJEC	CT:	Southw	est Ligh	t Rail Tr	ansit Pro	o <b>ject,</b> ]	PEC	C East; 1	Hopl	cins	to I	Minn	eapo	lis				
SURFAC	CE ELEV	ATION:	893.7	I	Hennepin C	o. Coor	dina	tes: <u>N</u>	1	<u>52515</u>	5		<u>E </u> :	50490	7			
DEPTH IN		MA	TERIAL D	ESCRIPTIC	N		GE	EOLOGY	N	MC	SĄ	MPLE	REC	FIELD	) & LA	BORA	FORY	TESTS
FEET		41 - 114	1	1	1:441-		EII I	r				1112	1111	WC	DEN		PL	<b>%-#</b> 20
1 -	clayey	sand, brov	y sand wit vn, a little	dark brow	n (A-2-4)		FILI	L	21	M	M	SS	12					
2 —											$\mathbb{H}$							
3 -									41	M	Д	SS	2					
4	FILL,	mostly san	d with silt	, a little gr	avel and						I							
5 —	clayey	sand, brow	vn (A-2-4)	)					12	М	Х	SS	12					
6 -	FILI	mostly san	d with silt	a little or	avel and						Ł							
	clayey	sand, brov	vn (A-1-b)	)					4	М	$\square$	SS	12					
9											R							
10 -	FILL, little g	mostly clay	yey sand v roots, bla	vith organi ick (A-2-6)	ic fines, a				1	м	K	CC.	12	15				
11 -	U	,	,	× ,					1		Д	. 55	12	45				
12 -	SAPR	IC PEAT,	black (PT)	) (A-8)			SW	AMP		<b>_</b>	H						-	
13 -						<u> 1.1.7</u>		0011	4	M	Å	SS	12	285				
14 —	14 ORGANIC CLAY WITH SAND, a little gra										I							
15 -	15 – dark brown, soft (OH) (A-6)								2	M	X	SS	18	29				
16 -	BOGI	IME grav	very soft	(OH) (A.	6)						Ł							
17 -	DOOL	nivill, gray	, very som	. (OII) (A-	0)	<u>2.0.5</u> 			WH	M	M	SS	18	32				
10						<u></u>					सि							
20 -	LEAN	[ CLAY, sl CL) (A-6)	ightly orga	anic, brow	nish gray,		FIN ALI	E LUVIUM	2	м	M	22	16	22				
21 -		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,							2		A	55	10					
22 -	SANE	WITH SI	LT AND	GRAVEL,	medium to	D		ARSE			뵍							
23 -	(SP-S)	M) (A-1-b)	, water oe	aring, meu					12	W	Å	SS	12					
24 -	GRAV	/ELLY SA	ND, medi	um to coa	rse grained	,					I							
25 -	gray, v	waterbearin	ıg, mediur	n dense (S	P) (A-1-b)				20	W	М	SS	1					
											$\sum$							
									13	W	М	SS	12					
29 -	CDAX			• 1			-				Ы							
- 30 -	water	bearing, me	dium den	se (GP)	ray,	-			19	w	$\square$	SS	2					
31 -			<u></u>								Ĥ	~~						
DFP	TH: T	ORILLING M	TETHOD			WATI	ER LI	EVEL MEA	L SURF	L Emen	<u> ( ≬</u> TS		-	1				
				DATE	TIME	SAMPI	ED	CASING	CAL	/E-IN		RILLI	NG	WATH	ER	THE A	KEFE TTAC	ж IU ЧЕD
	<u>4½' 3</u>	9.25" HSA		5/20/14	1.10	DEPT	.н 5	DEPTH יייי	DE 14	<b>7 U</b> 5 1 H	FL	UID LE	VEL	12 A		SHEET	IS FOI	R AN
241/2-	2472-74 RDF W/DIVI 5/22/14 1:10 5/29/14 1:23						5	22.0	19	8.7				11.9		EXPLA	NATIO	ON OF
BORIN	BORING COMPLETED: 5/29/14						-								τ	ERMIN	IOLO	JY ON
$\overrightarrow{P}$ DR: S	DR: SG LG: TM Rig: 91C										1					TH	IS LO	G



AET JO	B NO: 01-05697			LO	G OF	BOF	RING N	Ю.	1221	SU	(p. 2	2 of	3)
PROJE	CT: Southwest Light Rail Transit Proj	ect,	PEC East; I	Iopl	cins	to I	Minne	eapol	lis				
	Hennepin Co.	Coor	dinates: <u>N</u>	1:	5251	5		E :	50490	7			
DEPTH	MATERIAL DESCRIPTION	1	GEOLOGY	N	мс	SĄ	MPLE	REC	FIELI	) & LAI	BORA	rory	TESTS
FËÈT							YPE	IIN.	WC	DEN	LL	PL	<b>%-#2</b> 00
33 -	GRAVELLY SAND, medium to coarse grained, gray, waterbearing, medium dense (SP) (A-1-b)			20	W	X	SS	6					
34 -	(continued)					Б							
35 -				15	W	М	22	6					
36 -				15		А	00	Ū					
37 -	GRAVELLY CLAYEY SAND, gray, very stiff		TILL			Ю		-					
38 -	(SC) (A-6)			20	W	М	SS	1	15				
39 -	CLAYEY SAND WITH GRAVEL grav very					$\square$							
40 -	stiff, laminations of waterbearing sand (SC)			17	W	М	SS	6	14				
41 -	(A-6)					Б							
42 -	SANDY LEAN CLAY, a little gravel, gray, very stiff laminations of waterbearing sand (CL)					Н		10					
43	(A-6)			23	W	Д	88	12	21				
44						Ц							
45 -				32	-	X	SS	0					
46	CLAYEY SAND, a little gravel, grayish brown to brown, hard (SC) (A-6)					$\left[ \right]$							
47 -				11	w	М	22	16	11				
48 -					**	А	55	10	11				
49 -						4							
50 -				36	W	М	SS	14	11				
51 -						$\sum$							
52 -													
53 -													
55 -						$\mathbb{H}$							
56 -				44	W	Å	SS	16					
± 57						K							
58 -						$\mathbb{R}$							
59 -	SILTY SAND, a little gravel, grayish brown, dense (SM) (A-2-4)		*			$\left \right\rangle$							
60 -				18	W	$\overline{\mathbb{N}}$	22	14	1				
61 -			•	10		Д	00	11					
62 -			•			K							
63 -	SAND WITH SILT a little gravel fine to			-		$\left \left\langle \right\rangle \right $							
64 -	medium grained, grayish brown, moist, very		ALLUVIUM			$\left[ \right]$							
65 -	dense, lenses of clayey sand (SP-SM) (A-2-4)		•	93/.5	W	$\square$	SS	12					
66 -						. [7]							
- 67 F						$ \rangle$							
68 -	LIMESTONE, weathered to generally fresh, gray		FORMATION										
8 - 69 -					w	$\sum$	22	1	-				
-			·		VV	F52	oo						



AET JO	OB NO: 01	-05697				LO	G OF	BOR	ING N	0	1221	SU	(p. 3	B of (	3)
PROJEC	CT: Sou	thwest Light	t Rail Transit Pr	oject, ]	PEC East; I	Iopl	kins t	to N	linne	eapol	is				
	Г		Hennepin C	Co. Coor	dinates: <u>N</u>	1:	52515	5		<u>E </u> 5	50490'	7			
DEPTH IN		MATERIAL D	ESCRIPTION		GEOLOGY	N	MC	SAN	MPLE	REC	FIELD	& LAI	3ORAT	ORY	TESTS
FEET	LIMPOTON	III	11- C1		DLATTEVILL	<b>D</b> 25/1		ा । इंड्रा		· ·	wc	DEN		PL	<b>%-#</b> 200
71	gray (contine	<i>ued</i> )	generally fresh,		FORMATION	<u>n</u> ,2 <i>3</i> /,1									
72 -					(continued)			₿w	VASH						
73 -															
74						100/0				0					
	END OF B	ORING				100/0			55	-0					
			ł												
														-	
t 107															
5															
									•						
5															
Ř Ř															
0															
NOO:															
b													,		
Ū.							1								



Γ	AET JO	B NO:	01-056	97						LO	G OF I	BOR	JNG N	0.	1222	SU	<b>(p.</b> 1	lof	3)
	PROJE	CT:	Southw	est Ligh	t Rail Tr	ansit Pro	oject, I	PEC	C East; H	Iopł	cins t	to I	Minno	eapol	lis				
	SURFA	CE ELE	VATION:	911.3	H	lennepin Co.	Coordin	nates:	<u>N</u>	1:	52618	3	- 	E É	50486	1			
I	DEPTH		МА	TERIAL D	ESCRIPTIO	N		GE	OLOGY	N	мс	SĄ	MPLE	REC	FIELD	) & LA	BORAT	ORY	FESTS
	FÉÉT	· ·				, I							YPE	11N.	WC	OC	LL	PL	%-#200
	1 —	FILI claye blacl	2, mostly silty by sand, piece c and dark bro	v sand witl es of bitun own (A-1-	h gravel, a ninous, trac -b)	little e roots,		FILI		13	М	M	SS	15					
	2	FILI a litt	, mostly sand le clayey sand	d with gra d, brown a	vel, possib and light br	le cobbles, own, a			-	22	М	$\square$	SS	5				(	
	4 —	little	black (A-1-b	)								Ĭ							
	5 — 6 —									18	М	Å	SS	1					
	3 7 —									12	м		55	13					
	8 9									12	111	R		15					-
	. 10 –									8	М	$\square$	SS	15					
	11 — 12 —											Ę							
	13 -									15	M	X स	SS	17					
	14 -	FILI little	, mixture of gravel and s	sandy lear and, brow	n clay and n and dark	lean clay, a brown, a	a			6	M	Å	SS	12	15				-
	16 -		black (A-6)									E							
	17 - 18 -									5	М		SS	15	27				
	19 - 20 -	FILI	L, mostly san	d with silt	and grave	l, brown		-		_		H							
	20 -		-0)							7	M	Å R	88	10					
	22 - 23 -	FILI   sanc	L, mostly san I, brown (A-1	d with gra b)	wel, a little	clayey				15	¥	X	SS	5					
	24 -	TH	( magathr gray	wally good	broumish	arou and					<u> </u>	E							
/8/14	25 –	- dark	brownish gr	ay (A-1-b)	)	gray and				5	W		SS	18					
3DT 5	26 -											ł							
+WELL.(	27 - 28 -									6	w	$\mathbb{M}$	SS	12					
+CPT	29 -	· ·										$\mathbb{F}$							
PJ AET	30 -	HEN	MIC PEAT, b	(PT)			AMP POSIT	21	M	M	SS	15	245				-		
397.GF	31 -	-				<u></u>				-		$\sum$							
01-05	DE	PTH:	DRILLING M	IETHOD			WAT	ER L	EVEL MEA	SURI	EMEN	TS					NOTE:	REFE	ER TO
INATES	0-2	291/21	3.25" HSA		DATE	TIME	SAMP	LED TH	CASING DEPTH	CAV DE	VE-IN PTH	J FL	ORILLI UID LI	NG EVEL	WAT LEVI	ER EL	THE A	TTAC	THED
OORD	291/2-8	89½'	RDF w/DM	1	4/29/14	9:55	26.	0	24.5	2	4.5				23.	5	SHEE'	IS FO	K AN
D-W-C	DOPP		A. C. Martine		10:05	26.	0	24.5	2	4.5				23.	5	EXPLA		JN OF GV ON	
CORI	COME	PLETEL	): <b>4/29/14</b>													] 」	CKIVIII TU		UT UN
Ē	DR: S	5G L	G: SB Rig:	1C													11		<u> </u>



Southwest Light Rail Transit Project, PEC East; Hopkins to MinneapolisItemepin Co. CoordinatesN152618ESolestDEFINMATERIAL DESCRIPTIONGRAUCOTYNMcSample PartPart CLAONATORY TEST33stiff (CH) ( $A-7.6$ ) (continued)MLUVIUM9MSS15613.04MATERIAL DESCRIPTIONGRAUCLLY SAND, medium grained, gray, waterbearing, locas (SP) ( $A-1-b$ )TORE ALLUVIUM9MSS15613.034FAT CLAY, gray, soft (CH) ( $A-7-6$ )4MSS164111135GRAVELLY SAND, medium grained, gray, waterbearing, locas (SP) ( $A-1-b$ )ALLUVIUM10WSS8111 <t< th=""><th>AET JO</th><th>B NO: <b>01-05697</b></th><th></th><th></th><th>LO</th><th>G OF</th><th>BOF</th><th>RING N</th><th>O</th><th>1222</th><th>SU</th><th>(p. 2</th><th>2 of</th><th>3)</th></t<>	AET JO	B NO: <b>01-05697</b>			LO	G OF	BOF	RING N	O	1222	SU	(p. 2	2 of	3)
DEPCH DEPCH PETMATERIAL DESCRIPTIONGHOLOGY (HOLOGYNMCSAMPLE MCPEC WCPEC WCOC LLPLNWC33FAT CLAY, slightly organic, trace roots, black, still (C1) (A-7-6) (continued)FAT CLAY, gray, soft (CH) (A-7-6)FAT CLAY, gray, gray, gray, gray, gray, gray, gray, gray, gr	PROJEC	CT: Southwest Light Rail Transit Proje	ect, ]	PEC East; I	Iopl	kins	to I	Minn	eapol	lis				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		Hennepin Co. Co	oordir	ates: <u>N</u>	1:	5261	8		E 🕄	50486	1			
THET	DEPTH IN	MATERIAL DESCRIPTION		GEOLOGY	N	мс	SA	MPLE VPF	REC	FIELD	) & LAI	BORAT	ORY	TESTS
PALCLAY, signify organic, trace roots, Duick, and StructuredPALCLAY is signify organic, trace roots, Duick, Continued $PALCLAY (ET) (A-7.6)$ $PALCLAY (ET) (A-7.6)$ FAT CLAY, gray, soft (CH) (A-7.6)FAT CLAY, gray, soft (CH) (A-7.6)4MSS1641GRAVELLY SAND, medium grained, gray, waterbearing, loose (SP) (A-1-b)COARSI: ALLUVIUM10WSS89SND WITH GRAVEL, possible cobbles at 42; waterbearing, medium dense (SP) (A-1-b)COARSI: ALLUVIUM10WSS844550.(4WSS1145650.(4WSS1467GRAVELLY SAND, medium grained, brownish 	FÊET	DATE OF ANY JULIA		EINIE					11 N,	WC	OC	LL	PL	<b>%-#200</b>
34FAT CLAY, gray, soft (CH) (A-7-6) $COMMEd)$ $COMMEd)$ $SS$ $SS$ $I6$ $41$ $35$ $GRAVELLY$ SAND, medium grained, gray, waterbearing, loose (SP) (A-1-b) $I0$ $W$ $SS$ $S$ $S$ $39$ SAND WITH GRAVEL, possible cobbles at 42, medium to fine grained, brownish gray, waterbearing, medium dense (SP) (A-1-b) $I0$ $W$ $SS$ $4$ $44$ $4$ $GRAVELLY$ SAND, medium grained, brownish gray, waterbearing, medium dense (SP) (A-1-b) $I1$ $W$ $SS$ $4$ $44$ $GRAVELLY$ SAND, medium grained, brownish gray, waterbearing, medium dense (SP) (A-1-b) $I1$ $W$ $SS$ $4$ $45$ $GRAVELLY$ SAND, brownish gray, very stiff, lenexe and laminations of waterbearing sand $MLLUVIUM$ $I1$ $W$ $SS$ $13$ $14$ $GS$ ( $SC$ ) ( $A$ - $6$ ) $SAND$ , a little gravel, fine grained, brownish gray, waterbearing, medium dense, a lens of gray, waterbearing, dense (SP) ( $A$ - $3$ ) $GOARSE$ $ALLUVIUM$ $13$ $W$ $SS$ $8$ $56$ $GOARSE$ $ALLUVIUM$ $I3$ $W$ $SS$ $8$ $56$ $GOARSE$ $I1$ $W$ $SS$ $8$ $I1$ $56$ $GOARSE$ $I1$ $W$ $SS$ $8$ $56$ $GOARSE$ $I1$ $W$ $SS$ $8$ $56$ $GCOARSE$ $I1$ $W$ $SS$ $8$ $56$ $GOARSE$ $I1$ $W$ $SS$ $8$ $56$ $GOARSE$ $I1$ $W$ $SS$ $8$	33 -	FAT CLAY, slightly organic, trace roots, black, stiff (CH) (A-7-6) <i>(continued)</i>		ALLUVIUM	9	M	$\mathbb{N}$	SS	15	61	3.0			
35       -       4       M       SS       16       41         36       -<	34	FAT CLAY grav soft (CH) (A-7-6)		(commued)			$\square$							
36- 37- GRAVELLY SAND, medium grained, gray, waterbearing, loose (SP) (A-1-b)       COARSE ALLUVIUM       10       W       SS       8         39       SAND WITH GRAVEL, possible cobbles at 42; waterbearing, medium dense (SP) (A-1-b)       22       W       SS       4         41       -       50/.4       W       SS       1         42       -       -       50/.4       W       SS       1         43       -       -       -       50/.4       W       SS       1         44       -       -       -       -       50/.4       W       SS       1         45       -	35 —	···· ····			4	M	M	SS	16	41				
37       GRAVELLY SAND, medium grained, gray, waterbearing, loose (SP) (A-1-b)       I0       W       SS       8         39       SAND WITH GRAVEL, possible cobbles at 42; waterbearing, medium to fine grained, brownish gray, waterbearing, medium dense (SP) (A-1-b)       I0       W       SS       4         41       waterbearing, medium dense (SP) (A-1-b)       50/.4       W       SS       4         42       GRAVELLY SAND, medium grained, brownish gray, waterbearing, medium dense (SP) (A-1-b)       I1       W       SS       0         44       GRAVELLY SAND, brownish gray, very stiff, lenses and laminations of waterbearing sand       III       W       SS       13       14         45       CLAYEY SAND, brownish gray, very stiff, lenses and laminations of waterbearing sand       MIXED       III       W       SS       13       14         51       (SC) (A-6)       SAND, a little gravel, medium grained, brownish gray, waterbearing, dense (SP) (A-1-b)       I13       W       SS       8         56       GRAVELLY SAND, a little gravel, fine grained, brownish gray, waterbearing, dense (SP) (A-3)       40       W       SS       13         60       SAND, a little gravel, fine grained, brownish gray, waterbearing, medium dense, a lens of gray, waterbearing, dense (SP) (A-3)       40       W       SS       13         64 <td< td=""><td>36 -</td><td></td><td></td><td>004202</td><td></td><td></td><td>[f]</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	36 -			004202			[f]							
10 W33 a38IDWSS339SAND WITH GRAVEL, possible cobbles at 42, medium to fine grained, brownish gray, waterbearing, medium dense (SP) (A-1-b)22WSS4414450/.4 WSS1424350/.4 WSS14450/.4 WSS14517WSS04617WSS047GRAVELLY SAND, medium grained, brownish gray, waterbearing, medium dense (SP) (A-1-b)11WSS449CLAYEY SAND, brownish gray, very stiff, lenses and laminations of waterbearing sandMIXED ALLUVIUM24M/WSS131451(SC) (A-6)11WSS131452SAND, a little gravel, medium dense, a lens of gray, waterbearing, medium dense, a lens of gray, waterbearing, dense (SP) (A-1-b)COARSE ALLUVIUM13WSS8565740WSS131456565657581314575859gray, waterbearing, dense (SP) (A-3)40WSS13606154558131463SAND, a little gravel, medium to fine grained, gray, waterbearing, medium dense19WSS8646519WSS81365661919WSS8 <td>37 -</td> <td>GRAVELLY SAND, medium grained, gray, waterbearing, loose (SP) (A-1-b)</td> <td></td> <td>COARSE ALLUVIUM</td> <td>10</td> <td>w/</td> <td><math>\square</math></td> <td>22</td> <td>R</td> <td></td> <td></td> <td></td> <td></td> <td></td>	37 -	GRAVELLY SAND, medium grained, gray, waterbearing, loose (SP) (A-1-b)		COARSE ALLUVIUM	10	w/	$\square$	22	R					
39       SAND WITH GRAVEL, possible cobbles at 42; medium to fine grained, brownish gray, waterbearing, medium dense (SP) (A-1-b)       22       W       SS       4         41       waterbearing, medium dense (SP) (A-1-b)       50/.4       W       SS       1         42       GRAVELLY SAND, medium grained, brownish gray, waterbearing, medium dense (SP) (A-1-b)       11       W       SS       4         44       -       -       -       -       -       -       -         44       -       -       -       -       -       -       -         44       -       -       -       -       -       -       -       -         45       -	38 -				10	vv	А	55	0					
41       waterbearing, medium dense (SP) (A-1-b)         42       50/.4       W SS       4         43       50/.4       W SS       1         44       45       50/.4       W SS       1         44       45       17       W SS       0         46       GRAVELLY SAND, medium grained, brownish gray, very stiff, lenses and lamiations of waterbearing sand (SC) (A-1-b)       11       W SS       4         47       CLAYEY SAND, brownish gray, very stiff, lenses and lamiations of waterbearing sand (SC) (A-6)       MIXED       11       W SS       13       14         50       Ittle gravel, medium dense, a lens of gray, waterbearing, medium dense, a lens of gray, waterbearing, dense (SP) (A-3)       COARSE       13       W SS       8         56       SAND, a little gravel, fine grained, brownish gray, waterbearing, dense (SP) (A-3)       40       W SS       13       40         61       SAND, a little gravel, medium to fine grained, grayish brown, waterbearing, medium dense       19       W SS       8       13	39 -	SAND WITH GRAVEL, possible cobbles at 42',					H							
41       50/4       W       SS       1         43       -	40 -	medium to fine grained, brownish gray, waterbearing, medium dense (SP) (A-1-b)			22	W	M	SS	4					
30/4       W Z SS 1         43	$\begin{vmatrix} 41 \\ 42 \end{vmatrix}$				601.1	117	2	00	1					
44       45         45       17       W       SS         46       17       W       SS       0         47       GRAVELLY SAND, medium grained, brownish gray, waterbearing, medium dense (SP) (A-1-b)       11       W       SS       4         49       CLAYEY SAND, brownish gray, very stiff, 10       MIXED       ALLUVIUM       24       M/W       SS       13       14         50       lenses and laminations of waterbearing sand       MIXED       ALLUVIUM       24       M/W       SS       13       14         51       (SC) (A-6)       11       W       SS       13       14         52	42				50/.4 	W	$\left  \right\rangle$	22						
45       -       17       W       SS       0         46       - </td <td>44 -</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td><math>\left \right\rangle</math></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	44 -						$\left \right\rangle$							
46       -	45 -			-	17	w	$\square$	SS	0					
47       - GRAVELLY SAND, medium grained, brownish gray, waterbearing, medium dense (SP) (A-1-b)       11       W       SS       4         48       -       CLAYEY SAND, brownish gray, very stiff, lenses and laminations of waterbearing sand       MIXED       11       W       SS       4         50       Lenses and laminations of waterbearing sand       MIXED       ALLUVIUM       24       M/W       SS       13       14         51       (SC) (A-6)       SAND, a little gravel, medium grained, brownish gray, waterbearing, medium dense, a lens of gray, waterbearing, medium dense, a lens of gray, waterbearing, dense (SP) (A-1-b)       13       W       SS       8         56       -       -       -       40       W       SS       13         60       -       -       40       W       SS       13         61       -       -       -       40       W       SS       13         62       -       -       -       -       -       -       -         64       -       -       -       -       -       -       -       -         65       -       -       -       -       -       -       -       -       -       -       -       -	46 -						H	22						
48       gray, waterbearing, medium dense (SF) (A-10)       11       W       SS       4         49       CLAYEY SAND, brownish gray, very stiff, lenses and laminations of waterbearing sand SLUUVIUM       11       W       SS       4         50       lenses and laminations of waterbearing sand (SC) (A-6)       MIXED ALLUVIUM       24       M/W       SS       13       14         51       SAND, a little gravel, medium dense, a lens of gravel (SP) (A-1-b)       COARSE ALLUVIUM       13       W       SS       8         56       57       gray, waterbearing, dense (SP) (A-3)       40       W       SS       13         60       61       62       40       W       SS       13       14         64       grayish brown, waterbearing, medium to fine grained, grayish brown, waterbearing, medium dense       19       W       SS       8	47 -	GRAVELLY SAND, medium grained, brownish					H	~~						
49       CLAYEY SAND, brownish gray, very stiff, lenses and laminations of waterbearing sand (SC) (A-6)       MIXED ALLUVIUM         51       (SC) (A-6)         52       -         53       SAND, a little gravel, medium dense, a lens of gravel (SP) (A-1-b)       COARSE ALLUVIUM         56       -         57       -         58       SAND, a little gravel, fine grained, brownish gray, waterbearing, dense (SP) (A-3)         60       -         61       -         62       -         63       SAND, a little gravel, medium to fine grained, grayish brown, waterbearing, medium dense         64       grayish brown, waterbearing, medium dense         65       (SP) (A-1-b)         66       -         66       -	48 -	gray, waterbearing, medium dense (Sr) (A-1-0)			11	W	Д	SS	4					
50 -       lenses and laminations of waterbearing sand (SC) (A-6)       ALLUVIUM       24       M/W       SS       13       14         51 -       (SC) (A-6)       SAND, a little gravel, medium grained, brownish gravel (SP) (A-1-b)       COARSE ALLUVIUM       13       W       SS       8         56 -       SAND, a little gravel, fine grained, brownish grave (SP) (A-1-b)       13       W       SS       8         56 -       SAND, a little gravel, fine grained, brownish gray, waterbearing, dense (SP) (A-3)       40       W       SS       13         60 -       -       -       -       -       -       -         61 -       -       -       -       -       -       -         62 -       -       -       -       -       -       -         63 -       SAND, a little gravel, medium to fine grained, grayish brown, waterbearing, medium dense       19       W       SS       8         65 -       (SP) (A-1-b)       -       -       -       -       -         66 -       -       -       -       -       -       -       -         67 -       -       -       -       -       -       -       -       -         66 -       - <td>49 -</td> <td>CLAYEY SAND, brownish gray, very stiff,</td> <td></td> <td>MIXED</td> <td>-</td> <td></td> <td>Ц</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	49 -	CLAYEY SAND, brownish gray, very stiff,		MIXED	-		Ц							
51 -       (SC) (A-0)         52 -       SAND, a little gravel, medium dense, a lens of gravel (SP) (A-1-b)         54 -       gravel (SP) (A-1-b)         55 -       gravel (SP) (A-1-b)         56 -	50 -	lenses and laminations of waterbearing sand		ALLUVIUM	24	M/W	γX	SS	13	14				
52       -         53       SAND, a little gravel, medium grained, brownish gravel (SP) (A-1-b)         54       gravel (SP) (A-1-b)         55       gravel (SP) (A-1-b)         56       -         57       -         58       SAND, a little gravel, fine grained, brownish gray, waterbearing, dense (SP) (A-3)         60       -         61       -         62       -         63       SAND, a little gravel, medium to fine grained, grayish brown, waterbearing, medium dense         65       -         65       -         66       -         66       -	51						$\left[ \right]$							
53       SAND, a little gravel, medium grained, brownish       COARSE         54       gray, waterbearing, medium dense, a lens of       III         55       gravel (SP) (A-1-b)       III         56       SAND, a little gravel, fine grained, brownish       IIII         57       gray, waterbearing, dense (SP) (A-3)       IIIII         60       Go       Go         61       Go       Go         62       Go       Go         63       SAND, a little gravel, medium to fine grained, grayish brown, waterbearing, medium dense       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	52 -													
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	53 -	SAND, a little gravel, medium grained, brownish		COARSE										
$\begin{array}{c} 13 \\ 56 \\ 57 \\ 57 \\ 58 \\ 59 \\ 9 \\ 73 \\ 73 \\ 58 \\ 59 \\ 9 \\ 73 \\ 73 \\ 74 \\ 58 \\ 75 \\ 74 \\ 58 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 74 \\ 75 \\ 75$	55 -	gravel (SP) (A-1-b)			10	117	$\mathbb{H}$	60	0					
$\begin{array}{c} 57 \\ 58 \\ 59 \\ -58 \\ 37 \\ 37 \\ 59 \\ -58 \\ 37 \\ 59 \\ -58 \\ 59 \\ -58 \\ 59 \\ -58 \\ 59 \\ -58 \\ 59 \\ -58 \\ 59 \\ -58 \\ 59 \\ -58 \\ -$	56 -				13	W	Å	88	δ					
58 - SAND, a little gravel, fine grained, brownish $59 - gray, waterbearing, dense (SP) (A-3)$ $60 - (A-1) $	57 -	4		•			$\left \left\langle \cdot\right\rangle \right $							
$\begin{array}{c c} & & \text{SAND, a little gravel, fine grained, of ownish} \\ \hline & & \text{Solution} \\ \hline$	58 -	SAND a little around fine argument because		- - -			$\left \left\langle \cdot\right\rangle \right $							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	59 -	gray, waterbearing, dense (SP) (A-3)		•			$\langle \langle$							
$\begin{array}{c c} 61 - \\ 62 - \\ 63 - \\ 63 - \\ 64 - \\ grayish brown, waterbearing, medium dense \\ 65 - \\ 66 - \\ 67 - \\ 67 - \\ 68 - $	60 -			• •	40	w	$\mathbb{N}$	SS	13					
$\begin{array}{c c} 62 - \\ 63 \\ 64 - \\ grayish brown, waterbearing, medium dense \\ 65 - \\ 66 - \\ 66 - \\ 67 \\ 66 - \\ 67 \\ 67 \\ 68 \\ 68 \\ 68 \\ 68 \\ 68 \\ 68 \\ 68 \\ 68$	61 -	· ·					$\beta$							
63       SAND, a little gravel, medium to fine grained,         64       grayish brown, waterbearing, medium dense         65       (SP) (A-1-b)         66       19         W       SS         8	62 -						$\left \right\rangle^{(}$							
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	5 63 -	SAND, a little gravel, medium to fine grained,		4 • •			$\left \right\rangle$							
$\begin{bmatrix} 65 \\ 66 \\ - \end{bmatrix} = \begin{bmatrix} 19 \\ W \\ \hline \\ 0 \end{bmatrix} = \begin{bmatrix} 19 \\ 0 \end{bmatrix} = \begin{bmatrix} 1$	64 -	grayish brown, waterbearing, medium dense						1						
	65 -				19	W	X	SS	8					
	66 -						2							
		1					$ \rangle$						-	
CLAYEY SAND, a little gravel, gravish brown, Key Start (SC) (A-6)	5 08	CLAYEY SAND, a little gravel, grayish brown,		MIXED ALLUVIUM			$ \rangle$							
OR TILL				OR TILL										



