#### STANDARD RECOMMENDATIONS FOR UTILITY TRENCH BACKFILLING

#### GENERAL

Clayey and silty soils are often difficult to compact, as they may be naturally wet or may become wet due to ground water or surface/rain water during construction. Soils will need to be placed within a certain range of water (moisture) content to attain desired compaction levels. Moisture conditioning to within this range can be time consuming, labor intensive, and requires favorable weather.

The degree of compaction and the soil type used for backfill within open cut utility trenches depends on the function of the overlying land surface. Details are as follows:

#### ROADWAYS

Where trenches are located below roadways, we recommend using inorganic fill and compacting these soils per Mn/DOT Specification 2105.3F1 (Specified Density Method). This specification requires 100% of the Standard Proctor density in the upper one meter subgrade zone, and 95% below this. Note that this specification includes moisture content range requirements which are important for proper subgrade stability.

Where available soils are wet or of poor quality, it may be possible to use the "Quality Compaction Method" (Mn/DOT Specification 2105.3F2) for soils below the upper one meter subgrade zone if you can tolerate some subsidence. However, a high level of stability is still important within the upper subgrade zone and recommend that the "Specified Density Method" be used in this upper subgrade area. We caution that if backfill soils in the lower trench area are significantly unstable, it may be difficult or even impossible to properly compact soils within the upper one meter subgrade zone. In this case, placing a geotextile fabric directly over the unstable soils can aid in offsetting the instability.

#### STRUCTURAL AREAS

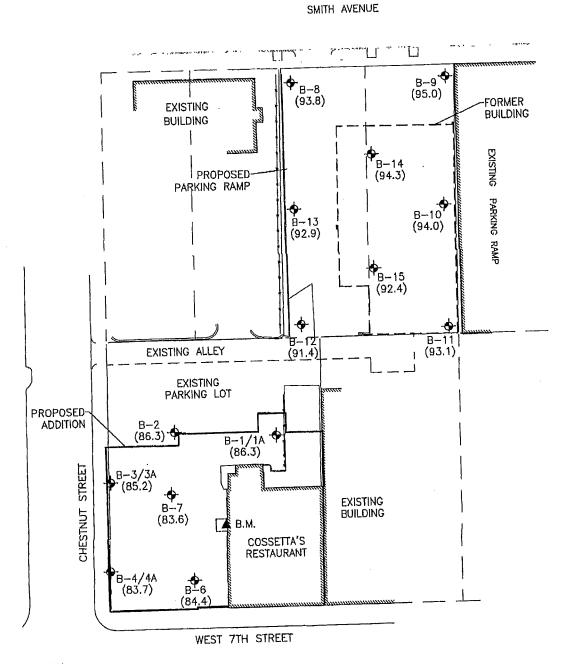
If fill is placed beneath or within the significant zone of influence of a structure (typically a 1:1 lateral oversize zone), the soil type and minimum compaction level will need to be evaluated on an individual basis. Because trenches result in variable fill depths over a short lateral distance, higher than normal compaction levels and/or more favorable (sandy) soil fill types may be needed. If this situation exists, it is important that special geotechnical engineering review be performed.

#### NON-STRUCTURAL AREAS

In grass/ditch areas, backfill soils should be placed in reasonable lift thicknesses and compacted to a minimum of 90% of the Standard Proctor density (ASTM:D698) and/or per the Mn/DOT "Quality Compaction Method." If lower compaction levels are attained, more noticeable subsidence at the surface can occur. Steep or high slopes require special consideration.

# Appendix

Figure 1 – Boring Locations
Logs of 2007 Test Borings
Logs of 2006 Test Borings
Exploration/Classification Methods
Boring Log Notes
Unified Soil Classification System



#### LEGEND

- = APPROXIMATE SOIL BORING LOCATION (AND GROUND SURFACE ELEVATION)

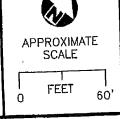
▲ = BENCHMARK: FIRST FLOOR SLAB OF EXISTING BUILDING ELEVATION = 85.23 FEET SPCD DATUM

NOTE: BORING 5 WAS NOT DRILLED DUE TO CONFLICT WITH UNDERGROUND UTILITIES



AMERICAN ENGINEERING TESTING, INC. CONSULTANTS

- GEOTECHNICAL
- ENVIRONMENTAL
- MATERIALS



#### FIGURE 1: BORING LOCATIONS

Proposed Cossetta's Restaurant Addition & Parking Ramp 211 7th Street West/212 Smith Avenue St. Paul, Minnesota

