

AET JO		nt Rail Tr	ransit Pr	niect	PEC Fact.			BORING I						
PROJEC				•			48101		<b>^</b>	49543	0			
	CE ELEVATION:922.3		Hennepin C	.0. C00	rdinates: <u>N</u>		4010		Ī	T		BORA	TODY	TEST
DEPTH IN FEET	MATERIAL I	DESCRIPTIO	)N		GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	WC	DEN	1		1ES %-#
1 - 2 -	FILL, mostly clayey sand little plastic, trace roots, da \(A-2-6) FILL, mostly gravelly silty	ark brown,	frozen		FILL		F	22222		12				
3 - 4 -	brown, frozen (A-1-b)	-			-	_	F							
5 - 6 -	LEAN CLAY, brown, a li (CL) (A-6)	•			FINE ALLUVIUM	7	M	st Ss F	8	26		¢		
7 -	GRAVELLY SAND, fine light brown, moist, medium of silt (SP) (A-1-b)	to medium n dense, la	grained, minations		COARSE ALLUVIUM	24	M	k ss	14					
9 — 10 — 11 —	GRAVELLY SAND, fine light grayish brown, moist (A-1-b)	to medium , medium c	grained, lense (SP)			28	M	되 Ss 고	13					
12 - 13 - 14 -	SAND WITH GRAVEL, 1 brown, moist, medium der	nse (SP) (A	-1-b)			23	М	뇌 X ss 관	11	-				
14 — 15 — 16 —	SAND WITH GRAVEL, 1 grained, brown, moist, me (A-1-b)	dium dense	e (SP)			16	. <b>M</b>	날 Ss 된	10					
17 – 18 –	CLAYEY SAND, a little g stiff, a lamination of silty s	gravel, brov sand (SC) (	vn, very A-6)		TILL	19	M	남 X ss 관	16	12	-	-		
19 — 20 — 21 —	SANDY LEAN CLAY, a brown mottled, very stiff, silty sand and sandy silt (C	laminations	l, gray and s of sand,			18	 M/W	ss	17	17			-	
	END OF BORING													
													-	
DEP'	TH: DRILLING METHOD	-		WAT	ER LEVEL ME	ASURI	 EMEN'	 rs					DEFE	
0-19		DATE	TIME	SAMPI DEPI		1	/E-IN PTH	DRILLI FLUID LI		WATI LEVE	ER	NOTE: THE A		
		3/3/14	12:47	21.(			0.9			20.7		SHEET	S FOF	R AN
		3/3/14	12:55	21.0	) 19.5		0.8			19.5		XPLA	NATIC	)N (
BORIN	G LETED: <b>3/3/14</b>											ERMIN	IOLOC	GY (
COMPT	A LG: SG Rig: 85C					+						TI	IS LOO	~



AET JO	B NO: 01-05697					LC	)G OF	BORINO	3 NO	1193	B ST	<b>(p.</b> 1	l of ]	<u>l)</u>
PROJEC	CT: Southwest Ligh	t Rail Tr	ansit Pro	oject,	PEC East;	Hop	kins	to Mir	neapo	olis				
SURFAC	CE ELEVATION: 922.1	l	Hennepin C	o. Coo	rdinates: <u>1</u>	<u>1</u>	4791	5	<u> </u>	49501	5		<u></u>	
DEPTH IN FEET	MATERIAL D	ESCRIPTIC	) N		GEOLOGY	N	MC	SAMPI	E REC		) & LA	BORAT		1
FÊÈT									IN.	WC	DEN	LL	PL	<b>%-</b> #2
1 -	FILL, mostly silty sand wit gravel, trace roots, dark bro		fines and		FILL		F							
2	FILL, mostly sand with silt brown, frozen (A-1-b)	and grave	el, dark				F	7	•					
4	GRAVELLY SAND, medi brown, moist, medium den	um to fine se (SP) (A	grained, -1-b)		COARSE ALLUVIUM	15	М	₽ X ss	6					
6 — 7 — 8 —	SAND WITH SILT AND fine grained, brown, moist, (SP-SM) (A-1-b)	GRAVEL, medium d	medium to lense		· 	13	м	E ss	8					
9 — 10 — 11 —	CLAYEY SAND, a little g dense, laminations of sand	ravel, brov (SC/SM) (	vn, medium (A-2-4)	n ///	TILL	15	М	SS A	16	7				
12 - 13 - 14 -	CLAYEY SAND, a little g light brown, medium dense lenses of sand (SC/SM) (A	e, laminatio	vn, a little ons and			14	M	ע א se רז	12	10				
15 — 16 — 17 —	CLAYEY SAND, a little g dense to loose, laminations (A-2-4)	ravel, brow of sand (S	vn, mediun SC/SM)	n ///		24	M	s:	0					
17 18 - 19 -						10	<b>T</b>	X ss स	17	12				
20 -	SILTY SAND, a little grav (A-2-4)	el, brown,	loose (SM	)		10	M/W		5 17					
21 -	END OF BORING			-										
		·				-								
DEP	TH: DRILLING METHOD		<u>.</u>	WAT	ER LEVEL ME	ASUR	l EMEN	⊥ TS			ŀ	I NOTE:	DEFE	<u> </u>
		DATE	TIME	SAMP DEP			VE-IN PTH	DRII	LING	WAT	ER	THE A		
0-19	9 <sup>1</sup> / <sub>2</sub> ' 3.25" HSA							FLUID	LEVEL	LEVI	EL	SHEET		
	· · · · · · · · · · · · · · · · · · ·	3/3/14	11:16	21.			1.0			<u> </u>		EXPLA		
BORIN	G	3/3/14	11:51	21.	0 19.5	2	0.5			18.	•	ERMIN		
COMPI	LETED: 3/3/14												IS LO	
$\frac{DR: T}{03/2011}$	A LG: SB Rig: 85C							1					01-D	

03/2011



B NO: 01-05697					LC	OG OF	BORING N	10	1194	I ST	(p. 1	of 1	<u>)</u>				
T: Southwest Ligh	t Rail Tra	ansit Pro	oject,	PEC East;	Hopl	kins	to Minn	eapo	lis								
E ELEVATION: 922.5	H	lennepin C	o. Cooi	dinates: <u>N</u>	1	47674	4	E é	49436	5							
	ESCRIPTIO	N		GEOLOGY	N	MC	SAMPLE	REC	FIELI	) & LA	BORAT	ORYI	res'				
		. ч			11	INIC	TYPE	ĪN.	WC	DEN	LL	PL	<b>%-</b> #:				
little gravel, trace roots, dar (A-2-6)	k brown, fi	rozen		FILL		F			9	-							
FILL, mostly clayey sand, a roots, dark brown (A-2-6)	a little grav	el, trace				F			8								
little gravel and clayey sand	l, trace root	e fines, a ts, dark			9	M	ss	10	12	I							
SAND, a little gravel, fine t light brown, moist, medium	o medium 1 dense (SP	grained, ) (A-3)		COARSE ALLUVIUM	27	М	SS	7		-							
GRAVELLY SAND, fine t light brown, moist, medium	o medium 1 dense (SP	grained, ) (A-1-b)			22	M	SS SS	9									
CLAYEY SAND WITH G little light brown, very stiff (SC) (A-6)	RAVEL, b , a laminati	rown, a on of sand	1	TILL	19	М	SS A	6	10								
SILTY SAND, a little grav dense, a lens of sandy lean	el, brown, clay (SP-S	medium M) (A-2-4	)	· · ·	15	M	上 X ss	14									
CLAYEY SAND, a little g light brown, very stiff, a lar (A-2-6)	ravel, brow nination of	n, a little sand (SC			16	M	SS R	11	10								
CLAYEY SAND, a little g (SC) (A-6)	ravel, brow	n, stiff			12	·M	比 X ss	16	12			· ·					
END OF BORING	· · ·												T				
											-						
									-								
		·															
TH: DRILLING METHOD			WAT	ER LEVEL ME	ASUR	EMEN	I I I I I I I I I I I I I I I I I I I	<u> </u>	1	<u> </u> .		) DEEE	<u> </u>				
	DATE	TIME	1	Г	1		1	NG EVEL	WAT	ER							
9½' 5.25'' HSA	3/3/14	10.20									SHEE	IS FOI	R Al				
	5/5/17	10.20	41.	17.5			-		1 101		EXPLA	NATIO	)N (				
G							-			1	ERMIN	10LOC	ΞY				
LETED: 3/3/14										1		• •	-				
	T: Southwest Light T: Southwest Light E ELEVATION: 922.5 MATERIAL D FILL, mostly clayey sand w little gravel, trace roots, dar (A-2-6) FILL, mostly clayey sand, a roots, dark brown (A-2-6) FILL, mostly clayey sand w little gravel and clayey sand brown, a little brown (A-2-6) SAND, a little gravel, fine t light brown, moist, medium GRAVELLY SAND, fine t light brown, moist, medium CLAYEY SAND WITH G little light brown, very stiff. (SC) (A-6) SILTY SAND, a little grav. dense, a lens of sandy lean CLAYEY SAND, a little grav. dense, a lens of sandy lean CLAYEY SAND, a little gr (SC) (A-6) END OF BORING TH: DRILLING METHOD 9/2' 3.25'' HSA	T:       Southwest Light Rail Transmer         E ELEVATION:       922.5       H         MATERIAL DESCRIPTION       FILL, mostly clayey sand with organic little gravel, trace roots, dark brown, fr (A-2-6)         FILL, mostly clayey sand, a little grav roots, dark brown (A-2-6)       FILL, mostly clayey sand, a little grav roots, dark brown (A-2-6)         FILL, mostly clayey sand with organic little gravel and clayey sand, trace root brown, a little gravel, fine to medium light brown, moist, medium dense (SP         GRAVELLY SAND, fine to medium light brown, moist, medium dense (SP         CLAYEY SAND WITH GRAVEL, b little light brown, very stiff, a laminati (SC) (A-6)         SILTY SAND, a little gravel, brown, i dense, a lens of sandy lean clay (SP-S)         CLAYEY SAND, a little gravel, brown (SC) (A-6)         END OF BORING         TH:       DRILLING METHOD         D/2'       3.25" HSA         DATE         3/3/14	T:       Southwest Light Rail Transit Pro- E ELEVATION:       922.5       Hennepin C         MATERIAL DESCRIPTION       MATERIAL DESCRIPTION         FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)       FILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)         FILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)       FILL, mostly clayey sand, trace roots, dark brown, a little brown (A-2-6)         SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) (A-3)         GRAVELLY SAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)         CLAYEY SAND WITH GRAVEL, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)         SILTY SAND, a little gravel, brown, medium dense, a lens of sandy lean clay (SP-SM) (A-2-4)         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC (A-2-6)         CLAYEY SAND, a little gravel, brown, stiff (SC) (A-6)         END OF BORING         TH:       DRILLING METHOD         DM'       3/3/14         MATE       TIME         3/3/14       10:20	Southwest Light Rail Transit Project,         922.5       Hennepin Co. Coor         MATERIAL DESCRIPTION         FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)         FILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)         FILL, mostly clayey sand, a little gravel, trace roots, dark brown, (A-2-6)         FILL, mostly clayey sand with organic fines, a little gravel and clayey sand, trace roots, dark brown, a little gravel and clayey sand, trace roots, dark brown, a little gravel and clayey sand, trace roots, dark brown, a little gravel and clayey sand, trace roots, dark brown, a little gravel and clayey sand, trace roots, dark brown, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)         CLAYEY SAND, fine to medium grained, light brown, wery stiff, a lamination of sand (SC) (A-6)         SILTY SAND, a little gravel, brown, medium dense, a lens of sandy lean clay (SP-SM) (A-2-4)         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-2-6)         CLAYEY SAND, a little gravel, brown, stiff (SC) (A-6)         WITH OR BORING         WAT         MATE         MATE         TIME         ATE         TY SAND, a little gravel, brown, stiff (SC) (A-6) <td>Southwest Light Rail Transit Project, PEC East;         EELEVATION:       922.5       Hennepin Co. Coordinates:       N         MATERIAL DESCRIPTION       GEOLOGY         FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)       FILL       FILL         FILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)       FILL, mostly clayey sand, race roots, dark brown, (A-2-6)       FILL         FILL, mostly clayey sand, trace roots, dark brown, a little gravel and clayey sand, trace roots, dark brown, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) (A-3)       COARSE ALLUVIUM         GRAVELLY SAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)       TILL         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       TILL         SILTY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       TILL         CLAYEY SAND, a little gravel, brown, stiff (SC) (A-6)       END OF BORING         END OF BORING       WATER LEVEL ME         W/       3.25'' HSA       DATE       TIME       SAMPLED       CASING DEPTH         0//       3/3/14       10:20       21.0       19.5</td> <td>Southwest Light Rail Transit Project, PEC East; Hopl E ELEVATION: 92.5 Hennepin Co. Coordinates: N I MATERIAL DESCRIPTION GEOLOGY N          FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)       FILL       FILL         FILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)       FILL       9         SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) (A-3)       COARSE ALLUVIUM 27       27         GRAVELLY SAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)       11       19         SLTY SAND, a little gravel, brown, a little gravel stiff, a lamination of sand (SC) (A-6)       TILL       19         SLTY SAND, a little gravel, brown, nedium dense, a lens of sandy lean clay (SP-SM) (A-2-4)       16       16         CLAYEY SAND, a little gravel, brown, stiff (SC) (A-6)       12       16         ELYEY SAND, a little gravel, brown, stiff       12       16         CLAYEY SAND, a little gravel, brown, stiff       12       16         CLAYEY SAND, a little gravel, brown, stiff       12       16         CLAYEY SAND, a little gravel, brown, stiff       12       16         CLAYEY SAND, a little gravel, brown, stiff       12       16         END OF BORING       VATER LEVEL MEASUR       16         MIT       DATE       TIME</td> <td>Southwest Light Rail Transit Project, PEC East; Hopkins         E ELEVATION:       922.5       Hennepin Co. Coordinates:       N       14767.         MATERIAL DESCRIPTION       GEOLOGY       N       MC         FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)       FILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)       FILL, mostly clayey sand, trace roots, dark brown, a little brown, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) (A-3)       QCARSE ALLUVIUM       27       M         GRAVELLY SAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)       ILL       19       M         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       15       M         SILTY SAND, a little gravel, brown, a little gravel, brown, stiff       16       M         CLAYEY SAND, a little gravel, brown, stiff       12       M         CLAYEY SAND, a little gravel, brown, stiff       12       M         END OF BORING       VATER LEVEL MEASUREMEN       Image: tevel measurements       Image: tevel measurements         W'       3/3/14       10:20       21.0       19.5       20.8</td> <td>Southwest Light Rail Transit Project, PEC East; Hopkins to Minn         E ELEVATION:       92.5       Hennepin Co. Coordinates:       N       147674         MATERIAL DESCRIPTION       GEOLOGY       N       MC       SAMPLE         FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)       FILL, mostly clayey sand, a little gravel, trace roots, dark brown, a little gravel and clayey sand, trace roots, dark brown, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) (A-3)       FILL       7       M       SS         GRAVELLY SAND, fine to medium grained, light brown, noist, medium dense (SP) (A-1-b)       TILL       19       M       SS         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       TILL       19       M       SS         SILTY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       16       M       SS         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       16       M       SS         END OF BORING       VATER LEVEL MEASUREMENTS       VATER LEVEL MEASUREMENTS       DATE       TIME       SAMPLE       DATE       &lt;</td> <td>Southwest Light Rail Transit Project, PEC East; Hopkins to Minneapo         TE ELEVATION:       922.5       Hennepin Co. Coordinates:       N       147674       E         MATERIAL DESCRIPTION       GELOGGY       N       MC       SAMPLE       FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown (A-2-6)       FILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)         FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown (A-2-6)       COARSE       9       M       SS       7         GRAVELLY SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)       COARSE       9       M       SS       9         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC)       15       M       SS       14         CLAYEY SAND, a little gravel, brown, stiff       SS       16       M       SS       16         SS       16       M       SS       16       M       SS       16         CLAYEY SAND, a little gravel, brown, stiff       SS       16       M       SS       16         CLAYEY SAND, a little gravel, br</td> <td>Southwest Light Rail Transit Project, PEC East; Hopkins to MinneapolisE ELEVATION:922.5Hennepin Co. Coordinates:N147674E49436MATERIAL DESCRIPTIONGEOLOGYNMcSAMPLE NTEFRCHELL WCFILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)FILLGEOLOGYNMcSAMPLE NTEFRCHEL WCFILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)FILLFILLFR98FILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)FFR8GRAVELLY SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)COARSE ALLUVIUM RS9MSS7CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)TILL19MSS14CLAYEY SAND, a little gravel, brown, a little gravel, brown, medium dense, a lens of sandy lean clay (SP-SM) (A-2-4)15MSS11CLAYEY SAND, a little gravel, brown, a little gravel, brown, suffiIIItle12MSS1612KWSS1612MSS1612MO F BORINGWWWSS1612MWSS1612MSS1612MSS1612MSS1612M<th< td=""><td>Southwest Light Rail Transit Project, PEC East; Hopkins to Minneapolis         Interprint Co. Coordinates: N 147674 E 494365         MATERIAL DESCRIPTION       GEOLOGY       N       Mc       SAMPLE       FEC.       FRID. &amp; LA         FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)       FILL, mostly clayey sand, a little gravel, trace roots, dark brown, and little gravel, trace roots, dark brown, frazen (A-2-6)       FILL, mostly clayey sand, trace roots, dark brown, frazen (A-2-6)       9       M       SS       10       12         SAND, a little gravel, trace roots, dark brown, moist, medium dense (SP) (A-3)       COARSE ALLUVIUM       9       M       SS       7       8         CLAYEY SAND, fine to medium grained, light brown, worst, medium dense (SP) (A-1-b)       22       M       SS       9       M       SS       6       10         SULTY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       12       M       SS       11       10         CLAYEY SAND, a little gravel, brown, stiff (SC) (A-6)       12       M       SS       14       12         FND OF BORING       VATER LEVEL INFAMENTS       VATER LEVEL MEASUREMENTS       VATER LEVEL MEASUREMENTS       VATER LEVEL MEASUREMENTS         PX'       325' HSA       DATE       TIME       S</td><td>T: Southwest Light Rail Transit Project, PEC East; Hopkins to Minneapolis         Integravel, 1923       Hennepin Co. Coordinates: N       147674       E       494365         MATERIAL DESCRIPTION       GEOLOGY       N       MC       SAMPLE       RIC       PIELD &amp; LABORAT         FILL, mostly clavey sand with organic fines, a little gravel, trace roots, dark brown (A-2-6)       F       I       9       M       SS       10       I         FILL, mostly clavey sand, al little gravel, trace roots, dark brown (A-2-6)       F       I       9       M       SS       10       I         FILL, mostly clavey sand, trace roots, dark brown, five and theory (A-2-6)       COARSE         FILL       SS       10       I         GRAVELLY SAND, fine to medium grained, light brown, rest, medium dense (SP) (A-1-b)       IIL         IIL       IIIL         IIIL       IIIL         IIIL       IIIL         III A I       <th <="" colspan="4" td=""><td>Southwest Light Rail Transit Project, PEC East; Hopkins to Minneapolis         ELENVATION:       922.5       Hencein Co. Coordinates:       N       147674       E       494365         MATERIAL DESCRIPTION       GEOLOGY       N       Md Staboratory 1         FILL, mostly clayey sand with organic fines, a liftle gravel, trace roots, dark brown, frozen (A-2-6)       FILL, mostly clayey sand, a liftle gravel, trace roots, dark brown, (A-2-6)         SAND, a liftle gravel, trace roots, dark brown, frozen (A-2-6)       COARSE HALL VAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)       COARSE ALL VAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)         CLAYEY SAND WITH GRAVEL, brown, a little gravel, three roots, dark brown, most, medium dense (SP) (A-2-4)       TILL       19       M       SS 5       0         CLAYEY SAND WITH GRAVEL, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       10       11       10       12       10         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC)       12       M       SS       10       12       10         CLAYEY SAND, a little gravel, brown, stiff       ISC       12       M       S</td></th></td></th<></td>	Southwest Light Rail Transit Project, PEC East;         EELEVATION:       922.5       Hennepin Co. Coordinates:       N         MATERIAL DESCRIPTION       GEOLOGY         FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)       FILL       FILL         FILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)       FILL, mostly clayey sand, race roots, dark brown, (A-2-6)       FILL         FILL, mostly clayey sand, trace roots, dark brown, a little gravel and clayey sand, trace roots, dark brown, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) (A-3)       COARSE ALLUVIUM         GRAVELLY SAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)       TILL         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       TILL         SILTY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       TILL         CLAYEY SAND, a little gravel, brown, stiff (SC) (A-6)       END OF BORING         END OF BORING       WATER LEVEL ME         W/       3.25'' HSA       DATE       TIME       SAMPLED       CASING DEPTH         0//       3/3/14       10:20       21.0       19.5	Southwest Light Rail Transit Project, PEC East; Hopl E ELEVATION: 92.5 Hennepin Co. Coordinates: N I MATERIAL DESCRIPTION GEOLOGY N          FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)       FILL       FILL         FILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)       FILL       9         SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) (A-3)       COARSE ALLUVIUM 27       27         GRAVELLY SAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)       11       19         SLTY SAND, a little gravel, brown, a little gravel stiff, a lamination of sand (SC) (A-6)       TILL       19         SLTY SAND, a little gravel, brown, nedium dense, a lens of sandy lean clay (SP-SM) (A-2-4)       16       16         CLAYEY SAND, a little gravel, brown, stiff (SC) (A-6)       12       16         ELYEY SAND, a little gravel, brown, stiff       12       16         CLAYEY SAND, a little gravel, brown, stiff       12       16         CLAYEY SAND, a little gravel, brown, stiff       12       16         CLAYEY SAND, a little gravel, brown, stiff       12       16         CLAYEY SAND, a little gravel, brown, stiff       12       16         END OF BORING       VATER LEVEL MEASUR       16         MIT       DATE       TIME	Southwest Light Rail Transit Project, PEC East; Hopkins         E ELEVATION:       922.5       Hennepin Co. Coordinates:       N       14767.         MATERIAL DESCRIPTION       GEOLOGY       N       MC         FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)       FILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)       FILL, mostly clayey sand, trace roots, dark brown, a little brown, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) (A-3)       QCARSE ALLUVIUM       27       M         GRAVELLY SAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)       ILL       19       M         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       15       M         SILTY SAND, a little gravel, brown, a little gravel, brown, stiff       16       M         CLAYEY SAND, a little gravel, brown, stiff       12       M         CLAYEY SAND, a little gravel, brown, stiff       12       M         END OF BORING       VATER LEVEL MEASUREMEN       Image: tevel measurements       Image: tevel measurements         W'       3/3/14       10:20       21.0       19.5       20.8	Southwest Light Rail Transit Project, PEC East; Hopkins to Minn         E ELEVATION:       92.5       Hennepin Co. Coordinates:       N       147674         MATERIAL DESCRIPTION       GEOLOGY       N       MC       SAMPLE         FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)       FILL, mostly clayey sand, a little gravel, trace roots, dark brown, a little gravel and clayey sand, trace roots, dark brown, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) (A-3)       FILL       7       M       SS         GRAVELLY SAND, fine to medium grained, light brown, noist, medium dense (SP) (A-1-b)       TILL       19       M       SS         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       TILL       19       M       SS         SILTY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       16       M       SS         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       16       M       SS         END OF BORING       VATER LEVEL MEASUREMENTS       VATER LEVEL MEASUREMENTS       DATE       TIME       SAMPLE       DATE       <	Southwest Light Rail Transit Project, PEC East; Hopkins to Minneapo         TE ELEVATION:       922.5       Hennepin Co. Coordinates:       N       147674       E         MATERIAL DESCRIPTION       GELOGGY       N       MC       SAMPLE       FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown (A-2-6)       FILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)         FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown (A-2-6)       COARSE       9       M       SS       7         GRAVELLY SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)       COARSE       9       M       SS       9         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC)       15       M       SS       14         CLAYEY SAND, a little gravel, brown, stiff       SS       16       M       SS       16         SS       16       M       SS       16       M       SS       16         CLAYEY SAND, a little gravel, brown, stiff       SS       16       M       SS       16         CLAYEY SAND, a little gravel, br	Southwest Light Rail Transit Project, PEC East; Hopkins to MinneapolisE ELEVATION:922.5Hennepin Co. Coordinates:N147674E49436MATERIAL DESCRIPTIONGEOLOGYNMcSAMPLE NTEFRCHELL WCFILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)FILLGEOLOGYNMcSAMPLE NTEFRCHEL WCFILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)FILLFILLFR98FILL, mostly clayey sand, a little gravel, trace roots, dark brown (A-2-6)FFR8GRAVELLY SAND, a little gravel, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)COARSE ALLUVIUM RS9MSS7CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)TILL19MSS14CLAYEY SAND, a little gravel, brown, a little gravel, brown, medium dense, a lens of sandy lean clay (SP-SM) (A-2-4)15MSS11CLAYEY SAND, a little gravel, brown, a little gravel, brown, suffiIIItle12MSS1612KWSS1612MSS1612MO F BORINGWWWSS1612MWSS1612MSS1612MSS1612MSS1612M <th< td=""><td>Southwest Light Rail Transit Project, PEC East; Hopkins to Minneapolis         Interprint Co. Coordinates: N 147674 E 494365         MATERIAL DESCRIPTION       GEOLOGY       N       Mc       SAMPLE       FEC.       FRID. &amp; LA         FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)       FILL, mostly clayey sand, a little gravel, trace roots, dark brown, and little gravel, trace roots, dark brown, frazen (A-2-6)       FILL, mostly clayey sand, trace roots, dark brown, frazen (A-2-6)       9       M       SS       10       12         SAND, a little gravel, trace roots, dark brown, moist, medium dense (SP) (A-3)       COARSE ALLUVIUM       9       M       SS       7       8         CLAYEY SAND, fine to medium grained, light brown, worst, medium dense (SP) (A-1-b)       22       M       SS       9       M       SS       6       10         SULTY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       12       M       SS       11       10         CLAYEY SAND, a little gravel, brown, stiff (SC) (A-6)       12       M       SS       14       12         FND OF BORING       VATER LEVEL INFAMENTS       VATER LEVEL MEASUREMENTS       VATER LEVEL MEASUREMENTS       VATER LEVEL MEASUREMENTS         PX'       325' HSA       DATE       TIME       S</td><td>T: Southwest Light Rail Transit Project, PEC East; Hopkins to Minneapolis         Integravel, 1923       Hennepin Co. Coordinates: N       147674       E       494365         MATERIAL DESCRIPTION       GEOLOGY       N       MC       SAMPLE       RIC       PIELD &amp; LABORAT         FILL, mostly clavey sand with organic fines, a little gravel, trace roots, dark brown (A-2-6)       F       I       9       M       SS       10       I         FILL, mostly clavey sand, al little gravel, trace roots, dark brown (A-2-6)       F       I       9       M       SS       10       I         FILL, mostly clavey sand, trace roots, dark brown, five and theory (A-2-6)       COARSE         FILL       SS       10       I         GRAVELLY SAND, fine to medium grained, light brown, rest, medium dense (SP) (A-1-b)       IIL         IIL       IIIL         IIIL       IIIL         IIIL       IIIL         III A I       <th <="" colspan="4" td=""><td>Southwest Light Rail Transit Project, PEC East; Hopkins to Minneapolis         ELENVATION:       922.5       Hencein Co. Coordinates:       N       147674       E       494365         MATERIAL DESCRIPTION       GEOLOGY       N       Md Staboratory 1         FILL, mostly clayey sand with organic fines, a liftle gravel, trace roots, dark brown, frozen (A-2-6)       FILL, mostly clayey sand, a liftle gravel, trace roots, dark brown, (A-2-6)         SAND, a liftle gravel, trace roots, dark brown, frozen (A-2-6)       COARSE HALL VAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)       COARSE ALL VAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)         CLAYEY SAND WITH GRAVEL, brown, a little gravel, three roots, dark brown, most, medium dense (SP) (A-2-4)       TILL       19       M       SS 5       0         CLAYEY SAND WITH GRAVEL, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       10       11       10       12       10         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC)       12       M       SS       10       12       10         CLAYEY SAND, a little gravel, brown, stiff       ISC       12       M       S</td></th></td></th<>	Southwest Light Rail Transit Project, PEC East; Hopkins to Minneapolis         Interprint Co. Coordinates: N 147674 E 494365         MATERIAL DESCRIPTION       GEOLOGY       N       Mc       SAMPLE       FEC.       FRID. & LA         FILL, mostly clayey sand with organic fines, a little gravel, trace roots, dark brown, frozen (A-2-6)       FILL, mostly clayey sand, a little gravel, trace roots, dark brown, and little gravel, trace roots, dark brown, frazen (A-2-6)       FILL, mostly clayey sand, trace roots, dark brown, frazen (A-2-6)       9       M       SS       10       12         SAND, a little gravel, trace roots, dark brown, moist, medium dense (SP) (A-3)       COARSE ALLUVIUM       9       M       SS       7       8         CLAYEY SAND, fine to medium grained, light brown, worst, medium dense (SP) (A-1-b)       22       M       SS       9       M       SS       6       10         SULTY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       12       M       SS       11       10         CLAYEY SAND, a little gravel, brown, stiff (SC) (A-6)       12       M       SS       14       12         FND OF BORING       VATER LEVEL INFAMENTS       VATER LEVEL MEASUREMENTS       VATER LEVEL MEASUREMENTS       VATER LEVEL MEASUREMENTS         PX'       325' HSA       DATE       TIME       S	T: Southwest Light Rail Transit Project, PEC East; Hopkins to Minneapolis         Integravel, 1923       Hennepin Co. Coordinates: N       147674       E       494365         MATERIAL DESCRIPTION       GEOLOGY       N       MC       SAMPLE       RIC       PIELD & LABORAT         FILL, mostly clavey sand with organic fines, a little gravel, trace roots, dark brown (A-2-6)       F       I       9       M       SS       10       I         FILL, mostly clavey sand, al little gravel, trace roots, dark brown (A-2-6)       F       I       9       M       SS       10       I         FILL, mostly clavey sand, trace roots, dark brown, five and theory (A-2-6)       COARSE         FILL       SS       10       I         GRAVELLY SAND, fine to medium grained, light brown, rest, medium dense (SP) (A-1-b)       IIL         IIL       IIIL         IIIL       IIIL         IIIL       IIIL         III A I <th <="" colspan="4" td=""><td>Southwest Light Rail Transit Project, PEC East; Hopkins to Minneapolis         ELENVATION:       922.5       Hencein Co. Coordinates:       N       147674       E       494365         MATERIAL DESCRIPTION       GEOLOGY       N       Md Staboratory 1         FILL, mostly clayey sand with organic fines, a liftle gravel, trace roots, dark brown, frozen (A-2-6)       FILL, mostly clayey sand, a liftle gravel, trace roots, dark brown, (A-2-6)         SAND, a liftle gravel, trace roots, dark brown, frozen (A-2-6)       COARSE HALL VAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)       COARSE ALL VAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)         CLAYEY SAND WITH GRAVEL, brown, a little gravel, three roots, dark brown, most, medium dense (SP) (A-2-4)       TILL       19       M       SS 5       0         CLAYEY SAND WITH GRAVEL, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       10       11       10       12       10         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC)       12       M       SS       10       12       10         CLAYEY SAND, a little gravel, brown, stiff       ISC       12       M       S</td></th>	<td>Southwest Light Rail Transit Project, PEC East; Hopkins to Minneapolis         ELENVATION:       922.5       Hencein Co. Coordinates:       N       147674       E       494365         MATERIAL DESCRIPTION       GEOLOGY       N       Md Staboratory 1         FILL, mostly clayey sand with organic fines, a liftle gravel, trace roots, dark brown, frozen (A-2-6)       FILL, mostly clayey sand, a liftle gravel, trace roots, dark brown, (A-2-6)         SAND, a liftle gravel, trace roots, dark brown, frozen (A-2-6)       COARSE HALL VAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)       COARSE ALL VAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)         CLAYEY SAND WITH GRAVEL, brown, a little gravel, three roots, dark brown, most, medium dense (SP) (A-2-4)       TILL       19       M       SS 5       0         CLAYEY SAND WITH GRAVEL, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       10       11       10       12       10         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC)       12       M       SS       10       12       10         CLAYEY SAND, a little gravel, brown, stiff       ISC       12       M       S</td>				Southwest Light Rail Transit Project, PEC East; Hopkins to Minneapolis         ELENVATION:       922.5       Hencein Co. Coordinates:       N       147674       E       494365         MATERIAL DESCRIPTION       GEOLOGY       N       Md Staboratory 1         FILL, mostly clayey sand with organic fines, a liftle gravel, trace roots, dark brown, frozen (A-2-6)       FILL, mostly clayey sand, a liftle gravel, trace roots, dark brown, (A-2-6)         SAND, a liftle gravel, trace roots, dark brown, frozen (A-2-6)       COARSE HALL VAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)       COARSE ALL VAND, fine to medium grained, light brown, moist, medium dense (SP) (A-1-b)         CLAYEY SAND WITH GRAVEL, brown, a little gravel, three roots, dark brown, most, medium dense (SP) (A-2-4)       TILL       19       M       SS 5       0         CLAYEY SAND WITH GRAVEL, brown, a little light brown, very stiff, a lamination of sand (SC) (A-6)       10       11       10       12       10         CLAYEY SAND, a little gravel, brown, a little light brown, very stiff, a lamination of sand (SC)       12       M       SS       10       12       10         CLAYEY SAND, a little gravel, brown, stiff       ISC       12       M       S