AET JO	B NO: <b>01-05697</b>			LO	GOF	BOR	ING N	0	1222	SU	(p. 3	of 3	9
PROJEC	CT: Southwest Light Rail Transit Project	<b>ct,</b> ]	PEC East; H	Iopl	cins (	to N	Ainne	eapol	is				
	Hennepin Co. Co	ordin	nates: <u>N</u>	1	52618	3		E É	50486	1			
DEPTH IN	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA	MPLE YPE	REC IN.	FIELD	& LAE	BORAT	ORY 1	ESTS
FEET	CLAVEV SAND a little gravel gravish brown	7777	MIXED		M		22	18	WC	oc	LL	PL	·
71 -	very stiff (SC) (A-6) <i>(continued)</i>		ALLUVIUM OR TILL	20	141	Å	55	10	12				
72 -			(continued)		-	$\left  \left\langle \right\rangle \right $							
73 -	SAND WITH SILT, fine grained, brown,		COARSE			$\left \left\langle \cdot\right\rangle \right $							
74	waterbearing, medium dense, a lens of sand with $(SP, SM)$ (A, 3)		ALLUVIUM			Ц							
75 —	graver (SP-SW) (A-3)			30	W	X	SS	16					
76 —						$\sum$							
77 —						$\left \right\rangle$							
78 -	CLAYEY SAND WITH GRAVEL, grayish		MIXED			$\left \right\rangle$							
- 79 -	orown, nard (SC/SIVI) (A-2-0)		OR TILL	20	117	$\mathbb{H}$	00	14	11				
81 -				39	W	Щ	22	14					
82 -						$\langle \langle$							
83 -						$\left \left\langle \right\rangle \right $							
84 -	dense, a lens of clayey sand with gravel (SM)		. 11L/L/			$\left \right\rangle$							
85 -	(A-2-4)			32	W	$\square$	SS	12					
86 -			• •			В							
87			-										
88 -						S		-					
89 -	LIMESTONE, weathered, light gray		4 PLATTEVILL 4 FORMATION	도 <del>100/(</del>	w w	(.(		0-					
	END OF BORING											1	
4													
2/8/2													
- en													
1+0													
PJ AE													
697.G		° .											
01-05													
ATES													
ORDIN	· ~												
M-CO													
CORP													

¢



AET JO	B NO: 01-0	5697						LO	G OF I	BOR	UNG N	01	1227	SW	<b>(p.</b> )	l of	2)
PROJEC	CT: South	west Light	t Rail Tra	ansit Pro	ject, ]	PEC	CEast; I	Iopk	cins (	to I	Ainne	eapol	is				
SURFAC	CE ELEVATION: _	886.9	H	ennepin Co.	Coordir	nates:	<u>N</u>	1	55737	7.	]	E S	51133	1	000.47	0.0.11	
DEPTH IN FEET		MATERIAL D	ESCRIPTION	N		GE	OLOGY	N	MC	SA T	MPLE YPE	REC IN.	WC	DEN	LL	PL	~#200
1	FILL, mostly s bituminous and (A-1-b)	ilty sand with 1 brick, black	n gravel, pi and dark b	eces of prown		FILL	1	8	М	M	SS	12					
2 - 3 - 1	FILL, mixture with gravel, a brown and dar	of sand with little sandy le k brown (A-1	silt and silt an clay, lig b)	ty sand ht brown,				18	М	R	SS	14					
4								15	М	X	SS	8					
6 — 7 — 8 —	FILL, mostly s (A-1-b)	and with silt,	, a little gra	vel, brown	1			15	<b>▼</b> W		SS	8					
9 — 10 —	FILL, mostly s sand, light bro (A-1-b)	and with gra wn, brownisł	vel, a little n gray and l	clayey brown				20	w		SS	10					
11 - 12 - 13 - 13 - 13				·				13	w	Ĭ	SS	12					
14	FILL, mostly organic clay, b (A-2-6)	a little ack				5	W		SS	10	12						
16 – 17 – 18 –	16 – (A-2-6) 17 – HEMIC PEAT, brown (PT) (A-8) 18 –						AMP POSIT	9	М	X	SS	14	357				1
19 - 20 -	ORGANIC C (OH) (A-8)	LAY WITH	GRAVEL,	black, firm	1 			5	M	X	SS	2	142				
21 - 22 - 23 -	ORGANIC C. brownish gray	LAY, trace sl , soft (OH) (.	nells and ro A-8)	oots,				2	M		SS	2	114				
24 - 25 -	-				<u>7.84</u> 7.84 7.84			2	M		SS	16	207				
26 – 27 – 28 –		•						2	М	X	SS	14	109				
29 - 30 -	SAND WITH fine grained, o loose, a lens o	SILT, a little lark brownish of clayey sand	e gravel, m n gray, wat l (SP-SM)	edium to erbearing, (A-1-b)		CO/	ARSE LUVIUM	8	w	X	SS	6					
-16	·				<u>.</u>				l				<u> </u>				
DE	PTH: DRILLIN	G METHOD			WAT	ER L	EVEL MEA	ASURI					117 4 77		NOTE:	REF	ER TO
0-1	4½' <u>3.25"</u> H	SA	DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	DE	VE-IN EPTH	FL	UID LI	EVEL	LEVI	EL	THE A	TTAC	CHED
141/2-2	24½' RDF w/	DM	4/29/14	9:30	13.	5	12.0	1	1.5				9.4	<u> </u>	SHEE	IS FO	
BORIN	NG		4/29/14	9:40	13.	.5	12.0	1	1.3				7.4	ן   ז	TERMI	NOLO	GY ON
	PLETED: 4/29/1	4			<u> </u>									-	Tŀ	IIS LC	)G
<u>∦ DR: </u> T	TA LG: SHS	Rig: 69C			1	]										01.7	

201



AET JO	B NO: <b>01-05697</b>			LO	G OF I	BOR	ING NO	D1	1227	SW	(p. 2	2 of 2	2)
PROJEC	Southwest Light Rail Transit Proje	ect,	PEC East; H	Iopl	cins t	to N	linne	eapol	is				
	Hennepin Co. Co	oordir	nates: <u>N</u>	1	55737	7		<u> </u>	51133	L		0.5.5	
DEPTH IN FEET	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SAN T	MPLE YPE	REC IN.	FIELD WC	& LAE	SORAT	ORY T PL	ESTS %-#200
33 -	SAND, a little gravel, medium to coarse grained, gray, a little black, waterbearing, loose (SP) (A-1-b) <i>(continued)</i>		COARSE ALLUVIUM (continued)	8	w	Å	SS	11					
34 — 35 —	SAND, a little gravel, medium grained, gray, a little black, waterbearing, loose (SP) (A-1-b)			7	W		SS	8					
36				9	-		SS	0					
39 - 40 -	SAND, a little gravel, fine to medium grained, gray, waterbearing, loose (SP) (A-3)				w		SS	8	×				
41 -	END OF PODINC					[A]							
	END OF BORING												
AET CORP W-COURDINALES VI-UDDY/ UR1 AET TOT ITY													



AET JO	B NO: 01-056	97	<del></del>					LO	G OF I	BOR	LING N	0	1228	SS	(p. 1	of 4	<b>I</b> )
PROJEC	Southwe	est Light I	Rail Tra	ansit Pro	ject,	PEC	C East; I	Iopl	kins t	to I	Ainne	eapol	is	_			
SURFAC	CE ELEVATION:	874.5	He	ennepin Co.	Coordir	nates:	<u>N</u>	1	57076	<u> </u>	]	Е 5	51526	0			
DEPTH IN FEET	МА	TERIAL DES	CRIPTION	1		GE	OLOGY	N	MC	SA T	MPLE YPE	REC IN.	FIELD WC	0 & LA	BORAT	ORY 7	FESTS %-#200
1 -	FILL, mostly silty gravel, pieces of c dark brown (A-2-	sand with concrete and 4)	organic fir plastic, t	nes, with race roots,		FILI	. ·	11	М	X	SS	4					
	FILL, mostly silty brown (A-2-4)	sand, a littl	e gravel,	dark				10	М	X F	SS	17					
4 — 5 — 6 —	FILL, mostly sand (A-3)	l with silt, a	little grav	vel, brown				15	M	H H	SS	14					
7 — 8 —	FILL, mostly silty (A-1-b)	v sand with §	gravel, da	rk brown				12	М		SS	15					
9 10 11	FILL, mostly silty lean clay and ashe brown (A-2-4)	v sand, a littl es/cinders, b	le gravel, prown and	sandy l dark				7	М		SS	16					
12 — 13 —								16	<b>X</b>		SS	15					
14 15 16	14 - 15 - 16 - 16 - 10 - 10 - 10 - 10 - 10 - 10							13	w		SS	15					
17 - 18 -	<ul> <li>16 –</li> <li>17 – FILL, mostly silty sand with gravel, gray to da brown (A-1-b)</li> </ul>							18	w		SS	16					
19 - 20 - 21 -	-							10	w	H H H	SS	8					
22	-							15	w		SS	15					
24 25 26	SAPRIC PEAT,	black (PT) (	A-8)				AMP POSIT	20	М		SS	12	210				
27 - 28 -	-							17	М	H K K	SS	12	239				
<ul> <li>ORGANIC CLAY, trace roots, dark brown, volume</li> <li>stiff, laminations of sapric peat (OH) (A-8)</li> <li>31 -</li> </ul>								16	M	H H	SS	12	172				
	PTH: DRILLING M	IETHOD			<u>////</u> WA1	∕∕∕ ΓER L	EVEL ME	ASUR	EMEN	LIFA ITS	I	1		-	LNOTE	REF	ER TO
	1.40' 3.25" HSA		DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	CA DI	VE-IN EPTH	FI	DRILLI JUID LI	NG EVEL	WAT LEV	ER EL	THE A	ATTA	CHED
49_11	4 <sup>1</sup> / <sub>2</sub> ' RDF w/DN	1	5/15/14	9:45	16.	.0	14.5	1	5.0				13.	8	SHEE	TS FO	R AN
		Ξ	5/15/14	9:55	16	.0	14.5	1	4.6				13.	4	EXPLA	NATI	ON OF
BORI	BORING COMPLETED: 5/15/14 5/15/14 11:00						37.0	3	4.0				31.	0	fermi	NOLO	GY ON
DR; <b>1</b>	<b>FK</b> LG: <b>SB</b> Rig:												TH	IIS LC	G		

03/2011



AET JO	B NO: <b>01-05697</b>			LO	G OF	BOI	RING N	0	1228	<b>SS</b>	(p. 2	of 4	b)
PROJEC	T: Southwest Light Rail Transit Proj	ect,	PEC East; I	Hopl	kins	to I	Minno	eapol	is				
	Hennepin Co. C	oordii	nates: <u>N</u>	1	5707	6		E 📫	51526	0			
DEPTH IN	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA	MPLE YPE	REC	FIELD	) & LAI	BORAT	ORY	ESTS
FEET	CANDY LEAN CLAY slightly organic trace	V////	TIII						wc	DEN	LL	PL.	% <b>₀-</b> #200
33 —	roots, dark brownish gray, firm (CL) (continued)		(continued)	6	M	М	SS	18	70				
34 —	SILTY SAND a little gravel grav medium		TILL			3							
35 -	dense (SM) (A-2-4)			12	W	М	SS	16					
36 -						R							
37 —	SILTY SAND WITH GRAVEL, medium to fine grained gray wet loose (SM) (A-1-b)		ALLUVIUM	10	w	K	55	10					
38 -	GRAVEL, gray and brown, waterbearing,	0	•	10	W	Д	55	10					
39 —	medium dense (GP) (A-1-a)	0				EL,							
40		0		30	W	Х	SS	1					
41		0				$\sum$							
42 -		0		21	w	$\square$	SS	2					
43 -		0				A	55	_					
44	SAND WITH GRAVEL, coarse to medium		•			H							
45 -	(A-1-a)		•	13	W	X	SS	1					
46 -	SAND WITH GRAVEL medium to fine					E							
4/-	grained, brownish gray, waterbearing, medium			14	W	$\mathbb{N}$	SS	6					
48 -	dense (SP) (A-1-b)					$\beta$							
49 - 50 -				177		$\left\{ \right\}$	00					r.	
51 -				17	W	Å	- 55	0					
52 -						$\left \right\rangle$							
53 -						$\left \right $							
54 -	SAND, fine to medium grained, brown, waterbearing, medium dense (SP) (A-3)					$\left \right\rangle$							
55 -						$\overline{\mathbf{N}}$		10					
56			· .	23	M	Ň	55	13					
± 57 –						$\sum_{i=1}^{n}$							
58 -	SAND a little gravel medium to fine grained		· · · · ·			$ \rangle$	1						
59 -	brown, waterbearing, medium dense (SP)	r <del>t ii</del>				$\sum$	4						
i	(A-1-b) SAND WITH SILT AND GRAVEL, medium to		· • •	15	w	$\mathbb{N}$	SS	11					
61 -	fine grained, brown, waterbearing, medium			10		$\Lambda$	~~~						
62 -	dense (SP) (A-1-b)					R							
63 -	-		•			$ \rangle$							
64 -	4					μ <u>λ</u>	\$						
65 -				24	W	X	SS	7					
66 -						17	ļ						
67 -						$\rangle$	Ì						
≤ 68 -	SILTY SAND, a little gravel, fine to medium					$\rangle$							
8 69 - -	grained, gray, wet, medium dense (SM) (A-2-4)												
71							L				1		