DIGHTH DATE 102	CHECKED BY: CAU
DATE: 04/18/07	AET JOB NO. 05-03034

550 Cleveland Avenue North St. Paul, Minnesota 55114 Phone: 651-659-9001 Fax: 651-659-1379 Website: www.amengtest.com



AET JOB	NO: 05-03034									UNG N		1 <i>A</i>	(p.	1 of	1)
		ant Add	ition a	nd	Parki	ng R	am	p; St	t, I	Paul,	MN				
PROJECT		16.3		T		1									RY TESTS
EPTH IN FEET	SURFACE ELEVATION:  MATERIAL DESCR				GEOLC	IG1	N	MC	Ť	MPLE YPE	īN.	REC	RQD IN.	RQD %	
FEET	No samples taken; refer to log o		<del></del>	十					П						
	No samples taken; refer to log of	L Doing ".		-				'				, }	١		ļ
1 -										en wa i	.				}
2 -								M		6" FA				Ì	
			ļ	1											
3 -															
4	a se emanas re l'alt anno and m	row minkly			PLATT	EVILL	E		$\Pi$	NQ	14.5	101	5.5	38	
_	LIMESTONE, light gray and greedded, rubble zone from about	(0, 10 0 1	-	T	FORMA MIFFL	N			Ш	110	1,,,,	101			
5 -	Westhaming Maderately Westh	erea		$\pm_{\rm I}$	МЕМВ	ER				1			ļ		
6 -	Fracturing: Very fractured Stratification: Very thinly bede	led							Ш		1				
,	Hardness: Hard			$\perp$	771 4 7777	e con r	-		Ш		į				
7 -	LIMESTONE, light gray	.1	}	$\dashv$	PLATI FORM	ation	1			ИQ	60	100	18.5	31	
8 -	Weathering: Slightly weathered Fracturing: Slightly fractured Stratification: Very thinly bed	:d	ď		PECAT	ONIC ER	1				}				
9 ~	Stratification: Very thinly bed	ded			GLEN	MOOL									
9	Hardness: Hard	n light grav	sandy		FORM	AHUI	"		۱						
10 -	shale to light brown and ngut t	gray shaley	,	E	1										
11 -	sandstone														
•••				E	<u> </u>										
12 -	SANDSTONE, light gray and	light brown	ı, well		ST. PI FORM	ETER IATIO	N			NC	24.	5 41			
l   13 -	cemented								•			1			
									١			1		}	
14	-												i		
15				182			+		7	Щ		<del></del>		1	
	END OF BORING								1			1	Ì		
1															
				1									,		
													Ì		
														ļ	
													1		
<b>\</b>															
					İ										
														1	
				137	ATER LE	VEL N	ÆAS	LL UREM	ŒΝ	TS				NOT	E: REFER TO
	DEPTH: DRILLING METHOD					CASI	1G	CAVE	-IN	ומת	rrivg	ÿ	ATER EVEL	٦	ATTACHED
	0-4' 6" FA	DATE	TIME	ğ	APLED SPTH	DEPT	H	DEPT	i'H	FLUD	LEVI	L L	LYEL	SHE	ETS FOR A
	4'-15' NQ Core									1 -		-		EXP	ANATION C
										<del> </del>				l l	MNOLOGY (
BO	ORING OMPLETED: 3/12/07									-					THIS LOG
DR	n'-														



TIO	B NO:	05-03034									ING NO		3A	(p.	1 01	<u></u>
OJEC		Cossetta's Re	staurant Ad	dition	and	<u>Parkin</u>	g Rai	m	); S	t. P	aul,	MN				
			~ ~			GEOLOG	i	- 1	мс		1	220		& LAB		ORY TESTS
PTH N EET	SUR	FACE ELEVATION: _ MATERIAL	DESCRIPTION	_	-	CDODG		'	IVIC	T	YPE	IN.	%	IN.	%	
	No sa	mples taken; refer to		<b>‡</b> 3							l	Ì			Ì	
1							{	İ				1			ļ	
١ ١						•										
2 -	T 13 (Y	STONE, light gray	and gray crinkl	v	1	PLATTE	/ILLE			$\prod$					- 1	7
3 -	hedde	ed rubble zone from	1 2.2 10 0,2	,	-	FORMAT MIFFLIN	<b>\</b>				210	26	100	10.5	29	
	Want	haring: Slightly We	athered		出	MEMBEF	`			III	NQ	36	100	10.5	-	
4 -	Strati	uring: Very fracture fication: Very thind ness: Hard	y bedded		田											
5 -	Hard	ness: maid			日											
6 -		_			出	DI Ameri	VII I									
	LIM	ESTONE, light gray	'			PLATTE FORMA	rion			$\parallel \parallel$						
7 -	Weat	thering: Fresh turing: Slightly frac ification: Very thin	tured	i		PECATO MEMBE	R _∫				NQ	60	100	19.5	32	
8 –	Strat	ification: Very thin lness: Hard	ly bedded			GLENW FORMA	OOD									
9 -	SHA	Iness: Hard LE, gray to about 1 y shale	0,2' then light gr	ray		LOMM	1.01,									
10 -		y 311110								$\parallel$						
11 -			1 ( -1.4 huns	va vvall		ST. PET	ER				1				1	
		NDSTONE, light gra	ay and light brow	WII, WEII		FORMA	TION				l					
12 -		<b>~</b>									NQ	13	22			
13 -	7						ļ							1		
14	_															
										_	<u> </u>					-
15	EN	D OF BORING								1						
	ļ															
			•													
				•						į						
												-				
ļ ļ																
1	1													1.		
	 DEPTH:	DRILLING METH	OD		WA	TER LEV	EL ME								1	E: REFER
	)EF1 EI;	Didden to the	DATE	TIME	SAN	APLED C	ASING DEPTH	1	DEPT	•IN H	DRII FLUID	LEVE	L L	ATER EVEL	ì	E ATTACHI
	0-2.2'	6" FA			1			+							1	EETS FOR
2.	2'-15 <u>.2</u>	NQ Core			+-			1								LANATION
RO	RING			,	+			1					1		1	MINOLOGY THIS LOG
l čŏ	RING MPLET	ED: 3/12/07	<del></del>	<b></b>	_			1							<u></u>	1110 000