#### 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				
DEPTH IN FEET		М	ATERIAL D	ESCRIPTIO	N ·		GE	OLOGY	N	MC	SĄ	MPLE YPE	REC		r	BORAT		1
FEET	FILI	mostly cl	wey sand y	vith gravel,	trace		FILI				म			WC	DEN		PL	%-#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 -			n, frozen (. tv sand a l	A-1-b) ittle gravel	trace	]				F	F	SU						
4	-\roots,	dark brow	n, frozen (	A-2-4)				ARSE		F	E	SU						
6		, mostly sa 1, frozen (4		, a little gra	avel,			LUVIUM	29	M	Å	SS	12					
7	SAN	O WITH G	RAVEL, n	nedium to o	coarse		TIL	L			1							
8 -	(A-1-	b)							20	M	Х	SS	12	10				
9 -			D, a little g f (SC/SM)	ravel, light (A-2-4)	brown to						I							
10 -	-	-,,							23	M	X	SS	14	7				
11 -		$\overline{)}$ a little a	marial fina	to medium	grainad		CO	ARSE	-		सि							
12 -	light	brown, mo	ist, mediun	n dense, lai	ninations			LUVIUM	27	M	$\square$	SS	14					
13		yey sand (					•				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	M	K	SS	14					
16 -		(SP-SM) (A			5 5				21	11/1	A	20	14					
17 -		DY LEAN stiff (CL) (		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	id (SC) (A-	6, A-1-b)				14	Μ	Х	SS	12	11				
-21 -	END	OF BOR	NG				1											
1/14												- - -						
1 3/1					·					-								
ET+C																		
GPJ A																		
05697.				[											L			_
5 DEI	PTH:	DRILLING	METHOD			1	1	EVEL MEA	· · · · ·		T	ייזייסס		117.4 (20)		NOTE:		
ILVII 0-1	19½'	3.25" HSA	<u> </u>	DATE	TIME	SAMP DEP	TH TH	CASING DEPTH	DE	/E-IN PTH	FÍ	DRILLI JUID LE	EVEL	WAT LEVI		THE A		
COOR				2/26/14	2:55	21.	0	19.5	2	0.7				Non		SHEE'		
ĕ ₽ BORI	NG															EXPLA		ON OF GY ON
S COMF	PLETED:		050												1		IS LO	
DR: T	l'A Le	i: <b>TM</b> Rig	g: 85C	<u> </u>														~



AET JC	DB NO: 01-05697					LC	OG OF	BO	RING N	10	1196	5 SS	<b>(p.</b> 1	l of 1	1)
PROJE	CT: Southwest Lig	ght Rail Tr	ansit Pr	oject,	PEC East;	Hop	kins	to ]	Minn	eapo	lis				
SURFA	CE ELEVATION: 924.2	H	Hennepin C	o. Coo	rdinates: <u>N</u>	<u>J 1</u>	4732	1	· _	<u>E</u> '	49338	-			
DEPTH IN	MATERIAI	DESCRIPTIO	)N		GEOLOGY	N	MC	SA	MPLE YPE	REC		1	ABORA	Γ	1
IN FEET								1 5	YPE	IN.	WC	DEN		PL	<b>%-</b> #200
1 -	FILL, mostly gravelly sil frozen (A-1-b)	ty sand, dark	t brown,		FILL		F	Ħ							
2 -								K							
3 -							F	Ŧ							
4 -	FILL, mostly gravelly sa	nd with silt	light		- ·			R							
5 -	grayish brown to brown	(A-1-b)	ngin			55	М	$\square$	SS	12					
6 -	-							मि							
7 -						50/.4	M	K	SS	5					
8 -					1. 1.			Ł							
9-	SAND WITH GRAVEL	, medium to	fine		COARSE	-		E							
10 -	grained, light grayish bro moist, medium dense to	own to light b dense (SP) (A	orown, A-1-b)		OR FILL	27	M	М	SS	12					
11 -	(possible fill)		,		•			Ł							
12 -	]				•	50	M	$\mathbb{N}$	SS	12					
13			· · · ·		•			सि							
15 -	SILTY SAND, a little gr grained, brown, moist, m	avel, fine to r redium dense	medium e. lenses of		COARSE	20	M	K	SS	12					
16 -	clayey sand (SM) (A-2-4	)	,		•	20	IVI			12					
17 -	SILTY SAND, a little gr	avel, brown,	medium		TILL			뉟							
18 -	dense, lenses of clayey s	and (SM) (A	-2-4)		* *	20	M	Å	SS	10					
19 -	CLAYEY SAND, a little	e gravel, brov	vn, stiff		***			1							
20 -	(SC/SM) (A-2-4)					14	M	X	SS	12	10				
21 -	END OF BORING				1	-									
14															
, ,															
L.GD															
T+WEI															
L+CP															
PJ AE															
5697.G															
CORP W-COORDINATES 01-05697.GPU AET+CPT+WELL.GDT 3/17/14 HOOD II -0 III -0 II -0 III -0 II -0 II -0 II -0 II -0 II -0 II	PTH: DRILLING METHOD		••••••	WAT	ER LEVEL ME	ASUR	EMEN	TS					NOTE:	REFE	ER TO
NATE: N-1	19½' 3.25" HSA	DATE	TIME	SAMP	LED CASING TH DEPTH	CA	VE-IN PTH	I FL	ORILLI UID LE	NG EVEL	WAT LEVI	ER EL	THE A	TTAC	HED
		3/7/14	9:50	21.			1.0	1			Non		SHEE	IS FO	R AN
No.													EXPLA	NATIO	ON OF
BORIN COMP	NG PLETED: <b>3/7/14</b>									_			TERMI		
	TA LG: JMMRig: 1C												TH	IS LO	G



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						
SURFA	CE ELE	VATION: <u>924.1</u>	F	Iennepin Co	o. Cooi	rdinate	s: <u>N</u>	1	47234	4	. <u> </u>	<u>E '</u>	49314				
DEPTH IN		MATERIAL D	ESCRIPTIO	N .		GEO	LOGY	N	MC	SĄ	MPLE TYPE	REC IN.		1	BORAT		Т
FEET						FILL						11.1.	WC	DEN	LL	PL	<b>%-</b> #200
	silty s and d	, mostly clayey sand v and, pieces of concre ark brown, frozen (A-	te, trace roo ·2-4)	ots, brown					F		SU		10				
3 -	FILL	, mostly gravel with s n (A-1-b)	ilt and sand	l, brown,		4			F	Į	SU						
4	FILL	, mostly silty sand wit n (A-1-b)	h gravel, d	ark brown,		_			F	E	SU						
5 - 6 -	FILL	, mostly sand with silt y sand, trace roots, bro						10	M	Å	SS ·	4		-	-		
7	GRA	VELLY SAND, medi brown, moist, dense (	um to fine	grained,		COAI	RSE JVIUM	35	М		SS	12					a
9 10 11	SAN grain (A-1-	D WITH GRAVEL, n ed, light brown, moist b)	nedium to o	coarse lense (SP)				27	М		SS	12					
11 - 12 - 13 -		D, a little gravel, med n, moist, medium den						11	М		SŞ	12			-		
14 15 16	CLA light (A-2-	YEY SAND, a little g brown, very stiff, a le 4)	ravel, brov	vn, a little (SC/SM)		TILL		16	М		SS	14	8				
17 -	light	YEY SAND, a little g brown, very stiff, lam SM) (A-2-4)	ravel, brov inations of	vn, a little `sand				23	М		SS	14	8				
19 - 20 -	lamir	YEY SAND, a little g nations of sand with si	lt (SC) (A-	6)				37	M		SS	14	10				
21 -	Medi (A-1-		H SILT, fir wn, dense (	ie to SP-SM)		COAI	RSE *										
	END	<b>OF BORING</b>															
-GD1 3/11/14		x															
CORPLACE 01-06697.GPJ AET+CPT+WELL.GDT 3711/14 TO																	
597.GPJ A												-					
S DE	_L PTH:	DRILLING METHOD			WAT	ER LE	VEL MEA	SURI	EMEN	ITS	ł	1	1		I NOTE:	REFI	ER TO
ATES	101/1	3.25" HSA	DATE	TIME	SAMP DEP	LED (	CASING DEPTH	CAV	VE-IN PTH	FI	DRILLI JUID LI	NG EVEL	WAT LEVI	ER	THE A		
	191/2'	J.43 HJA	2/26/14	1:45	21.		19.5		1.0	+			Non		SHEE	ГS FO	R AN
 M-CO	•	· · · · · · · · · · · · · · · · · · ·								1				I	EXPLA	NATI	ON OF
BORI COMI	NG PLETED:	2/26/14												Γ	ERMI	IOLO	GY ON
DR: 1		B: 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; ]				Minn						
SURFA	CE ELEV	ATION: 920.7	ŀ	Hennepin Co	o. Cooi	dinates: <u>N</u>	1	47082	2		<u>E</u> '	49272				
DEPTH IN FEET		MATERIAL I	DESCRIPTIO	N		GEOLOGY	N	MC	SA J	MPLE YPE	REC IN.	FIELI WC	D & LA	BORAT		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	gravel FILL, frozen FILL, cinder GRA fine g very c SANI brown CLA light t (SC/S SILT brown	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	a little rown, a little b) edium to on to 5' ther ined, light -1-b) vn, a little sand a little ligh		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 -	browi (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					
CORP WC00RDINATES 01-05697.GPJ AET+CPT+WELL.GDT 3/11/14					,											
05697.GPJ		· .														
ATES DE		DRILLING METHOD	DATE	TIME	WAT SAMP DEP	ER LEVEL ME		EMEN VE-IN EPTH	1	DRILLI JUID LI	NG	WAT LEVI		NOTE: THE A		
NDN N 0-]	19½'	3.25" HSA	2/26/14	12:20	21.			1.0				Non		SHEE	IS FO	R AN
V-CO							<u> </u>		$\square$					EXPLA	NATI	ON OF
BORI	NG PLETED:	2/26/14					1		+				1	TERMI	10LO	GY ON
DR: 7		: TM Rig: 85C					1							TH	IIS LO	G



AET JO	OB NO: 01-0	5697						LO	G OF	BOI	RING N	0	1199	ST	<b>(p.</b> 1	of	l)
PROJE	CT: Sout	nwest Light	Rail Tr	ansit Pro	oject,	PEC	C East; I	Iopl	cins 1	to I	Minn	eapo	lis				
SURFA	CE ELEVATION:	916.1	H	lennepin C	o. Coo	rdina	tes: <u>N</u>	1	46897	7		E 4	49221				
DEPTH IN FEET		MATERIAL DE	SCRIPTIO	N		GE	EOLOGY	N	мс	SA T	MPLE YPE	REC IN.	FIELE WC	D&LA	BORAT		FESTS %-#200
FEET	FILL mostly	clayey sand wi	th gravel	nieces of		FIL	[,		F	मा	SU		wC 16	DEN	LL	rL	/0-#200
1 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -	frozen (A-6) FILL, mostly FILL, mostly cinders/ash, bl FILL, mostly trace roots, da	ace roots, dark concrete, light silty sand with ack (A-2-4) clayey sand wi rk brown, froze , trace roots, br	brown gravel, a th organic en (A-6)	little c fines,		FIN			F F F		SU SS SS	12 12	19			•	
7 8 9	(A-6)	SILT, a little g	gravel, fin	e to		ALI	ARSE		F		SS	6	12				
10	medium grain (SP-SM) (A-1	ed, brown, mo	ist, mediu	m dense		ALI	LUVIUM	11	М	X	SS	12					
12 13 14	fine to medium dense (SP-SM	n grained, brov () (A-1-b)	vn, moist	, medium	<b>'</b>			19	M	X R	SS	6					
15 - 16 -	grained, light (A-1-b)	GRAVEL, fin brown, moist, i	medium c	lense (SP)				25	M		SS	6					
17 - 18 -	brown, moist, CLAYEY SA	gravel, mediu medium dense ND, a little gra	e (SP) (A-	·1-b)		TIL	L	17	M	R R R	SS	12	9				
19 - 20 - 21 -	stiff (SC/SM)	ND, a little gra (A-2-4)	ivel, brow	n, very				27	м		SS	14	9				
CORP W-COORDINATES 01-05697 GPJ AET+CPT+WELL GDT 3/1/1/14	END OF BO	RING															•
	PTH: DRILLIN	G METHOD			TA 1,67	ו מקי	EVEL MEA			<u></u> те							
	19½' <b>3.25''</b> H		DATE	TIME	SAMP DEP		CASING DEPTH	,	VE-IN	· · · · ·	ORILLI UID LI	NG EVEL	WAT LEVI		NOTE: THE A		
	<u>1772 J.43 П</u>		2/26/14	11:00	21.		19.5	+	1.0				Non		SHEE	rs foi	R AN
20-20-20-20-20-20-20-20-20-20-20-20-20-2														I	EXPLA	NATIO	)N OF
BORI COMP	NG PLETED: <b>2/26/1</b>	4												T	ERMI		
	TA LG: TM	Rig: 85C													TH	IS LO	3



AET JOI		4 Dal T-	ang:4 D	inst 1	ወድረግ	Fast. T				RING N			~ ''			_,
PROJEC								ans 1 18374				11S 49602	5			
	CE ELEVATION:921.9	F	Iennepin Co	b. Coor	dinates	s: <u>IN</u>	 	103/4	•	<u></u>		1		BORAT		TEST
EPTH IN PEET	MATERIAL D	ESCRIPTIO	N		GEOI	LOGY	N	MC	SA ' T	MPLE YPE	REC IN.	WC	DEN	T	PL	T
1 -	FILL, mostly sandy lean cl trace roots, dark brown (A- FILL, mostly gravelly sand	.6)			FILL		18	М	M	SS	16	20				
2	Clayey sand, grayish brown FILL, mostly silty sand, a l brown and black (A-2-4)	n, a little bla	ack (A-1-b)	2/			7	М	रि स	SS	12					
4 — 5 — 6 —	FILL, mostly sand with gra brown (A-1-b)	avel, light b	rown and				16	М		SS	12					
7 8							16	М	H H	SS	14					
9	FILL, mixture of sand with lean clay, brown and light	n silt, claye gray (A-3,	y sand and A-6)				13	М		SS	16	18				
12 - 13 -	CLAYEY SAND, a little g gray, firm (SC) (A-6)	ravel, dark	brownish		TILL		5	М		SS	8	17				
14	GRAVELLY SAND WITH fine grained, brownish gray waterbearing, medium den	y to brown,	moist to		COAR ALLU	RSE IVIUM	19	<b>М</b> /W		SS	8					
17 - 18 -							11	w	H H H	SS	6					
19 — 20 — 21 —	SAND WITH SILT, a little medium grained, grayish b medium dense (SP-SM) (A	rown, wate					21	w		SS	1					
22 – 23 –	CLAYEY SAND, a little g light brown, very stiff, a le (A-2-4)	gravel, brov ns of sand	vn, a little (SC/SM)		TILL		21	M/W		SS	12	11				
24	CLAYEY SAND, a little g very stiff, a lens of silty sa	gravel, gray nd (SC) (A	to brown, -6)				23	М		SS	14	17				
27 — 28 — 29 —	SILTY SAND, a little grav grained, brown, a little ligh dense, lenses and laminatio (A-2-4)	nt brown, w	vet, mediun	n	COAF ALLU	RSE JVIUM	18	М		SS	16					
30 — 31 —	CLAYEY SAND, a little g stiff to soft, a lens of water gravel at 45 <sup>1</sup> / <sub>2</sub> ' (SC/SM) (A	bearing sai			TILL		16	M		SS	8					
DEP				WAT	ER LEV	/EL MEA	SURI	EMEN	TS					NOTE:	REF	ERI
0.4	41/1 3 2511 HSA	DATE	TIME	SAMPI DEPT	LED C	CASING DEPTH	CAV DE	/E-IN PTH	FI	DRILLI UID LE	NG EVEL	WAT LEVI		THE A		
0-4	<u>4½' 3.25" HSA</u>	5/8/14	9:25	18.		17.0		7.0	1			16.		SHEE	IS FO	R A
		5/8/14	9:35	18.		17.0		7.0				15.		EXPLA	NATI	ON
BORIN	IG LETED: <b>5/8/14</b>	5/8/14	10:30	46.		44.5		4.5	<u> </u>			36.		TERMIN	10L0	GY
COMP	LEIED, J/0/14							-	+					T	IIS LO	~

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AET JO	B NO:	01-05697					LO	G OF I	BOI	RING N	01	1200	SW	(p. 2	2 of 2	2)
PROJEC	CT:	Southwest Light Rail	<b>Fransit Proj</b>	ect, ]	PEC East	; H	opk	ins t	<b>0</b> I	Minne	eapol	lis				
	•		Hennepin Co.	Coor	dinates:	<u>N</u>	14	18374			E 4	19602				
DEPTH IN FEET		MATERIAL DESCRIPT	TION		GEOLOGY	ł	N	MC	SA T	MPLE YPE	REC IN.	FIELI WC	) & LAI DEN	30RAT LL		FESTS %-#20
33 -	CLAY stiff to	EY SAND, a little gravel, gr	ayish brown,		TILL (continued)		4	М	X	SS	18	12			•	
34 -	gravel	at 45½' (SC/SM) (A-2-4) (cc	ontinued)						Ŧ							
35 - 36 -							4	Μ	X	SS	18	12				
37 -							0	м		CC	18	11				
38 39							9	M	∧ र्र	SS	18	11				
40 -							5	М	X	SS	18	12				
41 - 42 -									Ŧ							
43 -							5	М	X FI	SS	18	12				
44							8	M/W	H H	SS	18	11		-		
46	END	OF BORING					,						<u> </u>			
			·													
															01 5	HR-0



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				
DEPTH IN FEET		MATERIAL I	DESCRIPTIO	IN		GEOLOGY	N	MC	sĄ	MPLE FYPE	REC	<u> </u>	) & LAI	30RA'I		TESTS
FËÈT										1 Y PE	IN.	WC	DEN	LL	PL	%-#200
1 -	14.5" Conc	crete Pavement				FILL			Ŧ	SU		15				
2 -	4" Void								R	SU		-				
3 -		tly sand with sil 1, brown and gra		avel and			5	M	N	SS	14					
4 -		, 0	• • • •						Ĥ							
5 -	-						12	$2   \frac{1}{W}$	$\overline{\mathbf{N}}$	SS	16					
6 -	4								A	55						
7 -	ORGANIC	CLAY, trace s	hells and ro	oots, dark	<u>- 2.2.7</u> - <u>- 2.7</u>	SWAMP DEPOSIT			Ł							
8 -	of sapric p	t to very soft, le 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	н м	$\mathbb{V}$	SS	18	201				
13 -	-				<u>==</u>		vv.		A	00	10	201				
14 -									EL							-
15 -							2	M	X	SS	18	103				
16 -	-				<u>==</u> =				E							
17 -							3	M	$\mathbf{N}$	SS	18	137				
18 -									R							
20 -					<b>3.2.</b>				K	00	10	170				
20							3	M	Å	SS	18	172				
22 -	ORGANIC	C CLAY, trace s	shells and ro	oots, dark	- The				1							
23 -	brown to b	lack, a little bro ations of silt an	wn and ligh d hemic new	nt gray, at (OH)	<u></u>		4	M	X	SS	10	165				
24 -	(A-8)		a nonne per	<i>m</i> (011)					R							
<u>₹</u> 25 -	-				ier Ier		4	H M	$\square$	SS	18	220				
26 -	_				<u></u>				H		10					
27 -	-					÷			ł							
19 - 28 -							2	2 M	X	SS	14	184				
년 29 -					<u>337</u>				I							
I 30 -					<u>ter</u> 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
TES			DATE	TIME	SAMPL DEPT	ED CASIN H DEPTH	G C	AVE-IN DEPTH	1 LT	DRILLI JUID LE	NG	WATI LEVE		THE A		
		' HSA	5/6/14	11:33	6.0	4.5		4.2				4.5		SHEET		
40- 2	74.5' RDF	w/DM	5/6/14	1:43	41.0			32.0				16.0		XPLA	NATIO	ON OF
BORI	NG PLETED: <b>5/6</b>	/14	5/6/14	2:00	41.0			29.1				13.2	—	ERMIN	IOLO	GY ON
$\frac{1}{2}$ DR: S														TH	IS LO	G
۹ <u>ــــــــــــ</u> ـه	C			J	1										01 0	



