OWNER LOG OF BORING NUMBER B-1 Mn/DOT PROJECT NAME ARCHITECT-ENGINEER Mn/DOT Hiawatha LRT LSI STS Consultants, Ltd. STS Consultants Ltd. UNCONFINED COMPRESSIVE STRENGTH SITE LOCATION TONS/FT.² Minneapolis, Minnesota (PPM) PHOTO-IONIZATION DETECTOR READING PLASTIC WATER LIQUID **ELEVATION(FT)** DISTANCE LIMIT % CONTENT % LIMIT % DESCRIPTION OF MATERIAL \times UNIT DRY WT. LBS./FT.³ SAMPLE TYPE 10 20 30 50 40 STANDARD \otimes PENETRATION BLOWS/FT, 20 30 40 50 SURFACE ELEVATION Topsoil Fine to medium sand, trace gravel and silt - brown - (SW) 1 МС 1 5.0 2 MC 0 Coarse sand, with gravel - brown - (SP) 3 MC 0 10.0 MC 0 15.0 MC Silty sand, trace gravel - brown - (SM) 1 6 MC End of borehole at 19 feet (refusal). 20.0 All samples placed in zip-closure polyethylene bags and screened with a photoionization detector equipped with a 10.6 eV lamp source and calibrated to a benzene reference gas. Background PID readings ranged from 0 to 2 PID A soil sample for laboratory analysis was collected at 19 feet below ground surface. 25.0 30.0 The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual. WL BORING STARTED STS OFFICE Not Encountered 4/15/04 Minneapolis Area - 06 BORING COMPLETED 4/15/04 WL ENTERED BY SHEET NO. WL RIG/FOREMAN STS JOB NO.

Geoprobe/DJ

99552-XA

OWNER LOG OF BORING NUMBER B-1A Mn/DOT PROJECT NAME ARCHITECT-ENGINEER Mn/DOT Hiawatha LRT LSI STS Consultants Ltd. SITE LOCATION O UNCONFINED COMPRESSIVE STRENGTH TONS/FT.²
1 2 3 4 5 Minneapolis, MN (PPM) DETECTOR READING PLASTIC WATER LIQUID ELEVATION(FT SAMPLE DISTANCE PHOTO-IONIZATION LIMIT % CONTENT % LIMIT % \times **DESCRIPTION OF MATERIAL** UNIT DRY WT. LBS./FT.3 Δ RECOVERY 10 30 50 STANDARD PENETRATION BLOWS/FT \otimes SURFACE ELEVATION Topsoil Fine-medium SAND - brown - (SP) 5.0 10.0 1 HS 15.0 Silty, sandy clay - gray to brown - (CL) 20.0 2 SS 0 3 SS 0 25.0 Fine-medium SAND - brown - (SP) 0 End of boring at 27.0 feet (refusal - possibly bedrock). Boring grouted with high solids bentonite upon completion. 30.0 35.0 The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual. WL BORING STARTED STS OFFICE Minneapolis Area - 06 10/7/04 BORING COMPLETED 10/7/04 WL ENTERED BY AC SHEET NO. STS JOB NO. 99552-XA WL APP'D BY RIG/FOREMAN D-50/TM