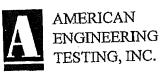
	TESTING, INC.				<del></del>		1.00	G OF	BOR	NG NO	). <u></u>	4A	(p.	1 of	1)
AET JOI		urant Ad	ldition a	nd	Park	ing R									
PROJECT DEPTH	SURFACE ELEVATION:	83.7	-		GEOL	- 1	N	мс	•	APLE PE	173	EC I	RQD	RQD	RY TESTS
DEPTH IN FEET	MATERIAL DES		нл Г						$\vdash$			%	IÑ.	%	
	No samples taken; refer to log	of Boring i	14												
1 -													ļ		
2 -															
3 -															
4 -															
5 -															
6 -															
8 -															
9 -															
10 -	FILL, mixture of lean clay, s	andy lean c	lay, silty		FILL	OR JUVIUN	1 19	М	M	SS	6				
11 -	sand and gravel, brown, gray	ish olowii	and dark						/\ 된						
12									1						
13							49	M	1  X	SS	10				
14											0.5				
15							100/	0.1 N		SS	0.5				
16									1						
i		-t -vorsi dor			8	<del></del>	_ 13	32 N	иχ	SS	13				
\ ''	SANDSTONE, brown, moi	st, very del id with silt	, fine				$\top$						ļ		
	grained (SP-SM) END OF BORING			1											
,															
					arr.	EVEL N	TE A ST	ID EV	ENT	s				NOTE	E: REFER TO
I	DEPTH: DRILLING METHOD					CASIN DEPT		CAVE DEPT			LING LEVEL	WA	TER VEL	1	ATTACHED
	0-17½' 3.25" HSA	DATE	TIME	DE	PLED PTH	DEPT	H	DEPI	Н	rLUID	LEVEL	<del> </del>	one	SHE	ETS FOR AN
		3/12/07					+					1-		1	ANATION OF
												1		TERM	IINOLOGY ON
BO CO	ORING OMPLETED: 3/12/07			-		-						<del>                                     </del>		1:	THIS LOG
DR	R; LG; Rig:					ــــــــــــــــــــــــــــــــــــــ				L					



r JOB	NO: <b>05-03034</b>									ING N			8 (	(p. 1	OI	1)_	
	C 44 1- Destan	rant Ado	dition a	nd I	<u>Parkir</u>	ıg R	amj	o; S	<u>t. P</u>	aul,	MN						
OJECI				- 1			1									FORY	TESTS
TH ET	SURFACE ELEVATION: MATERIAL DESC	93.8	•		GEOLO	31	И	MC	T	VPLE YPE	REC IN.	REC		QD I N.	(QD %_		
		LRIPTION		F	ILL				H	SU							1
$\neg$	2.75" Bituminous pavement FILL, mostly gravelly sand wi	th sand a lit	tle			1			掛	SU						ĺ	i
, 11	Calle road biggly to Dark Diowi.	I. HOVAH		1		Ì			<u>}</u>	SU	]			- [			ļ
1	EII I mostly lean clay with sa	ind, a little s	ilty			ļ			H				ļ				1
2	sand, black to dark brown, fro	zen	İ				16	М	IXI	SS	16			Ì			
3 —	FILL, mixture of clayey sand,	silty sand, l	ean						W								
	alou limestone fragments san	o, a mue gra	ivel,	-					1		1		ļ	Ì			· ·
4 -	brown, dark brown and gray,	frozen to 3	1	1		1	53/9	М	X	SS	14						
5 -						ļ		,	प्ति		1						
-	LIMESTONE, light gray wat	erbearing,			PLATT		E		片								
6 -	1 1	ess: maru.	ed to F		FORMA PLATTI		E		m								
,	Obstructed to split spoon at 5	,9', Obstruct		-	FORMA	MOIT											
7-	THE COURT COME TO THE OWN AND	gray, crink	ley	田	MIFFLI MEMBI				-	1							
8 –	bedded, rubble zone irolli av	out 13.6' to a	about						III	NQ	47.	5   10	01	24	51		
	14.4' Weathering: Moderately we	athered								l	1	- }					
9 –	Emoturing Very tractified								-								
10	Stratification: Very thinly be Hardness: Hard	eaaea							Н	ł			1				
	naroness. Haid			廿	1							Ì	-				
11 -	-																
12 -				二	1										_		
,,_				二	1					NC	) 61	0   1	00	42	7	0	
13 -	-			耳	<b>d</b>									i	1	-	
14 -				円	H				- II	1	-	\				-	
14				王	PLAT	TEVIL	LE		١								
15	LIMESTONE, light gray Weathering: Slightly weath	nered		上	FORM	OITA) INOT	N]		ı	H							
	h Exacturing: Moderately Ira	cturea		佢	MEM	BER	⅃		l							l	
16	Stratification: Very thinly	bedded			GLEN	OITAL	D		1		ļ				1		
17	Hardness: Hard SHALE, gray to about 18'	hen light gr	av sandy	' 崖	FORM	ичто	1				_   _	_	^^		.	9	
	shale to light gray and light	brown shal	ey							N	Q   5	5.5	92	5.3	'	7	
18	sandstone				<u> </u>		1									Ì	
19	, 🚽			=	3							1					
	SANDSTONE, light gray	and light bro	wn, well		ST. P	ETER MATIC	ומו										
20	cemented			_/ "	TOM	ATCT 17	4.1										
	END OF BORING							ļ								Ì	
																	negen g
	DEPTH: DRILLING METHOD			WA	TER LE								357 A S	TED	7.		REFER T
	Jul 1141	DATE	TIME	SAM	PLED PTH	CASIN	G H	CAVE	ŦĮN ĮĮ	FLUI	P LEA	EL	LEV	TER VEL	1		TTACHE
	0-6.1' 3.25" HSA			DE	4 111	6.1'		6		1			No	ne			rs for A
6.1	'-20.3' NQ Core	3/1/07	9:50	-		None	-+	3'		1	<del></del>	1	No	ne	1		MOITAN
		3/1/07	9:55	-	+	14011	+			+		$\neg$			TE	RMI	10LOGY
BO	RING MPLETED: 3/1/07			-						+		十			1	TH	IS LOG
(4)		1	i		f					1		- 1					