AET JOE	B NO: <b>01-05697</b>			LO	G OF	BOF	N N RING	0	1211	SB	(p. 2	2 of 3	<u> </u>
PROJEC	<b>Southwest Light Rail Transit Proj</b>	ect,	PEC East; F	Iopl	cins	to I	Minn	eapol	lis				
	Hennepin Co. C	Coordin	nates: <u>N</u>	1:	52093	3		E :	50404	8			
EPTH	MATERIAL DESCRIPTION		GEOLOGY	N	мс	SA	MPLE	REC	FIELI	) & LAI	BORAT	ORY	EST
IN TEET	WATERIAL DESCRIPTION		OFOLOGI	N		T	YPE	ĨN.	WC	DEN	LL	PL	%-#2
22	ORGANIC CLAY, trace shells and roots, dark			3	М	М	SS	10	276				
33 – 34 –	brown to black, a little brown and light gray, soft, laminations of silt and hemic peat (OH)					मि							
34 - 35 -	(A-8) (continued)					R							
36 -	· · · · · · ·	122		3	M	M	SS	18	125				
37 -	ORGANIC CLAY, pieces of wood around 37.5',					I							
38	dark brownish gray, very soft (OH) (A-8)	<u>==</u> =		1	M	М	SS	18	68				
39 -						R							
40	LEAN CLAY, brownish gray, stiff (CL) (A-6)		FINE ALLUVIUM			K							
				9	<b>M</b> .	M	SS	18	26				
41 - 42 -		\///				H							
43 -	No sample taken at 42' due to blow up in hole (left advanced HSA in ground overnight)					ł							
44						Ł							
45 -	GRAVELLY SAND, medium grained, brownish gray, waterbearing, medium dense to loose (SP)		COARSE ALLUVIUM			ł							
46 -	(A-1-b)					I							
47 -				12	W	X	SS	2	-				
48 -				11	w	Ħ	SS	4					
49 -				11	W	Д	22	4					
50 -			•	7	w	М	SS	6					
51 -			•	/	Ŵ	Д	33	0					
52 -						$\left \left\langle \right\rangle \right $							
53 -						$\left \right\rangle$							
54	GRAVELLY SAND, medium to coarse grained, brownish gray, waterbearing, loose (SP) (A-1-b)		•			$\left \right\rangle$							
55 -			•	9	w	$\square$	SS	10		1	1		
56 -				9		Д	33	10					ļ
57 —			•			$\left \left\langle \right\rangle \right $							
58 -	CLAVEY CAND a little anough and the harm	111	TILL			K							
59 —	CLAYEY SAND, a little gravel, grayish brown, very stiff (SC) (A-6)					$\left \right\rangle$	•						
60 -				18	w	$\square$	SS	6	14				
61 —						A	20						
62 —						$ \langle  $							
63 —						K							
64 —						K							
65 —				25	M	$\square$	SS	4	15				
66 -						Ĥ	-						
67 —						$\left \left\langle \right\rangle\right $							
68 -	LIMESTONE, weathered, gray		4 PLATTEVILL	Ē		$\langle \langle$							
69 —	Envires rorve, weathered, gray		FORMATION	Γ		$\langle \langle$							
		<u> </u>	4										

03/2011



AET JOB NO:	01-05697			LO	G OF	BORING N	0	1211	SB	(p. 3	of .	3)
PROJECT:	Southwest Light Rail Transit	Project,	PEC East; I	Iopl	kins	to Minn	eapol	lis				
	Hennepi	n Co. Coordin	ates: <u>N</u>	1:	52093	3	E É	50404				
DEPTH IN FEET	MATERIAL DESCRIPTION		GEOLOGY	N	мс	SAMPLE TYPE	REC IN.		) & LAI			1
								WC	DEN	LL	PL	%-#2
	STONE, weathered, gray (continued)		PLATTEVILL FORMATION (continued)	5 *	М	ss	6					
72 —			(continued)			$ \langle \langle$						
73 —						$\langle \langle$						
74 —						$\langle \langle \rangle$						
75 –	OF BORING			200/.7	M	SS SS	1					
	+ 50/.5 + 100/.4			÷.,			-					
207.0												
				-								
										·		



#### AMERICAN ENGINEERING TESTING, INC.

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#### SUBSURFACE BORING LOG

AET JO	B NO: 01-0	5697						LO	G OF I	BOR	ING NO	)	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						
SURFAC	CE ELEVATION:	888.8	He	nnepin Co.	Coordin	ates:	N	1:	52126	5		3 5	504117				
DEPTH	l	MATERIAL DI	ESCRIPTION	ſ		GEO	OLOGY	N	MC	SĄ	MPLE YPE	REC IN.			BORAT		ESTS
IN FEET											TPE	11N.		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	a 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		SS	2					
6-						GWIA	N/D	4	М	A 73	22	2					
7	ORGANIC CI brownish gray lenses of hemi	dark brown	and black, s	soft,			OSIT	2	М	A	SS	16	177				
9 — 10 —					<u></u>						TW	24	204 190	25 26			1010 Cons.
11								2	<b>▼</b> M	Ł	SS	18	200				
13 -						1		2	IVI	Ą	66	10	200				
14 -						7				₽ ₽	66	10	100				
15 -						1		2	M	Å	SS	18	182				
17 -	-					-				1							
18 -	_					7		2	M	Å	SS	18	108				
19 -						-				H	TW	18	76	54			675
20 -	SAPRIC PEA	T, black, a lit	ttle dark bro	ownish	<u></u>					K	IW	10					
21 - 22 -	gray (PT) (A-	3)			<u>1.5.</u>					1							
23 -					<u></u>	1		4	M	X	SS	18	251				
24 -	ORGANIC C	LAY, trace ro	oots, black t	to		5				Į							
25 -	brownish gray	r, soft (CL) (4	A-8)					2	M	X	SS	18	261			-	
20										Į							
	-				12.			2	M	X	SS	18	51				
27 - 28 - 29 - 30 - 31 - DE	4					7			M/V	v	TW	18					
- 30 -					<u> ₽₽</u>		ARSE LUVIUM	-		F							
9-7690 31 -			· · · · · · · · · · · · · · · · · · ·			: :				5	٩			<u> </u>		_	
	PTH: DRILLIN	G METHOD	 		1		EVEL ME			- 1			***		NOTE		
	)-29' <u>3.25'' H</u>	SA	DATE	TIME	SAMF DEP	YLED TH	CASING DEPTH		VE-IN EPTH	F	DRILL LUID L	EVEL	WAT LEV			ATTA(	
29	9-85' RDF w/	DM	5/1/14	10:15	30	.5	29.0	2	7.6				12.			TS FO	
Š																	ON OF GY ON
BORI COM	NG PLETED: <b>5/1/14</b>							_		_						HIS LO	
1	SG LG: SB	Rig: 1C															



AMERICAN ENGINEERING TESTING, INC.

## SUBSURFACE BORING LOG

ET JO	B NO:	01-05697				LC	GOF	BOF	RINGN	0	1213	SB	(p. 2	2 of 3	5)
ROJEC	CT:	Southwest Light Rail	Transit Proj	ect, I	PEC East;	Hopl	kins	to I	Minne	eapo	lis				
		1. 00-9-9-9-	Hennepin Co. C	Coordin	ates:	N 1	52120	5		E:	50411	7			
PTH		MATTERIAL DECORD	TION		GEOLOGY	N	мс	SA	MPLE YPE	REC	FIELI	) & LAI	BORAT	TORY 7	TES'
PTH N EET		MATERIAL DESCRIP	HON		GEOLOGI	N	MC	I	YPE	IN.	wc	DEN	LL	PL	q
-	SANI	O WITH GRAVEL, possible	cobbles,		COARSE	9	W	М	SS	0					
33 -	dense	im grained, gray, waterbearin to loose, lenses of sand with	ig, medium silt (SP)		ALLUVIUM (continued)			Ą		-					
34 –		b) (continued)						H							
35 —						5	W	М	SS	0					
36 -								[]							
37 –						14	W	$\square$	SS	3					
38 –						17		Д	• • • •						
39 -								4							
40 —						7	W	Х	SS	7					
41 —								$\left[ \right]$							
42 —								$\square$		_					
43 —	-					6	W	Ň	SS	7			-		
44 —								Б							
45 —	SAN	D WITH GRAVEL, medium ed, gray, waterbearing, loose	to coarse (SP) (A-1-b)			6	W	X	SS	10					
46 -	gram	eu, gruy, willerbeuring, reese	(22)(22-1)					Д							
47 —	SAN	DY LEAN CLAY, little grav	el, gray, very		TILL			$\bigwedge$							
48 -		(CL) (A-6)				18	M	Ň	SS	16	14				
49 -				XIII.	GOADGE			E							
50 -	GRA	VEL WITH SAND, apparen n, waterbearing, medium der	t cobbles, use (GP)		COARSE ALLUVIUN	1 25	W	N	SS	2					
51 -	(A-1-			- Fill				Д							
52 -	-							$\left \left\langle \cdot\right\rangle \right $							
53 -	SAN	D, a little gravel, medium gra	ined, brownish					2							
54 -	- gray,	waterbearing, medium dense	e(SP)(A-1-b)					2							
55 -	-					11	W	N	SS	16					
56 -	-				•			$\mathbb{A}$							
57 -	-							K							
58 -	GRA	VELLY SAND, medium gra	ined, gravish		•			$\left \right\rangle$	d						
59 -	- brow	n, waterbearing, medium der	nse (SP)					2	\$						
60 -	(A-1	-0 <i>)</i>				20	W	X	SS	12					
61 -	SAN	D WITH SILT, a little grave	l, fine grained,		- - -			4	4						
62 -	brow	n, waterbearing, dense, a len	s of sand		:			K	4						
63 -	+ (SP-	SM) (A-3)						$\left \right\rangle$	d						
64 -	4								4						
65 -	4					37	w	$ \rangle$	ss	19					
66 -							. "	4							
67 -	-							R	4						
68 -	GR	VEL WITH CLAY AND S.	AND, brown.		;			$ \rangle$	d						
69 -	wate	rbearing, very dense (GP-GC	C) (A-1-b)					$ \rangle$	Å .						
				-				ſ	1					01-]	

03/2011



AET JO							UNG N			SB	(p. 3	of 3	5)
PROJEC	T: Southwest Light Rail Transit Proj	ect, ]						-					
	Hennepin Co. C	oordin	ates: <u>N</u>	1:	52126	<u> </u>	]	<u>E 5</u>	50411'		0.0.0.1.7		
DEPTH IN FEET	MATERIAL DESCRIPTION		GEOLOGY	N	мс	SA T	MPLE YPE	REC IN.		& LAE	LL	ORY T PL	
	GRAVEL WITH CLAY AND SAND, brown, waterbearing, very dense (GP-GC) (A-1-b)	<b>₩</b> ₩¶	COARSE ALLUVIUM	53	W	M	SS	3	WU	DEN	LL.	I'L	qu
71 — 72 —	(continued)	<u>1      </u>	OR COLLUVIUM			$\mathfrak{H}$							
73 -		<b>•</b>	(continued)			$\rangle$							
74 —		1				$\left  \right\rangle$							
75 —		1 1 1 1 1		43	w	M	SS	6					
76 -		1 1 1 1				$\mathbb{R}^{1}$							
77			ST. PETER			$\left \right\rangle$							
79 —	SHALEY SANDSTONE, highly weathered to weathered, gray		FORMATION			$\left  \right\rangle$							
80				25	w	X	SS	24				2	
81 - 82 -						$\mathbb{H}$							
83 -	SANDSTONE, fresh, gray					$\left \right\rangle$			-				
84 -	SANDSTONE, Itesh, Eury					$\sum$	~~~						
85 -	END OF BORING			<u>270/.5</u>	W_	X	SS	6					
20													
L AE													
0.7200													
INALEX													
INNO													



AET JOI	B NO: <b>01-05697</b>					LC	GOF	BOR	ING N	0	1214	SW	(p.	1 of	2)
PROJEC	T: Southwest Ligh	ıt Rail Tr	ansit Pro	ject,	PEC East;	Hopl	kins 1	to N	Ainne	eapol	lis			_	_
	CE ELEVATION:889.9	H	Iennepin Co.	Coordir	nates: <u>N</u>	1	52175	5		E t	50427	9			
EPTH					GEOLOGY			SA	MPLE	REC	FIELD	& LA	BORAT	TORY '	ΓES'
IN FEET	MATERIAL I	DESCRIPTIO	N		GEOLOGY	N	MC	Ť	MPLE YPE	ĪN.	WC	DEN	LL	PL	%-#
1 - 2 -	6" FILL, mostly silty sand (A-1-b) FILL, mostly gravelly silty				FILL	27	М	X	SS	14	-			-	
2 - 3 - 4 -	sand, pieces of concrete an brown, black and brownish	d bituminon gray (A-1-	us, dark ·b)			4	M	R	SS	6					
5 - 6 -	FILL, mostly organic clay, roots, black (A-8)	a little grav	vel, trace			2		Å	SS	12	77				
7	HEMIC PEAT, brown and	black (PT)	(A-8)		SWAMP DEPOSIT	1	M		SS	14	364				
9 - 10 -	SAPRIC PEAT, black (PT	) (A-8)				1	-		SS	0					
11 — 12 — 13 —						2	М		SS	12	129				
14 — 15 —	ORGANIC CLAY, black, laminations of sand and lea	a little gray an clay (OH	r, very soft, I) (A-7-6)			2	M	E X	SS	14	41				
16 — 17 — 18 —	CLAYEY SAND WITH C soft to firm, lenses and lam waterbearing sand (SC) (A	ninations of			MIXED ALLUVIUM	1	W		SS	24	28				
19 20 21						1	w	E	SS	4	19				
22 - 23 -						6	w	R	SS	14	21				
24 - 25 - 26 -	GRAVELLY SAND WIT grained, gray, waterbearing clayey sand (SP-SM) (A-1	g, very loos		f	COARSE ALLUVIUM	3	w	R	SS	4					
27	SAND WITH GRAVEL, twaterbearing, loose to very clayey sand at $27\frac{1}{2}$ (SP) (	y loose, a le			- - - - -	5	W	H H H	SS	6					
29 30 31					•	3	w	X	SS	6					
DEP	TH: DRILLING METHOD			 WAT	<u> </u> ER LEVEL ME	ASUR	L EMEN	TS	·		1				 2D /
DEP				1			VE-IN	Ι	ORILLI	NG	WAT		NOTE:		
0-34	4½' 3.25" HSA	DATE	TIME	SAMP DEP			EPTH	FĹ	UIDLE	EVEL	LEVI	EL	THE A		
341/2-64	4.4' RDF w/DM	8/5/14	10:35	19.			6.9				13.	<u> </u>	SHEE'		
		8/5/14	10:45	19.	0 17.0	1	6.8				6.2		EXPLA		
BORIN COMPI	G LETED: <b>8/5/14</b>											T	ERMI		
	TS LG: TM Rig: 1C												TH	IIS LO	G



PROJEC	CT: Southwest Light Rail Transit Proj Hennepin Co. (				5217				50427	9			
EPTH			<u></u>			Τ			T	) & LAI	BORAT	ORY	TEST
IN EET	MATERIAL DESCRIPTION		GEOLOGY	N	MC		MPLE YPE	REC IN.	WC	DEN	LL	PL	%-#2
33 -	SAND WITH SILT, a little gravel, gray, waterbearing, very loose (SP-SM) (A-1-b)		COARSE ALLUVIUM (continued)	3	w	X	SS	12					
34 — 35 — 36 —	GRAVEL, gray, waterbearing, very loose (GP) (A-1-a)			4	w		SS	1					
37 - 38 - 39 -	SAND WITH GRAVEL, medium to coarse grained, a little black, waterbearing, loose, a lens of sand with silt (SP) (A-1-b)			8	w	Á	SS	6					
40 - 41 -	GRAVEL WITH SAND, gray, waterbearing, loose (GP) (A-1-a)			5	w	Å	SS	3					
42 — 43 — 44 —	GRAVELLY SAND, medium to coarse grained, gray, waterbearing, loose (SP) (A-1-a)			8	w	Ŕ	SS	6					
45 — 46 —				11	w	Å	SS	6					
47 48 49	GRAVEL WITH SAND, gray, waterbearing, medium dense (GP) (A-1-a)			13	W	X	SS	6					
50 51 52 53		<u> </u>		11	w	X	SS	6					
54 — 55 — 56 — 57 —	CLAYEY SAND, a little gravel, brown, a little dark gray, hard, laminations of fat clay and waterbearing sand (SC) (A-6)		TILL	34	M/W		SS	14	14				
58 — 59 — 60 — 61 —	SAND, a little gravel, fine to medium grained, grayish brown, medium dense (SP) (A-3)		COARSE ALLUVIUM	27	w		SS	12					
62 — 63 — 64 — 65 —	GRAVEL WITH SILT AND SAND, grayish brown, waterbearing, very dense (GP-GM) (A-1-b)		*	100/.2	w w	X	SS	6					
	LIMESTONE, weathered, light brown END OF BORING		*PLATTEVILI FORMATION	E									



	AET JO	B NO:	01-05	697						LO	GOF	BOR	LING N	0	1215	SW	(p. 1	1 of	2)
	PROJEC	CT:	Southv	vest Ligh	t Rail Tr	ansit Pro	oject,	PEC	C East; H	Iopł	cins 1	to I	Minn	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 D	ESCRIPTIO	N		GE	OLOGY	N	мс	SĄ	MPLE YPE	REC			BORAT		1
	IN FEET												YPE	IN.	WC	DEN	LL	PL	%-#200
	1 —		ILL, mixtur vn and dark			avel,	$\prod$	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		, mostly cla																
	5 — 6 —		oncrete and (petroleum			ts, black				10	M	Д	SS	8	12			-	
	0 — 7 —		AIC PEAT,	• •	-	(PT)	TARA	SWA				I							
	8	(A-8					<u>125</u> 125	DEP	OSIT	3	<u> </u>	М	SS	13	380				
	9 —	OR	GANIC CLA	Y WITH	SAND bla	ck to dark						ł							
	10 —		vn, soft, lam							4	М	М	SS	16	79				
	11	CP	AVEL WITH	I SAND	max matar	anning		COA	ARSE			Ł							
	12 — 13 —	med	ium dense (	GP) (A-1-a	(ray, water) ()	Jeanng,			UVIUM	11	W		SS	12					
	13											सि							
	15 —		ND, a little g erbearing, lo			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	SS	1					
	18 -	wate (A-1	erbearing, lo	ose to med	ium dense	(GP)				10	vv	А	33	1					
	19 — 20 —		(°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 -						<u>        </u>			7	W	М	SS	2					
ILL.GD	29 -											Ĥ							
T+WE	30 -	GR	AVELLY S. Darse graine	AND, poss	ible cobble	s, medium		•		6	W	$\square$	SS	5					
ET+C	31 —	(A-1		u, gray, wa	ter bearing,	10030 (51)	/			Ŭ		Д	00						
GPJ A	32 -		YEY SAN	D WITH C	RAVEL	possible		TILI	[.	9	M	M	SS	11	15				
CORP W-COORDINATES 01-05697.GPJ AET+CPT+WELL.GDT 8/13/14	33 -	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			1		EVEL MEA			<b>T</b>					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	ORILLI UID LE	NG IVEL	WATI LEVE	ER EL	THE A		
OORD	141/2-6		RDF w/D		8/7/14	1:45	13.	5	12.0	1	1.5				7.9		SHEE		
P W-C	ם מערים														<i></i>		EXPLA		ON OF GY ON
	BORIN COMP	LETEL														1		IS LO	
AET	DR: S	G L	G: SB Rig	g: 91C															-



ET JO	B NO: 01-05697		LO	GOF	BORINGN	0	1215	SW	(p. )	2 OI .	2)
ROJEC	T: Southwest Light Rail Transit Project,	PEC East; H	Iopl	cins 1	to Minn	eapol	lis				
	Hennepin Co. Coordir	nates: <u>N</u>	1:	52250	)	Е :	50442	0			
EPTH IN					SAMPLE	REC	FIELD	) & LAI	30RAT	ORY	TEST
IN EET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	TYPE	IN.	WC	DEN	LL	PL	%-#
35 - 36 -	GRAVELLY SILTY SAND, possible cobbles, fine to medium grained, grayish brown, wet, medium dense (SM) (A-1-b)	COARSE ALLUVIUM	28	w	ss	4					
37 — 38 — 39 —	GRAVELLY SAND WITH SILT, possible cobbles, fine to medium grained, brown, waterbearing, medium dense (SP-SM) (A-1-b)		18	w	ss	12					
40 - 41 -	SAND WITH SILT AND GRAVEL, medium to fine grained, grayish brown and brown, waterbearing, medium dense, lenses of silty sand		27	w	ss	16					
42 43 44	(SP-SM) (A-1-b)		37	-	ss	0					
45 - 46 - 47 -			16	W	ss	12					
48 - 49 -	GRAVEL WITH SAND, brown, waterbearing, very dense (GP) (A-1-a) *32/.5 + 64/.5 + 36/.2		*	W	X ss	6					
50 — 51 — 52 —	SAND, a little gravel, brown, waterbearing, very dense (SP) (A-1-b)		100	w	ss	24	-			- -	
53 — 54 — 55 — 56 —	CLAYEY SAND, a little gravel, possible cobbles, brown, hard, laminations of waterbearing sand (SC) (A-2-6)	TILL	**	M/W	ss	14	10				
57 — 58 — 59 —	**18/.5 + 53/.5 + 100/.4										
60 — 61 — 62 —			293	M/W	ss	18	11				
63 64 65	* **66/.5 + 148/.5 + 100/.05		***	M/W	ss	12	10				
66 — 67 — 68 —	00,011140,011100,00			-			-				
69 —	LIMESTONE, weathered, gray and light gray, a little brown END OF BORING	PLATTEVILL FORMATION	E 100/.0:	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 Ligh	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				
DEPTH		MATERIAL D	ESCRIPTION	N	G	EOLOGY	N	МС	SA	MPLE YPE	REC			BORAT		T
IN FEET						<b>T</b>				SU	11N.	WC	OC	LL	PL	%-#200
1 -		Bituminous pavement TLL, mostly sand with		ravel	/FII	J,	9	M M	R R	SU	12					
2 -	\pieces	s of concrete, dark bro	wn (A-1-b	)			,	1.11	A	SS	14	11				
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-	6, A-2-4)					2	М	M	SS	7	13				2
6 -	4								स्रे						-	
7 -	_						2	м	M	SS	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	$\square$	SS	6	21	3.8			
16 -	0	· · · · · · · · · · · · · · · · · · ·							Д	55						
.17 -	FILL	, mostly sand with gra	vel, a little	clayey					뵍							
18 -	sand, $ $ (A-1-	light brownish gray a b)	nd light bro	own			18	M	M	SS	6					
19 -	-							-	国							
20 -							18		X	SS	14					
21 -				<u>~</u>		DARSE	-		रि							
22 -	- SAN medi	D WITH SILT AND um grained, grayish bi	GRAVEL, rown, a littl	fine to le gray and	1 1 1 1 1	JARSE LLUVIUM	19	W	M	SS	6		-			
23 ·	- light	um grained, grayish bi tan, waterbearing, me nations of silty sand ar	dium dense	e, / (SP-SM)					A	55						-
24	(A-1)	-b)	\$						R	_						
11/8/5 26		VEL WITH SAND, a		wn,			8	W	Д	SS	2					
20	_ SAN	D WITH GRAVEL, r	nedium gra	ined,					I							
	brow	nish gray, waterbearin of clayey sand (SP) (A	ng, medium	i dense, a			12	W	Х	SS	18					
		•••	-	10001 04166		ILL	_		Ł							
		YEY SAND, a little g (A-6)	gravel, gray	, very suff			17	М	$\square$	SS	12	12				
GD. 31									सि							
		DRILLING METHOD	1		WATER	LEVEL ME	ASUR	EMEN			1		1	NOTE		
	EPTH:			TIME	SAMPLEI		1	VE-IN EPTH	- T-	DRILLI	NG	WAT LEV		THE		
	0-32'	3.25" HSA	DATE		DEPTH				FL	UID L	EVEL					RAN
Boo 32-	-34½'	RDF w/DM	4/30/14	10:20	25.5	22.0		2.0 2.0	_			20. 20.				ON OF
25           26           27           28           29           30           31           30           31           DI           31           BOR           COM           BOR           COM	ING		4/30/14	10:30	25.5	22.0		2.0				20.	4	FERMI	NOLC	GY ON
	ING IPLETED		·				+							TI	-IIS LC	)G
DR:	SG LC	B: SB Rig: 1C	1										•			



AET JO					BORING NO		9 SW	(p. 2 d	of 2)
PROJEC									
	Hennepin	Co. Coordir	nates: <u>N</u>	15238		<u>5042</u>	2 <b>60</b> LD & LAB		VTESTS
DEPTH IN FEET	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 35 36	(A-1-b/A-2-4) (continued) SAND, a little gravel, medium grained, brown gray, waterbearing, loose (SP) (A-1-b)	/ 6:53		7 W	ss	4			
30 -	END OF BORING								
								-	
							jų.		,
± 000									
			•						
1-USOB/, GPU AE		-							
JORDINALES									