DRING LOG HIAWATHA | BT | OGS GP | STS G

OWNER						_	LC					G OF BORING NUMBER B-2									
Mn/DOT PROJECT NAME							ARCH				CHITECT-ENGINEER										
STS Car						^{NAME} T Hiawatha Li	RT I SI	41		TS Consultants, Ltd.											
SITE LO			IO.	1		i mawama ci	III LOI		010	T	T			INED CC	MPRES:	SIVE S	RENGTH				
Min	nea	pol	is,	M	inneso	ta					(PPM)	TO	NS/FT	2	3	4	RENGTH				
DEPTH(FT) ELEVATION(FT)		ш	SAMPLE DISTANCE			DESCRI	PTION OF MATERIAL			٥	PHOTO-IONIZATION DETECTOR READING (PI	PLAS		CON	ATER TENT %	L	IQUID IMIT %				
DEPTH(FT) ELEVATION	Š.	₹	DIS	RΥ		B2001111				 	ONIZ OR F	10		20	30	40	50				
DEF	SAMPLE NO.	SAMPLE TYPE	MPLE	SOVE						UNIT DRY WT.	DTO-			STAND							
\boxtimes	SA	SAI	SA			E ELEVATION				LBS	PHC	⊗ 10			RATION 30	BLOW 40	S/FT. 50				
		H	Н	Н	24 205		m sand, trace gravel -	brown (S)	(4/)			-		-		-					
	1	мс				i ine to media	m sand, trace graver	biowii - (o	••,	2	1										
5.0	2	мс			5.0	Coarse sand	with gravel - brown - (SD)													
						Coarse sand,	with graver - brown - (<i>3F)</i>			0										
10.0	3	мс									0										
15.0	4	МС									0										
	5	ме			16.5		ce gravel - brown - (SN	.A\													
			П	П	18.0		e graver - brown - (Si	vij			0										
20.0					. [6] 5 [16.0	End of borehol All samples pla bags and scree equipped with calibrated to a Background Pl units. A soil sample f	le at 18 feet (refusal). aced in zip-closure polened with a photoioniz a 10.6 eV lamp source benzene reference ga ID readings ranged fro for laboratory analysis w ground surface.	lyethylene zation detect e and as. om 0 to 2 Pli	D												
25.0											3										
30.0	The		L	_													l				
WL	rne	strat	rica	aTIC	on lines re	epresent the appr	oximate boundary line	es between s	soil ty	7		he trans	ition	may b	e grad	ual.					
	Enc	ount	ere	d			BORING STARTED 4/15/	04			FFICE	- 1			Area -	06					
							BORING COMPLETED 4/15/	04			AC				0F	1					
WL							RIG/FOREMAN Geoprol	be/DJ		APP'D	APP'D BY STS JOB NO. 99552-X					Α					

G	to			- 1	Mn/DOT	LOG OF BORING NUMBER B-3												
	_	11			PROJECT NAME	DT I O		CHITECT-ENGINEER 'S Consultants, Ltd.										
SITE LC			td.		Mn/DOT Hiawatha I	LRT LSI	STS	Con	sultar	its, Lt	d.	TIMED CO	OMBDEC	SSIVE ST	DENOT			
			is	, N	linnesota				Σ		NS/F	F. ² 2	3	4	5			
DEPTH(FT) ELEVATION(FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY		RIPTION OF MATERIAL			PHOTO-IONIZATION DETECTOR READING (PPM)	PLASTIC WATER LIMIT % CONTENT % HO 20 30 4 STANDARD					LIQUID LIMIT %			
\bowtie	ŝ	ςς	Š	H	SURFACE ELEVATION Topsoil			UNIT DRY WT. LBS./FT. ³	PH DE	10		PENET 20		BLOWS 40	5/FT 50			
	1	мс				um sand, trace gravel and silt - bro	own		1									
5.0	2	MC			5.2 Coarse sand	, with gravel - brown - (SP)			О									
10.0	3	мс							0									
	4	мс			14.0				0									
20.0					All samples p bags and screequipped with calibrated to a Background F units. A soil sample	ole at 14 feet (refusal). laced in zip-closure polyethylene eened with a photoionization detect a 10.6 eV lamp source and a benzene reference gas. PID readings ranged from 0 to 2 PII for laboratory analysis was collected by ground surface.	D						×					
30.0																		
	he s	tratif	ıca	tio	lines represent the app	roximate boundary lines between s	oil typ	es: in	situ, th	e trans	ition	may be	gradı	ıal.				
	Enco	unte	red			BORING STARTED 4/15/04		STS OF	FICE	N	linne	apolis	Area -	06				
WL						BORING COMPLETED 4/15/04		ENTER	ED BY AC		SHEE	T NO.	OF	1				
WL						RIG/FOREMAN Geoprobe/DJ		APP'D BY STS JOB NO. 995						9552-XA				