	NO: 05-03034_	<del>,</del>							ING N		9	(p.	1 01	1)_	
		urant Ad	dítion a	nd Par	king R	amı	p; S1	<u>t. P</u>	aul,	MN					
JEC.				1	i i		1		1	REC	FIELD	& LA	BORAT	ORY	TESTS
H r	SURFACE ELEVATION: MATERIAL DES	95.0 CRIPTION			LOGY	N	мс	可	MPLE YPE	ÎÑ.	wc	DEN	LL	PL	V6-#20
	4.25" Bituminous pavement	101 - 114 Janeary	/	FILL						. '					
	FILL, mostly gravelly sand was frozen				ļ			}							
2	FILL, mostly gravelly clayey	sand, dark b	orown			9	м	M	SS	8					
3 –	FILL, mixture of silty sand as little gravel, brown	nd clayey sai	nd, a			,	,,,	R	-						
4 -								KI KI							
5 -					•	3	М	M	SS	12					
6 –	FILL, mixture of sand with s	ilt and grave	el,			100/0	1	1							
7 -	pieces of concrete, brown an to split spoon at 8.1', Obstru	d gray, Obsi cted to HSA	at 8.5'			00//0	М	NA PARTIES	SS	7					
٦ ٥	END OF BORING														
															}
								١							
r	DEPTH: DRILLING METHOD				LEVEL M						,   "	ATED	~~		EFER
		DATE	TIME	SAMPLE DEPTH	D CASIN	G (	DEP	H H	DRI FLUII	PLEV		ATER EVEL	- TF		TACE FOR
	0-8½' 3.25" HSA	3/1/07	10:11	8.11	8.5'		8.5					None	ì		ATIO
		3/1/07	10:15	8.1'	0,0	_	6.2				-	None			orog
BO	RING MPLETED: 3/1/07					_							-		SLOG



AET JO	B NO: 05-03034								ING N		1	0 (1	p. 1	of 1)	
ROJEC		urant Ad	ldition a	nd ]	Parking	Ram	p; S	t. P	aul,	MN					
EPTH IN EET	SURFACE ELEVATION: MATERIAL DES	94.0			GEOLOGY	1	мс	1	i i	REC IN.		RQI IN.	) Re		Y TESTS
1 -	2.75" Crushed limestone base FILL, mostly silty sand with g frozen	light brow	n brown,	F	ILL			****							
. 2 -	FILL, mixture of gravelly silt sand, a little concrete, brick a brown and brown, frozen to 1	ng grass, da	clayey rk			20	F/M	N P	SS	11					
4 -			1			70/0.	3 M	A A	SS	10					
5 - 6 -	FILL, mostly sandy silt with and gray HIGHLY WEATHERED DO grayish brown, moist, very de Classification: Sandy silt with	LOSTONI			PLATTEVI FORMATI	LLE		177	SS	1					
7 -	LIMESTONE, light gray, mo hard, Obstructed to split spoo	oderately we on at 7.1'	eathered,		PLATTEV	50/0	.ı M	17	ac						
8 - 9 - 10 -	bedded, rubble zone from ab 15.5' Weathering: Slightly weather	ered	cly about	片	FORMATI MIFFLIN MEMBER	ON			NQ	35	10	1 5	9	26	
11 -	Stratification: Very thinly b	edded													
12	-										-				
13	-			H		ļ			NQ	60	10	00 4	42	70	
14 15				HH											
16	Weathering: Fresh	ed		上层	PLATTE FORMAT PECATO MEMBE	TON NICA }									
18	Hardness: Hard SHALE, gray to about 18.9		gray		GLENW FORMA'	LION			NO	56	5.5	94	9	15	
26	SANDSTONE, light gray	and light br	own, well	1	ST. PET FORMA	ER TION	+					-			
	END OF BORING	1			TER LEVE	MEAC	UREN	ŒNT	 'S					NOTE:	REFER T
	DEPTH: DRILLING METHOD	D 4 mm	TIME				CAVE		DRII FLUID	LING	I N	ATE!			TTACHE
	0-7½' 3,25" HSA 4'-20,8' NQ Core	3/1/07	9:07	·		.5'	7.5		7. TO II	******		None			ts for a Nation
177	4'-20.8' NQ Core	3/1/07	9:09	7.	.1'	0.0	4'					None	<i>5</i>		NOLOGY
BC	ORING OMPLETED: 3/1/07										<del></del>		$\dashv$		IIS LOG