AET.	JOB NO:	01-05	697						LO	GOF	BOF	RINGN	0	1220	SS	(p. 1	lof	2)
PROJ	ECT:	Southv	vest Ligh	t Rail Tr	ansit Pro	oject, ]	PEC	CEast; H	lopł	cins 1	to I	Minn	eapol	lis				
SURF	ACE EL	EVATION:	891.7	H	Iennepin Co	Coordin	ates:	<u>N</u>	15	52357	7		<u>E </u>	50465				
DEPTH IN FEET	H	М	IATERIAL D	ESCRIPTIO	N		GE	OLOGY	N	МС	SA T	MPLE YPE	REC IN.	FIELD WC	D & LA	BORAT	FORY ' PL	FESTS %-#200
1	FIL	L, mostly cru wn (A-1-b)	ushed limes	tone base,	light		FILI	,	35	М	M	SS	22	10				
2	clay	L, mixture o , a little grav	vel, pieces c	nd and sand of concrete	ly lean , dark				10	М	$\left  \right\rangle$	SS	4	10			*	
4		wn and gray	(A-0)								E							
5 6	- root	L, mostly or ts, dark brow		a little grav	vel, trace				2	-	X FJ	SS	0					
8	- SAI	PRIC PEAT,	, black (PT)	(A-8) (po	ssible fill)		SWA DEP	OSIT OR	2	<b>₩</b>		SS	13	126				
9 10	- blac	AN CLAY, s ck, soft (CL)		anic, trace	roots,		FILI FINI ALL		3	M		SS	17	17				
11 12		AVELLY SA	AND WITH	I SILT. po	ssible		COA	ARSE			E							
13 14	- cob wat	bles, mediun erbearing, lo	n to fine gra oose (SP-SN	ained, gray (A) (A-1-b)	,			UVIUM	7	W	$\tilde{\Lambda}$	SS	6					
15	- cob	ND WITH S bles, medium y loose (SP-S	n grained, g	gray, water					3	w	Å	SS	7					
17 18	- cob wat	ND WITH S bles, fine to erbearing, lo	medium gra	ained, gray	ssible				7	w	Ø	SS	1					
19 20 21	- wat	AVEL WITH erbearing, lo			bbles, gray				7	W	$\Delta$	SS	3					
22	-								9	М	K	SS	1	-				
24									7		Ø	60	1					
						<u>" # # # #</u>			7	W	$\Delta$	SS	1					
27 28 20									8	W	Д	SS	6					
26 27 28 29 29 20 20 20 20 20 20 20 20 20 20 20 20 20	– SA me	ND WITH C dium to fine cerbearing, lo	grained, gra	ayish brow					6	w	Å	SS	3					
32 32							•				$\square$							
06 D	EPTH:	DRILLING	METHOD			WAT	ER LI	EVEL MEA	SURF	EMEN	TS		.1	1		NOTE:	REFI	ER TO
0 INATES	-14½'	3.25" HSA	A	DATE	TIME	SAMPI DEP1	LED TH	CASING DEPTH	CAV DE	/E-IN PTH	I FL	DRILLI UID LI	NG EVEL	WAT LEVI		THE A	ATTAC	HED
14 <sup>1</sup> /2	-69½'	RDF w/D	М	8/7/14	9:05	13.5	5	12.0	1	1.0				8.6		SHEE		
Ŭ ≯																EXPLA		
	RING APLETE	D: <b>8/7/14</b>									<u> </u>					ERMI TL	NOLO IIS LO	
UR:	SG I	LG: SB Ri	g: 91C													11	113 LU	<u> </u>



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				
DEPTH IN	MATERIAL DESCRIPTION		GEOLOGY	N	мс	SĄ	MPLE TYPE	REC		) & LAI			
IN FEET			COADCE	8	w		SS	4	WC	DEN	LL	PL ·	%-#200
34 —	SAND WITH GRAVEL, possible cobbles, fine to medium grained, grayish brown, waterbearing,		COARSE 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	$\mathbb{N}$	SS	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 — 46 —	CLAYEY SAND, a little gravel, possible cobbles, grayish brown (SC) (A-6)		TILL	13	W/M	X	SS	8	10				
40						Ы							
48 -	SAND, a little gravel, possible cobbles, medium to fine grained, grayish brown, waterbearing,		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, loose (SP) (A-1-b)			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 -		# <b>∥</b>		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				
61 - 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	0					
	LIMESTONE, weathered, gray and light gray		** **PLATTEVII				1101						
	END OF DORING		FORMATION										
201 201													



PROJEC	CT: Southwest Lig	ht Rail Tr	ansit Pro	oject. I	PEC East:				ring n <b>Minn</b>						
	CE ELEVATION:893.7		Hennepin C	<u> </u>			5251:				50490	7			
DEPTH								<u> </u>	MPLE	REC	FIELD	) & LA	BORA	FORY	TES
IN FEET	MATERIAL I	DESCRIPTIO	N		GEOLOGY	N	MC		YPE	IN.	WC	DEN	LL	PL	%-#
-	FILL, mostly silty sand wi	ith gravel, a	little		FILL	21	M	М	SS	12					
1 - 2 -	clayey sand, brown, a little	e dark brow	II (A-2-4)			21	M	М	55	12					
2 3 -						41	M	М	SS	2					
4								R							
5 —	FILL, mostly sand with sil clayey sand, brown (A-2-4		avel and			12	М	$\square$	SS	12					
6 -	•••					12	141	Д	00	12					
7 —	FILL, mostly sand with si		avel and					<u></u>					r -		
8 -	clayey sand, brown (A-1-ł	<b>)</b> .				4	Μ	М	SS	12					
9 —	FILL, mostly clayey sand	with organi	c fines. a					Ĭ							
10 -	little gravel, trace roots, bl					1	М	М	SS	12	45				
11 -					<u></u>		▼	R							
12 -	SAPRIC PEAT, black (PT	(A-8)			SWAMP DEPOSIT	4	M	M	SS	12	285				
13 -							141	A	55	12	205				
14	ORGANIC CLAY WITH		ittle gravel,					뵍							
15 16	dark brown, soft (OH) (A-	-6)		135		2	M	М	SS	18	29				
10 -	BOGLIME, gray, very sof	ft (OH) (A-6	6)					I							
18 -			,	<u>Lor</u> Lor		WH	M	M	SS	18	32				
19 -	L DANLOI AN JULA				FINE	_		Ł							
20 -	LEAN CLAY, slightly org soft (CL) (A-6)	game, brown	msn gray,		ALLUVIUM	2	M	$\square$	SS	16	33				
21 –						_		H	22						
22 –	SAND WITH SILT AND fine grained, gray, waterba			)	COARSE ALLUVIUM			R							
23 –	(SP-SM) (A-1-b)	caring, meu	ium dense		1000 1000	12	W	Å	SS	12					
24 —	GRAVELLY SAND, med			<u></u> ,				国							
25 –	gray, waterbearing, mediu	ım dense (Sl	P) (A-1-b)			20	w	X	SS	1					
26 -								$[\mathcal{I}]$							
27 28						13	w	$\square$	SS	12					
28 - 29 -						r r		H							
29 - 30 -	GRAVEL WITH SAND, waterbearing, medium der	brownish gi nse (GP)	ray,			10	177	H	aa						
31 -						19	W	Д	SS	2					
		1													
DEP	TH: DRILLING METHOD				ER LEVEL MI				ORILLI		<b>11</b> 7 A 771		NOTE:		
0-2-	4½' 3.25" HSA	DATE	TIME	SAMPL DEPT	ED CASINO H DEPTH		/E-IN PTH	FL	UID LE	VEL	WATI LEVE	SK SL	THE A		
241/2-	-74' RDF w/DM	5/29/14	1:10	23.5	22.0	1	9.0				12.4		SHEE		
יתתהם	IC.	5/29/14	1:23	23.5	22.0	1	8.7				11.8	,	EXPLA		
COMPI	IG LETED: <b>5/29/14</b>											1	ERMIN		
DR: S	G LG: TM Rig: 91C												1H	IIS LO	



AET JO	B NO: <b>01-05697</b>			LO	G OF	BOI	RING N	ю	1221	SU	(p. 2	2 of	3)
PROJEC	CT: Southwest Light Rail Transit Proj	ect,	PEC East;	Hopl	<b>cins</b>	to I	Minn	eapo	lis				
	Hennepin Co.				5251				50490	7			
DEPTH IN						SA	MPLE	REC	FIELI	) & LA	BORAT	TORY	TEST
IN FEET	MATERIAL DESCRIPTION		GEOLOGY	N	MC	Î	MPLE YPE	IN.	WC	DEN	LL	PL	<b>%-</b> #2
	GRAVELLY SAND, medium to coarse grained,			20	W	М	SS	6					
33 -	gray, waterbearing, medium dense (SP) (A-1-b) (continued)					H							
34 - 35 -						Ю							
35 -				15	W	Д	SS	6					
37 -	GRAVELLY CLAYEY SAND, gray, very stiff		TILL	-1.		Ц		-					
38 -	(SC) (A-6)			20	W	М	SS	1	15				
39 -						Ы							
40 -	CLAYEY SAND WITH GRAVEL, gray, very stiff, laminations of waterbearing sand (SC)			1.7	337	Ю	aa		14				
41 -	(A-6)			17	W	Д	SS	6	14				
42	SANDY LEAN CLAY, a little gravel, gray, very					Ц							
43	stiff, laminations of waterbearing sand (CL) (A-6)			23	W	X	SS	12	21				
44 —	(A-0)					$\left[ \right]$							
45 —				32	_	$\square$	SS	0					
46 —	CLAYEY SAND, a little gravel, grayish brown			54		А	55						
47 —	to brown, hard (SC) (A-6)					K							
48 —				44	W	X	SS	16	11		,		
49 —						$\sum$							
50 —				36	w	$\square$	SS	14	11				
51 —						Ю							
52 —						$\left \left\langle \right\rangle \right $				1			
53 —						$\left \left\langle \right \right\rangle$							
54 —						$\square$							
55 —				44	W	М	SS	16	_11				
56 —						6							
57 —						5							
58 —	SILTY SAND, a little gravel, grayish brown,					$ \langle  $							
59 —	dense (SM) (A-2-4)					K							
60 -			•	48	W	X	SS	14					
61 -						$[\mathcal{T}]$							
62 -	4		•										
63 -	SAND WITH SILT, a little gravel, fine to		COARSE			$\left \right\rangle$							
64 -	medium grained, grayish brown, moist, very dense, lenses of clayey sand (SP-SM) (A-2-4)		ALLUVIUM			$\left \right\rangle$		1.0					1
65 -			•	93/.5	5 W	Å.	SS	12					
66 -						$\left \left\langle \right\rangle \right $							
67 -	LIMESTONE, weathered to generally fresh,		PLATTEVIL			$\langle \langle$							
68 -	gray		FORMATION			$\left \right\rangle$			-				
69 -	1	Ä	4		W		SS	1					
			<u> </u>						<u> </u>		<u> </u>	01-Г	



AET JOB NO:	01-05697			LO	G OF	BORING N	0.	1221	SU	(p. 3	of 3	3)
PROJECT:	Southwest Light Rail Transit Pr	oject, F	PEC East; H	Topk	cins 1	to Minne	eapol	lis				
	Hennepin C				52515			50490	7			
EPTH			OF OL OOV			SAMPLE	REC	FIELD	) & LAI	BORAT	ORY	rest
EPTH IN 'EET	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	WC	DEN	LL	PL	<b>‰-</b> #2
- LIME 71 - gray ( 72 - 73 - 74 -	STONE, weathered to generally fresh, <i>continued)</i>		PLATTEVILL FORMATION (continued)			WASH						
	OF BORING			100/0		SS SS	0-					
	ι											



AET JO	B NO: 01-05697					LO	GOF	BORIN	GNO	)	1222	SU	<b>(p.</b> ]	lof	3)
PROJEC	CT: Southwest Ligh	t Rail Tra	ansit Pro	ject,	PEC East;	Hopl	<b>cins</b> 1	to Mi	nne	apol	lis				, –
SURFAC	CE ELEVATION: 911.3	Н	lennepin Co.	Coordia	nates: <u>N</u>	[ 1	52618	8	E	;	50486	1			
DEPTH					GEOLOGY			SAM	PLE	REC	FIELC	& LA	BORAT	ORY	FESTS
IN FEET	MATERIAL D	VESCRIPTION	.N.		GEOLOGI	N	MC	TYF	E	IN.	WC	OC	LL	PL	%-#20
1 - 2 -	FILL, mostly silty sand wit clayey sand, pieces of bitur black and dark brown (A-1	ninous, trac			FILL	13	М	s s	s	15					
2 3 4	FILL, mostly sand with gra a little clayey sand, brown a little black (A-1-b)	vel, possibl and light br	le cobbles, own, a		-	22	M	X s FJ	S	5				<u> </u>	
5 - 6 -						18	М	2	s	1					
7 - 8 -						12	M		s	13	-				
9 — · 10 —						. 8	M	۲ ۲	s	15			-		
11 — 12 — 13 —						15	M	₽ X s	s	17					
14 — 15 —	FILL, mixture of sandy lea little gravel and sand, brow little black (A-6)			1		6	M		ss	12	15				
16						5	M		ss	15	27				
19 — 20 —	FILL, mostly sand with silt (A-1-b)	t and gravel	, brown			7	M		ss	10					
21 — 22 — 23 —	FILL, mostly sand with gra sand, brown (A-1-b)	avel, a little	clayey			15	₩		SS	5					
24 — 25 —	FILL, mostly gravelly sand dark brownish gray (A-1-b	l, brownish )	gray and			5	w		SS	18					
26 27 28						6	w		ss	12					
20 29 - 30 -	HEMIC PEAT, brown to c	lark brown	(PT)	<u>1.2.4</u>	SWAMP DEPOSIT	21	M		55	15	245				
31 -						_		$\left\{ \right\}$							
DFI	PTH: DRILLING METHOD			WAT	Ø TER LEVEL ME	ASUR	L EMEN	(  TS	1		_1	· .	NOTE:		<u> </u>
		· DATE	<b>TD (T</b> )	r				1	ILLIN	IG T	WATI	ER	NOTE: THE A		
0-2	9 <sup>1</sup> / <sub>2</sub> ' 3.25" HSA	DATE	TIME	SAMP DEP			VE-IN PTH	FLŨÌ	D LĒV	VEL	LEVE	EL			
29 <sup>1</sup> /2-8	9 <sup>1</sup> /2' RDF w/DM	4/29/14	9:55	26.			4.5	<u> </u>			23.5		SHEE'		
	~~	4/29/14	10:05	26.	0 24.5	2	4.5				23.5	,	EXPLA		
BORIN COMP	NG LETED: <b>4/29/14</b>												ERMI		
DR: S													TF	IIS LO	G



AET JOE	B NO:	01-05697			LO	G OF	BOR	UNG N	o	1222	SU	(p. 2	2 of :	3)
PROJEC	T:	Southwest Light Rail Transit Proj	ect,	PEC East; I	Topk	tins	to I	Ainne	eapol	lis				
	-	Hennepin Co. C	Coordin	nates: <u>N</u>	1:	52618	8	_]	E :	50486	1			
EPTH		MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA	MPLE	REC	FIELI	) & LA	BORAT	ORY	TEST
IN TEET		MATERIAL DESCRIPTION	_		N	MC	T	YPE	IN.	WC	OC	LL	PL	%-#2
33 -	FAT C stiff (C	LAY, slightly organic, trace roots, black, CH) (A-7-6) <i>(continued)</i>		FINE ALLUVIUM (continued)	9	М	Å	SS	15	61	3.0			
34 — 35 —	FAT (	CLAY, gray, soft (CH) (A-7-6)			4	М		SS	16	41				
36 -				COADSE			$\left[ \right]$							
37 - 38 -	GRAV waterł	/ELLY SAND, medium grained, gray, bearing, loose (SP) (A-1-b)		COARSE ALLUVIUM	10	W	X	SS	8					
39 — 40 —	mediu	WITH GRAVEL, possible cobbles at 42', m to fine grained, brownish gray, bearing, medium dense (SP) (A-1-b)			22	w		SS	4					
41 - 42 -				•	50/.4	w	X	SS	1					
43 — 44 —				· • •			$\sum_{i=1}^{n}$							
45 - 46 -				•	17	W	Å	SS	0					
47 — 48 —	GRA' gray,	VELLY SAND, medium grained, brownish waterbearing, medium dense (SP) (A-1-b)		· • •	11	w	X	SS	4					
49 — 50 — 51 — 52 —	CLAY lenses (SC)	(EY SAND, brownish gray, very stiff, and laminations of waterbearing sand (A-6)		MIXED ALLUVIUM	24	M/W		SS	13	14				
53 — 54 — 55 — 56 — 57 —	gray,	D, a little gravel, medium grained, brownish waterbearing, medium dense, a lens of l (SP) (A-1-b)		COARSE	13	w		SS	8					
58	SANI gray,	D, a little gravel, fine grained, brownish waterbearing, dense (SP) (A-3)			40	W		SS	13					
61 - 62 - 63 - 64 - 64 - 64 - 64 - 64 - 64 - 64	SAN	D, a little gravel, medium to fine grained, sh brown, waterbearing, medium dense												-
65 — 66 — 67 —		(A-1-b)			19	w		SS	8	*				
68 — 69 —		YEY SAND, a little gravel, grayish brown, stiff (SC) (A-6)		MIXED ALLUVIUM OR TILL										



ET JO	B NO:	01-05697				LO	G OF	BOF	LING N	0	1222	SU	<u>(p. 3</u>	5 of .	3)
ROJEC	CT:	Southwest Light Rail 7	<b>Fransit Proje</b>	ct, F	PEC East; 1	Hopl	cins <sup>-</sup>	to I	Minno	eapol	lis				
			Hennepin Co. Co				52618				50486	1			
PTH					GEOLOGY			SA	MPLE	REC	FIELD	& LAI	BORAT	'ORY	TES
PTH N ET		MATERIAL DESCRIPT	ION		GEOLOGY	N	MC	T	MPLE YPE	IN.	WC	OC	LL	PL	%-#
-	CLAY	EY SAND, a little gravel, gra	iyish brown,		MIXED ALLUVIUM	28	M	М	SS	18	12				
71 –	very s	tiff (SC) (A-6) (continued)			OR TILL			$\left[ \right]$							
72 –					(continued)			$\left \right\rangle$							
73 –	SANI	WITH SILT, fine grained, b	rown,		COARSE	-		$\left \right\rangle$				•			
74	watert gravel	bearing, medium dense, a lens (SP-SM) (A-3)	of sand with		ALLUVIUM			$\mathbb{H}$							
75 —	Brates					30	W	M	SS	16					
76 –			•					$\sum$							
77 –			•												
78 -	CLAY	(EY SAND WITH GRAVEL a, hard (SC/SM) (A-2-6)	, grayish		MIXED ALLUVIUM										
79 80	brown	i, naru (SC/SWI) (A-2-0)			OR TILL	20		$\mathbb{H}$	99	14					
81 -						39	W	Д	SS	14	11				
82 -								$\left \left\langle \right\rangle \right $			-				
83 -	G11 (7)	141	1.1		TILL	-		K							
84 -	SILT   dense	Y SAND, brown, a little grayi , a lens of clayey sand with gr	sh brown, avel (SM)		IILL			$\left \right\rangle$			E				-
85 -	(A-2-					32	w	$\square$	SS	12					
86 -		· · · ·						В							
87 -	-				-			5							
88 -															
89 -		STONE, weathered, light gra	У	Ż	PLATTEVILI FORMATION	JE 4100/	<del>w</del>	(.		0-					
	END	OF BORING				100									
			× .												
					1										
					· · · ·										
		2													
														01-I	

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AET JO	B NO: <b>01-0569</b>	7					LOG	OF E	BOR	ING NO	o. <u>1</u>	1227	SW	(p. 1	l of	2)
PROJEC	CT: Southwes	t Light Rail Tr	ansit Pro	ject, ]	PEC Eas	it; Ho				linne						
SURFAC	CE ELEVATION: <u>8</u>	<b>86.9</b> H	lennepin Co.	Coordin	ates:	N	155	5737		]	E S	51133				
DEPTH IN	MATE	ERIAL DESCRIPTIO	N		GEOLOG	Y ]	N I	MC	SAN	MPLE YPE	REC IN.		) & LA			r
FEET	TTTT T (1 11/2)	1 11			FILL							WC	DEN	LL	PL	%-#200
1	FILL, mostly silty sa bituminous and bric (A-1-b)				FILL		8	М	X	SS	12					
3 -	FILL, mixture of sat with gravel, a little s brown and dark bro	sandy lean clay, lig				]	18	M	X स	SS	14					
4 — 5 —							15	M	¥ Х	SS	8					
6 —	- 								रा स्		_					
7 — 8 —	FILL, mostly sand v (A-1-b)	with silt, a little gra	wel, brown	1		-	15	W		SS	8					
9 10	FILL, mostly sand v sand, light brown, b (A-1-b)	with gravel, a little prownish gray and	clayey brown				20	w		SS	10					
11 - 12 -	(A-1-0)		•					Ŷ	Ŧ							
13 —		·					13	W	Å И	SS	12					
14 15 16	FILL, mostly clayey organic clay, brown (A-2-6)	y sand with gravel, iish gray, a little bl	a little ack				5	W		SS	10	12				
17 -	HEMIC PEAT, bro	wn (PT) (A-8)		<u></u>	SWAMP DEPOSIT		9	М	K	SS	14	357				
18 19	ORGANIC CLAY	WITH GRAVEL,	black, firm													
20	(OH) (A-8)		2				5	М	Å	SS	2	142				
22 -	ORGANIC CLAY, brownish gray, soft		oots,		1		2	М	$\bigwedge$	SS	2	114				
23 -					s =											
$\frac{1}{5}$ 25 - 26 -							2	Μ	Д	SS	16	207				
20 -	-			<u>1</u>	1		2	М	H	SS	14	109				
28 29 -				<u></u>	=		4	141	A	00	14	109				
29 – 30 –	SAND WITH SILT fine grained, dark b loose, a lens of clay	prownish gray, wat	erbearing,		COARSE		8	W	M	SS	6					
31 -					· ·	-			$\left[ \right]$			· .				
DE	PTH: DRILLING ME	THOD			ER LEVEL				1					NOTE:	REFI	ER TO
0-1	14½' 3.25" HSA	DATE	TIME	SAMP DEP	LED CASI TH DEP	ING TH	CAVI DEP	E-IN TH	FL FL	ORILLI UID LI	NG EVEL	WAT LEV	ER EL	THE A		
141/2-2	24 <sup>1</sup> / <sub>2</sub> ' RDF w/DM	4/29/14	9:30	13.	5 12.	.0	11		<u> </u>			9,4		SHEE		
	NG	4/29/14	9:40	13.	5 12.	.0	11	.3				7.4	•			ON OF GY ON
	NG PLETED: <b>4/29/14</b>							** ***							IIS LC	
DR: T	TA LG: SHS Rig: 6	9C				l									01.7	

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AET JC	B NO:	01-05697			LC	OG OF	BORING N	0	1227	SW	(p. 2	2 of 2	2)
PROJE	CT:	Southwest Light Rail Transit Pr	oject,	PEC East; I	Hopl	kins	to Minn						
		Hennepin Co	. Coordi	nates: <u>N</u>	1	5573'	7	E t	51133				
DEPTH IN FEET		MATERIAL DESCRIPTION		GEOLOGY	N	мс	SAMPLE	REC		) & LAI		1	
FEET							IYPE	IN.	WC	DEN	LL	PL	%-#20
33 -	gray, a	D, a little gravel, medium to coarse grained a little black, waterbearing, loose (SP) b) (continued)	,	COARSE ALLUVIUM (continued)	8	W	ss	11			-		
34 -	SANI	), a little gravel, medium grained, gray, a black, waterbearing, loose (SP) (A-1-b)	_	•			<del>K</del> 1						
35 - 36 -	little b	black, waterbearing, loose (SP) (A-1-b)		•	7	W	ss s	8					
30 -							2						,
38 -				•	9	-	X ss	0					
39 -	SANI	D, a little gravel, fine to medium grained, waterbearing, loose (SP) (A-3)		•			Ы						
40 -	,				6	W	ss s	8					
41 -		AT DODING				vv	$\bigwedge^{33}$	0					
	END	<b>OF BORING</b>											
							-						
	:												
5													
2													
5										-			
5													
		e e e e e e e e e e e e e e e e e e e											
2													•
02/2011				<u> </u>	I					1	1	01-D	



AET JC	B NO:	01-05697		- Allana ra		<u>,                                     </u>		LO	G OF ]	BOF	UNG N	0	1228	SS	(p. 1	of	4)
PROJE	CT:	Southwest Ligh	t Rail Tra	ansit Pro	ject, I	PEC E	ast; H				Minno						
SURFA	CE ELEV	ATION:874.5	H	ennepin Co.	Coordin	ates:	N	15	57076	5	]	E t	51526				
DEPTH IN FEET		MATERIAL D	ESCRIPTION	J		GEOL	OGY	N	МС	SĄ	MPLE	REC			BORAT		1
FËET											YPE	IN.	WC	DEN	LL	PL	%-#200
1 -	grave	mostly silty sand with l, pieces of concrete a prown (A-2-4)	n organic fi nd plastic, t	nes, with race roots,		FILL		11	М	X	SS	4					
2 - 3 -		mostly silty sand, a li n (A-2-4)	ttle gravel,	dark				10	М	X	SS	17					
4 - 5 -	FILL, (A-3)	mostly sand with silt	, a little gra	vel, brown				15	M	Å	SS	14					
6	FILL, (A-1-	, mostly silty sand wit b)	h gravel, da	irk brown				12	М		SS	15					
9 10	lean d	, mostly silty sand, a l clay and ashes/cinders n (A-2-4)	ittle gravel, , brown and	sandy 1 dark				7	M	ł	SS	16					
11 - 12 -		n (A-2-4)						16		Ł	SS	15					
13 -	-							10	<b>_</b>	A	55	15					
14 -	-									H							
15 -								13	W	Å	SS	15			č.		
10 - 17 - 18 -		, mostly silty sand wit n (A-1-b)	h gravel, gr	ray to dark				18	w		SS	16					
19 - 20 -	-							10	w	E	SS	8					
21 -								10	vv	A H	00	0					
23 - 24 -								15	W	X	SS	15					
	SAPI	RIC PEAT, black (PT	) (A-8)			SWAM DEPOS		20	M		SS	12	210				
27 - 28 -	_							17	М		SS	12	239				
25 - 26 - 27 - 27 - 27 - 27 - 27 - 27 - 27	ORG stiff,	ANIC CLAY, trace r laminations of sapric	oots, dark b peat (OH)	orown, very (A-8)				16	M	ł	SS	12	172				
d 31 -	-									8							
B DE	 EPTH:	DRILLING METHOD			WAT	ER LEV	EL MEA	SUR	EMEN	ITS	<b>)</b>	- I	·· ·· ··		NOTE	REF	ER TO
			DATE	TIME	SAMPI DEP	LED CA	ASING DEPTH	CA	VE-IN EPTH	FI	DRILLI JUID LI	NG EVEI	WAT LEV	ER EL			CHED
	<u>0-49'</u>	3.25" HSA	5/15/14	9:45	16.		14.5		5.0				13.		SHEE	TS FC	OR AN
<b>49-1</b>	14½'	RDF w/DM	5/15/14	9:45	16.	-	14.5		<u> </u>	+			13.		EXPLA	NAT	ION OF
≷ BORI	NG PLETED	E 11 E 11 A	5/15/14	11:00	38.		<u>37.0</u>		4.0				31.		TERMI	NOLC	OGY ON
		: 5/15/14 G: SB Rig: 85C	5/15/17			-				-			•		TI	HIS LO	)G
DR: '		J. DU KIE. OOC			1			L								01-	DHR-0