AET JO	B NO: <b>01-05697</b>			LO	GOF	BOI	RING N	0	1228	SS	(p. 3	of 4	4)
PROJEC	CT: Southwest Light Rail Transit Proje	ct, ]	PEC East; I	Iopł	cins (	to ]	Minn	eapol	is				
	Hennepin Co. C	Coor	dinates: <u>N</u>	1	57076	<u>,</u>		Е- \$	51526	0			
DEPTH	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA	MPLE	REC	FIELD	& LAI	BORAT	ORY	TESTS
FEET	MATERIAL DESCRIPTION		GEOLOGI	IN	MC	נ	YPE	IN.	WC	DEN	LL	PL	<b>%-</b> #200
	SILTY SAND, a little gravel, fine to medium grained, gray, wet, medium dense (SM) (A-2-4) (continued)			24	W	X	SS	13					
73 74 75 76	SAND WITH SILT, a little gravel, fine to medium grained, grayish brown, waterbearing, medium dense (SP-SM) (A-1-b)			16	W	S	SS	4					
77 78 79	SAND, fine to medium grained, grayish brown,					$\sum_{i=1}^{n}$							
80 81 82				21	W	Ź	SS	10					
83 84 85 86 87	SAND WITH GRAVEL, possible cobbles, medium to fine grained, gray, waterbearing, medium dense (SP) (A-1-b)			13	W		SS	4					
88 — 89 — 90 — 91 — 92 —				14	W		SS	13					
93 — 94 — 95 — 96 — 97 —	LEAN CLAY, possible cobbles, gray, hard (CL) (A-6		FINE ALLUVIUM	38	Μ		SS	3	29				
98 99 100 101 102	SAND, a little gravel, medium to fine grained, gray, waterbearing, medium dense (SP) (A-1-b)		COARSE ALLUVIUM	13	W	X	SS	10					
103 104 105 106 107	SANDY LEAN CLAY, a little gravel, possible cobbles, grayish brown, hard (CL) (A-6)		TILL	32	М	2 2 2 2	SS	7	25				



AET JO	DB NO: 01-05697			LO	G OF	BORING	NO	1228	SS	(p. 4	of 4	<b>b</b>
PROJE	CT: Southwest Light Rail Transit Proj	ect,	PEC East; l	Hopl	kins	to Min	ieapo	lis				
	Hennepin Co. C	oordi	nates: <u>N</u>	1	57070	<u> </u>	<u> </u>	51526	0			DEGTE
DEPTH IN FEET	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SAMPLI TYPE	E REC IN.	FIELI WC	D & LAH	LL	PL	%-#200
108 - 109 -	SANDY LEAN CLAY, a little gravel, possible cobbles, grayish brown, hard (CL) (A-6)		TILL (continued)		w		3					
110 - 111 -	SANDSTONE, fresh, white, light brown and light gray		FORMATION	100/.2								
112 -						$\left \right\rangle$						
113 -						$\left \right\rangle$						
114 -				100/.2:	-w	S SS						ļ
	END OF BORING											
1												
4												
7710												
+WEL			• •									
4												
U AE												
0-10												
ES (												
ANICA		1										
RP W												
E1_C0												


AET JO	B NO:	01-05697	19.46 <del>936999</del>					LO	G OF I	30R	LING N	0	1229	SV	<b>(p.</b> 1	l of 4	4)
PROJE	CT:	Southwest Light	t Rail Tra	ansit Pro	ject, I	PEC	East; I	Iopl	tins t	o I	Minn	eapol	lis				
SURFA	CE ELEV	ATION: 872.8	H	ennepin Co.	Coordin	ates:	<u>N</u>	1	57322			E É	51545	5			
DEPTH IN		MATERIAL D	ESCRIPTION	J		GEO	OLOGY	N	мс	SA T	MPLE YPE	REC	FIELI	) & LAI	BORAT	ORY	TESTS
FEET	FILL	mostly alayou and w	ith graval	a littla		FILI				$\overline{\Lambda}$				DEN		PL.	%o-#200
1	$\int \operatorname{silty} s$	and with organic fines	s, brown, a	little		1.1777	,	10	М	XI	SS	18	11				
2 -	black	(A-6) mostly silty sand a li	ttle gravel	nieces of	/					$\left( \right)$	~~	10					
3 -	coal, c	lark brown and black	(A-2-4)	precessor				9	M	Å	88	10					
4	FILL,	mostly sand, a little g	ravel, light	brown						1							
5	and br	rown (A-3, A-1-b)						6	М	Х	SS	10					
6-										3							
7-								5	М	М	SS	8					
9 -										रि							
10 -	1							14	м	M	22	4		-			
11 -	_							14	141	$\mathbb{A}$	55						
12	FILL,	mostly clayey sand w	vith gravel,	brown and						뉟							
13 -	black	(A-6)					4	M	Д	SS	3						
14 -	FILL.	mostly sand with silt	vel, trace						凵								
15 -	roots,	brown (A-1-b)	,					8	M	Х	SS	10					
16 -			1:44	- 1		EINI	C		Ţ	रि							
17 -	- SILT firm (	Y CLAY, trace roots, CL-ML) (A-4)	gray, a nui	e brown,		ALL	LUVIUM	7	М	M	SS	16	27				
18 -	SILT,	light brown, a little b	prown and g	gray, wet,						मि			26				
19 -	loose,	, a lens of lean clay at	20' (ML) (	A-4)						R		10	00				
20 -								6	M	Å	88	18	29				
22 -	SILT	Y CLAY, grayish bro	wn, a little	brown,						B							
23 -	firm (	(CL-ML) (A-4)						7	Μ	Х	SS	18	32	-			
24 -	CIIT	V SAND fine anging	d brownish	grav wet		$\frac{1}{CO^4}$	ARSE	-		E							
25 -	- loose	, laminations of silt (S	SM) (A-2-4	)		ALL	LUVIUM	8	w	$\square$	SS	12					
26 -	4									सि							
27 - 27	-					•		7	XX/	K	55	18					
₽ 28 -	-								vv	$\mathbb{A}$	20	10					
학 29 -	SAN	D WITH SILT, fine g	rained, gra	у,						H							
30 - G	⊣ water	bearing, loose (SP-SN	vi) (A-3)					9	W	Д	SS	18					
31 -	-								1				<u> </u>				
DE	PTH:	DRILLING METHOD		WAT	ER LI	EVEL MEA	ASUR	EMEN	TS					NOTE	REF	ER TO	
NATES	)-44'	3.25" HSA	TIME	SAMPI DEP1	LED TH	CASING DEPTH	CA' DE	VE-IN PTH	FI	DRILLI JUID LI	NG EVEL	WAT LEV	ER EL	THE A	ATTA(	CHED	
a 44-12	44-124 <sup>1</sup> / <sub>2</sub> ' RDF w/DM 5/15/14 12:00						19.5	1	9.5				Noi	1e	SHEE	TS FO	R AN
			12:40	21.	0	19.5	1	8.4				16.	6 <sup>1</sup>	EXPLA	NATI	ON OF	
BORI COMI	NG PLETED:	5/15/14							_				]1	ERMI	NOLO	GY ON	
UR: S	SG LG	: CD Rig: 91C												11			

03/2011



AET JO	DB NO: <b>01-05697</b>		<u>., , , , , , , , , , , , , , , , , , , </u>	LO	G OF I	3OR	UNG N	0	1229	SV	(p. 2	c of 4	<b>1</b> )
PROJE	CT: Southwest Light Rail Transit Project	t, PE	C East; H	lopk	ins t	o N	Ainne	eapol	lis				
	Hennepin Co. Coor	dinates	s: <u>N</u>	15	57322		]	E Ś	51545	5			
DEPTH	MATERIAL DESCRIPTION	G	EOLOGY	N	MC	SĄ	MPLE	REC	FIELI	) & LAI	BORAT	ORY	ESTS
FËET							IFE	шч.	WC	DEN	LL	PL	%-#200
33 -	SILTY SAND, fine grained, gray, wet, very			2	W/M	X	SS	18	39				
34 -	LEAN CLAY, brownish gray, soft to firm (CL)	AL	LUVIUM			Ł							
35 -	(A-6)			4	М	$\mathbf{N}$	SS	18	35				
36 -						प्ति							
37 -				6	м	H	66	10	27				
38 -				0	1/1	A	66	10	57				
39 -	LEAN CLAY WITH SAND, dark brownish					Į.							
40 -	+ gray, stiff, laminations of waterbearing sand		DARSE	11	M/W	М	SS	18					
41 -	SAND WITH SILT, a little gravel, medium to					1							
42 -	medium dense to very loose (SP-SM) (A-1-b)			3	W	$\mathbb{N}$	SS	18					
44 -			T T			图							
45 -	SANDY LEAN CLAY, dark grayish brown to gravish brown, very stiff (CL) (A-6)			17	м	$\square$	SS	16	20				
46 -				17		А	00						
47 -	-					H							
48 -	-			20	M	Д	SS	18	17				
49 -						Ц							
50 -	-			16	Μ	X	SS	18	18				
51 -	-					$\sum$							
52 ·													
53 -													
54 -						$\mathbb{H}$	99	10	10				
55			-	17	M	Å	88	18	18				
± 57						K							
58						K							
59	SAND WITH GRAVEL, medium grained,	C	OARSE	1		$\langle$				-			
	brown, waterbearing, dense (SP) (A-1-D)			31	W	$\mathbb{N}$	SS	6				ł	
61						6							
62 G	-					$\left \right\rangle$							
15. 63	GRAVELLY SAND, medium grained, brown,					$\left \right\rangle$							
56 64	waterbearing, very dense (SP) (A-1-b)					$\left \left(\cdot\right)\right $							
65 IS	1			70	W	X	SS	6					
66 66						2							
67						$\left \right\rangle$							
A C C C C C C C C C C C C C C C C C C C						$\left \right\rangle$							
ŭ U													



AET JO	в NO: <b>01-05697</b>			LO	GOF	BOF	RING N	O	1229	SV	(p. 3	8 of	4)
PROJEC	CT: Southwest Light Rail Transit Pro	ject, ]	PEC East; I	Iopk	cins 1	to I	Minne	eapol	is				
	Hennepin Co.	Coordin	ates: <u>N</u>	15	57322	2		E É	51545	5			
DEPTH	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA	MPLE	REC	FIELD	) & LAI	BORAT	ORY	TESTS
FËÈT							1115	11N,	WC	DEN	LL	PL	%-#200
71 - 72 - 73 -	SAND WITH GRAVEL, medium grained, brown, waterbearing, medium dense (SP) (A-1-b) <i>(continued)</i>			19	W	X	SS	10					
74 — 75 —	SAND, a little gravel, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)					$\sum_{i=1}^{n}$							
76				35	W	Å	SS	12					
77													
79 -						4							
80				25	W	Å	SS	12					
82 -			x			$\left \right\rangle$							
83 -	SAND, a little gravel, medium grained, brown,					$\left \right\rangle$							
85 -	water bearing, medium dense (SI) (A-1-0)			19	w	$\overline{\mathbb{N}}$	SS	8					
86 -						6							
87 -						$\left \right\rangle$	·						
89 -	SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)					$\left \right\rangle$							
90 -				21	W	Å	SS	6					
91 -						K							
93 -	-		•			K							-
94 -						$\left( \right)$							
95 -			•	13	W	X	SS	8					
97 – 97 –			•			K							
98 -	-		•			K							
99 -			*			$\left( \right)$	Í						
100 - 101 -	1. -		•	14	W	X	SS	10					
102 -	-					2							
- 103 -	SAND, a little gravel, medium grained, grayish					R							
104 - 105 -	brown, waterbearing, medium dense (SP) (A-1-b)					K							
106 - 107 -	SAND, fine grained, brown, waterbearing, medium dense, a lens of sand with silt (SP) (A-3)			15	W	X Z	ss						

01-DHR-060



AET JO	B NO: 01-05697			LO	G OF	BOI	RINGN	Э, <u> </u>	1229	SV	(p. 4	of 4	<b>1</b> )
PROJEC	Southwest Light Rail Transit Proj	ect, ]	PEC East; H	Iopl	cins 1	to ]	Minne	eapol	is				
	Hennepin Co. C	oordin	ates: <u>N</u>	1	57322	2		E 5	51545	5			
DEPTH IN	MATERIAL DESCRIPTION		GEOLOGY	N	мс	SĄ	MPLE	REC	FIELD	& LAE	BORAT	ORY	ESTS
FËET		<del></del>					IFE	<u>лля</u> ,	WC	DEN	LL	PL	%-#200
108 —	CLAYEY SAND WITH GRAVEL, brown, very		TILL			KI							
109 -	stiff, laminations of wet silty sand (SC) (A-6)					Н							
110 -				28	M/W	X	SS	16	14				
111 -						6)							
112	GRAVEL WITH SAND, grayish brown, waterbearing, dense (GP) (A-1-b)		COARSE ALLUVIUM			$\left \right\rangle$							
114 -													
115 -				40		M	99	ο					
116 -				49	Ŵ	Д	22	0					
117 —						$\left \right\rangle$							
118 —	SANDSTONE, fresh, light gray		ST. PETER			$\left \right\rangle$							
119 -			FORMATION	200/ 7	w		SS	2					
120 -				2007.2	1	$\left \left\langle \left\langle \right\rangle \right\rangle \right $	-		5				
121 -						$\mathbb{R}$						-	
122 -						$\left \right\rangle$							
123 -						$\left \right\rangle$							
124 -	END OF BORING	<u> </u>		150/.2	2 W	Þ	SS						
5													
5													
202													



AET JC	OB NO:	01-05697						LO	GOF	BOI	RING N	10.	1230	SV	<b>(p.</b> ]	lof	3)
PROJE	CT: S	outhwest Ligh	nt Rail Tr	ansit Pro	oject,	PE	C East; I	Iopl	cins (	to I	Minne	eapo	lis				
SURFA	CE ELEVAT	ION: 873.0	H	Hennepin C	o. Coo	rdina	tes: <u>N</u>	1:	57440	)		E :	51558	4			
DEPTH IN FEET		MATERIAL I	DESCRIPTIO	N		GI	EOLOGY	N	мĊ	SA T	MPLE YPE	REC IN.	FIELI WC	D & LA	BORAT	PL	FESTS %-#200
1	FILL, mo little grav brown (A	stly clayey sand, el and silty sand, -2-6, A-2-4)	with organ trace roots,	ic fines, a , dark		FIL	L	6	М	$\mathbb{N}$	SS	14					
3-	FILL, mo	stly sand, a little	gravel, san	d with silt		4		5	М	R	SS	12					
4 5 6	brown, a	little black (A-1-1	b)	0015,				7	М	₽  }	SS	4					
7			· ·		t,			7	M	ľ	SS	8					
9 10	FILL, mo roots, bro	stly clayey sand, wn and dark brow	a little grav wn (A-6)	vel, trace				7	м	E	SS	14	13				
11 — 12 —	FILL, mo	stly sand with sil	t and grave	l, brown, a	Ļ	-		,		EI	55						
13 – 14 –	nue dark	brown (A-1-0)		·				6	M	X FI	SS	10			-		
15 - 16 -	- - -							22	₩ 	X R	SS	10					
17	SILT, bro	own, wet, loose (I	ML) (A-4)			FIN AL	Æ LUVIUM	9	w	A A	SS	.14	34				
19 - 20 -	LEAN Cl brown, fi	LAY, light grayis rm, laminations c	sh brown, a of silt (CL)	little (A-4)				8	; M/W	¥	SS	18	37				
22 - 23 -	SILTY C	LAY, gray, soft (	(CL-ML) (A	4-4)				4	М		SS	18	35				
24 - 25 -	SAND W waterbear	۲TH SILT, fine و ring, medium der	grained, gra ise (SP-SM	y, ) (A-3)		CO AL	ARSE LUVIUM	12	w		SS	6	n mar an				
20 27 – 27 – 28 –	SANDY	SILT, gray, wet,	loose (ML)	) (A-4)		FIN AL	₩ LUVIUM	8	w	Ĭ	SS	12	31				
40+13V 29 - 30 - 30 -	SILTY S. (SM) (A-	AND, fine graine 4)	ed, gray, we	et, loose		CO AL	ARSE LUVIUM	8	w		SS	16	•				
02697.					: : 				Ľ								
ង់ DEI	PTH: DRI	LLING METHOD			WAT	ERL	EVEL MEA	SURE	EMEN	TS			***		NOTE:	REFE	ER TO
0 OINATE	-49' 3.25	5" HSA	DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	DE	/E-IN PTH	FL	UID LE	NG EVEL	WATI LEVE	EK EL	THE A	TTAC	HED
1200 <b>49-9</b>	9½' RD	F w/DM	5/14/14	9:36	21.	0	19.5	19	9.5	ļ			18.9	9	SHEE!	IS FOI	R AN
	NG		9:48	21.	0	19.5	19	9.0				16.2	2   <sup>1</sup>	UXPLA TEDMIN		JN OF	
č COMP	PLETED: 5/	15/14	ļ											TUNAS TH		G UN	
DR: S	G LG: C	D Rig: 91C											10	10 1.0	<u>.</u>		



AET JO	B NO: 01-05697			LO	G OF	BOI	RING N	10	1230	SV	(p. 2	2 of :	3)
PROJEC	T: Southwest Light Rail Transit Project	ct, I	PEC East; H	Iopl	cins 1	to I	Minn	eapol	is				-
	Hennepin Co. C	Coor	dinates: <u>N</u>	1:	5744(	)		E 5	51558	4			
DEPTH	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA	MPLE	REC	FIELD	& LAI	BORAT	FORY	TESTS
FEET	MATERIAL DESCRIPTION			11	IVIC	T	YPE	IN.	WC	DEN	LL	PL	%-#200
22 _	SILTY SAND, fine grained, gray, wet, loose		COARSE ALLUVIUM	6	W	М	SS	18					
31	(SIVI) (A-4) (Communu		(continued)			स्रि							
35	LEAN CLAY, gray, firm (CL/CH) (A-7-6)		FINE ALLUVIUM	6		R	66	10	41				
36 -				6		Д	55	18	41				
37/	FAT CLAY, gray, a little light grayish brown,					1							
38 -	firm, laminations of silt (CH) (A-7-6)			8	М	X	SS	18	43				
39 -						रि							
40				c	м	M	66	10	20				
41 -				0	IVI	Д		10	20				
42	LEAN CLAY, gray, stiff, laminations of sand					띱							
43 -	(CL) (A-6)			15	M	Х	SS	16	20				
44	DANDY LEAN CLAY and some stiff a long of		TIT			Ł							
45 -	waterbearing gravelly sand at 45' (CL) (A-6)			17	M/W	$\mathbb{N}$	SS	18	18				
46				*'		$\square$	00	10					
47 —	CLAYEY SAND, a little gravel, trace roots,					묍							
48	brownish gray, a little black, very stiff to hard, a lamination of organic clav at 47½ (SC) (A-6)			20	M	М	SS	18	27				
49 -						Ł							
50 -				27	M	$\square$	SS	18	15				
51 -	· · ·					Ĥ							
52 -	· · · ·					$\left \left\langle \cdot\right\rangle \right $							
53 -						K(							
54 -													
55 —				24	M	М	SS	18	17				
56 -						Ы							
57 -						$\mathbb{S}$							
58 -					,	$\left \left\langle \right\rangle \right $							
59 -	· · · ·					Ц							
₩ 60 -				32	M	X	SS	12.	17				
61 –						Ы				ų.	ļ		
₩ 62 -						$\left \right\rangle$							
63 -	SAND WITH SILT AND GRAVEL, fine to		COARSE										
86- 56 - 56 - 56 - 56 - 56 - 56 - 56 - 56	medium grained, brown, waterbearing, medium		ALLUVIUM			K							
65 –	uoise (51-510) (A-1-0)			30	W	X	SS	8					
66 -			• •			5							
67 –			*			$\left \right\rangle$							
≱ 68 –	GRAVEL WITH SAND, brown, moist, very	نن <u>ا</u> ند 	-										
ŏ 69 −	dense (GP) (A-1-b)					$\square$							
			<u> </u>							<u> </u>			

01-DHR-060



AET JO	B NO:	01-05697				LO	G OF I	30RI	NG N	0	1230	SV	(p. 3	of 3	3)
PROJEC	CT:	Southwest Light Rail T	ransit Proje	ct, I	PEC East; H	lopł	kins t	o M	linne	apol	is				
			Hennepin Co. C	Coord	linates: <u>N</u>	15	57440		<u>_</u>	3, 5	51558 <sub>4</sub>	<u>4</u>			
DEPTH		MATEDIAL DESCRIPTION	ON		GEOLOGY	N	MC	SAM	<b>IPLE</b>	REC	FIELD	& LAE	BORAT	ORY	TESTS
FEET		MATERIAL DESCRIPTION				IN	MC	ΤY	TPE	IN.	WC	DEN	LL	PL 1	<b>%-</b> #200
_	GRA	VEL WITH SAND, brown, mo	ist, very		COARSE	82	M/W	Х	SS	8					
71 -	aense	(GP)(A-1-0)(continuea)	Ę		( <i>continued</i> )		Ĺ	$\sum_{i=1}^{n}$							
72 –								$\left  \right $							
73 –			=					$\sum_{i=1}^{n}$							
74 —			=					Ц							
75 —			=			64	M/W	XI	SS	-					
76 —			-					71							
77 -			-					$\rangle$							
78 -								$\left  \right $							
79 -			-					$\subseteq$							
80 -			•			57	M/W	XI	SS	10					
81			1					5							
82 -			3					$\left\{ \right\}$							
83 -								$\langle \langle$							
04			1					$\mathcal{A}$	~~						
85 -						70	M/W	Д	SS	12					
87 -								$\langle \langle$							
88 -			1					21							
89 -								$\left( \right)$							
90 -						00	3 6/337	$\forall$	00	0					
91 -				-		88	1V1/ W	Д	22	ð					
92 -	4							$\langle \langle$							
93 -	-			-				$\langle \langle \rangle$							
94 -				3				2							
<u>*</u> 95 –	CANT	D fine to medium animal two	wn moist			80	_	$\square$	SS	0					
96 -	very	dense (SP) (A-3)	wii, 11018t,					H	~~		,				
97 –	-							KΥ							
₩ 98 -								K							
99 –	-							Ц							
3 100 -	-					61	M/W	M	22	16					
101 -			c			04	141/ 44	$\square$		10					
01-05	END	OF BORING													
VTES							1								
										ļ					
000															
N N N											•				
1 00															
<b>#</b>	1						1				1				1

AMERICAN ENGINEERING TESTING, INC.