ET JO	OB NO: 05-03034									0	11	Th:	1 of .	<u>.,                                    </u>
ROJE		urant Ad	ldition a	and Pa	rking R	am	p; S1	t. P	aul,	MN				
EPTH IN EET		93.1			EOLOGY	N			PLE PE	- (	FIELD REC			NY TESTS
EET -	2.25" Crushed limestone base,	light brow	n /	FIL	L			77	-					
2 -								H						
3 -						37	M	X	SS	11				
4 - 5 -	CLAYEY SAND, a little gra (SC) (may be fill), Obstructed 4.9', Obstructed to HSA at 5.5	g to spin sp	, hard oon at	AI W	XED LUVIUM FILL	50/0.4	М	11271	SS	2				
6 · 7 · 8 ·	Fracturing: Very fractured  Stratification: Very thinly be	out 13' to 1.	kly 3.6'	FC	ATTEVILL ORMATION IFFLIN EMBER				NQ	53	100	15	28	
9	Hardness: Hard													
10 11				田										
12				H										
13									NQ	60	100	31	52	. •
14 15	LIMESTONE, light gray Weathering: Slightly weath				LATTEVIL ORMATIO ECATONIO MEMBER	N CA								
	6 - Stratification: Very thinly to SHALE, gray to about 17.2 sandy shale to about 18.2' the sandy shale the sandy shale th	' then light nen light br	gray own and		LENWOO! ORMATIO	N								
	7 - light gray shaley sandstone 8 -								NÇ	5	3 88			
	SANDSTONE, light gray a cemented	nd light bro	own, well		ST. PETER FORMATIO	אמ								
2	END OF BORING													
-	DEPTH: DRILLING METHOD			WATE	R LEVEL M	EASU	JREM						7	e: refer t
-		DATE	TIME	SAMPL DEPT	ED CASIN DEPT	G (	DEPT	I H	DRIL	LING LEVE		YEL	i	ATTACHE ETS FOR A
5!	0-5½' 3.25" HSA ½'-20.4' NQ Core	3/1/07	10:40	4.9'			5.5' 2.7'					one one	EXPI	MOITANA.
B	ORING OMPLETED; 3/1/07	3/1/07	10:43	4.9	<b>V.</b> U		<i></i>						1	IINOLOGY THIS LOG
	OR: SG LG: EW Rig: 91C												J	



AET JOB NO: 05-03034									Ю	1	2 (p.	1 of	1)	
PROJECT: Cossetta's Re	staurant A	ddition	and	Parking	Ran	ıp; S	t. I	Paul,	MN					
	91.4			GEOLOGY		мс	1	MPLE YPE	1		& LA			
FEET MATERIAL	DESCRIPTION		,		1.		וגו	YPE	114,	WC	DEN	LL	PL	% <b>-</b> #200
3.0" Bituminous pavement 4.25" FILL, crushed limest frozen	tone base, ligh	- 1	1 3	FILL .		F/M	} } }	su						
FILL, mixture of clayey s silt with gravel, ashes, day	k brown, brov	vn, and		PLATTEVII FORMATIO	LE N 88	М	X	SS	12					
HIGHLY WEATHERED gray, Textural classificati sand, very stiff (CL-ML)	on: Silty clay v	with			-		F		-					
LIMESTONE, light brow weathered, Hardness: So Obstructed to HSA at 4.0	n, weathering to moderately	y hard,										-		
END OF BORING														
				}										!
									-					
				ļ										
			.									-		
									1		ļ			
									-					
						ļ								
			İ						1			1		
·														
			-		j									
								1						
						l		1				Ì		
			į							1				
							1			-				
														ŀ
								ŀ						
THE PRINCIPLE OF THE PR	<u> </u>		L WA	TER LEVEL	MEAS	UREM	LLENT	 S			<del></del>	NOT	E: RE	FER TO
DEPTH: DRILLING METHO		TD CO		PLED CAS	NG	CAVE	INI	DRII	LING	WA	TER VEL	i		ACHED
0-4' 3.25" HSA	DATE	TIME		PTH DEI	TH	DEPT.	H	LLUID	LEVE	<del></del>	one	SHE	ETS F	OR AN
	3/1/07	9:30	-	5.5' 4.		2.0'					one	EXP	LANA'	LION OI
	3/1/07	9:31	$+\frac{3}{2}$	6.51 0.	-	4.0				+-		TERN	IONIL	OGY O
BORING COMPLETED: 3/1/07			-							-		1	THIS !	LOG
DR: SG LG: EW Rig: 91C			<u></u>			<del> </del>						1		