03/2011



AET JO	B NO:	01-05697			LO	G OF	BOI	RING N	0	1228	8 SS	(p. 2	2 of 4	4)
PROJEC	CT:	Southwest Light Rail Transit Proj	ect,	PEC East; ]				Minn						
		Hennepin Co. C	Coordin	nates: <u>N</u>	1:	57070	5		Е ぢ	51526				
DEPTH IN FEET		MATERIAL DESCRIPTION		GEOLOGY	N	мс	SA J	MPLE YPE	REC IN.	FIELI WC	D & LA	30RA7 LL	PL	TESTS  %-#200
33 -	SAND roots,	Y LEAN CLAY, slightly organic, trace dark brownish gray, firm (CL) (continued)		TILL (continued)	6	М	X	SS	18	70				
34 — 35 —	SILTY dense	Y SAND, a little gravel, gray, medium (SM) (A-2-4)		TILL	12	w	Ĭ	SS	16					
36 - 37 -		SAND WITH GRAVEL, medium to fine		COARSE ALLUVIUM			E					-		
38	GRA	d, gray, wet, loose (SM) (A-1-b) /EL, gray and brown, waterbearing, m dense (GP) (A-1-a)	· · · · · · ·		10	W	X Ł	SS	18					
40 41			0 0 0		30	w	A	SS	1					
42 — 43 —					21	w	$\left  \right $	SS	2					
44	SANE	WITH GRAVEL, coarse to medium d, gray, waterbearing, medium dense (SP)	0		10			00						
46 — 47 —	(A-1-a	a) D WITH GRAVEL, medium to fine		• • •	13	W	Å	SS	1					
48 49	graine	d, brownish gray, waterbearing, medium (SP) (A-1-b)		•	14	W	Ķ	SS	6					
50 - 51 - 52 -					17	w		SS	0					
53 — 54 —	SANI water	D, fine to medium grained, brown, bearing, medium dense (SP) (A-3)												
55 - 56 - 57 -					23	M	X	SS	13					
57 - 58 - 59 - 60 - 61 - 62 - 63 - 64 - 65 - 65 - 66 - 67 - 68 - 69 - 69 - 69 - 69 - 69 - 69 - 69	SANI	D, a little gravel, medium to fine grained, n, waterbearing, medium dense (SP) b)	/				$\left  \right\rangle$							
60 - 61 - 62 -	SANI fine g	D WITH SILT AND GRAVEL, medium to rained, brown, waterbearing, medium (SP) (A-1-b)			15	W	X	SS	11					
63 - 64 -	-						$\left  \right\rangle$							
65 - 66 -					24	W	X	ss	7					
67 - 68 -	SILT	Y SAND, a little gravel, fine to medium					$\left \right\rangle$							
69 - E	grain	ed, gray, wet, medium dense (SM) (A-2-4)												 DHR-0



AET JO	B NO: <b>01-05697</b>			LO	GOF	BOI	RINGN	0	1228	B SS	(p. 3	3 of	4)
PROJEC	T: Southwest Light Rail Transit Proj	ect, P	EC East;	Hopł	<b>cins</b>	to ]	Minne	eapol	lis				
	Hennepin Co.	. Coord	inates: <u>N</u>	1 1	5707(	6	]	E - \$	51526	0			
EPTH			CEOLOGU			SA	MPLE	REC	FIELI	) & LA	BORA	FORY	TEST
IN FEET	MATERIAL DESCRIPTION		GEOLOGY	N	MC		MPLE YPE	IN.	WC	DEN	LL	PL	<b>%-#</b> 2
	SILTY SAND, a little gravel, fine to medium			24	w	М	SS	13					
71 —	grained, gray, wet, medium dense (SM) (A-2-4) (continued)					Д							
72 —						K							
73 —	SAND WITH SILT, a little gravel, fine to					$\left \right\rangle$							
74 —	medium grained, grayish brown, waterbearing,					$\sum$							
75 —	medium dense (SP-SM) (A-1-b)			16	w	М	SS	4					
76 —				16	W	Μ	22	4					
77 —						$\sum$							
78 -	SAND, fine to medium grained, grayish brown,												
79 —	waterbearing, medium dense (SP) (A-3)					$\mathbb{N}$							
80 —						М							
81 —				21	W	١Ň	SS	10					
82 —						Ы							
83 -						$\mathbb{S}$							
84	SAND WITH GRAVEL, possible cobbles, medium to fine grained, gray, waterbearing,					KI							
85 -	medium dense (SP) (A-1-b)					H							
				13	W	IXI	SS	4					
86 -						А							
87 —						K(							
88 —						K							
89 —						Д							
90 —				14	W	M	SS	13					
91 -						Д	~~ .	10					
92 –						2							
93 -	LEAN CLAY, possible cobbles, gray, hard (CL)		FINE	-		$\left \right\rangle$							
94 –	(A-6		ALLUVIUM			$\left \right\rangle$							
95 –				38	М	М	SS	3	29				
96 -						Ĥ							
97 -						K							
98 -	SAND a little gravel medium to fine grained		COARSE	-		K							
99	SAND, a little gravel, medium to fine grained, gray, waterbearing, medium dense (SP) (A-1-b)		ALLUVIUM			$\left \right\rangle$							
100 -						[7]							
101 -				13	W	X	SS	10					
102 -						$\begin{bmatrix} \\ \end{bmatrix}$							
103 -													
104 -	SANDY LEAN CLAY, a little gravel, possible cobbles, grayish brown, hard (CL) (A-6)		TILL			$ \langle \langle  $							
105 -	cours, gruptsh orown, nard (CD) (11-0)					Ю	_						
105 -				32	Μ	M	SS	7	25				
						[]							
107 -				·		$ \rangle $							



AET JOB NO:	01-05697			LO	G OF	BORING N	0.	1228	B SS	(p. 4	of 4	<b>I</b> )
PROJECT:	Southwest Light Rail Transit Pro	ject, ]	PEC East; H	Iopł	cins	to Minn						
-	Hennepin Co.	Coordin	ates: <u>N</u>	1:	57070	5	E ś	51526	0			
EPTH	MATERIAL DESCRIPTION		GEOLOGY	N	мс	SAMPLE TYPE	REC IN,	FIELI	) & LAI	30RAT		
EPTH IN TEET				IN	IVIC	TYPE	IN,	WC	DEN	LL	PL	%-#2
cobble	Y LEAN CLAY, a little gravel, possible s, grayish brown, hard (CL) (A-6)		TILL (continued)			3						
	STONE, fresh, white, light brown and	/	ST. PETER FORMATION	100/.2	W	ss ss	3					
111 – light g	ray		1 Oldminon			5						
112 —						$\left \right\rangle$						
113 -						$\sum$						
114 -				100/.2:	-w	S-ss	3					
END	OF BORING											
					1							
			• 1									
											÷	