#### SUBSURFACE BORING LOG

Γ	AET JO	B NO: (	)1-05697						LO	G OF I	BOR	ING N	0	1232	SB	(p. 1	lof2	2)
	PROJEC	CT: S	outhwest Ligh	t Rail Tr	ansit Pro	oject, I	PEC	East; H	Iopł	tins t	to N	Ainne	eapol	lis				
	SURFAC	CE ELEVATI	ON: <b>885.6</b>	Н	lennepin Co.	Coordin	ates:	N	15	55935	;		<u>E</u> :	51179	8			
	DEPTH IN FEET		MATERIAL D	DESCRIPTIO	N		GEO	DLOGY	N	MC	SA T	MPLE YPE	REC IN.	FIELD WC	) & LA DEN	BORAT	ORY 1	FESTS %-#200
	1 -	FILL, mo gravel, tra	stly sandy silt, a l ce roots, dark bro	ittle silty sa own (A-4)	nd and		FILL		10	М	$\mathbb{N}$	SS	6					
	2	FILL, mo (A-1-b)	stly sand with gra	wel, light b	rown				13	М	R	SS	10		-			
	4 — 5-—	FILL, mo brown (A	stly lean clay, a li -4)	ttle sand, li	ght grayisł	1			5	М		SS	14	18				
	8 – 7 – 8 –	FILL, mo roots, gra	stly sand with silt yish brown, a littl	and gravel e black (A-	, trace 2-4)				17	М		SS	12					
	9 10 11	SAND W medium t little gray	ITH SILT, a little o fine grained, lig ish brown, moist, ses of silty sand a	e gravel, tra ht brownis medium de	ce roots, h gray, a ense to sand		COA ALL	RSE UVIUM	17	М		SS	14					
	12 — 13 —	(SP-SM)	(A-1-b)						6	M/W		SS	10					
	14 — 15 — 16 —	<ul> <li>SAND, a little gravel, medium to fine graine</li> <li>light gravish brown, waterbearing, loose (SI</li> <li>(A-1-b)</li> </ul>							7	M/W	LA R	SS	8					-
	17 — 18 —								7	W	A	SS	2					
	19 20 21	SAND, a brownish (SP) (A-1	little gravel, med gray, waterbearin -b)	ium graineo ng, medium	d, light dense			-	23	w	H K K	SS	18					
	22 - 23 -	GRAVEI medium d	L WITH SAND, I lense (GP) (A-1-a	orown, wate a)	erbearing,				28	W		SS	4					
r 5/9/14	24 - 25 - 26 -	SAND W grained, I	/ITH GRAVEL, 1 prown, waterbear	fine to med ing, dense (	ium SP)				31	w	Ц К И	SS	6					
PT+WELL.GD1	27 28	GRAVE loose to r	L WITH SAND, I nedium dense (G	brown, wate P)	erbearing,				10	w	H K K	SS	0					
37.GPJ AET+C	29 - 30 - 31 -	29 - 30 - 31 - 31 - 31 - 31 - 31 - 31 - 31							11	w		SS	2					
1-0565	DFI	PTH DRI	LLING METHOD		WAT	I ER LE	EVEL MEA	L SURI	l EMEN	⊥(() TS		l	-1	1	NOTE	REE		
ATES 0			TIME	SAMPI		CASING	CA	VE-IN PTH	I FI	DRILLI UID I I	NG EVEL	WAT LEVI	ER	THE A	ATTAC	CHED		
RDIN	0-2	<u>0-29<sup>1</sup>/2' 3.25" HSA</u> <u>19<sup>1</sup>/-67' BDF w/DM 4/30/14 9:15</u>						12.0	1	2.7	1			Non	ie	SHEE	TS FO	R AN
V-COC	1972	<u>19½-67' RDF W/DM</u> 4/30/14 9:50 4/30/14 9:50						19.5	1	7.4	-			16.	2	EXPLA	NATI	ON OF
N ARC	BORD													r	FERMI	NOLO	GY ON	
VET_C(	DR: 1	$\frac{1}{1} = \frac{1}{1} = \frac{1}$	K Rig: 69C													TH	IIS LO	G

03/2011

01-DHR-060



AET JO	B NO: <b>01-05697</b>		LO	G OF I	BORING N	0	1232	SB	(p. 2	c of 2	2)
PROJEC	CT: Southwest Light Rail Transit Project,	PEC East; H	lopk	tins t	o Minn	eapol	lis				
	Hennepin Co. Coord	inates: <u>N</u>	1	55935		E É	51179	8			
DEPTH	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE	REC	FIELI	) & LAE	BORAT	ORY	TESTS
FËET						IIN.	WC	DEN	LL	PL	%-#200
33 -	GRAVEL WITH SAND, brown, waterbearing, loose to medium dense (GP) <i>(continued)</i>	COARSE	11	w	ss	6					
34 —	GRAVEL WITH CLAY AND SAND brown	(commueu)			2						
35 —	waterbearing, medium dense (GP-GC) (A-1-b)		27	w	$\propto$ ss	6					
36 -	0				$\beta$						
37 —	CLAYEY SAND WITH GRAVEL, lenses of	TILL									
38 -	siny sand, brown, hard to still (SC) (A-2-0)		36	M	$\bigwedge$ ss	14	12				
39 -					2						
40 -			32	M	$\propto ss$	8	12				
41 -					6						
42 -					59						
43 -					K						
.44 -											
45 -			15	M/W	S ss	6	13				
46 -					6						
47 -					59						
48 -	CLAYEY SAND a little gravel, brown, stiff to				$\left \left\langle \cdot\right\rangle \right $						
49 -	hard (SC) (A-2-6)						1.1				
50 -			17	M	× ss	14	11				
51 -					IS I						
52 -					KI						
• 53 -					K						
54 -					4						
55 -			12	W	ss	14	13				
56 -					Б						
57 -					51						
58 -					$\left \left\langle \cdot\right\rangle \right $						
59 -					4						
60 -			100/.9	M	X ss	16	11				
61 -					$\sum$						
62 -											
63 -					$\left \right\rangle$						
64 -	LIMESTONE, weathered, gray to light gray	FORMATION	Ē	М	SS SS	16		1	-		
65 -			100/.1								
66 -				M	WASI	1					
67 -	END OF BORING	<b>X</b>			<u> </u>		-				-
D-W-G											
COR					.						
										1	

03/2011

01-DHR-060



AET JO	DB NO: <b>01-05697</b>	<u> </u>		LO	OG OF	BOF	UNG N	0	1235	SB	(p. 1	of	2)		
PROJEC	CT: Southwest Lig	ht Rail Tr	ansit Pro	ject, P	PEC East	; Нор	kins	to I	Minno	eapol	lis				
SURFA	CE ELEVATION:886.5	Н	ennepin Co.	Coordina	ites:	<u>N 1</u>	56089	9		E :	51222	9			000000
DEPTH IN FEET	MATERIAL	DESCRIPTIO	N	-	GEOLOGY	N	MC	SA T	MPLE YPE	REC IN.	FIELD WC	D & LAI	BORAT LL	ORY ' PL	ESTS %-#200
1 -	FILL, mostly sand with si roots, black (A-1-b)	lt, ash/cindei	rs, trace		FILL	5	М	M	SS	14					
2	FILL, mostly sand with si	lt and gravel	, trace			15	М	$\left  \right\rangle$	SŞ	10					
4	FILL, mostly clayey sand,	, a little grav	el, sand		L			I							
5 — 6 —	with silt and lean clay, tra gray and brown (A-6)	ce roots, dar	k brownisł	1		7	M	X	SS	10	18				
7 8	FILL, mostly sand and sag gravel, light brown and br	nd with silt, own (A-1-b)	with )			8	M	¥ الا	SS	12					
9	-					11	M		SS.	6		I	ţ.		
11 - 12 -	FILL, mostly clayey sand	, trace roots,	a little					E	80	10	01				
13 -	<ul> <li>13 - and black (A-6)</li> <li>14 - SAND WITH SILT, trace roots, fine to mediu</li> </ul>				COADSE	9	M	Å Ł	88	10	21				
15 -	<ul> <li>SAND WITH SILT, trace roots, fine to mediu</li> <li>grained, brownish gray, moist, medium dense,</li> <li>laminations of clayey sand (SP-SM) (A-3)</li> </ul>				ALLUVIUN	A 12	M	K	SS	12					
10	SAND WITH GRAVEL, brownish gray, waterbear	medium gra ing, loose (S	ined, P) (A-1-b)			9	W		SS	16					
19 - 20 -	SAND, fine grained, ligh medium dense (SP) (A-3)	t brown, wat )	erbearing,			12	w		SS	10				*	
21 - 22 - 23 -	GRAVEL WITH SAND, medium dense (GP) (A-1	, brown, wate -b)	erbearing,	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		18	W		SS	4	-				
24 - 25 -	SAND, a little gravel, fin brown, waterbearing, me	e to medium dium dense (	grained, SP) (A-3)			15	w		SS	10					
26 - 27 - 28 -						16	w	E X	SS	8					
29 - 29 - 30 -	GRAVEL WITH SAND waterbearing, loose to me	, brownish g edium dense	ray, (GP)			17	, w	Ϋ́	SS	2					
י <u>ר</u> ארי - 15	(A-1-0)						Ą								
DE	EPTH: DRILLING METHOD		WATI	ER LEVEL N	ÆASUI	REMEN	VTS					NOTE	REF	ER TO	
	0-19' 3.25" HSA	TIME	SAMPI DEPT	ED CASIN H DEPT	IG CA H D	VE-IN EPTH	I FI	DRILL JUID L	NG EVEL	WAT LEV	ER EL	THE A	ATTA(	CHED	
19-0	65.6' RDF w/DM	12:45	18.5	5 17.0		16.8				16.	5	SHEE	TS FO	K AN	
										,	EXPLA	NOT O	ON OF		
· BORI 이 COM	NG PLETED: <b>5/1/14</b>		ļ									LEKIMI TT	NULU TR T C	GI UN NG	
DR: 7	TA LG: TK Rig: 69C												11 		



AET JO	B NO: 01-05697		LO	GOF	BOF	RING NO	D	1235	SB	(p. 2	2 of 2	2)	
PROJEC	CT: Southwest Light Rail Transit Proj	ect, I	PEC East; H	lopl	tins t	to I	Minne	eapol	is				
	Hennepin Co. C	oordin	ates: <u>N</u>	1:	56089	)	]	3 5	51222	9			
DEPTH IN	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA	MPLE	REC	FIELD	& LAI	3ORAT	ORY	FESTS
FĒĖT		F ette							wc	DEN			%₀-#200
33	grayish brown, waterbearing, loose to medium			10	W	XI	SS	12					
34 —	dense (SP) (A-1-b) (continued)					E							
35 —				15	w	M	SS	12					
36 -						Д							
37	SAND, a little gravel, medium to fine grained, gravish brown, waterbearing, medium dense			10		Ń	66	0					
38 -	(SP) (A-1-b)			13	W	Ŵ	88	8					
39 -						F							
40 -				14	W	X	SS	14		-			
41 -						Ы							
42 -	CLAYEY SAND, a little gravel, grayish brown,		TILL			$\left \right\rangle$							
44 -	a little brown, very stiff, a lens of waterbearing and $(SC/SM)$ (A-2-4)					$\square$							
45 -	sand (SC/SWI) (A-2-+)			18	W	X	SS	14	11				
46 -						Ĥ				. *			
47 -						$\left \left\langle \cdot\right\rangle \right $							
48 -	CLAYEY SAND, a little gravel, brownish gray,					$\left \left\langle \right\rangle\right $							
49 -	IIIII (SC/SM) (A-2-4)					$\bigwedge$							
50 -				6	W	Ň	SS	22	13				
51 -	-					2							
52 -	CLAVEN SAND with gravel gravish brown					$\left \right\rangle$							
53 -	firm (SC) (A-6)					$\sum$							
54 -				7	W	$\mathbb{N}$	SS	2	14				
56 -						K							
± 57 -	_					K							
58 -	CLAYEY SAND, with gravel, grayish brown,					K	¢						
59 -	firm (SC/SM) (A-2-4)					K	4						
- 60 -				6	W	X	SS	3	17				
- 61 -	-					5	)						
62 -	_					$\left \right\rangle$	ſ						
63 -	-					$\left \right\rangle$	٩						
990-50 64 -	-			*	w	Ń	SS	12	9				
s 65 -	SILTY SAND, a little gravel, brownish gray,		4 4 PLATTEVILI	ŪE									
66 ·	Very dense, a lens of sand (SM) (A-2-4)		4 FORMATION	4			WASI	-H		_	_		
000 000 000	END OF BORING												
DRP W	*11/.5 + 22/.5 + 46/.5 + 100.1												
U U													
<∟												01-	DHR-C



AET JO	DB NO: 01-05697	7					LO	G OF I	BOR	ING N	0	1236	SB	(p. 1	of	2)
PROJEC	CT: Southwest	t Light Rail T	ransit Pro	ject,	PEC	C East; I	Iopl	cins t	to N	Ainn	eapol	is				
SURFA	CE ELEVATION:8	86.1	Hennepin Co.	Coordi	nates:	<u>N</u>	1:	56052	;		E 5	51239	1			
DEPTH IN	MATE	RIAL DESCRIPTION	ON		GE	OLOGY	N	мс	SA T	MPLE YPE	REC IN.	FIELD	0 & LA	BORAT	PL	ESTS
	FILL, mixture of sar with gravel, a little a	nd with silt and s sh/cinders, piece	ilty sand, s of brick	-	FILI		9	М	X	SS	16					
2 — 3 —	(A-1-b and A-2-4)	l dark brown, a n	uie black				7	М	A	SS	6					
4							3	м		22	8					
6 -							5	IVI	R	00	0					
7 8							4	М		SS	10					
9 10	FILL, mostly sand, (A-1-b)	light brown, a lit	tle brown				13	м́/W		SS	12					
11	FIBRIC PEAT, bro hemic peat (PT) (A-	wn to dark brown -8)	n, a lens of		SW.	AMP POSIT	4	M	ł	SS	14	311				
13	ORGANIC CLAY, black, soft, laminati \(OH) (A-8)	dark brown, a lit ons of sand to ar	tle gray to ound 14'		FIN	E			E	99	10	60 35				
15 -	LEAN CLAY, sligh (CL/OL) (A-6)	ntly organic, dark	brown, soft		ALI	LUVIUM	2		À FI	SS	18	27	2.8			
17	$\left[\begin{array}{c} \text{LEAN CLAY, If act}\\ \text{(A-6)} \end{array}\right]$	- 1001s, gray, to s					6	M	X F1	SS	16	30				
20 -	SAND WITH SILT	a little gravel, t	nedium		: <u>CO</u>	ARSE	11	M/W		SS	16	26				
21 -	grained, brownish g dense (SP-SM) (A-	gray, waterbearin 1-b)	g, medium			LUVIUM	12	W		SS	6					
24 -	SAND WITH GRA	VEL, medium g	rained, light						E							
25 - 26 -	- brownish gray, wat	erbearing, loose	(SP) (A-1-b)				7	W	Ą	SS	10					
	SAND WITH SILT fine grained, black,	f AND GRAVEL waterbearing, m	., medium to edium dense	<b>)</b>	· · · · · · · · · · · · · · · · · · ·		11	w		SS	6					
29 -	- 10056 (SF-SIVI) (J	<u>~-1-0)</u>							A	_		-				
9 30 - 4 31 -							8	W	Ķ	SS	6					
	_						10	w		SS	2		×			
5 DE	PTH: DRILLING ME	THOD		WA	TER I	EVEL ME	ASUR	EMEN	ITS					NOTE	: REF	ER TO
	241/21 3 25" HSA	DATE	TIME	SAMI DEF	PLED PTH	CASING DEPTH	CA	VE-IN EPTH	FI	DRILL JUID L	ING EVEL	WAT LEV	ER EL	THE A	ATTA	CHED
	69 <sup>1</sup> / <sub>2</sub> ' RDF w/DM	5/2/14	11:00	21	.0	19.5	1	7.2				16.	5	SHEE	TS FC	R AN
	USIN ALEX TITATI												· ]	EXPLA	NATI	ON OF
BORI COM	NG PLETED: 5/2/14													IERMI	NOLC	IGY ON
DR:	TA LG: TK Rig: 6	69C												TT		

01-DHR-060



AET JO	B NO: 01-05697			LO	GOF	BOI	RINGN	0	1236	SB	(p. 2	2 of 2	2)
PROJEC	T: Southwest Light Rail Transit Proj	ect,	PEC East; H	Iopl	tins t	to I	Minne	eapol	lis				
	Hennepin Co. C	oordir	nates: <u>N</u>	1:	56052	2		E t	51239	1			
DEPTH	MATERIAL DESCRIPTION		GEOLOGY	Ň	MC	SĂ	MPLE	REC	FIELD	& LAI	BORAT	ORY	TESTS
FÊÊT		<del>1</del>	CO A D CO				ιſΕ	шч.	WC	OC	LL	PL	%-#20
34 -	SAND WITH SILT AND GRAVEL, medium to fine grained, black, waterbearing, medium dense		COARSE ALLUVIUM			M							·
35 -	to loose (SP-SM) (A-1-b) (continued)		(continued)	10	w	M	SS	0					
36 -				10	**	Ĥ	20						
37 —	SAND, a little gravel, medium grained, brownish			_		KI	<i></i>						
38 -	gray, waterbearing, loose (SP) (A-1-D)		-	9	W	Д	SS	1					
39 -						Ц							
40 -				10	W	X	SS	6					
41 -						<u>لرا</u>							
42 -						$\left \right\rangle$							
43						S							
44 -						H	6						
45 -				9	W	Д	SS	10					
40 -						$\mathbb{Z}$							
4/-						$\left \right\rangle$							
40 -													
50 -				8	w	$\square$	22	8					
51 -			*	0	, vv	A	00						
52 -			•			K							
53			•			K							
54 -	CLAYEY SAND a little gravel brown very	1///	TILL			L							
55 -	stiff (SC) (A-6)			25	W	$\mathbb{X}$	SS	12	10				
56 -						$\int$							
. 57 -						$\left \right\rangle$							1
58 -	CLAYEY SAND, a little gravel, brown, firm					$\left \right\rangle$						1.41	
59 -	(SC) (A-2-6)					$\left( \right)$							
60 -				7	W	X	SS	4	14				
61 -						$\sum_{i=1}^{n}$							
62 -						$\left \right\rangle$							
03 - 64 -						$\left \right\rangle$						1	
65 -						$\left  \right $							
66 -				6	W	X	SS	0					
67 -						$\sum$						ľ	
68 -	LIMESTONE, weathered, gray		4 PLATTEVILL	Ē		$ \rangle$							
69 -	4				w	$\sum$	66						
	END OF BORING			1007.			-66						
Z	· · · · ·												
							1					1	



AET JO	B NO:	01-05697						LO	G OF I	BOR	ING N	Э	1238	SB	(p. 1	of	2)
PROJEC	CT:	Southwest Ligh	t Rail Tra	unsit Proj	ject, ]	PEC	East; E	Iopk	cins t	to N	Minne	eapol	lis				
SURFAC	CE ELEV	VATION: 888.4	He	ennepin Co. (	Coordin	nates:	<u>N</u>	1	56173	<b>;</b>	]	E 5	51270	1			reere
DEPTH IN FEET		MATERIAL D	DESCRIPTION	1		GEO	OLOGY	N	MC	SA T	MPLE YPE	REC IN.	FIELD	D& LAI	LL	PL	1ESTS %-#200
1 - 2 - 3 -	FILL with a of gla brown	, mixture of sand with gravel, a little sand an uss, trace roots, dark b n (A-1-b)	silt and silt d clayey san rown, light l	y sand, id, pieces brown and		FILL		11 26	M M		SS SS	18 18					
4	SAN moist	D, a little gravel, fine , medium dense (SP)	grained, ligh (A-3)	ht brown,		COA ALL	RSE UVIUM	25	М		SS	14					
7 8	SAN brow	D WITH GRAVEL, 1 n, moist, medium den	nedium grai se (SP) (A-1	ned, light I-b)				19	М		SS	14					
9 10 11			- <u>U.,</u>			•	!	17	M	H R	SS	10					
12 13 14	SAN grain mois lamin	D WITH SILT AND ed, brown, a little ligh t, medium dense, a len nations of silty sand (S	GRAVEL, 1 nt brown and ns of silt at 1 SP-SM) (A-	medium 1 light tan, 15', 1-b)		· · · ·		18	M	E E	SS	10					
15 -								17		R	SS	10					
17 -	SAN little	D, a little gravel, med light light tan, waterb nations of silt (SP)	lium grained bearing, loos	l, brown, a e,				8	W	Å	SS	18					
19 - 20 - 21 -	SAN loose GRA fine	e (SP) (A-3) VELLY SAND WIT grained, brown, water	H SILT, me bearing, me	edium to	]			17	w	Å	SS	6					
22 - 23 -	\dens   GRA   gray   dens	e (SP-SM) (A-1-b) VELLY SAND, mec , a little light tan, wate e, laminations of silt a	lium grained erbearing, m around 22.5'	l, brownish edium (SP)	/ 1	• • • • • • • • • • •		23	W	Ķ	SS	6					-
24 - 25 - 26 -	(A-1	-b)						12	w	Ķ	SS	6		7			
27 28	SAN grain dens	ID WITH GRAVEL, ned, brownish gray, w ne (SP) (A-1-b)	medium to f	fine , medium				20	w		SS	6					
29 - 30 - 31 -	SIL7 wate	ΓΥ SAND, a little gra prbearing, medium der	wel, grayish nse (SM) (A	brown, -2-4)		TIL	L ·	15	w		SS	14					
	рти.	DRILLING METHOD			<u>:::::</u> WA1	TER L	EVEL MEA	ASUR	 EMEN	_∦_ √TS	<u> </u>			-	 NOTF	: REF	TER TO
	0 17!	3 75" HSA	DATE	TIME	SAMP	'LED TH	CASING DEPTH	CA DI	VE-IN EPTH	I FI	DRILL LUID L	ING EVEL	WA1 LEV	ER EL	THE	ATTA	CHED
	34.6'	RDF w/DM	5/5/14	11:45	18	.5	17.0	1	8.0				16.	.7	SHEE	TS FO	OR AN
	~ 110		5/5/14	11:55	18	.5	17.0	1	7.4				16.	.3	EXPL	ANAT	ION OF
BORI	NG PLETEE	): 5/5/14						$\downarrow$						'	TERMI	NOLO	JGY OÌ DG
DR:	TA L	G: <b>TK</b> Rig: <b>69C</b>													1.	ms r.	