	0.5.00.004				<u> </u>	i	.OG (	OF BO	ORINO	3 NO.		13	(p.	1 of	1)	
	DB NO: 05-03034  CT: Cossetta's Restai		dition	hac	Parkin						N					
PROJE	CT: Cossetta's Restat		idition a	anu			1	1		ı ı	1 611	ELD 6	& LAB	ORAT	ORY	TESTS
DEPTH IN FEET	SURFACE ELEVATION: MATERIAL DES	92.9 CRIPTION	-		GEOLOG	BY N	М	1C S	AMPI TYPI	E RE	<u> —</u>		DEN	LL		<b>%-#20</b> 0
1 -	2.5" Bituminous pavement FILL, mixture of clayey sand gravel, cinders and ashes, blac frozen	k and brow	Π,		FILL			F L	{ } } }	ا ر	1	9				
3 -	FILL, mostly sandstone sand, white, frozen FILL, mostly sandy silt, a little					1	9 F	/M \	s	S   1	6	40				
5 -	HIGHLY WEATHERED LIN brownish gray, Textural class with sand, a little gravel, firm LIMESTONE, light brown, V	MESTONE, ification: L. (CL) Veathering:	, light ean clay		PLATTE' FORMAT	VILLE FION 50/	0.4	м	S	s	8					
	hard, Obstructed to SS at 5.4' at 5.8' END OF BORING	, dost dotes							-							
									JT0					l vor	TE: D	EFED TO
	DEPTH: DRILLING METHOD				ATER LEV					RILL	NG T	WA	TER	1		EFER TO CACHED
	0-5.8' 3.25" HSA	DATE	TIME	SAN	APLED C	ASING DEPTH	DI	VE-IN	FL	RILLI UID LI	VEL		TER VEL	1		FOR AN
-	0-5.8' 3.25" HSA	3/1/07				5.8'	<del> </del>	5.8'	_				one	1		ATION O
1		3/1/07				0.0	<u> </u>	4.5'				N	one	1		LOGY
BC	ORING OMPLETED: 3/1/07						<u> </u>		$\perp$					-		LOG
	R: DB LG: BZ Rig: 33C											L		<u> </u>		

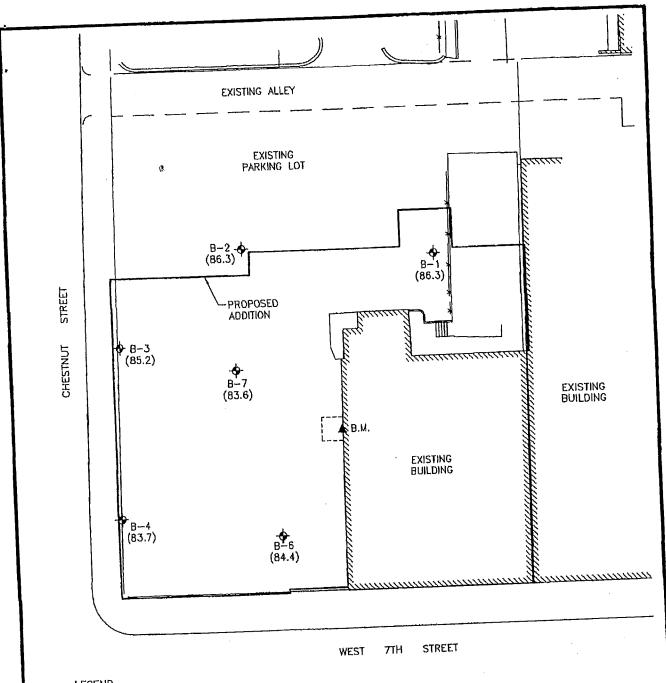


ET JO	в но: 05-03034								NG N		14	4 (p.	1 01	1)	
ROJEC	CT: Cossetta's Resta	urant Ad	dition a	nd Parl	cing Ra	mj	o; St	t. P	aul,	IATIA	EIGI F	& LA	BOB AT	ORY '	TESTS
PTH IN EET	SURFACE ELEVATION: MATERIAL DE:	94.3 SCRIPTION	-	GEOI	OGY 1	۷	мс	SAN YT	APLE OPE	REC IN.		DEN	LL		%-#200
1 -	FILL, 6.0" crushed limestone frozen FILL, mostly clayey sand, a of brick and nails, brown, from FILL, mostly silty sand, a litterial black fozen	e base, light b little gravel, p ozen tle gravel, pie	pieces	FILL		33	F F/M	**************************************	SU SS	16	19				
3 - 4 - 5 -	FILL, mixture of silty sand a little gravel, pieces of brick, brown and brownish gray, fr	ozen to 3'	iders,	I_PLAT	TEVILLE	20	М	N EE	SS	16					
6 -	horownish gray, Textural Cla	Issification: L., stiff (CL)  IMESTONE  Inottled, Texturely sand, very	light ral	FORM	IATION										
1				WATER	EVEL ME	ASI	JREM	ENT	s				NO	TE: F	EFER TO
	DEPTH: DRILLING METHOD		TIME	SAMPLED	<del></del>	1	CAVE	-IN		LLING	EL L	ATER EVEL	_		TACHEL
	0-6.4' 3.25" HSA	3/1/07	10:20	DEPTH	6.4'	+	6'					None	SI		FOR AN
-		3/1/07	10:25		None	+	3'					None	1		ATION ( )LOGY (
	ORING OMPLETED: 3/1/07			I		}							4		LOG