AET JO	OB NO: 01-05697					L	OG OF	BO	RING N	0	1229	SV	<b>(p.</b> ]	l of	4)
PROJE	CT: Southwest Ligh	nt Rail Tra	ansit Pro	ject, P	EC East	; Hop	kins	to	Minn						
SURFA	CE ELEVATION: <b>872.8</b>	H	ennepin Co.	Coordina	ites:	N	15732	2		E :	51545	5			
DEPTH IN FEET	MATERIAL I	DESCRIPTION	J		GEOLOGY	N	MC	SĄ	MPLE	REC		1	BORA	r	1
FEET									TYPE	IN.	WC	DEN	LL	PL	%-#20
1 —	FILL, mostly clayey sand v silty sand with organic fine				FILL	10	M	M	SS	18	11				
2 -	black (A-6)			/				Д							
3 -	FILL, mostly silty sand, a coal, dark brown and black	little gravel, $(A-2-4)$	pieces of			9	M	X	SS	10					
4 —								R							
5	FILL, mostly sand, a little and brown (A-3, A-1-b)	gravel, light	brown			6	М	$\nabla$	SS	10					
6 -									00						
7 —								EL							
8 -						5	M	Х	SS	8					
9 –								Ł							
10 -						14	M	$\square$	SS	4					
11 -								Д И	55						
12	FILL, mostly clayey sand	with gravel,	brown and					12							
13 -	black (A-6)					4	M	X	SS	3					
14 -	FILL, mostly sand with sil	t a littla gra	val traca					ß							
15 -	roots, brown (A-1-b)	it, a nuie gra	ivel, trace			8	M	$\mathbf{v}$	SS	10					
16 -								1							
17 -	SILTY CLAY, trace roots	, gray, a littl	e brown,		FINE ALLUVIUN	л		- [4]			27				
18 -	firm (CL-ML) (A-4) SILT, light brown, a little	brown and a	Trov Wat		ALLUVIUN	<b>vi</b>   7	M	Х	SS	16	26				
19 -	loose, a lens of lean clay a							ß							
20 -	-					6	M	$\nabla$	SS	18	29				
21 -	-							F							
22 -	SILTY CLAY, grayish br	own, a little	brown,					P	1						
23 -	firm (CL-ML) (A-4)					7	M	X	SS	18	32		-		
24 -	SILTY SAND, fine graine	ad brownish	aray wet		COARSE			1							
25 -	loose, laminations of silt (	SM) (A-2-4	)	'	ALLUVIU	M 8	w	$\cdot \left[ \right]$	SS	12					
26 -								मि							
27 -								. H							
28 -	- · ·					7	'   W	Ϋ́́́́́́	SS	18					
29 -	SAND WITH SILT, fine	grained grav	V.					Į							
30 -	waterbearing, loose (SP-S		<i>, ,</i>			9	w	N	ss	18					
31 -	_							ম							
	PTH: DRILLING METHOD			WATE	ER LEVEL M	/EASU	REME	山戸 NTS	•	. I		1	NOTE	, DEE	
	PTH: DRILLING METHOD								DRILL	NG	WAT LEV	ER	NOTE		
25 - 26 - 27 - 28 - 29 - 30 - 31 - DE 0 ( 44-12) BORI COM	)-44' 3.25" HSA	DATE	TIME	SAMPL DEPT			AVE-II DEPTH	F		EVEL					OR AN
44-12	24½' RDF w/DM	5/15/14	12:00	21.0			19.5	_			Noi		EXPLA		
	~~~~	5/15/14	12:40	21.0	19.5	5	18.4				16.		TERMI		
BORI COM	NG PLETED: <b>5/15/14</b>							_						HIS LO	
DR: S	SG LG: CD Rig: 91C														DHR-

03/2011



AET JOB NO:	01-05697		LC	)G OF	BORI	NG N	Э	1229	SV	(p. 2	2 of 4	4)
PROJECT:	Southwest Light Rail Transit Project,	PEC East; I	Iopl	kins	to M	linne	eapol	lis				
	Hennepin Co. Coordi	inates: <u>N</u>	1	57322	2	_]	E :	51545	5			
DEPTH		CEOLOCY	N		SAM	IPLE	REC	FIELI	) & LAI	BORAT	ORY	TEST
IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	TY	ΡĒ	ĪN.	WC	DEN	LL	PL	%-#2
	TY SAND, fine grained, gray, wet, very		2	W/M	M	SS	18					
	e (SM) (A-2-4) (continued)	FINE ALLUVIUM	\$		R			39				
(A-		ALLOVION			H							-
35 -			4	M	Д	SS	18	35				
36 -					Ľ							
37 -			6	M	Μ	SS	18	37				
38 -					मि							
39 LEA	AN CLAY WITH SAND, dark brownish				H							
	y, stiff, laminations of waterbearing sand	COARSE	11	M/W	Δ	SS	18					
$41 - \frac{1000}{\text{SAU}}$	ND WITH SILT, a little gravel, medium to				Ĭ							
42 - fine $43 - med$	grained, dark grayish brown, waterbearing, lium dense to very loose (SP-SM) (A-1-b)		3	W	X	SS	18					
43		·			प्ति							
$\begin{array}{c c} 44 & \\ 45 & \\ 45 & \\ grave$	NDY LEAN CLAY, dark grayish brown to yish brown, very stiff (CL) (A-6)	TILL	17		H	aa	10	20				
46			17	M	Д	SS	16	20				
40					Ц							
48			20	M	X	SS	18	17				
49					$[\mathcal{T}]$							
50 -			16	M	M	SS	18	18				
51 -			10	141	А	00	10	10				
52 -					$\langle \langle$							
53 -					$\langle \langle$							
54 -					21							
55 -			17	M	$\mathbf{N}$	SS	18	18				
56					Ą	00						
58 —					$\langle \langle$							
59 - SA	ND WITH GRAVEL, medium grained,	COARSE			$\left \left\langle \cdot\right\rangle \right $							
60 - brc	wn, waterbearing, dense (SP) (A-1-b)		31	W	$\square$	SS	6					
61 -					H							
62 —					K							
63 - GE	AVELLY SAND, medium grained, brown,				$\langle \langle$							
64 – Wa	terbearing, very dense (SP) (A-1-b)				$\langle \rangle$							
65			70	W	М	SS	6					
66 -					Ы							
67 -					$ \langle  $							
68					$\langle \langle$							
$\begin{array}{c} 57 - \\ 58 - \\ 59 - SA \\ 60 - \\ 61 - \\ 62 - \\ 63 - GF \\ 64 - \\ 65 - \\ 66 - \\ 65 - \\ 66 - \\ 67 - \\ 68 - \\ 69 - \\ \end{array}$												
AEL		<u></u>			Ń						01-I	



T: Southwest Light Rail Transit Pro Hennepin Co. C		PEC East; ]	Hopk	ins 1	to ]	Minn	eapol	lis				
Hennepin Co. 6												
	Coordin	ates: <u>N</u>	15	57322	2	-	E:	51545				
MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA	MPLE TYPE	REC		) & LA	BORAT		TEST
WITTERIAL DESCRIPTION		0101001				YPE	IN.	WC	DEN	LL	PL	%-#
SAND WITH GRAVEL, medium grained,		*	19	W	М	SS	10					
brown, waterbearing, medium dense (SP) (A-1-b) (continued)					Ą							
					$\langle \langle$							
SAND, a little gravel, medium to fine grained,	_				$\langle \langle$							
brown, waterbearing, medium dense (SP)					4		1					
(A-1-0)			35	W	X	SS	12					
					Д							
					$\langle \langle$							
					$\left \right\rangle$							
					2	8						
			25	W	Х	SS	12					
		,			$\int$							
					$\left \right\rangle$							
SAND, a little gravel, medium grained, brown,	-				<u></u> ((							
waterbearing, medium dense (SP) (A-1-b)												
			19	W	X	SS	8					
					$\int$							
					$\left \right\rangle$							
SAND medium to fine grained, brown,					$\left \left\langle \cdot\right\rangle \right $							
waterbearing, medium dense (SP) (A-1-b)					K							
			21	W	X	SS	6					
			1		5							
					$\left \right\rangle$							
		*			$\left \left\langle \cdot\right\rangle \right $	q						
		*			(	¢						
		•	13	W	X	SS	8					
		•			5	ľ						
		•			$\left \right\rangle$	q						
		•			K	٩						
		•			Ĺ	4						
		:	14	w	$\mathbb{N}$	ss	10					
					$\bigwedge$	1						
					R	d						
SAND, a little gravel, medium grained, gravish					$ \rangle$							
brown, waterbearing, medium dense (SP)					$\left \right\rangle$							
			15	w	$\mathbb{N}$	22	10					
medium dense, a lens of sand with silt (SP)		•		"	$\square$							
(A-3)					$ \rangle$	ł				1		
	<ul> <li>(A-1-b) (continued)</li> <li>SAND, a little gravel, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)</li> <li>SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)</li> <li>SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)</li> <li>SAND, a little gravel, medium grained, gravish brown, waterbearing, medium dense (SP) (A-1-b)</li> <li>SAND, fine grained, brown, waterbearing, medium dense (SP) (A-1-b)</li> <li>SAND, fine grained, brown, waterbearing, medium dense (SP) (A-1-b)</li> </ul>	(A-1-b) (continued)       SAND, a little gravel, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)         SAND, fine grained, brown, waterbearing, medium dense (SP) (A-1-b)         SAND, fine grained, brown, waterbearing, medium dense (SP) (A-1-b)	(A-1-b) (continued)         SAND, a little gravel, medium to fine grained, brown, waterbearing, medium dense (SP)         (A-1-b)         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)         SAND, a little gravel, medium grained, grayish brown, waterbearing, medium dense (SP) (A-1-b)         SAND, a little gravel, medium grained, grayish brown, waterbearing, medium dense (SP) (A-1-b)         SAND, fine grained, brown, waterbearing, medium dense, a lens of sand with silt (SP)	(A-1-b) (continued)       35         SAND, a little gravel, medium to fine grained, brown, waterbearing, medium dense (SP)       35         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)       19         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)       19         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)       21         SAND, a little gravel, medium grained, grayish brown, waterbearing, medium dense (SP)       13         I3       14         SAND, a little gravel, medium grained, grayish brown, waterbearing, medium dense (SP)       15	(A-1-b) (continued)       35         SAND, a little gravel, medium to fine grained, brown, waterbearing, medium dense (SP)       35         (A-1-b)       35         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)       19         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)       19         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)       21         W       13         W       14         W       14         W       15	(A-1-b) (continued)       35         SAND, a little gravel, medium to fine grained, brown, waterbearing, medium dense (SP)       35         (A-1-b)       35         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)       19         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)       19         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)       21         W       13         W       14         W       14         W       15	(A-1-b) (continued)       35       W       SS         SAND, a little gravel, medium dense (SP)       35       W       SS         (A-1-b)       35       W       SS         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)       19       W       SS         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)       19       W       SS         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)       13       W       SS         SAND, medium to fine grained, brown, waterbearing, medium dense (SP)       14       W       SS         SAND, a little gravel, medium grained, gravish brown, waterbearing, medium dense (SP)       14       W       SS         SAND, fine grained, brown, waterbearing, medium dense (SP)       15       W       SS	(A-1-b) (continued)       35       W       SS       12         SAND, a little gravel, medium dense (SP)       35       W       SS       12         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)       19       W       SS       8         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)       19       W       SS       8         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)       14       W       SS       8         SAND, a little gravel, medium grained, grayish brown, waterbearing, medium dense (SP)       14       W       SS       8         Indicate gravel, medium grained, grayish brown, waterbearing, medium dense (SP)       15       W       SS       10	(A-1-b) (continued)       35       W       SS       12         SAND, a little gravel, medium to fine grained, brown, waterbearing, medium dense (SP)       35       W       SS       12         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)       19       W       SS       8         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)       19       W       SS       6         13       W       SS       6       13       W       SS       10         SAND, a little gravel, medium grained, grayish prown, waterbearing, medium dense (SP) (A-1-b)       14       W       SS       10         SAND, a little gravel, medium grained, grayish prown, waterbearing, medium dense (SP)       15       W       SS       10	(A-1-b) (continued)         SAND, a little gravel, medium to fine grained, brown, waterbearing, medium dense (SP)         (A-1-b)         35       W         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)         19       W         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)         11       W         SAND, a little gravel, medium grained, gravish brown, waterbearing, medium dense (SP) (A-1-b)         13       W         SAND, a little gravel, medium grained, gravish brown, waterbearing, medium dense (SP)         14       W         SAND, a little gravel, medium grained, gravish brown, waterbearing, medium dense (SP)         15       W	(A-1-b) (continued)         SAND, a little gravel, medium to fine grained, brown, waterbearing, medium dense (SP)         (A-1-b)         35       W         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)         19       W         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)         19       W         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)         19       W         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)         113       W         SAND, a little gravel, medium grained, gravish brown, waterbearing, medium dense (SP)         13       W         SAND, a little gravel, medium grained, gravish brown, waterbearing, medium dense (SP)         14       W         SAND, a little gravel, medium grained, gravish brown, waterbearing, medium dense (SP)         15       W         SAND, fine grained, brown, waterbearing, medium dense (SP)	(A-1-b) (continued)         SAND, a little gravel, medium of fine grained, brown, waterbearing, medium dense (SP)         (A-1-b)         35       W         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)         19       W         SAND, medium to fine grained, brown, waterbearing, medium dense (SP) (A-1-b)         19       W         SAND, a little gravel, medium grained, brown, waterbearing, medium dense (SP) (A-1-b)         11       W         SAND, a little gravel, medium grained, grayish brown, waterbearing, medium dense (SP)         13       W         SAND, a little gravel, medium grained, grayish brown, waterbearing, medium dense (SP)         13       W         SAND, notifue grained, brown, waterbearing, medium dense (SP)         14       W         SAND, fine grained, brown, waterbearing, medium dense (SP)         15       W



AET JO	B NO: <b>01-05697</b>		Marrie .	LO	GOF	BORING	GNO.	1229	9 SV	(p. 4	4 of 4	4)
PROJEC	T: Southwest Light Rail Transit Proj	ect,	PEC East; H	Iopl	cins (	to Mir						
	Hennepin Co. C				57322			51545				
DEPTH IN FEET	MATERIAL DESCRIPTION		GEOLOGY	N	мс	SAMPI TYPI	LE REC		) & LA		T	T
		- <u>1</u>					2 IIN.	WC	DEN	LL	PL	%-#200
108 -	CLAYEY SAND WITH GRAVEL, brown, very		TILL			K						
109 -	stiff, laminations of wet silty sand (SC) (A-6)					K						
110 111				28	M/W	$ \chi $ s	5   16	14				
112 -			COLDOD			5						
112	GRAVEL WITH SAND, grayish brown, waterbearing, dense (GP) (A-1-b)	<b>₩</b> ₩	COARSE ALLUVIUM			$\left  \right\rangle$						
114 -		1				5						
115 -		1		49	w	S s	5 8					
116 -				49	vv	$\square$ .	5 0					
117 -						$\mathbb{Z}$						
118 -	SANDSTONE, fresh, light gray		ST. PETER			$\left \left\langle \cdot\right\rangle \right $						
119 -			FORMATION	200/.2	w	s s	S 2					
120 -				2007.2		$\langle \langle$						
121 -						R						
122 -						R						
125						R						
121	END OF BORING			150/.2	2 W	⇒ s	s	-				
<u>4</u>												
7710												
+												
1+0-1												
JAE												
597.GF												
01-05												
ATES												
ORDIN												
7007												
AET_CORP W-COORDINATES 01-05697.GPJ AE1+CP1+WELL-GD1 5/2274												
< <u></u>		•									01-T	DHR-0



ALI JU.	B NO: 01-05697				/		)G OF					101	(p. )	LUL	<u></u>
PROJEC	CT: Southwest Lig	ht Rail Tr	ansit Pro	ject,	PEC East; ]	Hopl	<u>kins</u>	to M	linne						
SURFAC	CE ELEVATION: 873.0	H	Iennepin Co	o. Coo	rdinates: <u>N</u>	1	57440	)	]	E É	51558	4			
DEPTH	MATERIAL	DESCRIPTIO	NT		GEOLOGY	N	MC	SAM	IPLE	REC	FIELI	)&L/	BORA	FORY	TEST
IN FEET	MATERIAL	DESCRIPTIO.	IN .		OLOLOGI	IN		TY	PE	IN.	WC	DEN	LL	PL	<b>%-</b> #:
1	FILL, mostly clayey sand, little gravel and silty sand brown (A-2-6, A-2-4)				FILL	6	М	X	SS	14					
3	FILL, mostly sand, a little and silty sand, pieces of w	ood, trace re				5	M	X	SS	12					
5 6	brown, a little black (A-1-	·b)				7	М	K	SS	4					
7 8 9				÷		7	M	T T	SS	8					-
9 – 10 – 11 –	FILL, mostly clayey sand roots, brown and dark bro	, a little grav wn (A-6)	el, trace			7	M	A A A	SS	14	13				
12 13	FILL, mostly sand with si little dark brown (A-1-b)	lt and grave	l, brown, a			6	М		SS	10					
14 — 15 —						22	M	X	SS	10					
16 17	SILT, brown, wet, loose (	ML) (A-4)			FINE ALLUVIUM	9	w	ł	SS	14	34				
18 19	LEAN CLAY, light grayi	sh brown, a	little		ALLOVION		;	F	55						
20 — 21 —	brown, firm, laminations		. ,			8	M/W	'X FI	SS	18	37				
22 - 23 -						4	M	A	SS	18	35				
24 — 25 — 26 —	SAND WITH SILT, fine waterbearing, medium de	grained, gra nse (SP-SM	y, ) (A-3)		COARSE ALLUVIUM	12	w	H H	SS	6	a for a first of the		-		
27 28 20	SANDY SILT, gray, wet,			•••	FINE ALLUVIUM	8	w	H H H	SS	12	31				
29 — 30 — 31 —	SILTY SAND, fine grain (SM) (A-4)	ed, gray, we	t, loose		COARSE	8	w	E C C C C C C C C C C C C C C C C C C C	SS	16	•				
DEP	TH: DRILLING METHOD			<u>    </u> w/w	ER LEVEL MEA		FMEN	 TS			<u> </u>	<u> </u>			
								· · · ·	יו ד דו	NG	WAT		NOTE:		-
0-	-49' 3.25" HSA	DATE	TIME	SAMP DEP	LED CASING TH DEPTH	DE	VE-IN PTH	FLU	RILLIN ID LE	VEL	WATI LEVI	я́с	THE A		
49-9	9½' RDF w/DM	5/14/14	9:36	21.	0 19.5	1	9.5				18.9	•	SHEE	IS FO	R Al
		5/14/14	9:48	21.	0 19.5	1	9.0				16.2	2	EXPLA	NATIO	ON (
DODIN	IG LETED: <b>5/15/14</b>							1				1	TERMIN	10LO	GY (
CUM	LETED 5/15/14	1								1					



ROJEC	T: Southwest Light Rail Transit Proj	ect,	PEC East; I	Iopl	cins t	to I	Minne	eapol	lis				
	Hennepin Co.				57440				51558	4			
PTH						54	MPLE	REC	FIELI	) & LA	BORAT	FORY	TEST
N ET	MATERIAL DESCRIPTION		GEOLOGY	N	MC	T	YPE	IN.	WC	DEN	LL	PL	<b>%-</b> #2
33 -	SILTY SAND, fine grained, gray, wet, loose (SM) (A-4) <i>(continued)</i>		COARSE ALLUVIUM (continued)	6	w	Å	SS	18					
34 —- 35 —	LEAN CLAY, gray, firm (CL/CH) (A-7-6)		FINE ALLUVIUM	6	M	ľ	SS	18	41				
36 — 37 — 38 —	FAT CLAY, gray, a little light grayish brown, firm, laminations of silt (CH) (A-7-6)			8	М		SS	18	43				
39 — 40 — 41 —				6	М		SS	18	28				
42 — 43 —	LEAN CLAY, gray, stiff, laminations of sand (CL) (A-6)			15	М	A A	SS	16	20				
44 45 46	SANDY LEAN CLAY, gray, very stiff, a lens of waterbearing gravelly sand at 45' (CL) (A-6)		TILL	17	M/W		SS	18	18				
47 - 48 - 40	CLAYEY SAND, a little gravel, trace roots, brownish gray, a little black, very stiff to hard, a lamination of organic clay at $47\frac{1}{2}$ (SC) (A-6)			20	М		SS	18	27		e		
49 - 50 - 51 -	· · ·			27	М	Ľ L	SS	18	15				
52 - 53 - 54 -											- - -		
55 — 56 — 57 —				24	М	X	SS	18	17				
58 59						$\left\{ \right\}$							
60 - 61 - 62 -				32	M	X	SS	12.	17	÷			
63 — 64 — 65 — 66 —	SAND WITH SILT AND GRAVEL, fine to medium grained, brown, waterbearing, medium dense (SP-SM) (A-1-b)		COARSE	30	W		SS	8					· ·
67 - 68 - 69 -	GRAVEL WITH SAND, brown, moist, very dense (GP) (A-1-b)		•									•	



PROJEC	T: Southwest Light Rail Transit Proj Hennepin Co.				5744(				51558	4			
										 0 & LA	BORA	FORY '	TEST
EPTH IN FEET	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA T	MPLE YPE	REC IN.		DEN	LL	PL	T
	GRAVEL WITH SAND, brown, moist, very	-	COARSE	82	M/W	M	SS	8					1
71 -	dense (GP) (A-1-b) (continued)	<b>h h</b>	ALLUVIUM			$\beta$							
72 -		11	(continued)			$\left \left\langle \cdot\right\rangle \right $							
73 –						$\left \left\langle \cdot\right\rangle \right $							
74 –						$\langle \langle$							
75 —		1 1 1 1	-	64	M/W	М	SS	-					
76 —		10				6							
77 —						$\left \left\langle \cdot\right\rangle \right $							
78 -						$\langle \langle$							
79 –						$\langle \langle$							
80 -				57	M/W	М	SS	10					
81 -				57	141/ 44	Д	00	10					
82 –		-				$\mathbb{Z}$							
83 —						$\left \right\rangle$							
84 —						$[\Delta]$							
85 —		+ +		70	M/W	X	SS	12					
86 -						$\left[ \right]$							
87 –		-				$\mathbb{S}^{(1)}$							
88 —		<b>*</b>				$ \langle  $							
89 -						Ц							
90 -				88	M/W	ĺΧ	SS	8					
91 —	14					Б							
92 –		1				51							
93 –		1 1 1				$\mathbb{S}$							
94 —		1				$\square$							
95 -	SAND, fine to medium grained, brown, moist, very dense (SP) (A-3)		 - -	80	-	Х	SS	0					
96 -	very dense (SP) (A-3)		•			$\left[ \right]$			ľ				
97 –													
98 —						$\left \right\rangle$							
99			•			K.							
100 -				64	M/W	γX	SS	16					
101 -			:			$\mathbb{P}$							_
	END OF BORING												
		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				
	DEPTH IN FEET		MATERIAL D	DESCRIPTIO	N		GEO	DLOGY	N	MC	SA T	MPLE YPE	REC IN.	FIELD WC	) & LA DEN	BORAT		FESTS %-#200
	1 —		stly sandy silt, a l ce roots, dark bro		nd and		FILL		10	М	$\mathbb{N}$	SS	6					
	2 3	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				
	6 — 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	medium t little gray	ITH SILT, a little o fine grained, lig ish brown, moist, ses of silty sand a	ht brownis medium de	h gray, a ense to		COA ALL	RSE UVIUM	17	М		SS	14					
	12 — 13 — 14 —	(SP-SM)	(A-1-b)						6	M/W		SS	10					
	14 — 15 — 16 —	SAND, a light gray (A-1-b)	little gravel, med ish brown, water	ium to fine pearing, loo	grained, se (SP)				7	M/W	LA R	SS	8					-
	17 — 18 —								7	W	A	SS	2					
	19 20 21		little gravel, med gray, waterbearin -b)					-	23	w	H K K	SS	18					
	22 - 23 -		L WITH SAND, I lense (GP) (A-1-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		L WITH SAND, I nedium dense (G		erbearing,				10	w	H K K	SS	0					
CORP W-COORDINATES 01-05697.GPJ AET+CPT+WELL.GDT 5/9/14	29 - 30 - 31 -					1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			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				DATE	TIME	SAMPI	LED	CASING DEPTH	·····	VE-IN PTH	T	DRILLI UID LI	NG EVEL	WAT LEVI		THE A		
RDIN			5" HSA F w/DM	4/30/14	9:15	13.5		12.0	1.	2.7	1			Non		SHEE	TS FO	R AN
V-COC	191/2	2-07 KD		4/30/14	9:50	21.0		19.5	+	7.4	-			16.		EXPLA	NATI	ON OF
N ANC	BORD	NG PLETED: 5/	/1/14													FERMI	NOLO	GY ON
AET_CC	DR: 1		<b>K</b> Rig: <b>69C</b>													TH	IIS LO	G

03/2011



101 901	B NO: <b>01-05697</b>	_		LO	G OF I	BOF	NING NO	D	1232	SB	(p. 2	: of 2	2)
PROJEC	T: Southwest Light Rail Transit Proj	ect, ]	PEC East; H	lopk	tins t	to I	Minne	eapol	is				
	Hennepin Co. C	Coordin	ates: <u>N</u>	15	55935	;	_I	Ξ :	51179	8			
EPTH			GEOLOGY	N	MC	SA	MPLE YPE	REC IN.	FIELI	) & LAI	BORAT	ORY	TEST
EPTH IN EET	MATERIAL DESCRIPTION			IN	MC	T	YPE	IN.	WC	DEN	LL	PL	%-#
33 -	GRAVEL WITH SAND, brown, waterbearing, loose to medium dense (GP) (continued)		COARSE ALLUVIUM (continued)	11	w	Å	SS	6					
34 — 35 —	GRAVEL WITH CLAY AND SAND, brown, waterbearing, medium dense (GP-GC) (A-1-b)			27	w	X	SS	6					- - -
36 37	CLAYEY SAND WITH GRAVEL, lenses of silty sand, brown, hard to stiff (SC) (A-2-6)		TILL		2.6	Z	6.0	14	10				
38 - 39 -	sing sand, brown, hard to suit (3C) (A-2-0)			36	М	Å	SS	14	12				
40 - 41 -				32	М	X	SS	8	12				
42 - 43 -						5				÷			
.44 -						$\left  \right\rangle$							
45 — 46 —				15	M/W	Å	SS	6	13				
47 — 48 —	CLAYEY SAND, a little gravel, brown, stiff to					$\left  \right\rangle$							
49 — 50 —	hard (SC) (A-2-6)			17	М		SS	14	11				
51 — 52 —						$\left  \right\rangle$							
53 — 54 —						$\sum_{i=1}^{n}$							
55 — 56 —				12	W	Ķ	SS	14	13				
57 58													
59 - 60 -				100/.9	M		SS	16	11				
61 - 62 -						$\left\{ \left( \right) \right\}$					-		
63 - 64 -	LIMESTONE, weathered, gray to light gray		PLATTEVILL	Ē									
65 66			FORMATION	100/.1	M M		SS WASH	16 1					
			4		<u> </u>								_
67 -	END OF BORING							1					
	END OF BORING												

03/2011



AET JO	B NO: <b>01-05697</b>		a •				LO	GOF	BOF	RING N	0	1235	SB	(p. 1	of	2)
PROJEC	CT: Southwest Light	Rail Tra	ansit Pro	ject,	PEC	East; I	lopk	tins 1	to I	Minn	eapol	lis				<u>.</u>
SURFAC	CE ELEVATION: 886.5	He	ennepin Co. (	Coordin	nates:	<u>N</u>	1:	56089	)		E É	51222	9			
DEPTH	MATERIAL DI	SCRIPTION	J		GEO	OLOGY	N	MC	SA	MPLE YPE	REC	FIELI	) & LA	BORAT	'ORY	TESTS
IN FEET	WATERIAL DI									YPE	IN.	WC	DEN	LL	PL	%-#200
1 -	FILL, mostly sand with silt, roots, black (A-1-b)	ash/cinder	s, trace		FILL		5	М	M	SS	14		-			
2	FILL, mostly sand with silt roots, brown (A-1-b)	and gravel,	trace		),		15	М	X H	SS	10					
4 5 6	FILL, mostly clayey sand, a with silt and lean clay, trace gray and brown (A-6)	roots, darl	c brownish				7	М		SS	10	18				
7 — 8 — 9 —	FILL, mostly sand and sand gravel, light brown and brow	with silt, v wn (A-1-b)	with				8	M		SS	12		1			
10							11	М	A A A A	SS.	6			1		
12 13	FILL, mostly clayey sand, the sandy lean clay and sand with and black (A-6)	race roots, ith silt, darl	a little k brown				9	М		SS	10	21				
14	SAND WITH SILT, trace r grained, brownish gray, mo laminations of clayey sand	ist, mediun	n dense,		COA ALL	ARSE UVIUM	12	M V		SS	12					
17 18	SAND WITH GRAVEL, m brownish gray, waterbearin	edium grat g, loose (S	ined, P) (A-1-b)				9	w	H H	SS	16					