OWNER LOG OF BORING NUMBER B-3A Mn/DOT PROJECT NAME ARCHITECT-ENGINEER Mn/DOT Hiawatha LRT LSI STS Consultants Ltd. -O-UNCONFINED COMPRESSIVE STRENGTH
TONS/FT.²
1 2 3 4 5 SITE LOCATION Minneapolis, MN DETECTOR READING PLASTIC WATER LIQUID ELEVATION(FT E DISTANCE PHOTO-IONIZATION LIMIT % CONTENT % LIMIT % DEPTH(FT) **DESCRIPTION OF MATERIAL** \times -UNIT DRY WT. LBS./FT.³ 10 50 20 30 40 SAMPL STANDARD ⊗ 10 PENETRATION BLOWS/FT, 20 30 40 50 SURFACE ELEVATION Topsoil PA Fine-medium SAND - brown - (SP) 1 0 2 SS 0 5.0 SS 3 0 4 SS 0 10.0 5 SS 0 Coarse SAND, with gravel - brown - (SM) 6 SS 0 15.0 Sandy SILT - brown - (ML) SS 0 Sandy SILT to CLAY, trace gravel - gray - (CL) 0 20.0 9 SS 0 10 SS 0 25.0 11 SS Fine-medium SAND - brown - (SP) 0 End of boring at 27.0 feet (refusal - possibly bedrock). Boring grouted with high solids bentonite upon completion. 30.0 35.0 The stratification lines represent the approximate boundary lines between soil types: in situ, the transition may be gradual. WL BORING STARTED STS OFFICE 20.5 10/7/04 Minneapolis Area - 06 BORING COMPLETED 10/7/04 WL ENTERED BY SHEET NO. STS JOB NO. 99552-XA WL RIG/FOREMAN APP'D BY D-50/TM

BORING LOG HIAWATHA LRT LOGS.GPJ STS.

त्त				I	OWNER LOG C							G OF BORING NUMBER B-4									
		AI.		ŀ	PROJECT	TNA				ITECT-E											
STS Co	_		Ltd.	1	Mn/DC)T	Hiawatha Ll	RT LSI	STS	Con	sultar	ıts, Lt	d.								
SITE LO			lis.	. N	linnes	ota	1				ŝ	-O-10	NCONI DNS/F1	INED CC	OMPRES:	SIVE ST	RENGTH 5				
DEPTH(FT) ELEVATION(FT)		SAMPLE TYPE	SAMPLE DISTANCE					PTION OF MATERIAL	UNIT DRY WT. LBS./FT.³	PHOTO-IONIZATION DETECTOR READING (PPM)	PLAS LIMI	STIC T % — -	CON 20	ATER TENT % — — 30 ARD	LI LI 	IQUID MIT %					
\boxtimes	SAN	SAN	SAN	Ä	No. of the last of		ELEVATION			UNI	PHO	11			RATION 30	BLOWS 40	5/FT. 50				
	-		H	H	7.7. 7.0	5_	Topsoil Fine to mediu	m sand - brown - (SW)					-	1	-	-	-				
	1	МС					Time to modia	modification (on)			0										
5.0	2	мс									0										
_10.0	3	мс									0										
15.0	4	мс			15						0										
			Ш	Ħ		0.0	Silty sand, trac	ce gravel - brown - (SM)													
	5	мс			18		0				0										
		_	Щ	Н	19	1.1		with gravel - brown - (SP)													
20.0	7	MC MC			22		Sandy clay, ira	ace silt - gray - (CL)			0										
25.0							All samples pla bags and scree equipped with calibrated to a Background Pl units.	e at 22 feet (refusal). aced in zip-closure polyeth ened with a photoionizatior a 10.6 eV lamp source and benzene reference gas. D readings ranged from 0	to 2 PID												
30.0							A soil sample f at 22 feet belov	or laboratory analysis was w ground surface.	collected												
	The	strat	ific		on lines	ren	recent the en-	ovimato beundare !! !	huss= =: 9.1				- 1				_				
WL	1116	oual	njG	au (inies i	ιeρι	езен ине аррг	oximate boundary lines be	tween soil ty	-		ne tran	sition	may b	e grad	ual.					
	t End	ount	ere	d				4/15/04		-	FFICE		_	eapolis		06					
			-					BORING COMPLETED 4/15/04			AC										
WL								RIG/FOREMAN Geoprobe/D		APP'D BY STS JOB NO. 99552-X						Α					