AET JC	DB NO: <b>01-05697</b>			LO	GOF	BOI	RING N	0.	1238	SB	(p. 2	2 of 2	2)
PROJE	CT: Southwest Light Rail Transit Proje	ect,	PEC East; l	Hopl	cins 1	to ]	Minn	eapol	lis				
	Hennepin Co. Co	oordi	nates: <u>N</u>	1:	56173	3		E ť	51270	1			
DEPTH IN	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA	MPLE YPF	REC	FIELD	& LAI	BORAT	ORY 7	ESTS
FEET	SILTY SAND, a little gravel, grayish brown,		TILL	28	W	M		0	WC	DEN	LL	PL	%-#200
33 - 34 -	waterbearing, medium dense (SM) (A-2-4) (continued)		(continued)	20		$\beta$	55						
	LIMESTONE, weathered, light gray	<u></u>		100/.1	<b>⊢</b> ₩–	<u> </u>	<u></u>	1					
	END OF BORING		FORMATION	μC									
			-										
								:	· .				
							·						
100													
AEL													
C10.													
reocn-													
7-7-7													
- <sup>1</sup>													



AET JC	OB NO: 01-05	697		·			LC	OG OF	BOI	RING N	10	1250	SV	<b>(p.</b> ]	l of 3	3)
PROJE	CT: South	vest Ligh	t Rail Tr	ansit Pro	ject,	PEC East;	Hop	kins 1	to I	Minn	eapo	lis				
SURFA	CE ELEVATION:	853.3	I	Iennepin C	o. Coor	dinates: <u>N</u>	[ 1	64623	3		<u>E </u> :	51933	5			
DEPTH IN FEET	M	IATERIAL D	ESCRIPTIO	N		GEOLOGY	N	MC	SA T	MPLE YPE	REC IN.	FIELI WC	D & LA DEN	BORAT	ORY 7 PL	TESTS qu
1 -	FILL, mostly cl little gravel and brown a little li	ayey sand v sand with s ght brown (	vith organi ilt, trace ro	c fines, a oots, dark 1-b)		FILL	22	М	M	SS	5	17			:	
2 3	FILL, mostly sa brown (A-1-b)	nd with silt	, a little gra	avel, light			15	М	X	SS	12					
4 5 6	SANDY LEAN gravel, trace roc firm, a lens of c	CLAY, sli ts, black, a layey sand	ghtly orgar little grayi (CL) (A-6)	nic, a little sh brown,		TOPSOIL OR FILL	8	X		SS	16	21				
7	FAT CLAY, sli dark gray, a littl silt (CH) (A-7-6	ghtly organ e light gray	ic, trace ro , firm, lam	ots, gray to inations of		FINE ALLUVIUM	5	M		SS	18	55				
9 - 10 -	OC = 2.7%, 7'-8	3 <sup>1</sup> / <sub>2</sub> ' sample						M	TT I	TW	18			89	28	
11 - 12 -	LEAN CLAY.	gray, firm,	aminations	s of					H	66	1.5	55	69			1095
13 - 14 -	waterbearing sa	nd (CL) (A	-6)	brownish		COARSE	8	M/W	\^ ₹]	SS	16	27				
15 - 16 -	gray, waterbear	ing, mediur	n dense (G	P) (A-1-b)		ALLUVIUM	14	w	Ą	SS	2					
17 - 18 -	-						18	w	Å	SS	2					
19 - 20 -	GRAVELLY S grained, browni dense (SP-SM)	AND WITI sh gray, wa (A-1-b)	H SILT, me terbearing	edium , medium			21	w	K	SS	6					
21 - 22 - 23 -		. ,					21	-	$\sum_{i}$	SS	0					
23 24 - ₹ 25 -	GRAVEL WIT	H SILT AN ing, mediur	ID SAND, n dense (G	brownish P) (A-1-b)	<u> </u> 				Ø							
20 20 20 20 20 - 22 - 27 -	- SAND WITH (	RAVEL. r	nedium gra	ained, grav			15	W	Å	SS	2					
	waterbearing, n	iedium den	se (SP) (A-	-1-b)			13	W	Ă	SS	5					
± 30 - 30 - 31 -	-						15	w	X	SS	6					
-02697		· · · · · · · · · · · · · · · · · · ·							1/1				<u> </u>			
DE DE	PTH: DRILLING	METHOD	DATE	TIME	WAT SAMPI DEP	ER LEVEL ME LED CASING TH DEPTH	ASUR CA' DE	EMEN VE-IN PTH	IIS IIS FL	ORILLI UID LI	NG EVEL	WAT LEVI	ER EL	NOTE: THE A	REFE	R TO HED
	17/2   3.23   HS.	M	6/9/14	8:58	16.	0 14.5	1	3.0	+			7.0		SHEE	<b>FS FOF</b>	۲ AN
0 2 2	$\sim 14$ RDF W/D	<u>. 1 .</u>	6/9/14	9:04	16.	0 14.5	1	1.4				5.6	I	EXPLA	NATIO	)N OF
BORI	NG PLETED: 6/9/14								-				Т	ERMI	VOLOC	3Y ON
DR: S	SHS LG: JM Ri	g: 68C												TH	IIS LOO	3



AET JO	B NO: <b>01-05697</b>			LO	G OF	BOI	RING N	0	1250	SV	(p. 2	2 of 3	3)
PROJEC	CT: Southwest Light Rail Transit Proj	ect,	PEC East; H	Iopl	cins	to I	Minn	eapol	is				
	Hennepin Co	. Coor	dinates: <u>N</u>	10	64623	3		<u>E</u> 5	51933	5			
DEPTH IN	MATERIAL DESCRIPTION		GEOLOGY	N	мс	SA	MPLE	REC IN	FIELD	& LAI	BORAT	ORY 7	TESTS
FEET	CAND WITH CDAVEL madium to fine	F							wc	DEN		PL	qu
33 -	grained, gray, waterbearing, medium dense (SP)			13	W	М	SS	8					
34 —	(A-1-b) <i>(continued)</i>					$\square$							
35 -				16	W	М	SS	5					
36 -						$\mathbb{H}$							
37 -	SAND, a little gravel, medium to fine grained, grav, waterbearing, medium dense (SP) (A-1-b)			22		М	qq	0					
38 -	g,, ,				-	А	60						
39 -						H							
40 -				21	W	$\mathbb{N}$	SS	10					
41 -			•			2							
42				16	W	X	SS	8					
44						Б							
45 -	GRAVELLY SAND WITH SILT, medium to fine grained, brownish gray, waterbearing,			22	w	$\square$	SS	4					
46 -	medium dense (SP-SM) (A-1-b)		•			Ą	00						
47 -						H							
48 -	SAND WITH GRAVEL medium grained, grav.		•	22	-	М	SS	0					
49 -	waterbearing, medium dense (SP) (A-1-b)		*			2							
50 -			•	20	W	Х	SS	6					
51 -			•			Б							
52 -	-		* *										
53 -	SAND WITH GRAVEL, medium to fine		<u>·</u> ·			$\left \right\rangle$							
54 -	dense (SP) (A-1-b)		•			$\mathbb{H}$							
55 -				22	W	$\mathbb{X}$	SS	8					
57						$\left \right\rangle$							
58 -	-					$\left \right\rangle$							
59 -	-					$\left \right\rangle$							
60 -				15	w	$\bigtriangledown$	22	6					
61 -						Ą	55						
62 -	SILTY CLAY brown very stiff (CLML) (A $4$ )		FINE	4		$\langle \langle$							
63 -			ALLUVIUM			$\langle \langle$							
64 -	-					$\left( \right)$							
65 -				18	W	$\mathbb{N}$	SS	4	23				
66 -	-					$\beta$	j						
67 -	-												
≦ - 68 -	LEAN CLAY, brown, hard, laminations of wet					$\left \right\rangle$							
5 69 -	silt (CL) (A-4)												
Ц	*								1		1	1	



AET JO	DB NO: _0	1-05697				LC	GOF	BOF	RING N	0.	1250	SV	(p. 3	8 of 3	8)
PROJEC	CT: S	outhwest Light Rail	Transit Proj	ect, ]	PEC East; I	Iopl	kins t	to I	Minn	eapol	lis				
			Hennepin Co.	Coor	dinates: <u>N</u>	1	64623	<b>}</b>		Е :	51933	5			
DEPTH IN		MATERIAL DESCRIP	TION		GEOLOGY	N	MC	SĄ	MPLE	REC	FIELI	) & LAI	BORAT	ORY 1	ESTS
FĒĖT									IFE	11N.	WC	DEN	LL	PL	qu
71	LEAN CL   silt (CL) (	AY, brown, hard, lamin A-4) (continued)	ations of wet			54	M/W	Д	SS	12	21				
72 -								$\left\{ \right\}$							
73 -								$\left\{ \right\}$							
74								$\left\{ \right\}$							
75 -						55	M/W	$\overline{\mathbf{A}}$	22	12	10				
76 -						55	101/ 00	Ą	66	12	17				
77								$\left \left\langle \right \right\rangle$							
78 -	SAND a	little gravel medium to	fine grained		COARSE			K(							
79 -	brown, wa	aterbearing, dense (SP) (	A-1-b)		ALLUVIUM			И							
80 -						43	W	М	SS	8					
81 -	-							$\mathbb{H}$							
82 -								$\mathbb{S}$							
83 -	SILTY SA	AND, a little gravel, brow	wn, very dense	<u>†††</u>	TILL			$\mathbb{S}$							
84	(SM) (A-2	2-4)						$\square$							
85 -						76	W	Х	SS	12					
86 -								$[\mathcal{I}]$							
87 -								$\left \right\rangle$							
88 -	SAND, fi	ne grained, brown, wate	rbearing, very		COARSE			$\left \right\rangle$							
89 -	dense (SP	) (A-3)						Н	~~						
90 -		(				53	W	М	SS	10					
92 -								$\left \right\rangle$							
93 -	GAND	1	• • •					$\mathbb{Z}$							
94 -	SAND, a brown, w	little gravel, fine to med aterbearing, dense (SP) (	ium grained, (A-1-b)					$\mathbb{R}$							
95 -						36	w	[	SS	6					
96 -	-						"	H	20						
97 -	4							KI							
98 -	SAND W	TTH SILT AND GRAV	EL, medium to	-				KI							
99 -	fine grain	ed, brown, waterbearing	, very dense,					Ц							
100 -		ns of sing sand (SP-SM)	(A-1-0)			117	W	X	SS	6					
101 -	END OF	BORING		1.1.1			-	$\left  \right $							
			ť												
		ч. 1													



AET JO	B NO: 01-0569	97						LC	G OF	BO	RING N	0	1251	l SS	(p. 1	lof	l)
PROJEC	CT: Southwes	st Ligh	t Rail Tr	ansit Pro	oject,	PE	C East;	Hopl	<b>cins</b>	to	Minn	eapo	lis				
SURFAC	CE ELEVATION:	850.5	F	Iennepin C	o. Coo	rdina	ates: <u>1</u>	<u>1</u>	64799	)		<u>E </u> ;	51970	3			
DEPTH IN FEET	MAT	ERIAL D	ESCRIPTIO	N		GI	EOLOGY	N	мс	SA 1	MPLE TYPE	REC IN.	FIELI WC	D & LA	BORA	PL	FESTS %-#200
1 -	FILL, mostly silty little gravel, trace r	sand wit oots, bla	h organic f ck (A-2-4)	ines, a		FIL	L	9	М	M	SS	16					
2 — 3 —	FILL, mostly sand (A-1-b)	with silt	and gravel	, brown				14	М	$\square$	SS	8					
4 — 5 —	FILL, mostly grave with silt, brown (A	elly claye -1-b)	ey sand, a l	ittle sand				16	М	ł	SS	6					
6 7 8	FILL, mostly grave gray (A-1-b) (petro	elly sand bleum-ty	with silt, t pe odor)	orownish				19	М	ł	SS	10					
9 - .10 -	CLAYEY SAND V stiff to stiff (SC) (A	WITH G A-6) (pet	RAVEL, g roleum-typ	ray, very be odor)		TIL	L	0	м	ł	22	10	16				
11 - 12 -	CLAYEY SAND,	a little g	ravel, gray	, stiff,				9		A Ł	00	10	10				
13 — 14 —	laminations of wate (petroleum-type od	erbearing lor)	g sand (SC)	) (A-6)		CO	ADSE	11	M/W	/X F3	SS	10	17				
15 — 16 —	<ul> <li>SAND WITH SILT AND GRAVEL, mediu</li> <li>fine grained, gray, waterbearing, medium de</li> <li>a lens of silty sand (SP-SM) (A-1-b) (petroleum-type odor)</li> </ul>						LUVIUM	13	w	R	SS	10					
17 — 18 —	SAND WITH SIL fine grained, water (SP-SM) (A-1-b) (	Γ, a little bearing, petroleu	e gravel, me medium de m-type odo	edium to ense or)		•		11	w	H H	SS	12					
19	CLAYEY SAND, laminations of wate	a little g erbearing	ravel, gray g sand (SC	, very stiff, ) (A-6)		TIL	L	17	M/W		SS	16	13				
21 – 22 – 23 –	SAND WITH SIL <sup>7</sup> fine grained, gray, medium dense (SP	Γ, a little waterbe	gravel, me aring, loose	edium to e to		CO AL	ARSE LUVIUM	6	w	ł	SS	14					
24 — 25 —	medium dense (or	-5101) (73				•		14	w	ł	SS	18					
26 -	END OF BORIN	G				•				H							
DEP	TH: DRILLING ME	THOD			WAT	ER L	EVEL ME	ASURI	EMEN	TS					NOTE:	REFE	R TO
0-24	4½' 3.25" HSA		DATE	TIME	SAMP DEP	LED IH	CASING DEPTH	CAV	/E-IN PTH	I FL	ORILLI UID LE	NG VEL	WATI LEVE	ER EL	THE A	TTAC	HED
			6/11/14	10:00	26.	0	24.5	2	4.2				12.5	5	SHEE?	IS FOI	K AN
DODD	0		6/11/14	10:10	26.	0	24.5	1	1.5				11.5	5	SXPLA	NATI(	ON OF
COMPI	BORING COMPLETED: 6/11/14									-				1	ERMIN		JY ON
DR: JI	M LG: SHS Rig: 6													TH	18 LO	ŭ	

.



AET JO	AET JOB NO: 01-05697								LO	G OF	BO	RING N	10	1254	ST	<b>(p.</b> 1	lof	1)
PROJE	ECT:	Southwest	t Light	t Rail Tr	ansit Pro	ject,	PEC	C East; I	Iopl	<b>cins</b>	to ]	Minn	eapo	lis				
SURFA	CE ELEV	ATION: 84	46.4	H	Iennepin Co	o. Cooi	rdinat	es: <u>N</u>	1	64982	2		<u>E </u>	52022	1			
DEPTH		MATE	RIAL D	ESCRIPTIO	N		GE	OLOGY	N	мс	SĄ	MPLE	REC	FIELI	) & LA	BORAT	ORY '	TESTS
FÉET	- DIT I		1		11.11 1		ETT T					IFE	11N,	WC	DEN	LL	PL	%-#200
1 -	FILL,	s of brick, trace	and with e roots,	h gravel, a black, a lit	little sand, tle brown	/	FILL	<b>_</b>	22	М	M	SS	16					
2 -	(A-2-	4)									$\mathbb{H}$							
3 -	_								27	M	М	SS	16					
4 -	FILL.	mixture of silt	ty sand	and clayey	/ sand, with	1	-				国							
5 -	grave	l, brown (A-1-	b, A-6)	5.5	,				8	M	$\mathbb{N}$	SS	12					
6 -		, , , , , , , , , , , , , , , , , , , ,				-	004	DCE			R							
7 -	- SANI moist	, medium dens	ium grai se, a len	s of lean c	n and gray, lay (SP)		ALL	UVIUM	26	м	$\square$	SS	12					
8 -	(A-3)								20	<b>X</b>	R	00						
9 -	SAN	O WITH GRA	VEL, n	nedium gra	ined,		•				R							
10 -	loose	, a lens of sand	l with si	ilt at 10' (S	P) (A-1-b)				37	W	Å	SS	14					
12 -											I							
13 -									9	W	Х	SS	16					
14 -	SAND	D a littla grave	al madi	um graina	d light	-	-				रि							
15 -	<ul> <li>SAND, a little gravel, medium</li> <li>brown, waterbearing, dense (SI</li> </ul>			e (SP) (A-1	-b)		•		31	w	$\square$	SS	6					
16 -	15 – brown, waterbearing, dense ( 16 –								-		Ĥ							
17 -	SAN	D WITH SILT	AND C	GRAVEL,	medium to						H	~~						
18 -	(SP-S	SM) (A-1-b)	vii, viau	crocaring,	uense				35	M	Å	88	8					
19 -	GRA	VEL WITH SI	ILT AN	D SAND,	brown, a		4				Ц							
20 -	little	gray, waterbea clay (GP) (A-1-	ring, de -a)	ense, lamin	ations of				32	W	М	SS	8					
21 -	END	OF BORING	, i			-												
4																		
6/20/1																		
100																		
WELL																		
-tt-			,															
AET																		
7.GPJ																		
-0568							<u>רי מסי</u>		CI ID I		 ITC				<u> </u>			
o DE	DEPTH: DRILLING METHOD			D.1		SAMP	LED		CAV	JULEN /E-IN		DRILLI	NG	WAT	ER	NOTE:	REFE	ER TO
-0-	0-14½' 3.25" HSA			DATE	TIME	DEP	ĨĤ	DEPTH	DÈ	PTH	FL FL	UID LI	ÉVEL	LÉVI	EL	THE A	LTTAC	HED
14 <sup>1</sup> /2-	14 <sup>1</sup> / <sub>2</sub> -19 <sup>1</sup> / <sub>2</sub> ' RDF w/DM			6/11/14	11:44	16.	0	14.5		1.1				8.8		STIEE	IS FU. NA TH	
₹ ₽ BORT	BORING			6/11/14	11:54	16.	0	14.5	1	1.0				9.2		FERMIN		GY ON
ğ <u>ČŎM</u>	BORING COMPLETED: 6/11/14										<u> </u>					TH	ISLO	G
DR: J	DR: JM LG: SHS Rig: 68C		8C				1									***		2