19 20 21	SAND, fine grained, light b medium dense (SP) (A-3)	prown, wate	erbearing,				12	w	Å	SS	10					
22 - 23 -	GRAVEL WITH SAND, b medium dense (GP) (A-1-b		erbearing,				18	w	X	SS	4					
24 - 25 - 25 - 26 -	SAND, a little gravel, fine t brown, waterbearing, mediu	to medium um dense (	grained, SP) (A-3)				15	w	ľ.	SS	10			-		
19 11 12 12 12 12 12 12 12 12 12 12 12 12							16	w	X	SS	8					
25 - 26 - 27 - 28 - 28 - 29 - 29 - 30 - 31 - 29 - 31 - DE	GRAVEL WITH SAND, b waterbearing, loose to med (A-1-b)	rownish gr ium dense	ay, (GP)		Þ		17	w	Ŕ	SS	2					
DE	PTH: DRILLING METHOD			WAT	FER LI	EVEL MEA	ASUR	EMEN	JTS					NOTE	REF	ER TO
		DATE	TIME	SAMP DEP	LED	CASING DEPTH	CA	VE-IN	171	DRILL	NG EVET	WAT LEV	ER			CHED
ā	0-19' 3.25" HSA					17.0		EPTH 6.8		JUID L	LYEL	$\frac{16}{16}$				OR AN
boo 19-0	65.6' RDF w/DM	5/1/14	12:45	18	.5	1/.0		0.0				10,				ION OF
≩ ₽ BORT	NG								_					FERMI	NOLC	OGY ON
. 4	NG PLETED: 5/1/14								+						-IIS LC	
DR: 7	<b>FA</b> LG: <b>TK</b> Rig: <b>69C</b>												l.		01-1	DHR-0



AET JOE	B NO:	01-05697			LO	GOFI	BOF	RINGN	D	1235	SB	(p. 2	<u>of</u> 2	2)
PROJEC	CT:	Southwest Light Rail Transit Proj	ect, l	PEC East; H	lopl	tins t	to I	Minne						
		Hennepin Co. C	Coordin	ates: <u>N</u>	1	56089	)		3 5	51222				
DEPTH IN FEET		MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA 1	MPLE YPE	REC IN.	FIELD WC	) & LAI DEN	BORAT LL	· · · · · ·	TESTS %-#20
33	grayis	D WITH GRAVEL, medium grained, h brown, waterbearing, loose to medium (SP) (A-1-b) <i>(continued)</i>			10	W	Å	SS	12					
35 — 36 —					15	w	Á	SS	12					
37 38 39	grayis	D, a little gravel, medium to fine grained, h brown, waterbearing, medium dense A-1-b)			13	w	Á	SS	8					
40 - 41 -					14	w	Á	SS	14					
42 - 43 - 44 - 45 - 46 - 47 -	a little	YEY SAND, a little gravel, grayish brown, e brown, very stiff, a lens of waterbearing (SC/SM) (A-2-4)		TILL	18	w		SS	14	11				
47 48 49 50 51 52		YEY SAND, a little gravel, brownish gray, (SC/SM) (A-2-4)			6	w		SS	22	13				
53 — 54 — 55 — 56 —	CLA firm	YEY SAND, with gravel, grayish brown, (SC) (A-6)			7	w		SS	2	14				
57 58 59 61 62 63 64 65 66 67		YEY SAND, with gravel, grayish brown, (SC/SM) (A-2-4)			6	W		ss	3	17				
62 63 64 65 66	- \very	Y SAND, a little gravel, brownish gray, dense, a lens of sand (SM) (A-2-4)		PLATTEVILI FORMATION	* E	w		SS	12 H	9				
67 -	LIM	ESTONE, weathered, gray <b>OF BORING</b> .5 + 22/.5 + 46/.5 + 100.1						8						
03/2011													01-	DHR



AET JO	B NO:	01-05697						LO	G OF I	BOF	UNG N	0	1236	SB	<b>(p.</b> 1	lof	2)
PROJEC	CT:	Southwest Light	: Rail Tra	ansit Proj	ject, ]	PEC	East; F	lopl	kins (	to I	Minn	eapol	is				
SURFAC	- CE ELEV	ATION: <b>886.1</b>	H	ennepin Co. (	Coordin	nates:	<u>N</u>	1:	56052	2		E É	51239	1			
DEPTH		MATERIAL DI	SCRIDTION	.т		GEO	DLOGY	N	мс	SA	MPLE	REC	FIELD	& LA	BORAT	ORY	TESTS
IN FEET		MATERIAL DI	LOCKIF HOI	<b>N</b> .		ULA		18	MC	r	YPE	IN.	WC	OC	LL	PL	%-#200
1 - 2 -	with g and co	mixture of sand with ravel, a little ash/cind al, brown and dark br	ers, pieces	of brick	-	FILL		9	М	M	SS	16					
3 -	(A-1-ł	o and A-2-4)						7	М	X	SS	6					
-4										붬							
5								3	M	М	SS	8					
6 —										Ł							
7 -								4	M	$\square$	SS	10					
8 -										R							
9 — 10 —	FILL, (A-1-l	mostly sand, light bro	own, a little	e brown				13	м/w		SS	12					
11 -						GIV	1.07			रि							
12 13	hemic	IC PEAT, brown to da peat (PT) (A-8) ANIC CLAY, dark br				SWA DEP	OSIT	4	M		SS	14	311 60				•
14	black,	soft, laminations of s	and to arou	and 14'		1				Ľ							
15 -	(OH)	(A-8)	· ·		ſ <i>₩</i>	FINE	e UVIUM	2	M	M	SS	18	35				
16 -		VCLAY, slightly orga DL) (A-6)	inic, dark b	orown, son		ALL				म			27	2.8			
17 -	LEAN	I CLAY, trace roots,	gray, to stil	ff (CL)						K	~~~						
18 -	(A-6)							6	M	X	SS	16	30				
19 -	-									1							
20 -	4							11	M/W	νN	SS	16	26				
21 -	SANI	O WITH SILT, a little	gravel, me	edium			ARSE JUVIUM			प्ति							
22 -	dense	ed, brownish gray, wa (SP-SM) (A-1-b)	terbearing,	meatum			.0 • 10101	12	W		SS	6					
23 -										R							
25 -	SANI brown	D WITH GRAVEL, n nish gray, waterbearin	nedium gra 1g, loose (S	ined, light P) (A-1-b)				7	w		SS	10					
26 -	C A NT	D WITH SILT AND	GRAVET	medium to		. <u> </u>				2							
27 -	fine g	rained, black, waterb	earing, med	lium dense				11	W	$\mathbb{N}$	SS	6					
	to loc	ose (SP-SM) (A-1-b)								6							
<u>}</u> 29 -	1					:	·	-		K		-					
	1					•		8	W	Ķ	SS	6					
₹ 31 - Go 20	1					.: .:				12							
9. 32 - 1690						: :		10		X	SS	2		<u> </u>			
ö DE	PTH:	DRILLING METHOD		,		r	EVEL MEA								NOTE	: REF	ER TO
100         26         -           27         -         27         -           28         -         29         -           30         -         31         -           31         -         32         -           32         -         -         -           28         -         -         -           30         -         31         -           32         -         -         -           0-2         -         -         -           0-2         -         -         -           0-2         -         -         -           0-2         -         -         -           0-2         -         -         -           0-2         -         -         -           0-3         -         -         -           0-3         -         -         -           0-2         -         -         -           0-3         -         -         -           0-3         -         -         -           0-3         -         -         -           0-3 <td>N 4171</td> <td>2 2511 115 4</td> <td>DATE</td> <td>TIME</td> <td>SAMP DEP</td> <td>LED TH</td> <td>CASING DEPTH</td> <td>CA DI</td> <td>VE-IN EPTH</td> <td>I   FI</td> <td>DRILL LUID L</td> <td>ING EVEL</td> <td>WAT LEV</td> <td>ER EL</td> <td>THE.</td> <td>ATTA</td> <td>CHED</td>	N 4171	2 2511 115 4	DATE	TIME	SAMP DEP	LED TH	CASING DEPTH	CA DI	VE-IN EPTH	I   FI	DRILL LUID L	ING EVEL	WAT LEV	ER EL	THE.	ATTA	CHED
		3.25" HSA RDF w/DM	5/2/14	11:00	21.		19.5		7.2				16.	5	SHEE	ETS FC	R AN
	0972							-						·	EXPLA	ANATI	ION OI
≤ BORI	NG PLETED:	E 12 /1 A													TERM	NOLC	GY O
. 4										-					T	HIS LO	)G
[] DR; ]	IA LO	i: TK Rig: 69C			1			1								01-1	DHR-(



AET JOI	B NO: <b>01-05697</b>			LO	GOF	BOR	ING N	0	1236	SB	(p. 2	2 of 2	2)
PROJEC	T: Southwest Light Rail Transit Proj	ject,	PEC East; H	Iopk	cins 1	tọ N	/linn	eapo	lis				
	Hennepin Co. C	Coordi	nates: <u>N</u>	1:	56052	2		E :	51239	1			
EPTH					NG	SA	MPLE	REC	FIELD	) & LAI	BORAT	'ORY '	TES'
N BET	MATERIAL DESCRIPTION		GEOLOGY	N	MC	Ť	YPE	ĪN.	WC	OC	LL	PL	%-#
24	SAND WITH SILT AND GRAVEL, medium to		COARSE ALLUVIUM			Ŗ							
34 -	fine grained, black, waterbearing, medium dense to loose (SP-SM) (A-1-b) (continued)		(continued)			$\left( \cdot \right)$							
35 -				10	W	М	SS	0			-		
36 – 37 –	SAND, a little gravel, medium grained, brownish	<u>    </u>				2							
38 -	gray, waterbearing, loose (SP) (A-1-b)		•	9	W	M	SS	1					
39 -			•			61							
40 -				10		H	aa						
41 -			•	10	W	Д	SS	6					
42 -			•			K							
43			e •			2							
44						$\left \right\rangle$							
45 —				9	w	$\square$	SS	10					
46 -			•			A	00						
47 -						$\langle \langle \rangle$				•			
48 -						K							
49 –						2							
50 -				8	W	Μ	SS	8					
51 -						Б							
52 —						59							
53 —			•			KI							
54 —	CLAYEY SAND, a little gravel, brown, very		TILL			K							
55 —	stiff (SC) (A-6)			25	W	X	SS	12	10				
56 -						$[\mathcal{T}]$							
57						51							
58 —	CLAYEY SAND, a little gravel, brown, firm					S						140	
59 —	(SC) (A-2-6)					H							
60 -				7	W	M	SS	4	14				
61 -						20							
62 -						$\left \right\rangle$							
63 - 64 -						$\left \right\rangle$							
65						$\mathbb{H}$							
-66 -				6	W	X	SS	0					
67 -						$[\mathbf{T}]$							
68 -	LIMESTONE, weathered, gray	Ŵ	PLATTEVILL	Ē		$\left \right\rangle$							
69 –			FORMATION				00						
	END OF BORING		· · · · · · · · · · · · · · · · · · ·	1007.	ı ₩		<del>S_</del>	1	-		1	-	
												01_T	



AET JOB	NO: 01-056	97						LO	G OF I	BOF	RING N	O	1238	SB	<b>(p.</b> ]	l of 2	2)
PROJECT	: Southwe	est Light	Rail Tra	insit Proj	ect, ]	PEC	East; H	Topl	kins t	to I	Minne	eapol	is				
SURFACI	E ELEVATION:	888.4	He	ennepin Co. C	Coordin	nates:	N	1:	56173	<u> </u>		E É	51270				
DEPTH		TEDIAL DI		T		GEO	DLOGY	N	MC	SA	MPLE YPE	REC	FIELI	) & LA	BORAT	FORY '	FESTS
IN FEET	MA	IERIAL DI	ESCRIPTION	ł		ULA	1001	IN	IVIC	Ĩ	YPE	IN.	WC	DEN	LL	PL	%-#200
	FILL, mixture of s with gravel, a little of glass, trace roo brown (A-1-b)	e sand and	clayey san	d, pieces		FILL		11 26	M M	M	SS SS	18		-			
3 -								20	191	A R	00						
4 5 - 6 - 6 - 6	SAND, a little gra moist, medium de	ivel, fine g nse (SP) (	grained, ligh A-3)	nt brown,		COA ALL	RSE UVIUM	25	М	H H	SS	14					
7 - 8 - 9 -	SAND WITH GR brown, moist, mee							19	М		SS	14					
10 - 11 -								17	M	R R	SS	10					
12 - 13 - 14 -	SAND WITH SII grained, brown, a moist, medium de laminations of sil	little light nse, a lens	t brown and s of silt at 1	l light tan, 5',		•		18	M	T T T	SS	10					
14 15 - 16 -	-					•		17		R R	SS	10					
17 — 18 —	SAND, a little grave little light light ta laminations of sil	n, waterbe t (SP)	earing, loos	е,	<u></u>			8	w	X	SS	18		-			
19 - 20 - 21 - 21 - 21 - 21 - 21 - 21 - 21	loose (SP) (A-3) GRAVELLY SA fine grained, brow	ND WITH wn, watert	I SILT, me	dium to	/			17	W	X	SS	6					
22 -	dense (SP-SM) (A GRAVELLY SA gray, a little light dense, laminatior	ND, medi tan, water	bearing, m	edium	/	*		23	W		SS	6					
$\begin{array}{c c} 24 - \\ 25 - \\ 26 - \\ 26 - \end{array}$	(A-1-b)							12	w		SS	6		7			
27	SAND WITH G grained, brownis dense (SP) (A-1-	h gray, wa	nedium to f terbearing,	ine medium				20	w		SS	6					
25 - 26 - 27 - 28 - 29 - 30 - 31 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 - 000 -	SILTY SAND, a waterbearing, me	little grav dium den	el, grayish se (SM) (A	brown, -2-4)		TIL	L .	15	w		ss	14					
DEP	TH: DRILLING N	/FTHOD			<u>i i i</u> Wan	TER L	EVEL ME	ASUR	EMEN	_∦ √TS	(	<b>l</b>			NOTE		ER TO
			DATE	TIME	SAMP		CASING		VE-IN EPTH	I	DRILL LUID L	ING EVEL	WA7 LEV	ER EL			CHED
2 <u>0</u> -	17' 3.25" HSA		5/5/14	11:45	18		17.0	_ <u>_</u>	18.0	-			16		SHE	ETS FO	OR AN
	4.6' RDF w/DN	/1	5/5/14	11:55	18		17.0		17.4				16		EXPL	ANAT	ION OF
0- 17-34 BORIN COMP	G		3/3/14	11:55	10		1/.V							-	TERM	INOLO	OGY ON
	LETED: 5/5/14	<i>(</i> <b>)</b> =								+-					Т	HIS L	ЭG
$\mathbf{H}$ DR: <b>T</b>	A LG: TK Rig	: 69C			l								l			01-	DHR-0



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				Minn						
	Hennepin Co. Co	oordi	nates: <u>N</u>	1:	56173	3		E t	51270				
DEPTH IN FEET	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA	MPLE YPE	REC IN.		) & LAI			
	SILTY SAND, a little gravel, grayish brown,		TILL	28	W	M	SS	0	WC	DEN	LL	PL	%-#200
33 - 34 -	waterbearing, medium dense (ŠM) (A-2-4) (continued)		(continued)	20		$\beta$							
	LIMESTONE, weathered, light gray	<u></u>	* *PLATTEVIL	100/.1	W	<u> </u>	<u></u>	1					
	END OF BORING		FORMATION										
								:	· .				
							·						
100													
AEL													
C10.													
reocn-													
7-7-7													
- <sup>1</sup>													



AET JOI	B NO: 01-05697					LO	G OF	BOI	RING N	10	1250	SV	<b>(p.</b> ]	l of (	3)
PROJEC	T: Southwest Ligh	t Rail Tr	ansit Pro	ject,	PEC East;	Hopl	kins	to l	Minn	eapol	lis				
SURFAC	CE ELEVATION: <b>853.3</b>	I	Iennepin Co	o. Coor	dinates: <u>N</u>	[ 1	64623	3	-	E \$	51933	5			
DEPTH	MATERIAL D	ESCDIDTIO	N		GEOLOGY	N	мс	SA	MPLE	REC	FIELI	)&L/	BORA	FORY '	TESTS
IN FEET	MATERIAL L	LSCKIF IIU	11		OLOLOGI		MC	I	YPE	IN.	WC	DEN	LL	PL	qu
1 - 2 -	FILL, mostly clayey sand v little gravel and sand with s brown, a little light brown	silt, trace ro (A-2-4, A-	oots, dark 1-b)		FILL	22	М	M	SS	5	17				
3 –	FILL, mostly sand with silt brown (A-1-b)	t, a little gra	avel, light		ч	15	М	X	SS	12					
4 — 5 — 6 —	SANDY LEAN CLAY, sli gravel, trace roots, black, a firm, a lens of clayey sand	little grayi	sh brown,		TOPSOIL OR FILL	8	Ţ		SS	16	21				
7 - 8 -	FAT CLAY, slightly organ dark gray, a little light gray silt (CH) (A-7-6)	iic, trace ro , firm, lam	ots, gray to inations of		FINE ALLUVIUM	5	M	H K K	SS	18	55				
9 — 10 — 11 —	OC = 2.7%, 7'-8 <sup>1</sup> / <sub>2</sub> ' sample						M	14	TW	18	55	69	89	28	109
12 — 13 —	LEAN CLAY, gray, firm, waterbearing sand (CL) (A		s of			8	M/W	¥ X	SS	16	27				
14	GRAVEL WITH SILT AN gray, waterbearing, medium	ID SAND, n dense (G	brownish P) (A-1-b)	1000	COARSE ALLUVIUM	14	w		SS	2					
17 — 18 —				<u>                                       </u>		18	w	Á	SS	2					
19 — 20 — 21 —	GRAVELLY SAND WIT grained, brownish gray, wa dense (SP-SM) (A-1-b)	H SILT, me	edium , medium			21	w	Å	SS	6					
22 – 23 –	GRAVEL WITH SILT AN	JD SAND,	brownish			21	-	Ŕ	SS	0					
24 25 26	gray, waterbearing, mediu	n dense (G	P) (A-1-b)			15	w	X	SS	2					
27 - 28 -	SAND WITH GRAVEL, 1 waterbearing, medium den					13	w		SS	5					
29 - 30 - 31 -					· · ·	15	w		SS	6					
51 -															
DEP	TH: DRILLING METHOD			WAT	ER LEVEL ME		EMEN			······			NOTE:	REFE	ER TO
Δ 1		DATE	TIME	SAMP DEP	LED CASING TH DEPTH	CAN	VE-IN PTH	I FI	DRILLI JUID LI	NG VEL	WAT LEVI	ER EL	THE A	TTAC	HEL
<u>0-14</u>		6/9/14	8:58	16.			3.0	1.2			7.0		SHEE	IS FOI	R Al
141/2-99	9½' RDF w/DM	6/9/14	9:04	16.			<u></u> 1.4	+			5.6		EXPLA	NATIO	ON (
BORIN	G CIDITA	0//17	7.07	10.		+ 1		+					FERMI	VOLO	GY (
	LETED: 6/9/14													IIS LO	
DR: SI	HS LG: JM Rig: 68C													01-D	



AET JO	)B NO:	01-05697			LO	G OF	BO	RING N	10	1250	SV	(p. 2	2 of 3	3)
PROJEC	CT:	Southwest Light Rail Transit Proj	ject, l	PEC East;	Hopl	cins <sup>-</sup>	to ]	Minn	eapol	is				
	•	Hennepin Co	. Coor	dinates: <u>N</u>	1	64623	3		E ź	51933	5			
DEPTH		MATERIAL DESCRIPTION		GEOLOGY	N	мс	SA	MPLE	REC	FIELI	) & LA	BORAT	FORY 1	TESTS
DEPTH IN FEET						MC		ГҮРЕ	IN.	WC	DEN	LL	PL	qu
33 -	SANE	WITH GRAVEL, medium to fine d, gray, waterbearing, medium dense (SP)			13	W	М	SS	8					
34 -	A-1-t	(continued)					Б							
35 -					16	w	M	SS	5					
36 -						vv	А	66						
37	SANE	), a little gravel, medium to fine grained,					4							
38 -	gray, v	waterbearing, medium dense (SP) (A-1-b)			22	-	М	SS	0					
39 -	1						$\mathbb{Z}$							
40 -					21	W	М	SS	10					
41 -	_						Б							
42 -					16	W	$\square$	SS	8					
43 -	-				16	W	А	22	0					
44		ELLY SAND WITH SILT, medium to					H							
45 -	fine g	rained, brownish gray, waterbearing, m dense (SP-SM) (A-1-b)			22	W	Х	SS	4					
46 -							2							
47 -	1				22	_	$\mathbf{N}$	SS	0					
48 - 49 -	SANI	O WITH GRAVEL, medium grained, gray, pearing, medium dense (SP) (A-1-b)					6							
49		bearing, medium dense (Sr) (A-1-0)					$\mathbb{H}$	66						
51 -					20	W	Д	SS	6					
52 -							K							
53 -							$\left \right\rangle$							
54 -	- graine	WITH GRAVEL, medium to fine ed, grayish brown, waterbearing, medium (SP) (A-1-b)					$\left \right\rangle$							
55 -	dense	(ŠP) (A-1-b)			22	W	Ń	SS	8					
56 -	- ·						ß							
57 -	_						5	1						
58 -	-						K							
59 -	-						K							
60 -	-				15	W	X	SS	6					
61 -	-						$\sum$							
₹ 62 - S	SILT	Y CLAY, brown, very stiff (CL-ML) (A-4)		FINE			$\left \right\rangle$	)						
63 -	1			ALLUVIUM			$ \rangle$							
64 -							(							
- 65 -					18	W	X	SS	4	23				
66 -							2	d						
67 - 68 -							$\left \right\rangle$	}						
AET_CORP W-COORDINATES 01-05697.0PJ AET+CP1 +WEIL-GD1 6Z2014 		NCLAY, brown, hard, laminations of wet (L) (A-4)					$\rangle$	Ì						
5 <sup>09 -</sup>		ע <i>יי</i> ד) (ג'ד)		1										
<u>مع/2011</u>			1					1		1				$HR_{-0}$



AET JOB NO:	01-05697			LC	G OF	BOF	RING N	Ю.	1250	SV	(p. 3	8 of 3	3)
PROJECT:	Southwest Light Rail Transit Proj	ect, ]	PEC East; I	Hopl	kins 1	to I	Ainn	eapo	lis				
	Hennepin Co.	. Coor	dinates: <u>N</u>	1	64623	3		E :	51933	5			
EPTH			GEOLOGY	2.1		SA	MPLE	REC	FIELI	) & LA	BORAT	ORY	res
EPTH IN EET	MATERIAL DESCRIPTION		GEOLOGY	N	MC	Ť	MPLE YPE	ÎN.	WC	DEN	LL	PL	¢
11. (0	VCLAY, brown, hard, laminations of wet			54	M/W	М	SS	12	21				
	EL) (A-4) <i>(continued)</i>					$\int$							
72 –						$\left \right\rangle$							
73 —						$\mathbb{S}$							
74 -						$\square$							
75 –				55	M/W	X	SS	12	19				
76 —						$[\mathcal{T}]$							
77 —						$\left \right\rangle$							
78 SANI	D, a little gravel, medium to fine grained,		COARSE							E			
	n, waterbearing, dense (SP) (A-1-b)		ALLUVIUM			$\square$							
80 —				43	W	М	SS	8					
81 -						$\sum$							
82 -						$\left \right\rangle$							
<sup>83</sup> SILT	Y SAND, a little gravel, brown, very dense		TILL			$\left \right\rangle$							
	(A-2-4)					$\mathbb{H}$							
85 -				76	W	М	SS	12					
86 -						$\sum$							
87 —						$\left \right\rangle$							
	D, fine grained, brown, waterbearing, very		COARSE ALLUVIUM			$\left \right\rangle$							
	e (SP) (Ā-3)		ALLOVION			Н							
90 -	(			53	W	M	SS	10					
91 -						$[\mathcal{D}]$							
92 - 93 - CAN						$\left \right\rangle$							
SAN	D, a little gravel, fine to medium grained, n, waterbearing, dense (SP) (A-1-b)					$\left \right\rangle$							
95 - 010W	ii, waterocaring, dense (Sr) (A-1-0)					$\mathbb{H}$							
96 —				36	W	Д	SS	6					
97 -	· · · · · ·					$\left \left\langle \right\rangle \right $							
08						$\mathbb{Z}$							
I SAN	D WITH SILT AND GRAVEL, medium to grained, brown, waterbearing, very dense,					$\left \right\rangle$							
100 – lamin	ations of silty sand (SP-SM) (A-1-b)			117	w	M	SS	6					
101	OF DODING			117		М				<u> </u>			
END	OF BORING												
A. C.													1
	· · · · · ·												



AET JO	DB NO: 01-05697						LC	G OF	BO	RING N	Ю.	1251	ISS	(p. 1	lof	1)
PROJEC		t Rail Tr	ansit Pro	ject,	PEC	East;							_			
	CE ELEVATION: <b>850.5</b>		Hennepin Co					64799				51970	3			
DEPTH	MATERIAL D				1	DLOGY	NT	MC	SA	MPLE	REC	FIELI	) & LA	BORA	FORY	TESTS
IN FEET							N	MC		MPLE FYPE	ÎN.	WC	DEN	LL	PL	<b>%-</b> #20
1 -	FILL, mostly silty sand with little gravel, trace roots, bla	ack (Ā-2-4)	)		FILL		9	M	M	SS	16					
2	FILL, mostly sand with silt (A-1-b)	t and grave	l, brown				14	M	K	SS	8					
4	FILL, mostly gravelly clay with silt, brown (A-1-b)	ey sand, a l	little sand				16	M	₽  }	SS	6					
6 — 7 —	FILL, mostly gravelly sand gray (A-1-b) (petroleum-ty	l with silt, l pe odor)	orownish				19	м	ł	SS	10					
8 9	CLAYEY SAND WITH G stiff to stiff (SC) (A-6) (pe				TILL	,			ł.							
10	CLAYEY SAND, a little g	ravel grov	etiff				9	M T	X	SS	10	16				
12	laminations of waterbearin (petroleum-type odor)	g sand (SC	) (A-6)				11	M/W		SS	10	17				
14 15 16	SAND WITH SILT AND fine grained, gray, waterbe a lens of silty sand (SP-SM	aring, medi			COA ALL	RSE UVIUM	13	W	H H	SS	10					
17 – 18 –	(petroleum-type odor) SAND WITH SILT, a little fine grained, waterbearing, (SP-SM) (A-1-b) (petroleu	medium d	ense		-		11	w		SS	12					•
19 20 21	CLAYEY SAND, a little g laminations of waterbearin	ravel, gray	, very stiff,		TILL	,	17	M/W		SS	16	13				
21 - 22 - 23 - 23 - 23 - 23 - 23 - 23 -	SAND WITH SILT, a little fine grained, gray, waterbe medium dense (SP-SM) (A	aring, loos	edium to e to			RSE UVIUM	6	w	$\mathbb{R}$	SS	14					
24 25							14	w	E	SS	18					
25 - 26 -	END OF BORING				:											-
DEI																
	PTH: DRILLING METHOD					VEL ME			1		r			NOTE:	REFE	ER TO
0-2	4½' 3.25" HSA	DATE	TIME	SAMP DEP	LED FH	CASING DEPTH	CAV DE	/E-IN PTH	I   FL	DRILLI JUID LE	NG EVEL	WATI LEVI	ER   EL	THE A	TTAC	HED
0-2		6/11/14	10:00	26.	0	24.5	2	4.2				12.5	5	SHEET	IS FO	R AN
		6/11/14	10:10	26.	0	24.5	1	1.5				11.	5	EXPLA		
BORIN COMP	NG LETED: 6/11/14												Т			GY ON
DR: J	M LG: SHS Rig: 68C													TH	IS LO	G



AET JOI									RING N			51	<b>(p.</b> ]	l of	<u>I)</u>
PROJEC	T: Southwest Ligh	t Rail Tr	ansit Proj	ject,	PEC East	t; Hop	kins	to ]	Minn						
SURFAC	CE ELEVATION:846.4	F	Iennepin Co	. Cooi	dinates:	<u>N</u>	16498	2	<u> </u>	E :	52022	1			
DEPTH	MATERIAL D	FSCRIPTIO	N		GEOLOGY	YN	MC	SA	MPLE	REC	FIELI	) & LA	BORAT	fory '	TEST
IN FEET									TYPE	IN.	WC	DEN	LL	PL	%-#2
1 2	FILL, mostly silty sand wit pieces of brick, trace roots, (A-2-4)			,	FILL	22		M	SS	16					
3 —						27	M	। स	SS	16					
4	FILL, mixture of silty sand gravel, brown (A-1-b, A-6)	l and clayey )	v sand, with			8	M		SS	12					
7 - 8 - 9 -	SAND, fine to medium gra moist, medium dense, a ler (A-3)	ns of lean cl	lay (SP)		COARSE ALLUVIUI	M 26	M		SS	12					
10 - 11 -	SAND WITH GRAVEL, r brown to light brown, wate loose, a lens of sand with s	erbearing, d	ense to			37	W		SS	14		-			
12 — 13 — 14 —	GANTS 1/4/		1 1:-14			9	W	<pre>X</pre>	SS	16					
15 — 16 —	SAND, a little gravel, med brown, waterbearing, dense	e (SP) (A-1	-b)			31	W	Å	SS	6					
17 18	SAND WITH SILT AND coarse grained, brown, wat (SP-SM) (A-1-b)	GRAVEL, terbearing,	medium to dense		•	35	M	Å	SS	8					
19 — 20 —	GRAVEL WITH SILT AN little gray, waterbearing, de lean clay (GP) (A-1-a)	ND SAND, ense, lamin	brown, a ations of			32	w	X	SS	8					
21 —	END OF BORING														
DEP											-				
	TH: DRILLING METHOD				ER LEVEL N			1					NOTE:	REFE	IR TO
- 0-14	4½' 3.25" HSA	DATE	TIME	SAMP DEP	LED CASIN TH DEPT	JG CA H D	VE-IN EPTH	FI	DRILLI JUID LI	NG EVEL	WAT LEVI		THE A	TTAC	HEI
0-14 14½-19 BORIN COMPI		6/11/14	11:44	16.			11.1	-			8.8		SHEE	IS FO	R AI
1472-1	7/2 NJF W/ J1¥1	6/11/14	11:54	16.			11.0				9.2	,	EXPLA	NATI(	) N C
BORIN	G	0/11/17	11107										ERMI	NOLO(	GY (
l	LETED: 6/11/14							+						IIS LO	
DR: JI	M LG: SHS Rig: 68C							<u> </u>						01-D	



AET JO	B NO: <b>01-05697</b>	* - I					LO	G OF	BO	RING N	10	1255	5 ST	• <b>(p.</b> 1	l of 1	<u>l)</u>
PROJEC	CT: Southwest Ligh	t Rail Tr	ansit Pro	ject,	PEC E	East; I	Iopl	tins	to l	Minn	eapo	lis				
SURFAC	CE ELEVATION: 841.2	F	Iennepin Co	o. Coor	dinates:	N	10	65167	7		E É	52069	9			
DEPTH	MATERIAL D	FSCRIPTIO	N		GEOL	OGY	N	мс	SA	MPLE YPE	REC		) & LA	BORA	FORY	TEST
IN FEET							ТЛ	MC		TYPE	IN.	WC	DEN	LL	PL	qu
1	FILL, mostly clayey sand v brick, trace roots, dark brow		pieces of		FILL		16	м	М	SS	14	8				
2 — 3 — 4 —	FILL, mostly sand with silt silty sand, grayish brown a						39	М		SS	12					
5 — 6 —	FILL, mostly lean clay, gra	y (A-6)					6	М		SS	10	35				
7 8	LEAN CLAY, gray, a little laminations of sand and sil	e brown, fir t (CL) (A-6	m, ))		FINE ALLUV	VIUM	5	М		SS	14	31				
9 – 10 –	FAT CLAY, brownish gray (CH) (A-7-6)	y to dark gr	ray, firm					М		TW	18	47	74			12
11 - 12 -							5	M	X F	SS	18					
13 – 14 –	LEAN CLAY, brownish g	rav a little	black and				5	<b>T</b>	X Z	SS	16	50				
15 — 16 —	gray, firm, laminations of f (A-7-6)	at clay and	silt (CL)				5	М	R	SS	16	42				
17 — 18 —							1	М	T T	SS	18	31				
19 — 20 — 21 —	FAT CLAY, dark gray, a l very stiff, a lens of sand, la (A-7-6)	ittle brown minations	and gray, of silt (CH				27	М		SS	10	47				
	END OF BORING															
DEF	PTH: DRILLING METHOD			WAT	ER LEV	EL MEA	SURI	EMEN	ITS	I			<u> </u>	NOTE:	REEF	R Τ
		DATE	TIME	SAMP DEP	LED Ç	ASING DEPTH	CAV	/E-IN PTH		<b>DRILLI</b>		WAT	ER	THE A		
0-1	9½' 3.25" HSA								FI	UID LI	3VEL				TS FOI	
		6/11/14	2:11	21.		19.5	+	0.0				16.		EXPLA		
BORIN	NG	6/11/14	2:21	21.	U	19.5		9.5				13.	1	TERMI		
COMP	LETED: 6/11/14								_						HIS LO	
DR: J	M LG: SHS Rig: 68C													11.	01 <u>-</u> Γ	



AET JO	B NO: <b>01-05697</b>					LC	G OF	BO	RING N	10	1256	SS	<b>(p.</b> 1	lof	<u>l)</u>
PROJEC	CT: Southwest Lig	nt Rail Tr	ansit Pro	ject,	PEC East; l	Hopl	kins	to ]	Minn	eapo	lis				
SURFAG	CE ELEVATION: 914.9	H	Hennepin Co	o. Cooi	rdinates: <u>N</u>	1	53740	6		E:	50739	8			
DEPTH	MATERIAL I		N		GEOLOGY	N	MC	SA	MPLE	REC	FIELI	) & LA	BORA	FORY	TES
IN FEET				_		N	WIC		TYPE	IN.	WC	DEN	LL	PL	%-#
1 -	FILL, mixture of clayey sa little gravel, pieces of glas	and and silty s, dark brov	y sand, a vn (A-2-6)		FILL	13	М	M	SS	12					
2 — 3 —	SAND, a little gravel, mec light brown, moist, very de	lium to fine ense (SP) (A	grained, A-1-b)		COARSE ALLUVIUM	53	M	Å	SS	6					
4 — 5 — 6 —	SAND, fine grained, light dense (SP) (A-3)	brown, moi	ist, medium			16	М		SS	12		-			
7 8	SAND WITH GRAVEL, brown, moist, medium der				•	15	М		SS	12					
9 10 11	SAND, a little gravel, fine light brown, moist, mediu	to medium m dense (SI	grained, P) (A-1-b)			11	М		SS	12					
12 — 13 —	SAND, a little gravel, med light brown, moist, mediu					10	М		SS	6					
14 — 15 — 16 —	SAND WITH GRAVEL, brown, moist, medium der					11	М		SS	6					
17 — 18 —	SAND, a little gravel, fine light brown, moist, mediu	to medium m dense (SI	grained, P) (A-1-b)			19	M		SS	12					
19 — 20 — 21 —	SAND WITH GRAVEL, grained, brown, moist, me					20	M		SS	12					