C	OWNER Mn/DOT						-			LOG C	F BOR	ING NU	MBER	Е	3-5			
	6	4		-	PROJE					ARCH	TECT-E	ENGINE	ER	_				
STS Co			_td.		Mn/l	DOT	Hiawatha L	RT LSI				sultar	nts. L	td.				
SITE LO			io	B /	linn								-O-1	INCONF ONS/FI	FINED C	OMPRES	SIVE ST	RENGTI
IVIII	T	apoi	15,	IV.	linne	2501	.d					PPM)		1	2	3	4	5
DEPTH(FT) ELEVATION(FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	'ERY			DESCR	PTION OF MATERIAL			UNIT DRY WT. LBS./FT.ª	PHOTO-IONIZATION DETECTOR READING (PPM)	LIM	STIC IT % ———		ATER ITENT % 30	LI	IQUID MIT %
	\MPL	MPL	MPL	RECOVERY							UNIT DRY LBS./FT. ³	OTO TECI	6	8	STAND	ARD RATION	DI OWI	
	8	Ś	S/S	Ŧ	SUR		E ELEVATION Topsoil				S 9	표 점			20	30	40	50
			IT	Ħ	::::	0.5		ım sand, trace gravel a	nd silt - bro	own					+-			-
	1	МС				3.5	- (SW)					0						
			П	1		0.0	Coarse sand,	with gravel - brown - (S	SP)									-
5.0	2	МС										0						
10.0	3	мс										0						
15,0	4	МС										0						
			#	H	T F	16,2	Silty sand - bro	(014)		_	_							
	5	мс				18.4						0						
			Ц	IJ:		19.2		n sand - brown - (SW)										
20.0	6	МС	Ц				Sandy clay, tra	ace silt - gray - (CL)			T	0						
	7	мс				22.0						1						
25.0							All samples pla bags and scree equipped with calibrated to a	e at 22 feet (refusal). aced in zip-closure poly ened with a photoioniza a 10.6 eV lamp source benzene reference gas D readings ranged fron	ition detect and									
							A soil sample f at 22 feet belov	or laboratory analysis w w ground surface.	vas collecte	ed								
30.0							samples for an	porary well and obtained water alysis. Boring was grouted with atonite upon completion.										
	Γhe :	stratif	ica	tio	n line	s rep	resent the appr	oximate boundary lines	between s	soil typ	es: in	situ th	ne tran	sition	may h	e aradi	ıal	
WL 18.9								BORING STARTED 4/15/04		sts office Minneapolis Area - 0						-		
WL								BORING COMPLETED 4/15/04		ENTERED BY				SHEET NO. OF				
WL								RIG/FOREMAN Geoprobe		APP'D BY STS JOB NO. 995					9552-X	Α .		

RING LOG 99465-XA GP. STS GDT

OWNER				T	OWNER	LOG	OF BOR	ING NU	MBER	В	-6			
1	L	1		4	Mn/DOT									
	_				PROJECT NAME		IITECT-E							
STS Co			td.		Mn/DOT Hiawatha LRT LSI	STS	Con	sultar			INED CO	MDDEC	CIVE OT	DENGT
1			is.	M	linnesota			ŝ		NCONF DNS/FT	INED CC	3	4	5
(FT)								PHOTO-IONIZATION DETECTOR READING (PPM)	PLAS LIMI	STIC	W	ATER	L	IQUID MIT %
DEPTH(FT) ELEVATION(FT)	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	PTION OF MATERIAL			10		20 STAND	30 ARD	40	50
	SAME	SAME	SAME	RECC	SURFACE ELEVATION				8	3	PENET	NOITAF		
	0,	5)	Ï	Ī	<u>№ №</u> Dosoil		UNIT DRY LBS./FT. ³		10	0	20	30	40	50
	1	мс			Fine to medium sand, trace gravel - brown -	(SW)		1						
5.0	2	мс						0						
10.0	3	мс						0						
15.0	4	МС						0						
					16.1									
	5	МС			Silty sand - brown - (SM)	-		0						
	6	мс	T		Coarse sand, with gravel - brown - (SP)			2						
25.0					End of borehole at 20 feet (refusal). All samples placed in zip-closure polyethylend bags and screened with a photoionization det equipped with a 10.6 eV lamp source and calibrated to a benzene reference gas. Background PID readings ranged from 0 to 2 units. A soil sample for laboratory analysis was collected at 20 feet below ground surface.	ector PID								
30.0														
	The	strati	ifica	atic	on lines represent the approximate boundary lines betwee	n soil ty	/pes: ir	n situ, t	he tran	sition	may b	e grad	lual.	
WL		ounte			BORING STARTED 4/15/04		_	OFFICE			eapolis			
WL					BORING COMPLETED 4/15/04		ENTE	ENTERED BY SHEET NO. OF 1 1						
WL					RIG/FOREMAN Geoprobe/DJ		APP'D BY STS JOB NO. 99552-X						(A	