AET JC	OB NO:	01-05697	1. John					LO	G OF	BOI	RING N	10	1255	ST	<b>(p.</b> 1	l of 1	l)
PROJE	CT: S	outhwest Ligh	t Rail Tr	ansit Pro	oject,	PEC	East; H	Iopl	cins	to I	Minn	eapo	lis				
SURFA	CE ELEVAT	ION: <b>841.2</b>	ŀ	Iennepin C	o. Cooi	rdinate	es: <u>N</u>	1	65167	7		<u>E </u> :	52069	9			
DEPTH IN FEET		MATERIAL D	DESCRIPTIO	N		GEO	OLOGY	N	мс	SA T	MPLE YPE	REC IN.	FIELI WC	D&LA	BORA	FORY T	rests qu
1-	FILL, mo brick, tra	ostly clayey sand v ce roots, dark brov	with gravel, wn (A-6)	, pieces of		FILL	,	16	м	M	SS	14	8				
2 - 3 -	FILL, mo silty sand	ostly sand with sil , grayish brown a	t and grave nd black (A	l, a little A-1-b)		4		39	М		SS	12					
4	EII I m	stly lean clay gra	w(4-6)			_		6	М	ł	SS	10	35				
6	LEAN C	LAY, gray, a little	e brown, fir	m,		FINE		Ū		E							
8 - 9 -	FAT CL	ns of sand and sil	t (CL) (A-6 y to dark gr	o) ray, firm		ALL	UVIUM	5	M	Å	SS	14	31				
10 -	(CH) (A-	7-6)		• • •				5	M	R	ss	18	47	74			1280
11								5	×	E	SS	16	50				
13 -	LEANC	LAY, brownish g	ray, a little	black and					<u> </u>	Ł							
15 -	gray, firm (A-7-6)	n, laminations of t	tat clay and	silt (CL)				5	M	X F3	SS	16	42				
17 18								1	М		SS	18	31				
19 - 20 -	FAT CL very stiff	AY, dark gray, a l , a lens of sand, la	ittle brown minations	and gray, of silt (CH				27	M		SS	10	47				
21 -	END OF	BORING															
WELL GDT 6/20/14																	
697.GPJ_AET+CPT									-								
δ DE	PTH: DR	LLING METHOD			WAT	ER LE	EVEL MEA	SUR	EMEN	TS					NOTE:	REFE	R TO
0-1	19½' 3.2	5" HSA	DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	CA DE	VE-IN PTH	I FL	ORILLI UID LI	NG EVEL	WAT LEVI	ER EL	THE A	ATTAC	HED
			6/11/14	2:11	21.	0	19.5	2	0.0				16.	4,	SHEE	15 FOI	K AN
A BOBH	NG		6/11/14	2:21	21.	0	19.5	1	9.5				13.	1   <sup>1</sup>	SAPLA TEDNAT		IN OF
S COM	PLETED: 6	/11/14												1	DKIVIII TL		G UN
b DR: J	IM LG: S	HS Rig: 68C													11		u l



AET JC	OB NO: 01-05	697						LO	G OF	BOI	RING N	10	1256	5 SS	<b>(p.</b> 1	of	1)
PROJE	CT: Southy	vest Light	t Rail Tr	ansit Pro	oject,	PEC	C East; H	Iopł	<b>cins</b>	to I	Minn	eapo	lis				
SURFA	CE ELEVATION:	914.9	F	Iennepin C	o. Cooi	rdinat	tes: <u>N</u>	1	53740	6		E :	50739	8			
DEPTH	м	ATERIAL DI	ESCRIPTIO	N		GE	OLOGY	N	MC	SA	MPLE	REC	FIELL	) & LA	BORAT	TORY '	TESTS
FÊÈT			1 1 11			511.1					YPE	IN.	WC	DEN	LL	PL	%-#200
1 -	FILL, mixture o	f clayey san ces of glass,	d and silty dark brov	/ sand, a vn (A-2-6)		FILI		13	М	M	SS	12					
2 -	SAND a little o	ravel medi	um to fine	orained			ARSE			H							
3 -	light brown, mo	ist, very der	nse (SP) (A	4-1-b)		ALL	JUVIUM	53	M	Д	SS	6					
4 -	SAND, fine gra	ined, light b	rown, moi	ist, mediun	n	• - •				I							
5 -	dense (SP) (Å-3	)				•		16	M	X	SS	12					
6 -	SAND WITH G	RAVEL m	edium ora	uned		-				I							
8-	brown, moist, m	edium dens	se (SP) (A-	-1 <b>-</b> b)				15	M	М	SS	12					
9 -		1.6 4	1.		_	-				रि							
10 -	light brown, mo	ist, medium	o medium dense (SI	P (A-1-b)		•		11	м	$\square$	SS	12					
11 -	-					•		••		R	~~~						
12 -	SAND, a little g	ravel, medium	um to fine 1 dense (SI	grained, P) (A-1-b)				10		R	aa						
13 -				)()				10	M	A	22	0					
14 -	SAND WITH C	RAVEL, m	nedium gra	ined, light						H							
15 -	orown, moist, n	learum dens	se (SF) (A-	-1-0)				11	M	Д	SS	6					
17 -	SAND, a little g	ravel, fine t	o medium	grained,						I							
18 -	light brown, mo	ist, medium	a dense (SI	P) (A-1-b)				19	M	М	SS	12					
19 -	SAND WITH C	RAVEL, m	nedium to	fine						I							
20 -	grained, brown,	moist, med	ium dense	(SP)				20	M	M	SS	12					
21 -	-									रि							
22 -	-							19	M	M	SS	12					
23	-									मि							
₹ 25 -	-							30	м	M	22	12					
26 -	END OF POD					.:  		30	IVI	Μ		12					
LLL.GD	END OF DOK	ling															
T+WE																	
A L 45																	
05697.1	,													<u> </u>			
ទី DEl	PTH: DRILLING	METHOD		<b>.</b>	WAT	ER LI	EVEL MEA	SURI	EMEN	TS					NOTE:	REFE	ER TO
ELAN 0-2	24 <sup>1</sup> / <sub>2</sub> ' 3.25" HSA	A	DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	CAV DE	/E-IN PTH	FL	UID LE	NG EVEL	WATI LEVI	ER EL	THE A	TTAC	HED
COORT			5/23/14	10:20	• 26.	0	24.5	2:	5.7				Non	e	SHEE	IS FOI	R AN
	NG									-				1  -	SAPLA TERMIN		UN OF
Ö COMF	PLETED: 5/23/14														THVING	IS LO	G :
UR: S	G LG: TM Ri	g: 91C															-

01-DHR-060



AET J	IOB NO:	01-05697		• • • • • • • • • • • • • • • • • • • •				LO	G OF I	BOI	RING N	iO.	1257	'SS	(p. 1	of 2	2)
PROJ	ECT:	Southwest Ligh	t Rail Tr	ansit Pro	ject, ]	PEC	East; E	Iopł	cins t	to I	Minn	eapo	lis				
SURF	ACE ELEVA	ATION: 886.2	H	Hennepin Co	o. Coor	dinate	es: <u>N</u>	1:	55692	, 		E É	51135	5			
DEPTH	I	MATERIAL D	ESCRIPTIO	N		GEO	DLOGY	N	мс	SĄ	MPLE	REC	FIELI	) & LA	BORA'I	ORY	TESTS
FÊÊT			•1. 1	1 1		TH I					IFE	11N.	WC	DEN	LL	PL	<b>‰-#20</b> 0
1	- FILL, n - with sil	nixture of gravelly s t, trace roots, dark b	orown and b	nd sand prown		FILL		28	М	XI	SS	4					
2	(A-2-4,	A-1-b)								$\left( \right)$							
3	-							12	M	Å	SS	6					
4	FILL, n	nostly sand with silt	and grave	l, a little						Į							
5	- silty sat (A-1-b)	nd, trace roots, brov	vn, a little d	lark brown				10	М	Ж	SS	6					
6	]` ′	· ·								ł							
. 8	_							10	М	Х	SS	6					
9	_									रि							
10	_							8	M₽₩	M	SS	4				9	
11										स							
12	- FILL, r trace ro	nostly sand, a little pots, gray and black	gravel and (A-1-b, A-	sapric peat 8)	,			3	w	Y	22	6					
13	-							5	**	P	00						
14										H	99		07	-			
16	_							4	W	Д	. 88	6	27				
17	FILL, r	nixture of clayey sa	nd and clay	yey sand						1						-	
18	gray an	ganic fines, a little § id black (A-6)	gravel, trace	e roots,				5	M/W	М	SS	8	20				
_ 19	- SILTY	SAND, a little grav	vel, gray, w	et, loose to		TILL				払							
20	- medium	n dense, lenses of cl	layey sand	(ŚM/SC)				10	M/W	Х	SS	8					
21		)								$\sum$							
$\begin{vmatrix} 22\\ 23 \end{vmatrix}$								14	-	M	SS	0					
23						0.0	Dan			Б							
₹ 25	- waterb	, a little gravel, med earing, very loose to	ium graine o loose, a le	d, gray, ens of sand		ALL	UVIUM	3	-	M	SS	0					
5 10 10 10 10 10	with sil	lt around 28' (SP) (A	4-1-b)							A	55						
09 27						•		0	W	Ю	CC						
₹ 28	-							8	W	Д	. 22	0					
	-									H							
								7	W	Å	SS	6					
			1							2				<u> </u>			
5 D	EPTH: D	RILLING METHOD			WAT	ERLE	EVEL MEA	SURI	EMEN'	TS			<b>XX7 A 77</b>		NOTE:	REFE	R TO
0 NATE	-19½' 3.	.25" HSA	DATE	TIME	DEP		DEPTH		PTH	FL	UID LI	EVEL	LEVI	EK EL	THE A	TTAC	HED
191/2	-29½' R	CDF w/DM	6/3/14	2:03	13.	5	12.0	1	2.1				10.2	2	SHEE	is foi Natio	
∛ BOR	RING		6/3/14	2:13	21.	0	19.5		9.9 0 0				15.	י א ד ס	ERMIN	VOLO(	GY ON
<u>Š</u> ČŎŇ	IN TO	<u>6/4/14</u>	0/4/14	/:30	21.	<b>U</b>	19.3		9.0				12.	<b>b</b>	TH	IS LO	G
띩 DR:	JIM LG:	5H5 Rig: 68C		1	1					1							



. AET JC	OB NO:	01-05697	·······			LO	G OF	BOI	RING N	0.	1257	' SS	(p. 2	2 of 2	3)
PROJE	CT:	Southwest Light Rail	Transit Projec	et, I	PEC East; H	Iopl	tins 1	to I	Minne	eapol	is				
	T		Hennepin Co. C	oor	dinates: <u>N</u>	1	55692	2	]	E 5	51135	5	2		
DEPTH IN FEET		MATERIAL DESCRIP	ΓΙΟΝ		GEOLOGY	N	MC	SA T	MPLE YPE	REC IN.	FIELD WC	0 & LAI DEN	BORAT	ORY T	ESTS %-#20
33 -	SANI	O WITH GRAVEL, medium	grained, gray,		-	7	W	М	SS	3					
34 -	(A-1-	b) (continued)						$\square$							
35 -		-				7	W	M	SS	3					
37 -							ę.	Ц							
38 -						11	-	Å	SS	0					
	CLAY stiff (	YEY SAND, a little gravel, b SC) (A-6)	rown, very		TILL	23	М	M	SS	14	14				
41 -	CLAY	YEY SAND WITH GRAVEI	, brown, firm					D							
43 -	(SC/S	M) (A-2-4)				5	M	Д	SS	1	14				
44 -						7	м	H	55	2	14				
46 -	END	OF PODINC			<u></u>	/		М		3	14				
		·													
LOOK W-LOOKUNALES UI-USBULGES AFT. VI LITELOVI VICELOVI VICEL															



AMERICAN ENGINEERING TESTING, INC.

PROJECT: Southwest Light Rail Transit Project, PEC East; Hopkins to Minueapolis         SURFACE ELEVATION: 910.1 Hennepin Co. Coordinates: N       150873       E       SURFACE ELEVATION: 910.1         PROJECT: MATERIAL DESCRIPTION       GEOLOGY       N       NC SAMPLE       REC       FILL & LABORATORY TESTS         POPETH       MATERIAL DESCRIPTION       GEOLOGY       N       MC SAMPLE       REC       FILL & LABORATORY TESTS         PLIL       MATERIAL DESCRIPTION       GEOLOGY       N       MC SAMPLE       REC       MATERIA DESCRIPTION         TOST, Marce of sand with silt and silty sand, a       FILL       IS M       SS 12       I       I         A       FILL, mostly clayey sand, a little gravel and fark brown (A-6)       SM M       SS 12       I         FILL, mostly sand with silt and gravel, a little clayey sand, light brown and dark brown (A-1-b, A-6)       9       M       SS 12       I         ORGANIC CLAY, a little gravel and sand, trace       SMAMPP <th>AET JC</th> <th>OB NO:</th> <th>01-05</th> <th>697</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>LO</th> <th>G OF</th> <th>BO</th> <th>RING N</th> <th>10.</th> <th>1260</th> <th>) SB</th> <th><b>(p.</b> 1</th> <th>lof</th> <th>3)</th>	AET JC	OB NO:	01-05	697						LO	G OF	BO	RING N	10.	1260	) SB	<b>(p.</b> 1	lof	3)
SURFACE ELEVATION:       91.1       Hennepin Co. Coordinates:       N       150873       E       501319         DEPTH FEET       MATERIAL DESCRIPTION       GEOLOGY       N       Mc       SAMPLE TYPE       REC WC       FILL & LABORATORY TESTS         1       Ititle gravel, light brown and black (A-1-b)       FILL, mixture of sand with silt and silty sand, a little gravel, light brown and black (A-1-b)       FILL       15       M       SS       14       V       V       Den LL       PL \$	PROJE	CT:	Southv	vest Ligh	t Rail Tr	ansit Pro	oject,	PEC	C East; I	Iopł	cins 1	to I	Minn	eapo	lis				
DEPTH FRET       MATERIAL DESCRIPTION       GEOLOGY       N       MC       SAMPLE TYPEF       RCC TYPEF       PRC TYPEF	SURFA	CE ELEV	ATION:	910.1	F	Iennepin C	o. Cooi	rdinat	tes: <u>N</u>	1	50873	3		E :	50131	9			
FÉET       IIIE	DEPTH IN		М	ATERIAL D	DESCRIPTIO	N		GE	OLOGY	N	MC	SĄ	MPLE	REC	FIELI	) & LA	BORA	TORY	TESTS
1       FILL, mixture of sand with silt and silty sand, a       15       M       SS       14         2       15       M       SS       14         3       FILL, mixture of sand with silt and silty sand, a       15       M       SS       12         4       FILL, mostly clayey sand, a little gravel and sand, gravish brown, a little light brown and dark       6       M       SS       12       19         6       M       SS       12       19       8       M       SS       14         9       FILL, mostly sand with silt and gravel, a little clayey sand, light brown and dark brown (A-1-b, clayey sand, light brown and dark brown (A-1-b, clayey sand, light brown and dark brown (A-1-b, clayey sand, light brown, waterbearing, medium grained, gray and brown, waterbearing, medium grained, gray and brown, waterbearing, medium dense to dense (SP-SM) (A-1-b)       SW/AMP       10       M       SS       14         10       M       SS       12       10       M       SS       14         12       0       M       SS       12       10       M       SS       14         14       15       M       SS       14       144       14         15       M       SS       14       14       14         15       M <td< td=""><td>FÊÊT</td><td></td><td></td><td>0 1 11</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>YPE</td><td></td><td>WC</td><td>DEN</td><td>LL</td><td>PL</td><td>%-#200</td></td<>	FÊÊT			0 1 11									YPE		WC	DEN	LL	PL	%-#200
2       3         3       FILL, mostly clayey sand, a little gravel and sand, gravel, a little light brown and dark         6       M       SS       12         7       8       6       M       SS       12         9       FILL, mostly sand with silt and gravel, a little clayey sand, light brown and dark brown (A-1-b, clayey brown, waterbearing, medium grained, gray and brown, waterbearing, medium grained, grayish brown, waterbearing, clayey brown, clayebrown, clayeb	1 -	FILL,   little s	mixture o gravel, ligh	f sand with it brown an	i silt and sil d black (A-	ty sand, a -1-b)		FIL	L	15	М	$\mathbb{N}$	SS	14					
3       -       15       M       SS       12         4       FILL, mostly clayey sand, a little gravel and sand, grayish brown (A-6)       6       M       SS       12       19         6       M       SS       12       19         7       8       6       M       SS       12       19         8       M       SS       4       14         9       FILL, mostly sand with silt and gravel, a little clayey sand, light brown and dark brown (A-1-b, A-6)       9       M       SS       10         11       A-6       10       M       SS       12       19         12       -       -       10       M       SS       10         14       -       -       10       M       SS       12         14       -       -       -       -       -       -         15       -       -       -       -       -       -         16       -       -       -       -       -       -         17       -       -       -       -       -       -       -         18       -       -       -       -       - <t< td=""><td>2 -</td><td></td><td></td><td></td><td></td><td>,</td><td></td><td></td><td></td><td></td><td></td><td><math>\left( \right)</math></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	2 -					,						$\left( \right)$							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	3 -	-								15	M	М	SS	12					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	4 -	FILI	mostly el	avey sand	a little orax	vel and		1				3							
$\begin{array}{c} 6 \\ 7 \\ 7 \\ 8 \\ 9 \\ \hline FILL, mostly sand with silt and gravel, a little clayey sand, light brown and dark brown (A-1-b, A-6) \\ 10 \\ 11 \\ - \\ 12 \\ 13 \\ - \\ 14 \\ - \\ 15 \\ - \\ 16 \\$	5	sand,	grayish br	own, a little	e light brov	vn and dar	k			6	М	Μ	SS	12	19				
7 -       8         9       FILL, mostly sand with silt and gravel, a little clayey sand, light brown and dark brown (A-1-b, A-6)       9       M       SS       4       14         10       clayey sand, light brown and dark brown (A-1-b, A-6)       9       M       SS       10       N         12       10       M       SS       8       17       10       M       SS       8       17         14       -       -       10       M       SS       8       17         16       -       -       -       26       M       SS       12         18       -	6 -	browi	n (A-6)									मि							
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	7 -	-										K	00		14				
9       FILL, mostly sand with silt and gravel, a little clayey sand, light brown and dark brown (A-1-b, A-6)       9       M       SS       10         11       A-6)       9       M       SS       10         12       10       M       SS       8       17         14       15       10       M       SS       8       17         16       0       GRAVELLY a little gravel and sand, trace roots, black, very stiff (OH) (A-8) (possible fill)       SWAMP DEPOSIT OR FILL       17       M       SS       14       144         19       SAND WITH SILT, a little gravel, fine to medium grained, gray and brown, waterbearing, medium dense to dense (SP-SM) (A-1-b)       COARSE ALLUVIUM       25       W       SS       10         21       GRAVELLY SAND WITH SILT, fine to medium grained, gray ish brown, waterbearing, very dense (SP-SM) (A-1-b)       31       W       SS       10	8 -	-				đ				8	M	Д	55	4	14				
10 -       clayey sand, light brown and dark brown (A-1-b, A-6)       9       M       SS       10         11 -       A-6)       10       M       SS       8       17         12 -       10       M       SS       8       17         13 -       10       M       SS       8       17         14 -       10       M       SS       8       17         16 -       0RGANIC CLAY, a little gravel and sand, trace roots, black, very stiff (OH) (A-8) (possible fill)       SWAMP FILL       26       M       SS       14       144         19       SAND WITH SILT, a little gravel, fine to medium grained, gray and brown, waterbearing, medium dense to dense (SP-SM) (A-1-b)       COARSE ALLUVIUM       25       W       SS       12         21 -       31       W       SS       10       14         22 -       31       W       SS       10       14         23 -       0       GRAVELLY SAND WITH SILT, fine to medium grained, grayish brown, waterbearing, very dense (SP-SM) (A-1-b)       71       W       SS       10	9 -	FILL,	, mostly sa	nd with silt	t and grave	l, a little		1				EL.							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	10 -	$\begin{vmatrix} claye \\ A-6 \end{vmatrix}$	y sand, ligh	nt brown ar	nd dark bro	wn (A-1-b	, '			9	M	Х	SS	10					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$												Z							
13       13       14         14       15       16         16       17       ORGANIC CLAY, a little gravel and sand, trace roots, black, very stiff (OH) (A-8) (possible fill)       26       M       SS       12         18       Image: roots, black, very stiff (OH) (A-8) (possible fill)       Image: roots, black, very stiff (OH) (A-8) (possible fill)       Image: roots, black, very stiff (OH) (A-8) (possible fill)       Image: roots, black, very stiff (OH) (A-8) (possible fill)       Image: roots, black, very stiff (OH) (A-8) (possible fill)       Image: roots, black, very stiff (OH) (A-8) (possible fill)       Image: roots, black, very stiff (OH) (A-8) (possible fill)       Image: roots, black, very stiff (OH) (A-8) (possible fill)       Image: roots, black, very stiff (OH) (A-8) (possible fill)       Image: roots, black, very stiff (OH) (A-8) (possible fill)       Image: roots, black, very stiff (OH) (A-8) (possible fill)       Image: roots, black, very stiff (OH) (A-1-b)       Image: roots, blac										10	M	$\square$	SS	8	17				
15       -       26       M       SS       12         16       -<												सि							
16 -       16 -       17 -       ORGANIC CLAY, a little gravel and sand, trace roots, black, very stiff (OH) (A-8) (possible fill)       SWAMP       17       M       SS       12         18 -       19       SAND WITH SILT, a little gravel, fine to medium grained, gray and brown, waterbearing, medium dense to dense (SP-SM) (A-1-b)       17       M       SS       14       144         19       SAND WITH SILT, a little gravel, fine to medium grained, gray and brown, waterbearing, medium dense to dense (SP-SM) (A-1-b)       COARSE       17       M       SS       12         21 -       23 -       31       W       SS       10       14         25 -       medium grained, grayish brown, waterbearing, very dense (SP-SM) (A-1-b)       71       W       SS       10	15 -	_								26		$\mathbb{M}$	aa	10					
17 -       ORGANIC CLAY, a little gravel and sand, trace roots, black, very stiff (OH) (A-8) (possible fill)       Image: Swamp DEPOSIT OR FILL       Image: Swamp DEPOSIT OR FILL         18 -       Image: SAND WITH SILT, a little gravel, fine to medium grained, gray and brown, waterbearing, medium dense to dense (SP-SM) (A-1-b)       Image: COARSE ALLUVIUM       Image: Ss sector state	16 -									20	IVI	$\mathbb{A}$	00	12					
18       roots, black, very stiff (OH) (A-8) (possible fill)       Image: DEPOSITION Fill       17       M       SS       14       144         19       SAND WITH SILT, a little gravel, fine to medium grained, gray and brown, waterbearing, medium dense to dense (SP-SM) (A-1-b)       COARSE ALLUVIUM       25       W       SS       12         21       GRAVELLY SAND WITH SILT, fine to medium grained, grayish brown, waterbearing, 26       31       W       SS       10         24       GRAVELLY SAND WITH SILT, fine to medium grained, grayish brown, waterbearing, 26       71       W       SS       10	17 -	ORG	ANIC CLA	AY, a little	gravel and	sand, trace		SW	AMP		<b>_</b>	Į.							
19 - 3AND WITH SILT, a little gravel, fine to 20 - medium grained, gray and brown, waterbearing, 21 - 22 - 23 - 23 - 24 - 31 W SS 10 25 - Medium grained, grayish brown, waterbearing, 26 - Very dense (SP-SM) (A-1-b) - 71 W SS 10 27 - 71 W SS 10 28 - 71 W SS 10 71 W SS 10	18 -	roots,	black, ver	y stiff (OH	l) (A-8) (pc	ssible fill)			L	17	M	М	SS	14	144				
20 -       medium grained, gray and brown, waterbearing, medium dense to dense (SP-SM) (A-1-b)       ALLUVIUM       25       W       SS       12         21 -       medium dense to dense (SP-SM) (A-1-b)       31       W       SS       10         22 -       31       W       SS       10         23 -       31       W       SS       10         24 -       GRAVELLY SAND WITH SILT, fine to medium grained, grayish brown, waterbearing, very dense (SP-SM) (A-1-b)       71       W       SS       10	19 -	SAN	D WITH S	ILT. a little	e gravel, fir	ne to	<u>===</u>  · ::1	: CO/	ARSE			I					-		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	20 -	medi	um grained	l, gray and	brown, wa	terbearing,		ALI	LUVIUM	25	W	М	SS	12					
22 - 23 - 23 - 24 - 31 W X SS 10 $24 - GRAVELLY SAND WITH SILT, fine to medium grained, grayish brown, waterbearing, very dense (SP-SM) (A-1-b)$ $71 W X SS 10$	21 -		um dense t	o dense (Si	P-SM) (A-1	1-0)						5							
$\begin{array}{c c} 23 \\ 24 \\ \hline GRAVELLY SAND WITH SILT, fine to \\ 25 \\ 26 \\ \hline W \\ Very dense (SP-SM) (A-1-b) \\ \hline \end{array} $	22 -									31	W	$\nabla$	22	10					
$\begin{array}{c c} 24 & \hline & GRAVELLY SAND WITH SILT, fine to \\ 25 & - & medium grained, grayish brown, waterbearing, \\ 26 & - & \hline & very dense (SP-SM) (A-1-b) \\ \hline & & & & & & \\ \end{array}$ $\begin{array}{c c} 71 & W & & & \\ \hline & & & & \\ \hline & & & & & \\$	23 -	-									, vv	Ą	00	10					
$\begin{array}{c c} 25 & - \end{array} & \text{medium grained, grayish brown, waterbearing,} \\ \hline & 26 & - \end{array} & \begin{array}{c c} 71 & W & X \\ \hline & & & \\ \hline \end{array} \end{array} $	24 -	GRA	VELLY S.	AND WITI	H SILT, fir	ne to						$\mathbf{H}$							
	125 -	very	um grainec dense (SP-	i, grayish b SM) (A-1-	brown, wate b)	erbearing,				71	W	Х	SS	10	8				
$[5]_{27} \rightarrow SAND WITH SILT AND GRAVEL, fine to [1,1]$	105 27 -	SAN	D WITH S	ILT AND	GRAVEL.	fine to		<u>.</u> 				2							
$\frac{1}{28} = \frac{1}{28} $		medi	um grained	l, dark brov	wnish gray,	1.b)				56	W	ļ,	SS	10					
$\frac{1}{29}$		Water	VEN GAN		51-5M) (A	(-1-0)			т	-		$\sum$							
42 M/W SS 12 10	- 30 -	- grayi	sh brown,	hard to stif	f, a lens of	vn to			ıL.	42	M/W	/X	SS	12	10				
31 - waterbearing sand with silt (SC) (A-6, A-1-b)	GD 31 -	water	bearing sa	nd with silt	t (SC) (A-6	, A-1-b)						ß	~~						
Image: State of the state o	-0200 -10200	PTH.	DRILLING	METHOD			<u>////</u> WAT	ER L	EVEL MEA	SURI	L EMEN	<u> (_(</u> TS				1			70 70
Date         TIME         SAMPLED         CASING         CAVE-IN         DRILLING         WATER         THE ATTACHED	S				DATE	TIME	SAMP	LED	CASING	CAV	/E-IN		DRILLI	NG	WAT	ER	NUTE:	KEFI	THED
2     0-19½'     3.25" HSA     DATE     Invit     DEPTH     DEPTH     DEPTH     FLUID LEVEL     LEVEL       2     -19½'     3.25" HSA     5/27/14     10.01     21.0     10.5     10.5     10.5     17.0     SHEETS FOR AN	<b>VID</b>	191/2'	3.25" HSA	4			DEP		DEPTH	DE	PTH	FL '	UID LE	EVEL	LEVI		SHEE	IS FO	R AN
0         19½-74½'         RDF w/DM         5/2//14         10:01         21.0         19.5         19.6         17.9         0111151 OK MK           9         5/27/14         10:11         21.0         19.5         19.6         17.9         0111151 OK MK	00 <b>19½-7</b>	74½'	RDF w/D	M	5/27/14	10:01	21.		19.5	1	9.0				17.	<b>y</b>	EXPLA	NATI	ON OF
S         S/2//14         10.11         21.0         17.3         17.0         /         10.7           E         BORING         BORING         FERMINOLOGY ON         TERMINOLOGY ON         TERMINOLOGY ON         TERMINOLOGY ON	≥ BORI	NG	EIDELLA		3141114	10:11	41.	v	17,3			+			10,2		FERMI	10LO	GY ON
DR IM LG SHS Rig 68C	נ יאַר <u> COW</u> דיאַר	IM 10	5/2//14														TH	IS LO	G