22 — 23 —					· · · ·	19	M	₽ }	SS	12					
24 — 25 — 26 —					• • • •	30	М		SS	12					
20	END OF BORING														
											-				
DEP	TH: DRILLING METHOD			WAT	ER LEVEL MEA	SURI	EMEN	TS					NOTE:	REFI	ER T
	41/1 2 2511 TTG 4	DATE	TIME	SAMP DEP	LED CASING TH DEPTH	CAV	VE-IN PTH	ן וק	ORILLI UID LE	NG	WAT LEVI	ER	THE A	ATTAC	HE
0-2	4½' 3.25" HSA	5/23/14	10:20	· 26.	·· · ·		<b>5.7</b>				Non		SHEE	IS FO	R A
		3/43/14	10.20	<i>4</i> 0.	v <u>4</u> 4.3		5.1	+			1101		EXPLA		
BORIN	IG												ERMI		
COMP	LETED: 5/23/14											1		IIS LO	
DR: S	G LG: TM Rig: 91C													01-L	



AET JOI	B NO: 01-05697						LO	GOF	BO	RING N	0	1257	SS	(p. 1	of	2)
PROJEC	T: Southwest Ligh	t Rail Tr	ansit Pro	ject,	PEC	C East; H	Iopł	cins (	to ]	Minn	eapo	lis				
SURFAC	CE ELEVATION; <b>886.2</b>	H	Hennepin Co	o. Coor	dinat	es: <u>N</u>	1:	55692	2		E :	51135	5			
DEPTH		PRODUCTIO	NT		CE	OLOGY		MO	SA	MPLE	REC	FIELL	) & LA	BORAT	ORY	TEST
IN FEET	MATERIAL D	ESCRIPTIO	IN		UE	OLOGI	Ν	MC		ГҮРЕ	IN.	WC	DEN	LL	PL	<b>‰-</b> #2
1 - 2 -	FILL, mixture of gravelly s with silt, trace roots, dark b (A-2-4, A-1-b)	ilty sand a rown and l	nd sand prown		FILI		28	М	M	SS	4					
3 -	• • •						12	М	X	SS	6					
4	FILL, mostly sand with silt silty sand, trace roots, brow (A-1-b)						10	М	Ц Н Н	SS	6					
7 - 8 -							10	м	ľ	SS	6					
9 10							8	MÆW	ł	SS	4					
11 — 12 —	FILL, mostly sand, a little g trace roots, gray and black			,					ET.	•						
13 14	uace roots, gray and black	(A-1-0, A-					3	W	$\mathbb{X}$	SS	6		-			
15 — 16 —						·	4	W	X И	SS	6	27				
17 — 18 —	FILL, mixture of clayey sa with organic fines, a little g gray and black (A-6)						5	M/W		SS	8	20				
19	SILTY SAND, a little grav medium dense, lenses of cl (A-2-4)	el, gray, w ayey sand	et, loose to (SM/SC)		TIL	L	10	M/W		SS	8					
21 22 - 23 -							14	-		SS	0					
24	SAND, a little gravel, med waterbearing, very loose to with silt around 28' (SP) (A	loose, a le	d, gray, ens of sand			ARSE LUVIUM	3	-		SS	0					
27 —							8	w	K	SS	. 6					
28 29									Ľ							
30 — 31 —		· · ·					7	W	Ķ	SS	6					
DEP	TH: DRILLING METHOD			 WAT	H ER LI	EVEL MEA	SURI	L EMEN	⊥(_( TS	]						
DEP			<b>TD C</b>				r			DRILLI	NG	WAT		NOTE:		
0-19	9½' 3.25" HSA	DATE		SAMP DEP		CASING DEPTH		VE-IN PTH	FI	DRILLI LUID LI	ÉVEL	WAT LEVI		THE A		
191/2-2	9½' RDF w/DM	6/3/14	2:03	13.		12.0		2.1	_			10.2		SHEE'		
		6/3/14	2:13	21.	0	19.5		9.9				15.		EXPLA		
BORIN COMPI	IG LETED: <b>6/4/14</b>	6/4/14	7:30	21.	0	19.5	1	9.0				12.	8	ERMI		
DR: JI	M LG: SHS Rig: 68C													TH	IIS LO	G



Southwest Light Rail Transit Proj         Hennepin Co         MATERIAL DESCRIPTION         AND WITH GRAVEL, medium grained, gray, aterbearing, loose to medium dense (SP)         A-1-b) (continued)         LAYEY SAND, a little gravel, brown, very iff (SC) (A-6)         LAYEY SAND WITH GRAVEL, brown, firm SC/SM) (A-2-4)         ND OF BORING	. Coor	,	N		мс w w м	2			51135	5 D&LAI DEN	BORAT	PL 9	1
Hennepin Co MATERIAL DESCRIPTION AND WITH GRAVEL, medium grained, gray, aterbearing, loose to medium dense (SP) A-1-b) <i>(continued)</i> LAYEY SAND, a little gravel, brown, very iff (SC) (A-6) LAYEY SAND WITH GRAVEL, brown, firm SC/SM) (A-2-4)	. Coor	dinates: GEOLO	N	15 N 7 7 11 23 5	мс w w м	2	MPLE YPE SS SS SS SS	E 5 REC IN. 3 3 0 14	FIELI WC	) & LA			1
MATERIAL DESCRIPTION AND WITH GRAVEL, medium grained, gray, aterbearing, loose to medium dense (SP) A-1-b) <i>(continued)</i> LAYEY SAND, a little gravel, brown, very iff (SC) (A-6) LAYEY SAND WITH GRAVEL, brown, firm SC/SM) (A-2-4)		GEOLO	GY	7 7 11 23 5	W W M M		SS SS SS SS	IN. 3 3 0 14	WC				1
AND WITH GRAVEL, medium grained, gray, aterbearing, loose to medium dense (SP) A-1-b) <i>(continued)</i> LAYEY SAND, a little gravel, brown, very iff (SC) (A-6) LAYEY SAND WITH GRAVEL, brown, firm SC/SM) (A-2-4)			Gr	7 7 11 23 5	W W M M		SS SS SS SS	IN. 3 3 0 14	14	DEN	LL	PL	₽⁄o-#
aterbearing, loose to medium dense (SP) A-1-b) <i>(continued)</i> LAYEY SAND, a little gravel, brown, very iff (SC) (A-6) LAYEY SAND WITH GRAVEL, brown, firm SC/SM) (A-2-4)		TILL		7 11 23 5	W - M M		SS SS SS	3 0 14					
iff (SC) (A-6) LAYEY SAND WITH GRAVEL, brown, firm SC/SM) (A-2-4)		TILL		11 23 5	- M M		SS	0					
iff (SC) (A-6) LAYEY SAND WITH GRAVEL, brown, firm SC/SM) (A-2-4)		TILL		23 5	М		SS	14					
iff (SC) (A-6) LAYEY SAND WITH GRAVEL, brown, firm SC/SM) (A-2-4)				5	М					-	-		
SC/SM) (A-2-4)						X	SS	1	14		-		
ND OF BORING				7		N7							
ND OF BORING				1	M	IXI	SS	3	14				
			1			Υ						· .	╀



AMERICAN ENGINEERING TESTING, INC.

AET JOI	· · · · · · · · · · · · · · · · · · ·									RING N			SB	<b>(p.</b> ]	l of :	3)
PROJEC	T: Southwest Ligh	t Rail Tr	ansit Pro	ject, ]	PEC	East; H	Iopł	cins 1	to I	Minn						
SURFAC	CE ELEVATION:910.1	· F	Iennepin Co	o. Coor	dinate	s: <u>N</u>	1:	50873	<u>}</u>		E '	50131	9			
DEPTH IN FEET	MATERIAL D	DESCRIPTIO	'N		GEO	LOGY	N	MC	SĄ	MPLE YPE	REC IN,		r	BORA		T
FEET		•1. 1 •1			THE L						11N,	WC	DEN	LL	PL	<b>%-</b> #2
1 —	FILL, mixture of sand with little gravel, light brown an	d black (A	ity sand, a -1-b)		FILL		15	M	$\mathbb{X}$	SS	14					
2 — 3 —							15	М	M	SS	12					
4	FILL, mostly clayey sand, sand, grayish brown, a little brown (A-6)						6	М		SS	12	19				
7 — 8 — 9 —			4				8	М	11 	SS	4	14				
10 — 11 —	FILL, mostly sand with silt clayey sand, light brown ar A-6)	t and grave nd dark bro	l, a little wn (A-1-b,				9	М	H R R	SS	10					
12 13 14							10	M		SS	8	17				
15 16							26	M	$\mathbb{X}$	SS	12					
17 — 18 —	ORGANIC CLAY, a little roots, black, very stiff (OH	gravel and () (A-8) (po	sand, trace ossible fill)		1 DLA C	OSIT OR	17	M		SS	14	144				
19 — 20 — 21 —	SAND WITH SILT, a little medium grained, gray and medium dense to dense (SI	brown, wa	terbearing,		COAI ALLU	RSE JVIUM	25	w		SS	12					
22 — 23 —							31	w	X	SS	10					
24 — 25 — 26 —	GRAVELLY SAND WITT medium grained, grayish b very dense (SP-SM) (A-1-	rown, wate	ne to erbearing,		•		71	w	Z	SS	10					
27 - 28 - 29 -	SAND WITH SILT AND medium grained, dark brow waterbearing, very dense (	wnish gray, SP-SM) (A	-1-b)		· · · · · · · · · · · · · · · · · · ·		56	w	,X	SS	10					
25 - 26 - 27 - 28 - 29 - 30 - 31 - DEP	CLAYEY SAND, a little g grayish brown, hard to stif waterbearing sand with sil	f, a lens of			TILL		42	M/W	X	SS	12	10				
DEP	TH: DRILLING METHOD			WAT	ER LE	VEL MEA	SURI	EMEN	TS	-			·	NOTE:	REFE	ER TO
		DATE	TIME	SAMPI DEPT	LED (	CASING DEPTH	CAN	VE-IN PTH	FI	ORILLI UID LE	NG	WAT	ER	THE A		
0-19 19½-7		5/27/14	10:01	<u>21.</u>		19.5		9.6	1		- 101	17.9		SHEE	rs fo	R AN
191/2-74	4½' RDF w/DM	5/27/14	10:01	21.		19.5		9.6	<del> </del> ,			16.9		EXPLA	NATIO	ON C
BORIN	IG LETED. 5/77/14		10.11	• 1 14	-	1710			+			± V).		FERMI	10LO	GY (
									<u> </u> .					TH	IS LO	G
BORIN COMPI DR: JI	IG LETED: <b>5/27/14</b> M LG: <b>SHS</b> Rig: <b>68C</b>															(



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AET JOB NO:	01-05697		_	LC	)G OF	BO	RING N	0	1260	SB	(p. 2	2 of (	3)
PROJECT:	Southwest Light Rail Transit Proj	ject,	PEC East	; Hop	kins	ťo l	Minn	eapol	lis				
	Hennepin Co.	. Coor	dinates:	<u>N 1</u>	5087	3,		E	50131				
DEPTH IN FEET	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SA	MPLE YPE	REC IN.	FIELI	) & LA	BORA	FORY	TEST
FEET							YPE	IN.	WC	DEN	LL	PL	<b>%-</b> #2
33 -			TILL (continued)	14	M/W	γX	SS	16	14				
						Б							
35 - CLAY 35 - soft to	/EY SAND, a little gravel, grayish brown, firm (SC/SM) (A-2-4)					M	SS	18	13				
36 - 361				4	M	Д	22	10	15				
37 -						Ц							
38 -				5	-	X	SS	0					
39 -						$\left[ \right]$							
40 -				8		$\square$	SS	0					
41 -				0		Д	00						
42 -						H				1			
43 -				4	M	Х	SS	18	15				
44 -						$\sum$							
45 —				15	-	$\square$	SS	0					
46 —						Ĥ							
47 —						H							
48 -				5	M	Å	SS	18	12				
49 -						2							
50 -				7	M	M	SS	18	12				
51 -						$\mathcal{F}$							
52 —						$\left \right\rangle$							
53 - CLA	YEY SAND WITH GRAVEL, brownish					$\left \left\langle \left( \right. \right) \right\rangle$							
54 – gray,	hard (SC) (A-6)												
55 —				64	Μ	ŀX	SS	14	10				
56 —						$\int$							
57 —						$\left \right\rangle$							
58 —						$\left \right\rangle$							
59 —													
60 —				98	M	X	SS	14	9				
61 —						$\sum$	1						
62 —						$\left \right\rangle$							
63 -						$\left \right\rangle$							
64 -					_	$\mathbb{H}$							
65 -				103	3   M	X	SS	12	11				
66 - 67 -						$\left \right\rangle$							
67 - 68 -						$\left \right\rangle$							
68 - 69 -						$\left  \right\rangle$	)						
09													



AMERICAN ENGINEERING TESTING, INC.

#### SUBSURFACE BORING LOG

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AET JO	B NO:	01-05697				LO	G OF	BO	RING N	0	1260	) SB	(p. 3	of 3	<u>})</u>
PROJEC		Southwest Light Rail	<b>Fransit</b> Proj	ject, I	PEC East;	Hopł	kins	to ]	Minn						
			Hennepin Co	. Coor	dinates: <u>N</u>	<u>v 1</u> :	50873	3		<u>E :</u>	50131				
DEPTH IN FEET		MATERIAL DESCRIPT	ION		GEOLOGY	N	мс	'SA	MPLE YPE	REC IN.		D & LAI			
FËET				VIII							WC	DEN	LL	PL	<b>%-</b> #20
71 -	CLAY grav. 1	(EY SAND WITH GRAVEL hard (SC) (A-6) (continued)	, brownish			69	Μ	Д	SS	16	10				
71 - 72 -	5.0,,,							$\mathbb{Z}$							
72 - 73 -								$\left \right\rangle$							
74								$\left \right\rangle$							
75 -						100/.3	M	$\mathbf{X}$	SS	10	8				
	END	OF BORING													
								1							
				2											
								1							
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ALL CORP W-COORDINALES UI-JOSSI. GF1 AET +CF1+WELL. GD1 92/14															
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AET JO	DB NO: 01-05697						LO	G OF I	BO	RING N	10.	1261	SB	(p. 1	lof	3)
PROJEC	CT: Southwest Light	t Rail Tr	ansit Pro	ject, ]	PEC	CEast; H	Iopk	tins t	to I	Minn	eapol	lis				
SURFA	CE ELEVATION: 910.1	H	Iennepin Co	o. Coor	dinat	es: <u>N</u>	15	50910	)		E É	50138	9			
DEPTH	MATERIAL D	FSCRIPTIO	N		GE	OLOGY	N	мс	SA	MPLE YPE	REC	FIELD	) & LA	BORAT	ORY	TESTS
IN FEET	MATERIAL D	ESCRI IIO.					14	IVIC		TYPE	IN.	WC	DEN	LL	PL	6-#20
1	FILL, mixture of sand with a little gravel, dark brown a	silt and cla nd brown (	ayey sand, (A-2-4)		FILL		7	М	M	SS	12					
3 - 4 -							9	М	X R	SS	12		-			
5 6	FILL, mostly sand, a little g sand, light brown and brow (A-1-b)	gravel and o n, a little d	clayey ark brown				14			SS	10					
7							15	М	R	SS	1					
10 - 11 -							5	М	H H H	SS	8					
12 13 14	SAND WITH GRAVEL, fi grained, light brown, a little dense, laminations of claye (possible fill)	e brown, m	oist, very		ALL OR I	ARSE LUVIUM FILL	56	М		SS	1					
14 15 16	SAND WITH SILT AND ( fine grained, light brown, n (SP-SM) (A-1-b)					ARSE JUVIUM	19	M	H X X	SS	8					
17	SAND, a little gravel, medi brown, waterbearing, loose	(SP) (A-1-	-b)				10	w.	R K	SS	10					
19 - 20 - 21 -	SAND WITH SILT AND ( fine grained, dark brown, w dense (SP-SM) (A-1-b)	vaterbearin	g, medium				30	w	R R R	SS	2					
22 - 23 -	SILTY SAND WITH GRA grained, gray, wet, dense (S	VEL, fine SM) (A-2-4	to medium 4)	1			32	w	H X	SS	2					
24 - 25 - 26 -	SAND WITH SILT AND medium grained, dark brov medium dense (SP-SM) (A	vn, waterbe	fine to earing,				29	W	R R	SS	10					
25 - 26 - 26 - 26 - 27 - 27 - 28 - 27 - 28 - 29 - 29 - 29 - 29 - 29 - 29 - 29	GRAVEL WITH SILT AN brown, waterbearing, very (A-1-a)	ID SAND, dense (GP	dark -GM)				69	w	H H	SS	10					
29 - 29 - 29 - 30 - 30 - 31 - 31 -	-						123	w	H H H H H H H H H H H H H H H H H H H	SS	3					
	PTH: DRILLING METHOD			WAT		EVEL MEA	1 \SURI	L		I				NOTE:	1 REFI	
		DATE	TIME	SAMPI		CASING DEPTH	1	/E-IN PTH		DRILLI JUID LI	NG	WAT LEVI		THE A		
N 0-2	29½' 3.25" HSA								+FI	LUID LI	≤VEL			SHEE'		
8 <b>29<sup>1</sup>/2-8</b>	84½' RDF w/DM	5/28/14	9:08	21.		19.5		9.9	1			18.	,	EXPLA		
<b>29½-8</b> BORI COME	NG	5/28/14	9:18	21.	U	19.5		9.5				17.	0	ERMI		
	PLETED: 5/28/14												1		HS LC	
[H] DR: J	M LG: SHS Rig: 68C															)HR-(



AET JOB NO:	01-05697			LC	OG OF	BORING N	Ю.	<u>1261</u>	SB	<u>(p. 2</u>	2 of 3	3)
ROJECT:	Southwest Light Rail Transit Pro	ject,	PEC East; H			•						
	Hennepin Co	-			5091(			50138	9			
PTH				-		SAMPLE	REC	FIELI	) & LAI	BORAT	ORY '	TES
EPTH IN EET	MATERIAL DESCRIPTION		GEOLOGY	N	MC	TYPE	IN.	WC	DEN	LL	PL	<b>%-</b> #
33 - dense	Y SAND, a little gravel, brown, wet, very , lens of clayey sand, lens of sand with silt (A-2-4) (continued)		TILL (continued)	56	M/W	ss	10					
34 CLA 35 - grayis	YEY SAND, a little gravel, brown to th brown, firm to soft, lenses of silty sand M) (A-2-4)			7	M/W	ss	18	13				
37 38				6	M/W	ss s	18	14				
39 - 40 - 41 -				4	M/W	ss	18	14				
42 - 43 -				4	M/W	ss s	18	13				
44 — 45 —				4	-	ss	0					
46 47 48				5	M/W	X ss	18	15				
49 - 50 -				4	M/W	ss	18	13				
51 — 52 —												
53 — 54 — 55 —				7	NAT	X ss	12	15				
56 57				7	M/W		12	15				
58 — 59 —								-				
60 - 61 - 62 - 62 - 62 - 62 - 62 - 62 - 62				5	M/W	ss (	10	13				
63 – CLA	YEY SAND, a little gravel, grayish brown, stiff (SC) (A-6)											
65 - 66 -				19	М	ss	14	10				
67 – CLA 68 – 69 –	YEY SAND WITH GRAVEL, grayish n, hard (SC/SM) (A-2-4)			97	M	ss s	10	11				

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AET JOB N	D: <b>01-05697</b>			LO	G OF	BORING N	0.	1261	SB	(p. 3	8 of 3	3)
PROJECT:	Southwest Light Rail Transit Pr	roject, I	PEC East; I								•	_
	Hennepin				5091(			50138	9			
EPTH						SAMPLE	REC	FIELI	) & LAI	BORAT	ORY	TES'
EPTH IN EET	MATERIAL DESCRIPTION		GEOLOGY	N	MC	SAMPLE , TYPE	REC IN,	WC	DEN	LL	PL	<b>%-</b> #
	AYEY SAND WITH GRAVEL, grayish own, hard (SC/SM) (A-2-4) (continued)			38	M	SS SS	12	11				
	own, hard (SC/SM) (A-2-4) (continued)					$\sum$						
72 —												
73 –						S						
74 —												
75 -				40	М	X ss	16	12				
76 -						2					а.	
77 -						$\left \right\rangle$						
78 -						$\rangle$						
79 — 80 —												
80 - 81 -				116	M	X ss	14	8				
82 -					ļ	2						
	<u></u>					2						
0	ANDY LEAN CLAY, a little gravel, brown, rd (CL/SC) (A-6)											
85 -				88/.7	M	ss 🕅	14	16				
	ND OF BORING		· · · · · · · · · · · · · · · · · · ·	00/./	111	$\Lambda$		10				
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/2011			<u> </u>	<u> </u>		<b></b>	1			1	01-D	

01-DHR-060

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AET JO	B NO: <b>01-05697</b>						LO	G OF	BOI	RING N	Ю	1262	ST	<b>(p.</b> 1	lof	l)
PROJEC	Southwest Ligh	t Rail Tr	ansit Pro	ject,	PEC	East; H	lopl	<u>cins</u> 1	to l	Minn	eapol	lis				
SURFAC	CE ELEVATION: 884.7	H	Iennepin C	o. Coor	dinate	es: <u>N</u>	1:	5595(	)		E t	51218	8			
DEPTH	s		N		CEC	DLOGY	ŇŢ	MG	SA	MPLE	REC	FIELD	) & LA	BORAT	TORY '	TEST
ÎN FEET	MATERIAL D	DESCRIPTIO	'I <b>N</b>		GEC		Ń	MC	Î	YPE	ĪN.	WC	DEN	LL	PL	<b>%-#</b> 2
	FILL, mostly sand with silt	t and grave	l, brown		FILL				М	00	10					
1	(A-1-b)						3	M	$\mathbb{N}$	SS	12					
2 -							6	М	Μ	SS	10					
3 -									स्र							
4 — 5 —	FILL, mostly silty sand, a l ashes/cinders and brick, br								R							
6 -	(A-2-4)	own and Di	aun				6	M	М	SS	14					
7 -									I							
8-							3	M	М	SS	6					
9									सि							
9 – 10 –							4 -		臣	CC	10					
10							15	M	Щ	SS	10					
12 -	······································							<b>_</b>	扛							
12	SAND, a little gravel, med grayish brown, waterbearing	ium graine	d, brown to 1 dense to	)	COA ALL	RSE UVIUM	20	W	M	SS	8					
14 -	loose (SP) (A-1-b)	ig, mearain	i delloe to						सि							
15 -									M							
16 -	•						7	W	M	SS	16					
17 -		CDATEL	<b>Ca</b>						E							
18 -	SAND WITH SILT AND medium grained, grayish b						6	W	X	SS	20					
19 -	dense (SP-SM) (A-1-b)		0.		•				Ł							
20 -							23	W/M	M	SS	8					
21 -	SANDY LEAN CLAY, a				TILL	,	23	VV/1VJ	Å	00		15				
22 –	cobbles, dark grayish brow (A-6)	n, very stil	ff (CL)						内							
23 –	()						16	M	M	SS	10	16				
24 -									ł							
25 –	SAND WITH SILT, a little	e gravel, gr	ayish			RSE UVIUM	17	w	$\mathbf{N}$	SS	18					
26 -	brown, waterbearing, medi clayey sand (SP-SM) (A-2	-4)				e riem			6							
27 —	SILTY SAND, a little grav	vel. gravish	brown.		•				H							
28 -	wet, medium dense, lenses	of clayey	sand (SM)		•		27	W	Å	SS	16					
29 —	(A-2-4) GRAVELLY SAND, med	ium graine	d. gravish					-	Ц							
30 -	brown, waterbearing, medi	ium dense,	lenses of				15	W	X	SS	6					
31 -	_silty sand (SP) (A-1-b) END OF BORING				1			1	$\uparrow$	-						
DEP				WAT	ER LE	VEL MEA	SURI	EMEN	TS		1		ـــــــــــــــــــــــــــــــــــــ	NOTE:	DUC	т. т.
		DATE	TIME	SAMPI		CASING DEPTH		/E-IN PTH	I	ORILLI	NG	WATI		THE A		
0-1									FL	UID LI	VEL			SHEE		
19½-2	9½' RDF w/DM	6/4/14	9:55	13.		12.0		2.5				12.		EXPLA		
BORIN	IG	6/4/14	10:10	13.	<b>&gt;</b>	12.0		2.5				11.1	<u></u>	ERMI		
	IG LETED: 6/4/14	-											1		IS LO	
$\frac{DR: \mathbf{D}}{3/2011}$	S LG: GH Rig: 41C														01-D	



AE	ET JOI	B NO: 01-05697						LO	G OF	BOI	RING N	Ю	1263	SB	<b>(p.</b> 1	l of 2	2)
PR	OJEC	T: Southwest Ligh	t Rail Tr	ansit Pro	ject,	PEC I	East; E	lopł	cins 1	to I	Minne	eapol	lis				
SU	RFAC	CE ELEVATION: <b>884.9</b>	H	Iennepin Co	o. Coor	dinates	: <u>N</u>	1:	55750	)	]	E É	51169	6			,
			PACDIDITIO	NI		CEOI	OCV		MO	SA	MPLE	REC	FIELD	)&LA	BORAT	ORY 1	ESTS
DEF II FE	ET	MATERIAL D	ESCRIPTIO	IN		GEOI	.001	Ν	MC	T	YPE	IN.	WC	DEN	LL	PL	%-#200
	1 — 2 —	FILL, mixture of sand with with gravel, light brown and A-2-4)	silt and sil d black (A-	ty sand -1-b,		FILL		10	М	M	SS	12					
	3 -							11	M	X म	SS	14					
	4 — 5 — 6 —	FILL, mostly silty sand wit little gravel ash/cinders, tra (A-2-4)	h organic f ce roots, bl	ines, a ack				4	M		SS	12					
	7 8 9							2	M/W		SS	6					
	10 - 11 -	FILL, mixture of silty sand and clayey sand, a little gra pieces of wood and glass, tr (A-2-4)	vel and ash	nes/cinders	,			3	M		SS	6					
	12 — 13 — 14 —							3	M	र्ति स	SS	6		-			
	15 — 16 —							3	M/W	X	SS	3				-	
	17 18	SAPRIC PEAT, dark brow brown (PT) (A-8)	nish gray t	o dark		SWAN DEPO		3	M		SS	12	165				
	19 20 21							3	М	H H H	SS	1					
	22 — 23 — 24 —				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			3	М		SS	4	146				
DT 6/12/14	25 — 26 —	ORGANIC CLAY, pieces roots, gray, lenses and lam (OH) (A-6)	inations of	boglime		=			M	H N	TW	14	106 72				
-CPT+WELL.G	27 — 28 — 29 —	SAND, a little gravel, med waterbearing, loose, lenses (A-1-b)	of sand wi	ith silt (SP)	)	COAR ALLU	SE VIUM	7	W	A R	SS	8					
01-05697.GPJ AET+CPT+WELL.GDT 6/12/14	30 - 31 -	SAND, a little gravel, med gray, waterbearing, loose, l (SP) (A-1-b)	ium to fine lenses of sa	grained, and with sil	it			9	W		SS	8					
01-05	DEP	TH: DRILLING METHOD			WAT	ER LEV	EL MEA	SURI	EMEN	TS					NOTE:	REFF	R TO
			DATE	TIME	SAMP DEP	LED Ç	ASING DEPTH	CAN	/E-IN PTH	I	DRILLI UID LE	NG	WAT	ER	THE A		
W-COORDINATES	0-2									FL	UID LE	VEL			SHEE		
	91/2-6	4.7' RDF w/DM	6/4/14	12:59	28.		27.0		4.8				12.		EXPLA		
≱ ਰੇਖ਼B	ORIN	IG LETED: 6/4/14	6/4/14	1:05	28.	<u>&gt;</u>	27.0	2	4.7				12.		ERMI		
																IS LO	
		M LG: SHS Rig: 68C															HR-0



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						
			Hennepin Co.	. Coor	dinates: <u>N</u>	1	5575(	)		E É	51169	6			
DEPTH IN FEET		MATERIAL DESCRIPT	ION		GEOLOGY	N	MC	SA	MPLE YPE	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 (GP) (A-1-b) <i>(continued)</i>	erbearing,			10	W	М	SS	1					
34 -	10050	(01)(11-1-0)(communua)		1) II				Б							
35 -	-			<b>1</b>		0		Ю							
36 -	SANI	D, a little gravel, medium grain	ned,			9	-	Д	SS	0					
37 -	water	bearing, loose (SP) (A-1-b)						Ц							
38 -						6	W	X	SS	3					
39 -		•						Б							
40 -	-					5	w	М	SS	3					
41 -						5	vv	Д	33	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	SS	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 -		YEY 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 -	-							$\sum$	SS	0					
	END	OF BORING			1	100/.1	-			V					
NOO															
±17         57         -           58         -         58         -           59         -         60         -           60         -         61         -           61         -         62         -           63         -         63         -           64         -         64         -							ĺ								
200															
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# AMERICAN ENGINEERING TESTING

R/20/13

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#### **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
Depth Donaton type (psi) (psi)	on Ratio Pore Pressure %) (psi)
0 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}             864.9 \\             5.9 \\             859.9 \\             x \\             x \\         $	
Bottom of Hole 46.37791	
AET CPT GRAPH	Edit: Date: 8/20/13 -GEO\GINTW1 GINT PROJECTS\01-05697.GPJ

#### AMERICAN ENGINEERING TESTING

### CONE PENETRATION TEST RESULTS

						· · · · · ·		
AET JOB NO	e: 01-05697	····· .		X			SOU	NDING NO.
PROJECT:	Southwest Lig	ght Rail T	ransit Proj	ject, PEC Ea	ıst; Hopki	ins to Minnea	oolis 111	2 CT (p. 1 of 1)
Location				<u>.</u>		achine 20 berator Adams		ace Elevation 864.4
Hennepin Co	. Coordinates: X	=517785	Y=161381	(feet)	Cone #		x Date	Completed: 8/1/13
Depth	Interpreted Soil Behavior Type	Sleeve F	Friction		sistance		tion Ratio	Pore Pressure
Flevation	UBC 1990 FR ) 2 4 6 8 10	(ps) 100 75 50		(۲ 1600 3200	osi) 4800 64	400 8000 0 2	(%) 4 <sup>.</sup> 6 8 <sup>.</sup>	<i>(psi)</i> 10 0 12 24 36 48
0 864.4 5 859.4 10 854.4 10 854.4 10 854.4 10 854.4 10 854.4 10 839.4 10 834.4 10 834.4 10 834.4 10 10 834.4 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10			WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW	Kottom of Hole 71				
5	<u>: : : : : : :</u>		<u></u>	AET CPT G	<u>: _: _: _:</u> _: _ RAPH			:::::: Edit: Date: 8/20/13 GINT PROJECTS\01-05697.GPJ
Ļ						X:	101-GEO\GINTW1	GINT 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		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	si)	Friction R (%)		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 \\ 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 \\ 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 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 844.5 \\ 20 \\ 20 \\ 844.5 \\ 20 \\ 20 \\ 844.5 \\ 20 \\ 20 \\ 20 \\ 20 \\ 20 \\ 20 \\ 20 \\ 20$			2000 4000		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		MMM ANNA MANNA
					X:\01-GEO	GINTW1 GINT	Edit: Date: 8/20/13 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	ercent Passing by Weig	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'	4½'-6'	2'-3½'	4½'-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:	Organic Silt (O	)H)				
Boring Number:	B-1012		<b>Depth:</b> 44.5-46.5	5 Soil Parameters:		
<b>Remarks:</b> Test conducted in general accordance with ASTM D2435		h ASTM D2435	Compres	blidation Pressure (Pc): 1.7 tsf sion Index (Cc): 0.715 ression Index (Cr): 0.135		
Tested By: Benjami	n Pomroy		Reviewed By:	Jeff Voy	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 (%):			
Saturation (%):	95.29	104.07				
Void Ratio:	4.8616	2.3802	Specific Gravity:	1.856	Measured	
Sample Description:	Sapric Peat (P)	[)				
Boring Number:	B-1036		<b>Depth:</b> 22-24	Soil Parameters:		
Remarks: Test condu	icted in general acc	cordance wit	h ASTM D2435	Preconsolidation Pressure (Pc): 0.9 tsf Compression Index (Cc): 2.658 Recompression Index (Cr): 0.438		
Tested By: Benjamin	Pomroy		Reviewed By:	Jeff Voye	en	



		Before	After	Liquid Limit (%):		<b>Test Date:</b> 9/6/2013	
Water Conte	ent (%):	214.49	134.53	Plastic Limit (%):			
Dry Density	(pcf):	22.64	33.15	Plasticity Index (%):			
Saturation ('	%):	95.33	97.77				
Void Ratio:		4.4193	2.5926	Specific Gravity:	1.972	Measured	
Sample Desc	ription:	Sapric Peat (PT	)				
Boring Number:		1053 SS		<b>Depth:</b> 24.5-26.5	Soil Parameters:		
Remarks:		ucted in general acc ressor failed during		h ASTM D2435	Preconsolidation Pressure (Pc): 1.3 tsf Compression Index (Cc): 2.557 Recompression Index (Cr): 0.469		
Tested By:	Benjamir	n Pomroy		Reviewed By:	Jeff Voye	en	



	Before	After	Liquid Limit (%):		Test Date:	
Water Content (%):	189.45	111.01	Plastic Limit (%):			
Dry Density (pcf):	25.64	39.50	Plasticity Index (%):			
Saturation (%):	98.33	103.59				
Void Ratio:	3.7861	2.1058	Specific Gravity:	1.967	Measured	
Sample Description:	Peat					
Boring Number:	1213 SB		Depth: 9'-11' Soil Parameters:		meters:	
Remarks: Test cor	nducted in general acc	cordance wit	h ASTM D2435	Preconsolidation Pressure (Pc): 0.5 tsf Compression Index (Cc): 1.860 Recompression Index (Cr): 0.383		
Tested By: Benjam	in Pomroy		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.