AET JOE	3 NO: 05-03034								NG NC		15	(p.	<u>1 of</u>	1)
ROJEC	The state of the s	ırant Ad	dition a	nd Park	ing Ra	mj	p; St	. P:	aul, I	MN				
EPTH IN EET	SURFACE ELEVATION:	92.4	-	GEOL		- 1			IPLE PE		REC .			ORY TESTS
1 - 2 - 3 - 4 - 4 -	brown, frozen FILL, mixture of clayey sand, clay with sand, and with grave brown, grayish brown and bla HIGHLY WEATHERED LINgray, Textural Classification: sand, a little gravel, very stiff LIMESTONE, light brown, V Moderately weathered, Hardnest Hard Obstructed to SS at 4.65 HSA at 4.8' LIMESTONE, light gray and bedded, rubble zone from about Weathering: Weathered to meathered Fracturing: Intensely fractured Stratification: Very thinly be Hardness: Hard  LIMESTONE, light gray, a Weathering: Moderately fracturing: Moderately fracturing: Moderately fracturing: Moderately fracturing: Hardness: Hard  SHALE, gray to about 16.4 sandy shale to about 17.4' the SANDSTONE, light brown cemented to about 19.2'	silty sand a sl, pieces of ck, frozen MESTONE, Silty clay w (CL-ML) Veathering: less: Moder by the coderately ed to very fredded  few vugs ered stured bedded then light pieces shaley s	nd lean brick, light with ately ed to ly 13' ractured	FORM.  PLATT FORM MIFFI MEM PLATT FORM MEM FORM MEM FORM ST.	TEVILLE ATION	E.	F/M		SU SS SS NQ NQ	60		39		
	DEPTH: DRILLING METHOD			WATER L		_		$\overline{}$	S		T	• (TO) TO	7	re: refer t
-	777	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	1	CAVE- DEPT		DRIL FLUID	LEVE		ATER EVEL	1	E ATTACHEI EETS FOR AI
4.0		3/1/07	10:40	4.65'	4 1/21	_	4 1/2	<u>'</u>			<del>- </del> -	Jone	1	LANATION
4.8	3'-20.2' NQ Core	3/1/07	10:45	4.65'	None	1	3'					9aok	l l	MINOLOGY
BO	ORING OMPLETED: 3/1/07					_							-	THIS LOG
	R: DS LG: BZ Rig: 33C				<u></u>				L		1			

### **LOGS OF 2006 BORINGS**



LEGEND - APPROXIMATE SOIL BORING LOCATION (AND GROUND SURFACE ELEVATION)

= BENCHMARK: FIRST FLOOR SLAB OF EXISTING BUILDING ELEVATION = 85.58 FEET SPCD DATUM

NOTE: BORING 5 WAS NOT DRILLED DUE TO CONFLICT WITH UNDERGROUND UTILITIES



**AMERICAN** ENGINEERING TESTING, INC.

CONSULTANTS

• GEOTECHNICAL

• ENVIRONMENTAL

MATERIALS

Phone: 651-659-9001 Fax: 651-659-1379 550 Cleveland Avenue North St. Paul, Minnesota 55114 Wabsite: www.amengiest.com



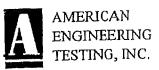
APPROXIMATE SCALE



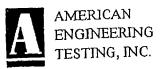
#### FIGURE 1: BORING LOCATIONS

Proposed Addition to Cossetta's Restaurant 211 7th Street West St. Paul, Minnesota

	CHECKED BY: CAU
DATE: 08/23/06	AET JOB NO. 05-02680



AET JOB NO: 05-02680 LOG OF BORING NO. 1 (p. 1 of 1)															
PROJECT: Proposed Addition to Cossetta's Restaurant; St. Paul, MN															
		GEOLOGY	N	мс	SAMPLE TYPE		REC IN.		DEN	BORAT		7ESTS			
DEPTH IN FEET	SURFACE ELEVATION: MATERIAL DES	CRIPTION					ਮ ਸ਼	su		W.L	DEN		12	70-172-00	
	5" Bituminous pavement FILL, mixture of silt, silty san	d and grave	:1,			52	М	M	SS	12					
1 -	pieces of glass, black, brown a	ınd gray		]	FILL .			H							
2 -	WEATHERED DOLOSTON	E, light gray	y, (	17	PLATTEVILI FORMATION	<u>.</u>	М		SS	2	l				
3 -	moist very dense. Textural Cl	assilication	): /	ZZ.	FORMATION	<del> </del>	-	15.11							
	Gravel with sand and silt (GP- REFUSAL TO HSA AT 3'														
			\					1				}			
											1				
					ļ										
l															
		÷													
														1	\ \
											Ì				
<del>                                     </del>	DEPTH: DRILLING METHOD WATER LEVEL MEASUREMENTS NOTE: REFER TO														
		DATE	TIME	SAM	PLED CASE PTH DEP	NG TH	CAVE DEPT	-IN TH	FLUI	LEVE	L Y	ATER EVEL	l l		TACHED FOR AN
	0-3' 3.25" HSA	8/8/06	6:20									None	1		ATTON OF
											+				DLOGY ON
BC CC	RING IMPLETED: 8/8/06					}							1		S LOO
	: SB LG: TM Rig: 1C		[						<u> </u>						