.

AET JC	DB NO:	01-05697			LO	G OF	BOF	RING N	0	1260	SB	(p. 2	2 of :	3)
PROJE	CT:	Southwest Light Rail Transit Proj	ect, ]	PEC East; I	Iopł	kins 1	to I	Minn	eapol	lis				
		Hennepin Co.	Coor	dinates: <u>N</u>	1	50873	<u>,</u>		E :	50131	9			
DEPTH		MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA	MPLE	REC	FIELI	) & LAI	BORAT	ORY	TESTS
FEET			177747					YPE	IN.	WC	DEN	LL	PL	%-#200
33 -				TILL (continued)	14	M/W	X	SS	16	14				
34 -							$[\mathcal{T}]$							
35 -	CLAY   soft to	o firm (SC/SM) (A-2-4)			4	м	M	88	18	13				
36 -	4					1.41	Ą	55	10	15				
37 -	-						H							
38 -	4				5	-	М	SS	0					
39 -	-						Ц							
40 -					8	-	M	SS	0					
41 -	-						5							
42 -	-				1	M	М	22	18	15				
43 -					-	111	А	55	10	15				
44 -	1						H							
45 -					15	-	Д	SS	0					
40 -							2							
4/-					5	М	M	SS	18	12				
49 -	- ·						Ы							
50 -	1				7	м	M	22	18	12				
51 -	_				'	141	А	55	10					
52 -	_						$\left \left\langle \right \right\rangle$							
53 -		VEX SAND WITH GRAVEL brownish					$\left \left\langle \right\rangle \right $							
54 -	- gray,	hard (SC) (A-6)					Ø							
55 -	-				64	Μ	Ņ	SS	14	10				
56 -	-						5							
57 -	-						$\left \right\rangle$							
<sup>3</sup> 58 -	-						$\left  \right\rangle$							
59 - 59 -							$\mathbb{H}$		1					
≨ 60 -					98	M	М	SS	14	9				
							2							
							$\left \right\rangle$							
64 -							$ \rangle$							
5 65 -					102	1	$\square$	QQ	12	11				
₩ 46 -	_				105	IVI	$\mathbb{A}$	ەد	12					
102 67 -	-						$\langle \langle$							
ö ≥ 68 -							K							
69 -	_						$\mathcal{C}$							
			(11/1	7			Χ-				1			



AMERICAN ENGINEERING TESTING, INC.

#### SUBSURFACE BORING LOG

,

AET JC	DB NO: <b>01-05697</b>			LO	GOF	BOI	RING N	0	1260	SB	(p. 3	of 3	<u>3)</u>
PROJE	CT: Southwest Light Rail	<b>Fransit Project,</b>	PEC East; l	Topl	tins 1	to I	Minne	eapol	is				
		Hennepin Co. Coo	rdinates: <u>N</u>	1:	50873	<u>}</u>	]	E S	50131	9			
DEPTH IN	MATERIAL DESCRIPT	ION	GEOLOGY	N	MC	'SA	MPLE VPF	REC	FIELD	& LAI	BORAT	ORY 1	TESTS
FEET	OT A VEV CAND MUTH OD A VEL	harmich		(0)	м	( <u>/</u>		10	WC	DEN	LL	PL '	%-#200
71 -	gray, hard (SC) (A-6) (continued)	, brownish		69	M	Щ	22	10	10				
72 -						$\langle \langle$							
73 -						6							
74 -						$\langle \langle$							
75 -				100/.3	M	A	SS	10	8				
	END OF BORING					,							
						'							
	· · · ·												
						ŀ							
						7							
						,							
<u>+</u>						,							
	1												
	-												
1.1800													
						1							
AIE						1							
-CO													
H.									1				

1

.



AET JC	OB NO:	01-05697						LO	GOF	BOI	RING N	10.	1261	SB	<b>(p.</b> 1	l of :	3)
PROJE	CT:	Southwest Lig	ht Rail Tr	ansit Pro	ject,	PEC	East; H	Iopk	kins t	to I	Minn	eapol	lis				
SURFA	CE ELE	VATION: 910.1	<u> </u>	Iennepin Co	o. Coor	dinat	es: <u>N</u>	14	50910	)		Е :	50138	9			
DEPTH IN FEET		MATERIAL	DESCRIPTIO	N		GE	OLOGY	N	MC	SA T	MPLE YPE	REC IN.	FIELD WC	D & LA DEN	BORAT	ORY PL	TESTS %-#200
1 -	FILL a littl	, mixture of sand wi e gravel, dark browr	th silt and cla and brown (	ayey sand, (A-2-4)		FILL		7	М	M	SS	12					
2 -	-							0	N	(	66	12					
3 -	-							9	111	মি	33	12					
4	FILL sand,	, mostly sand, a little light brown and bro	e gravel and wn, a little d	clayey ark brown				14	М	Ц	SS	10					
6 7	(11-1-	0)								I							
8	-							15	M	Å FJ	SS			-			
10 -								5	М	$\square$	SS	8					
12 -	SAN grain	D WITH GRAVEL, ed, light brown, a lit	fine to medi tle brown, m	ium loist, very		COA ALL	ARSE JUVIUM	56	м	1 V	SS	1					
13	dense (poss	e, laminations of clay ible fill)	yey sand (SP	) (A-1-b)		OR I	ARSE		111		55						
15 -	SAN fine g (SP-S	D with SiLt ANL grained, light brown, SM) (A-1-b)	, moist, medi	um dense	)	ALL	UVIUM.	19	M	X	SS	8					
17 - 18 -	SAN brow	D, a little gravel, me n, waterbearing, loo	edium graine se (SP) (A-1	d, light -b)		•		10	₩ w		SS	10					
19 - 20 - 21 -	SAN fine g dense	D WITH SILT ANI grained, dark brown e (SP-SM) (A-1-b)	O GRAVEL, waterbearin	medium to g, medium	<b>)</b>			30	w		SS	2					
22 - 23 -	SILT grain	Y SAND WITH GH ed, gray, wet, dense	RAVEL, fine (SM) (A-2-4	to mediun 4)	1			32	w		SS	2					
24 - 25 - 26 -	SAN medi medi	D WITH SILT ANI um grained, dark br um dense (SP-SM)	O GRAVEL, own, waterbe (A-1-b) .	fine to earing,				29	W		SS	10					
27 - 28 - 28 -	GRA brow (A-1	VEL WITH SILT A n, waterbearing, ver -a)	ND SAND, y dense (GP	dark -GM)				69	w		SS	10			2		
29 - El 29 - 30 -								123	w		SS	3					
31 -	-					<u>.</u>				$\sum_{i=1}^{n}$							
δ DE	PTH:	DRILLING METHOD			WAT	ER LI	EVEL MEA	SURI	EMEN	TS					NOTE:	REFI	ER TO
NATES	291/1	3.25" HSA	DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	CAV DE	/E-IN PTH	J FL	DRILLI ,UID LI	NG EVEL	WAT LEVI	ER   EL	THE A	TTAC	CHED
29 <sup>1</sup> / <sub>2</sub> -8	84½'	RDF w/DM	5/28/14	9:08	21.	0	19.5	1	9.9				18.	5	SHEE	FS FO	R AN
S N − − − − − − − − − − − − − − − − − − −			5/28/14	9:18	21.	0	19.5	1	9.5				17.	0	EXPLA	NATI	ON OF
BORI COMI	NG PLETED	5/28/14												]1	ERMI	NOLO	GY ON
DR: J	JM LO	G: SHS Rig: 68C													TH	IIS LC	G



A	ET JO	B NO: <b>01-05697</b>			LO	G OF 1	BORIN	J NO.	1261	SB	(p. 2	2 of :	3)
Р	ROJEC	T: Southwest Light Rail Transit Proj	ect,	PEC East; H	Topl	kins t	, to Miı	meapo	olis				
		Hennepin Co.	Coor	dinates: <u>N</u>	1	50910	)′	E	50138	9			
DF	EPTH	MATEDIAL DESCRIPTION	-	GEOLOGY	N	MC	SAMP	LE REC	FIELI	) & LA	BORAT	ORY	TESTS
F	EET	MATERIAL DESCRIPTION		GEOLOGI	IN	IVIC	TYPI	E IN.	WC	DEN	LL	PL	<b>%-</b> #200
	33 -	SILTY SAND, a little gravel, brown, wet, very		TILL (continued)	56	M/W	$\bigvee$ s	5 10					
	34	(SM) (A-2-4) (continued)		(,			$\int$						
	35 -	CLAYEY SAND, a little gravel, brown to			_		H .						
	36 -	(SC/SM) (A-2-4)			7	M/W	Å s	5 18	13				
	37 -						4						
	38 -				6	M/W	X s	5   18	14				
	39 -			·			5						
	40 -				4	M/337	M	2 10	14				
	41 -					101/ 00	Ą "	5 10	14				
	42 —						4						
	43 -				4	M/W	$ \chi $ s	5 18	13				
	44 -						$\sum$						
	45 —				4	_	S s	s   0					
	46 -						ß						
	47 —						H						
	48 —				5	M/W	X s	5   18	15				
	49 —						2						
	50 -				4	M/W	X s	5   18	13				
	51 —						$\left[ \right]$						
	52 —						$\left \right\rangle$						
·· .	53 —						S						
	54 —						$\square$						
	55 —				7	M/W	X s	5   12	15				
	56						2						
6/2/14	57 -						$\left \right\rangle$						
GDT	50 -						$\left \right\rangle$						
WELL	60 -				_	N # /YY 7	H.		12		,		
CPT+	61 -				>	1 <b>V1</b> / W	$\mathbb{A}$ s	5   10	13				
AET+	62 -						KI						
GPJ	63 -	CLAYEY SAND, a little gravel, grayish brown,					60						
05697	64 -	very stiff (SC) (A-6)					2						
S 01-	65 -				10	м	M .	S 14	10				
INATE	66 -					141	Η <sup>3</sup>						
DORD	67 -	CLAYEY SAND WITH GRAVEL, grayish					K						
M-CC	68 -	brown, hard (SC/SM) (A-2-4)			97	M	X s	S   10	11				
CORP	69 -						$\sum$						
ET_				9			M .						

•



,

AET JC	OB NO:	01-05697			LO	G OF	BORI	NG NO	0.	1261	SB	(p. 3	of 3	3)
PROJE	CT:	Southwest Light Rail	Fransit Project,	PEC East;	Hopl	kins	to M	inne	apol	lis			• • •	
	-1	·	Hennepin Co. Coc	ordinates: <u>N</u>	<u>[ 1</u> :	5091	0		- <u>-</u>	50138	9			
DEPTH IN		MATERIAL DESCRIPT	TION	GEOLOGY	N	MC	SAM	PLE	REC	FIELD	& LAI	BORAT	ORY 7	TESTS
FEET	CLAN								10	WC	DEN	LL	PL	<b>%-</b> #20
71 -	browr	h, hard (SC/SM) (A-2-4) (cont	tinued)		38	M	Д	55	12					
72 -	-						$\langle \langle$							
73 -	4						$\langle \langle$							
74 -							2							
75 -	-				40	М	M	SS	16	12				
76 -	-						6							
77	-						$\left \right\rangle$							2 2 2
78 -	-						$\left \right\rangle$	ĺ						
79 -	-						4							
80 -	-				116	M	Ж	SS	14	8				
81 -	-						27							
82 -					-		$\left \right\rangle$							
84 -	SANI	DY LEAN CLAY, a little grav	vel, brown,				$\left \right\rangle$					5		
85 -					88/.7	м	$\square$	SS	14	16				
	END	OF BORING												
							•							
							,							
									2					
												-		
4							,							
6/2/1							,							
T.GD1														
+WEL														
T+CP1														
J AE														
697.GI							,							
01-05														
ATES							'							
RDIN														
V-COO														
ORP V		•												
AET_C														

01-DHR-060

1



	AET JOE	3 NO:	01-05697	~				<u>.</u>	LO	G OF	BOF	RING N	Ю.	1262	ST	<b>(p.</b> )	l of	1)
1	PROJEC	T:	Southwest I	 Light Rail Tr	ansit Pro	oject,	PEC	C East; I	lopł	cins t	to I	Minn	eapo	lis				
5	URFAC	E ELE	VATION: 884	. <u>7</u> 1	Hennepin C	o. Cooi	rdina	tes: <u>N</u>	1	5595(	)		E :	51218	8			
D	EPTH IN FET		MATERI	IAL DESCRIPTIO	N		GE	EOLOGY	Ń	мс	SA T	MPLE YPE	REC IN.	FIELI WC	D & LA	BORA'	FORY PL	FESTS
	1	FILL	, mostly sand wit	h silt and grave	l, brown		FIL	L	3	M	М	SS	12					
	2 -	(	0)			-			_		$\left( \right)$							
	3 —								6	M	Å	SS	10					
	4 — 5 — 6 —	FILL ashes (A-2-	, mostly silty san /cinders and bric -4)	d, a little gravel k, brown and bl	, sand, ack				6	M		SS	14					
	7 8								3	М		SS	6					
	9 10 11								15	M T		SS	10					,
	12 — 13 —	SAN grayi loose	D, a little gravel, sh brown, waterb (SP) (A-1-b)	medium graine bearing, medium	d, brown to n dense to	<b>)</b>	CO.	ARSE LUVIUM	20	W.		SS	8					
	14 15 16								7	w		SS	16					
	17	SAN medi dense	D WITH SILT A um grained, gray e (SP-SM) (A-1-t	ND GRAVEL, ish brown, wate	fine to erbearing,		- - - - -		6	W	A R	SS	20					
	20 – 21 –	SAN	DY LEAN CLA	Y, a little gravel	l, possible		TIL	L	23	W/M	R	SS	8	15				
	22 - 23 - 24 -	(A-6)	)						16	M	H H	SS	10	16			· .	
JT 6/10/14	25 – 26 –	SAN brow claye	D WITH SILT, a n, waterbearing, ey sand (SP-SM)	a little gravel, gr medium dense, (A-2-4)	ayish lenses of		CO AL	ARSE LUVIUM	17	w	Å	SS	18					
CP1+WELL.GI	27 — 28 — 29 —	SILT wet, (A-2	Y SAND, a little medium dense, le -4)	gravel, grayish enses of clayey	brown, sand (SM)				27	W	Å	SS	16					
GPJ AE1+(	30 -	GRA brow silty	VELLY SAND, vn, waterbearing, sand (SP) (A-1-b	medium graine medium dense,	d, grayish lenses of				15	W	Ø	SS	6					
)5697.	51	END	OF BORING												<u> </u>			
01-0	DEP	TH:	DRILLING METH	OD		WAT	ER L	EVEL MEA	SURE	EMEN	TS		·····			NOTE:	REFI	K TO
NATE	0-19	91/2'	3.25" HSA	DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	CAV DE	/E-IN PTH	FL	DRILLI UID LE	NG EVEL	WAT LEVI	ER EL	THE A	ATTAC	HED
OORD	19½-29	91/2'	RDF w/DM	6/4/14	9:55	13.	5	12.0	12	2.5				12.	1	SHEE	TS FO	R AN
ŏ ×			-	6/4/14	10:10	13.	5	12.0	12	2.5				11.'	7	EXPLA	NATI	ON OF
CORP	BORIN COMPI	G LETED	: 6/4/14												]1	ERMI	NOLO	GY ON
4ET	DR: D	S LC	6: GH Rig: 41C													TH	IIS LO	G

01-DHR-060



Γ	AET JO	B NO:	01-050	<b>597</b>						LO	GOF	BOI	RING N	10	1263	SB	<b>(p.</b> 1	lof	2)
	PROJEC	CT:	Southw	est Light	t Rail Tr	ansit Pro	oject,	PEC	C East; I	Iopl	kins t	to I	Minn	eapo	lis				
	SURFA	CE ELEV	ATION:	884.9	H	Iennepin C	o. Cooi	dina	tes: <u>N</u>	1	55750	)		E ÷	51169	6			,
	DEPTH IN FEET		M	ATERIAL D	ESCRIPTIO	N		GF	EOLOGY	N	мс	SA T	MPLE YPE	REC IN.	FIELD WC	) & LA DEN	BORAT	PL	TESTS %-#200
	1 —	FILL, with g	mixture of ravel, light	sand with brown and	silt and sil d black (A-	ty sand -1-b,		FIL	L	10	М	M	SS	12					
	2 — 3 —	A-2-4)	)							11	М	$\left  \right\rangle$	SS	14					
	4	FILL,	mostly silt	y sand wit	h organic f	ines, a		-				Ł							
	5 — 6 —	little g (A-2-4	ravel ash/c	vinders, trad	ce roots, bl	ack				4	M	X स	SS	12					
	7 — 8 —	- - -								2	M/W	X	SS	6					
	9 — 10 —	FILL,	mixture of	silty sand	with organ	nic fines				2		ł	00						
	11 -	pieces (A-2-4	of wood a	nd glass, ti	race roots,	black	3			5			22	0					
	12 — 13 —	-								3	M		SS	6					
	14 —	_										Į							
	15 -	-								3	M/W	М	SS	3					
	16 -	SAPR brown	IC PEAT, (PT) (A-8	dark brow	nish gray t	o dark		SW DEI	AMP POSIT	3	м	ł	SS	12	165				
	18 — 19 —	-						-		. 5		\ ₹	55	12	100				
	20 21	-								3	М	X	SS	1					
	22 -						<u>2.83</u>	-		3	М	II X	SS	4	146				
	23 — 24 —							5 <b>H</b>				ł							
T 6/12/14	25 - 26 -	ORGA roots, (OH)	ANIC CLA gray, lense (A-6)	Y, pieces es and lami	of wood (r nations of	oots), trace boglime	) 111	u			М		TW	14	106 72				
+WELL.GD	27 28	- SANI waterl	D, a little groearing, lo	ravel, medi ose, lenses	ium graine of sand wi	d, gray, ith silt (SP	)	CO AL	ARSE LUVIUM	7	w	R	SS	8					
I AET+CPT	29 - 30 -	SANI gray,	), a little g waterbearing	ravel, med ng, loose, l	ium to fine enses of sa	grained, and with si	lt			9	W	ł	SS	8					
5697.GP.	31 -	(SP) (	A-1-b)									$\left\{ \right\}$	-						
01-0	DEI	PTH: I	ORILLING N	METHOD			WAT	ER L	EVEL MEA	SUR	EMEN	TS				:	NOTE:	REFI	ER TO
DINATES	0-2	291/2' 3	3.25" HSA		DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	CA' DE	VE-IN PTH	FL	ORILLI UID LE	NG EVEL	WAT	ER	THE A	TTAC	CHED
COOR	291/2-6	54.7' ]	RDF w/DI	M	6/4/14	12:59	28.	5	27.0		4.8				12.	7 	SHEE	IS FU NATI	
RP W-	BORIN	NG			6/4/14	1:05	28.	5	27.0		<b>4.</b> 7				12.	<b>і</b> 1 Т	ERMI	VOLO	GY ON
ET_CO	COMP	PLETED:	6/4/14	. 680								<u> </u>					TH	IIS LO	G
A	DK: J	INT TO:	SHO KIg	. 000		I	1		L	1		1							



AET JO	B NO:	01-05697				LO	G OF	BOI	RING N	10	1263	SB	(p. 2	2 of 2	2)
PROJEC	CT:	Southwest Light Rail	Fransit Proj	ect, ]	PEC East; I	Iopł	cins 1	to I	Minn	eapol	is				
			Hennepin Co.	. Coor	dinates: <u>N</u>	1	5575(	)		E É	51169	6			
DEPTH		MATEDIAL DESCRIPT	ION		GEOLOGY	N	MC	SA	MPLE	REC	FIELD	& LAI	BORAT	ORY	TESTS
FEET					GLODOGI	19	WIC		YPE	IN.	WC	DEN	LL	PL	<b>%-</b> #20
33	GRA	VEL WITH SAND, gray, wat	erbearing,			10	W	М	SS	1					
34 -	10050	(01)(11-1-0)(communua)		¶ ∥				Б							
35 -	-			<b>1</b>		0		Ю							
36 -	SANI	D, a little gravel, medium grain	ned,			9	-	Д	88	0					
37	water	bearing, loose (SP) (A-1-b)						Ц							
38 -						6	W	X	SS	3					
39		•						Б							
40 -	-					5	w	М		3					
41 -						5	vv	Д	55	5					
42	CLA	YEY SAND, a little gravel, ap	parent cobble		TILL			Ц			-				
43 -	at 55',	, brown, soft to stiff (SC/SM)	(A-2-4)			2	W/M	ιXI	SS	18	16				
44	-							$[\mathcal{T}]$							
45 -	-					7	W/M	M	22	18	12				
46	4							Ά	55	10	14				
47 -	-							Ц							
48 -	-					10	W/M	ιX	SS	10	14				
49 -	4							$[\mathcal{I}]$							
50 -	-					28	W/M	M	SS	12	13				
51 -	_					20	11/1	Ά	55	12					
52 -	-							$\left \left\langle \right\rangle \right $							
53 -	-							$\langle \langle$							
54 -	-							$\left \right\rangle$							
55 -	4					117	_	M	SS	0					
56 -	-							A	~~						
57 -	-							$\langle \langle$							
58 -		VEV SAND a little gravel br	own hard					$\langle \langle$							
59 -	(SC)	(A-6)	own, nara					K							
60 -	4					50/.3	M	$\square$	SS	10	10				
61 -	-							$\sum$							
62 -	-							$\left \right\rangle$							
63 -	-							$\left \right\rangle$							
64 -	-							$\sum$	00	0					
	END	OF BORING			1	100/.1	-			V					
NOO															
							Ì								
200															
Į															

# AMERICAN ENGINEERING TESTING

R/20/13

CDIACTTOTTOTIC

#### **CONE PENETRATION TEST RESULTS**

AET JOB NO:	SOUNDING NO.
PROJECT: Southwest Light Rail Transit Project, PEC East; Hopkins to Minneapo	blis   1111 CT (p. 1 of 1)
Location CPT Machine 20 CPT Operator Adams	Surface Elevation 864.9
Hennepin Co. Coordinates: X=517776 Y=161291 (feet) Cone # 4583.119xx	Date Completed: 8/1/13
Interpreted Soil Depth Behavior Type Sleeve Friction Tip Resistance Friction FI UBC 1990 FR (psi) (psi)	on Ratio Pore Pressure %) (psi)
Elevation 0 2 4 6 8 10 100 75 50 25 0 1600 3200 4800 6400 8000 0 2	4 6 8 10 0 10 20 30 40
$ \begin{array}{c}                                     $	
Bottom of Hole 46.37791	

#### AMERICAN ENGINEERING TESTING

### CONE PENETRATION TEST RESULTS

AET JOB NO	e: 01-05697	·		X.					SOUNE	DING NO.	
PROJECT:	Southwest Lig	ght Rail Tra	ansit Proj	ect, PEC E	last; H	opkins (	to Minne	apolis	1112 (	CT (p. 1 of	1)
Location			······			PT Machir PT Operat	ne 20 or Adams		Surface	Elevation 54.4	
Hennepin Co	. Coordinates: X	=517785 Y	=161381	(feet)	C	one #	4583.11	9xx	Date Cor	npleted: 8/	1/13
Depth	Interpreted Soil Behavior Type	Sleeve Fr	iction	Tip Re	esistan (nai)	се	Fi	iction R	Ratio	Pore Pre	essure
Elevation	UBC 1990 FR	( <i>psi)</i> 100 75 50	25 0	( 1600 3200	( <i>psi)</i> ) 4800	6400	8000 0	( <i>70)</i> 2 4 6	6 8 10	0 12 24 3	9 86 48
			WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW	ottom of Hole 7	1.00703				MM	and the second second with the second s	
5	<u></u> .		<u>:</u>		<u>: :_</u> GRAPH	·	<u></u>	<u></u>		Edit: Date	: 8/20/13
								X:\01-GEO	\GINTW1 GIN	IT PROJECTS\01	-05697.GPJ

#### AMERICAN ENGINEERING TESTING

#### CONE PENETRATION TEST RESULTS


## CONE PENETRATION TEST RESULTS

AET JOB NO	): <b>01-05697</b>					SOUNDI	NG NO.
PROJECT:	Southwest Lig	ght Rail Transit P	Project, PEC Eas	st; Hopkins	to Minneapolis	1114 C	Г (р. 1 of 1)
Location	Location CPT Machine 20 CPT Operator Adams						
Hennepin Co	o. Coordinates: X	=517785 Y=1616	66 (feet)	Cone #	4583.119xx	Date Com	pleted: 8/1/13
Depth . Elevation	Interpreted Soil Behavior Type UBC 1990 FR	Sleeve Friction (psi)	Tip Res (ps	istance si)	Friction R (%)	Patio	Pore Pressure (psi)
$ \begin{array}{c} 0 \\ 864.5 \\ 5 \\ 859.5 \\ 10 \\ 854.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 839.5 \\ 20 \\ 844.5 \\ 20 \\ 839.5 \\ 20 \\ 844.5 \\ 20 \\ 839.5 \\ 20 \\ 844.5 \\ 20 \\ 839.5 \\ 20 \\ 844.5 \\ 20 \\ 839.5 \\ 20 \\ 834.5 \\ 20 \\ 20 \\ 834.5 \\ 20 \\ 20 \\ 834.5 \\ 20 \\ 20 \\ 834.5 \\ 20 \\ 20 \\ 834.5 \\ 20 \\ 20 \\ 834.5 \\ 20 \\ 20 \\ 834.5 \\ 20 \\ 20 \\ 20 \\ 20 \\ 20 \\ 20 \\ 20 \\ 20$			Bottom of Hole 68.	6000 8000			Edit: Date: 8/20/15
					X:\01-GEO	GINTW1 GINT	PROJECTS\01-05697.GPJ

AMERICAN ENGINEERING TESTING

#### **Monitoring Well/Piezometer Log** American Engineering Testing, Inc. 1066 PS Well No.: 01-05697 AET Job No.: Southwest Light Rail Transit Project, PEC East Unique Well No.: Project: HSA Drilling Method: N155687, E511232 Location: None Drilling Fluids (type): 5/15/13 Date Installed: SG/SB Completed by: JV Project Manager: **Annular Space Details** Top of Protective Casing 2.5 2.4 Top of Riser Pipe Type of Surface Seal: Concrete 0.0 Ground Surface Type of Annular Sealant: Bentonite Grout Top of Annular Sealant 1.0 Type of Bentonite Seal (Granular Pellet): None Type of Sand Pack: #30 Red Flint Sand Bottom of Protective Casing 4.5 **Well Construction Materials** Stainless Steel Specify Type PVC Specify Type Other Specify Type N/A Top of Seal 22.0 Top of Sand 2 " FT .... Riser Coupling Joint ---2 " FT -------Riser Pipe Above w.t. 2 " FT Riser Pipe Below w.t. --------2 " FT ..... ----24.0 Top of Screen Screen None -------Protective Posts 6" Steel ----Protective Casing --to 0.1 ft (where applicable) Measurements 7' Steel Protective Casing Length 26.4' Riser Pipe Length 10' Screen Length .010" Screen Slot Size 890.2 Top of Riser Elevation 887.8 Ground Surface Elevation 14.4' (5/15/13) Depth to Water 873.4' (5/15/13) Water Elevation 873.8' (6/6/13 & 7/10/13) Other Bottom of Screen 81/4" 34.0 874.3' (5/15/14) Do Bottom of Borehole 37'

## SIEVE ANALYSIS TEST RESULTS

PROJECT:AET NO.: 01-05697Southwest LRT, PEC EastDATE: August 19, 2014

**TEST METHOD:** General conformance with ASTM:D6913, Method A

#### **RESULTS:**

Boring Number	1005 SB	1038 ST	1041 ST
Sample Depth	4½'-6'	19½'-21'	19½'-21'
Dry Sample Weight (gms)	140.71	264.92	381.49
Sieve Size or Number	Pe	rcent Passing by Wei	ght
1"	100	100	100
3/4"	91	100	87
5/8"	91	94	83
1/2"	89	88	78
3/8"	85	81	73
#4	80	74	63
#10	68	68	52
#20	54	54	41
#40	36	20	23
#100	18	4.8	12
#200	14	3.8	8.8

Note: The small sample size limits the accuracy of the test, and the sample may not necessarily be representative of the entire layer shown on the boring log

## SIEVE ANALYSIS TEST RESULTS

**PROJECT:** 

**AET NO.:** 01-05697

Southwest LRT, PEC East Hopkins to Minneapolis, Minnesota

**DATE:** June 22, 2014

## **TEST METHOD:** General conformance with ASTM:D6913, Method A

#### **RESULTS:**

Boring Number	1009	1010	1044	1044	1064	1073	1073
Sample Depth	2'-3½'	4 <sup>1</sup> /2'-6'	2'-3½'	41⁄2'-6'	2'-4'	2'-4'	41/2'-61/2'
Dry Sample Weight (gms)	237.12	289.00	236.44	158.45	167.75	289.79	291.9
Sieve Size or Number			Percent	Passing By	Weight		
1-1/2"	100	100	100	100	100	100	100
1"	100	89	100	100	100	89	100
3/4"	100	87	94	100	100	89	100
5/8"	100	86	94	90	91	85	100
1/2"	96	78	94	90	87	82	98
3/8"	93	73	92	83	83	78	94
#4	82	66	88	78	75	70	84
#10	70	54	84	71	64	56	70
#20	54	41	70	61	52	38	50
#40	32	25	45	47	41	23	30
#100	17	13	17	23	26	10	13
#200	13	9.6	12	18	21	7.9	10

*Note:* The small sample size limits the accuracy of the test, and the sample may not necessarily be representative of the entire layer shown on the boring log.

AMERICAN ENGINEERING TESTING, INC.

## SIEVE ANALYSIS TEST RESULTS

#### **PROJECT:**

## **AET NO.:** 01-05697

Southwest LRT, PEC East Hopkins to Minneapolis, Minnesota

## **DATE:** June 22, 2014

## **TEST METHOD:** General conformance with ASTM:D6913, Method A

### **RESULTS:**

Boring Number	1074	1078	1080	1080	1081	1084	1092
Sample Depth	2'-4'	2'-4'	2'-4'	4½'-6½'	2'-4'	2'-4'	2'-4'
Dry Sample Weight (gms)	279.79	175.51.	287.96	260.60	248.99	267.66	263.00
Sieve Size or Number			Percent	Passing By	Weight		
1-1/2"	100	100	100	100	100	100	100
1"	100	100	85	100	100	100	100
3/4"	89	100	85	86	100	95	93
5/8"	84	100	79	86	100	95	93
1/2"	82	97	72	84	95	89	91
3/8"	80	92	69	84	93	89	.91
#4	71	84	62	76	81	81	79
#10	59	70	52	67	68	68	62
#20	45	54	41	54	52	50	47
#40	28	38	27	37	31	29	31
#100	10	22	12	12	7.9	11	15
#200	7.5	19	8.9	8.3	5.2	8.2	11

Note: The small sample size limits the accuracy of the test, and the sample may not necessarily be representative of the entire layer shown on the boring log.



Pressure, p (ton/ft<sup>2</sup>)

		Before	After	Liquid Limit (%):	94	<b>Test Date:</b> 5/23/13
Water Content (%	%):	57.49	54.39	Plastic Limit (%):	63	
Dry Density (pcf)	:	59.79	67.87	Plasticity Index (%):	31	
Saturation (%):		91.62	108.09			
Void Ratio:		1.5026	1.0261	Specific Gravity:	2.40	Measured
Sample Description	on:	Organic Silt (	OH)			
Boring Number:		B-1012	<b>.</b>	<b>Depth:</b> 44.5-46.5	meters:	
Remarks: Test conducted in		ed in general a	ccordance wit	h ASTM D2435	Preconsol Compress Recompre	lidation Pressure (Pc): 1.7 tsf sion Index (Cc): 0.715 ession Index (Cr): 0.135
Tested By: B	enjamin Po	omroy		Reviewed By:	Jeff Voye	en ·



Pressure, p (ton/ft<sup>2</sup>)

	Before	After	Liquid Limit (%):		<b>Test Date:</b> 7/24/2013	
Water Content (%):	249.21	130.61	Plastic Limit (%):			
Dry Density (pcf):	19.79	34.80	Plasticity Index (%):	T		
Saturation (%):	95.29	104.07				
Void Ratio:	4.8616	2.3802	Specific Gravity:	1.856	Measured	
Sample Description:	Sapric Peat (I	PT)				
Boring Number:	B-1036		<b>Depth:</b> 22-24	Soil Parameters:		
Remarks: Test conducte	ed in general accordance with ASTM D2435			Preconsolidation Pressure (Pc): 0.9 tsf		
-				Compressi	on Index (Cc): 2.658	
				Recompre	ssion Index (Cr): 0.438	
Tested Put Poniamin Da			Poviewed Pv	loff Vava	n	
resteu by: Benjamin Po	эптоу		Revieweu By:	Jen voye	[]	



		Before	After	Liquid Limit (%):		<b>Test Date:</b> 9/6/2013	
Water Content (%):		214.49	134.53	Plastic Limit (%):			
Dry Density (	Dry Density (pcf):		33.15	Plasticity Index (%):			
Saturation (%	<b>(6):</b>	95.33	97.77				
Void Ratio:		4.4193	2.5926	Specific Gravity:	1.972	Measured	
Sample Desci	ription:	Sapric Peat (P)	Г)				
Boring Number:		1053 SS		<b>Depth:</b> 24.5-26.5	Soil Parameters:		
Remarks:	Test conduc Air compres	ted in general acc sor failed during	cordance wit 16tsf	h ASTM D2435	Preconsolidation Pressure (Pc): 1.3 tsf Compression Index (Cc): 2.557 Recompression Index (Cr): 0.469		
Tested By:	Benjamin F	omroy		Reviewed By:	Jeff Voye	อก	



		Before	After	Liquid Limit (%):		Test Date:	
Water Content (%):		189.45	111.01	Plastic Limit (%):			
Dry Density (	ocf):	25.64	39.50	Plasticity Index (%):			
Saturation (%	):	98.33	103.59				
Void Ratio:		3.7861	2.1058	Specific Gravity:	1.967	Measured	
Sample Descri	ption:	Peat					
Boring Number:		1213 SB		<b>Depth:</b> 9'-11'	Soil Parameters:		
Remarks: Test conducte		ed in general ac	cordance wit	h ASTM D2435	Preconsol Compress Recompre	idation Pressure (Pc): 0.5 tsf ion Index (Cc): 1.860 ession Index (Cr): 0.383	
Tested By:	Benjamin Po	omroy		Reviewed By:	Jeff Voye	en	

# **Appendix C**

Geotechnical Report Limitations and Guidelines for Use

#### **B.1 REFERENCE**

This appendix provides information to help you manage your risks relating to subsurface problems which are caused by construction delays, cost overruns, claims, and disputes. This information was developed and provided by ASFE<sup>1</sup>, of which, we are a member firm.

#### **B.2 RISK MANAGEMENT INFORMATION**

#### **B.2.1** Geotechnical Services are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared solely for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. And no one, not even you, should apply the report for any purpose or project except the one originally contemplated.

#### **B.2.2 Read the Full Report**

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

#### B.2.3 A Geotechnical Engineering Report is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typically factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, always inform your geotechnical engineer of project changes, even minor ones, and request an assessment of their impact. Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.

#### **B.2.4** Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. Do not rely on a geotechnical engineering report whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. Always contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

ASFE, 8811 Colesville Road/Suite G106, Silver Spring, MD 20910 Telephone: 301/565-2733 : <u>www.asfe.org</u>

## Appendix C Geotechnical Report Limitations and Guidelines for Use Report No. 01-05697.01

#### **B.2.5** Most Geotechnical Findings Are Professional Opinions

Site exploration identified subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

#### **B.2.6 A Report's Recommendations Are Not Final**

Do not overrely on the construction recommendations included in your report. Those recommendations are not final, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.

#### **B.2.7** A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

#### **B.2.8** Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk.

#### **B.2.9** Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, but preface it with a clearly written letter of transmittal. In the letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need to prefer. A prebid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

#### **B.2.10 Read Responsibility Provisions Closely**

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their report. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

#### **B.2.11** Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a geoenvironmental study differ significantly from those used to perform a geotechnical study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Unanticipated environmental problems have led to numerous project failures. If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. Do not rely on an environmental report prepared for someone else.