AET JOB NO: 05-02	680		LOG OF BORING NO. 2 (p. 1 of 1)											
PROJECT: Propos	sed Addition to Cosse	tta's Re	estaurant; S	st. P	aul,	MN			& LAI		OBV T	CCTC		
DEPTH SURFACE ELEV			GEOLOGY	N	мс	SAMPLE TYPE	REC IN.		DEN	LL		6#20¢		
2.5" Bituminous FILL, mostly lin brown	pavement restone gravel with sand, gra	ayish		16	М	ss	12							
2			FILL	13	М	SS	12							
FILL, mostly si concrete, brown	lty sand with gravel, pieces (	of	FILL.	2	м	Ss ss	2							
(may be fill)	a little gravel, brown, moist gray, very dense ) HSA AT 7.6'	(SM)	COARSE*  PLATTEVIL FORMATIO  *ALLUVIUM OR FILL	N	М	R X ss	1							
								,						
	WALESTING TO STATE OF THE STATE		WATER LEVEL	MEA:	SURE	MENTS						EFER TO		
DEPTH: DRILLI	NG METHOD DATE		AMPLED CAS		CAV	E-IN DE	D LEV	EL \	VATER LEVEL			TACHED		
0-7.6' 3.25"	HSA	6:40	DEPTH DEP	111		-			None	- 1		FOR AN		
	8/8/06	0;40										ATION C		
POPING										_ TE		S LOG		
BORING COMPLETED: 8/8/ DR: SB LG: TM	06										1111			



AET JOB NO: 05-02680 LOG OF BORING NO. 3 (p. 1 of 1)															
PROJECT: Proposed Addition to Cossetta's Restaurant; St. Paul, MN															
	SURFACE ELEVATION:	GEOLOG	į.	мс	1		REC I-					%-#200			
DEPTH IN FEET	SURFACE ELEVATION: 85.2  MATERIAL DESCRIPTION							,	IFE	144.	wc	DEN	LL.	PL	V6-71201
	FILL, mostly gravelly silty sar limestone, brown	id, pieces o	ſ	F	ILL		М	M	SS	4					
17	· ·						<del> </del>	H							
	REFUSAL TO HSA AT 11/1														
			,												
									•						
														ļ	
										1					
						-			-						
								1							
						.									
						1									
	EPTH: DRILLING METHOD	WA1	ER LEVI	EL MEAS	UREM	IEN			····		1		EFER TO		
DEPTH: DRILLING METHOD		DATE	TIME	SAMP			CAVE			LEVEL	W.	ATER EVEL	1		ACHED
0-1½' 3.25" HSA		8/8/06	8:45	DEF	***							one	1		FOR AN
-		0,0,00		1							ļ		1		ATION OF LOGY OI
BOR	ING APLETED: 8/8/06								ļ		-		- I EK		LOG
DR:											L				



AET JC	ов NO: <u>05-02680</u>			LO	G OF	BO	RING N	ю	4	(p.	1 of	<u>1)</u>				
PROJEC	PROJECT: Proposed Addition to Cossetta's Restaurant; St. Paul, MN															
DEPTH SURFACE ELEVATION: 83.7					GE	OLOGY	N	мс	SAMPLE TYPE		REC IN.			BORAT	ORY 7	ESTS
DEPTH IN FEET	MATERIAL D	ESCRIPTIO	SCRIPTION				[VI	N MC		YPE	IN.	wc	DEN	LL	PL	% <del>-#</del> 200
1 -							20	М	$\bigvee$	SS	8					
3 -	FILL, mostly silty sand wit dolostone, brown	h gravel, pi	eces of		FILL	LL	25	м		SS	4					
5 - 6 -							13	М	Y K	SS	12					
7 -	WEATHERED DOLOSTO	NE, brown	ı, moist,	14	PLA	TTEVILL	E	М	区以	SS	4					
	very dense, Textural Classi silt and sand (GP-GM) REFUSAL TO HSA AT 7	fication: gr	ravel with	/	TOK	MATION										
												4				
										<u> </u>	<u> </u>		<u></u>	<u> </u>	<u></u>	<u> </u>
DEPTH: DRILLING METHOD						EVEL ME	-		-1		710	177.4.00		NOTE:		
0-7.6' 3.25" HSA		DATE	TIME	SAMP DEP	LED	CASING DEPTH	CA	VE-IN	FI	DRILL UID L	EVEL	WAT LEV	配	THE A		
		8/8/06	7:05				<u> </u>		1			No		SHEE EXPLA		
BORIN	16						_		+				- 1			GY ON
СОМР	LETED: 8/8/06 B LG: TM Rig: 1C						<del> </del>		+						มร LO	
DR'S	D LO: IVI KIE! IC	1	i				1		1							