**GEOTECHNICAL STREET TESTING PROGRAM OXFORD ST. / CAMBRIDGE ST. ALLEY,** WAVERLEY ST. /OXFORD ST. ALLEY, WATERLOO ST. / ASH ST. ALLEY, **GROSVENOR AVE. /DORCHESTER AVE. ALLEY,** STRADBROOK AVE. /WARDLAW AVE. ALLEY, KRAMBELE PLACE ALLEY, **WINNIPEG, MANITOBA** 

Prepared for:

**City of Winnipeg Public Works Department** 

**Project No: 151 13889 00** 

**April 6, 2016** 



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# TABLE OF CONTENTS

1.0	SUMMARY	2
2.0	INTRODUCTION	2
2.1	SCOPE OF WORK/ BACKGROUND	2
2.2	PROPOSED STREET RECONSTRUCTION AND UPGRADES	2
3.0	FIELD METHODOLOGY	3
4.0	FIELD TESTING	3
5.0	TEST RESULTS	3
6.0	CLOSURE	5

Appendix A – Oxford St. / Cambridge St. Alley

Appendix B – Waverley St. / Oxford St. Alley

Appendix C -Waterloo St. / Ash St. Alley

Appendix D - Grosvenor Ave. / Dorchester Ave. Alley

Appendix E –Stradbrook Ave. / Wardlaw Ave. Alley

Appendix F –Krambele Place Alley

#### 1.0 SUMMARY

A geotechnical investigation was conducted for the proposed back lane upgrade projects in Winnipeg, Manitoba. The purpose of this investigation was to assess the general subsurface conditions with respect to identifying the existing pavement structure and the underlying soil profile.

Six Alleys (Oxford St. / Cambridge St. Alley from Grosvenor Avenue to Corydon Avenue, Waverley St. / Oxford St. Alley from Grosvenor Avenue to Kingsway Avenue, Waterloo St. / Ash St. Alley from Wellington Crescent to Academy Road, Grosvenor Ave. / Dorchester Ave. Alley from Lilac Street to Wentworth Street, Stradbrook Ave. / Wardlaw Ave. Alley from Scott Street to Donald Street, Krambele Place Alley from Crossgate Road to Whitehall Boulevard) were cored and drilled to at least 2.13m depth in conjunction with City of Winnipeg (COW) geotechnical investigation guideline.

The subsurface conditions under the investigated streets are summarized in Appendix A to F consisting of a Table, Site Plan, Testhole Logs and Photographs.

### 2.0 INTRODUCTION

## 2.1 SCOPE OF WORK/ BACKGROUND

WSP Inc. was retained to undertake a soils investigation for a proposed alley reconstruction and upgrade in Winnipeg, Manitoba. The purpose of this work was to establish the soil and groundwater conditions at the sites, of which the pavement structure is identified and soil stratigraphy is profiled using the City of Winnipeg (COW) geotechnical investigation guideline. Authorization to proceed with the work was provided by City of Winnipeg.

## 2.2 PROPOSED ALLEY RECONSTRUCTION AND UPGRADES

The proposed alleys are from Oxford St. / Cambridge St. Alley (Grosvenor Avenue to Corydon Avenue), Waverley St. / Oxford St. Alley (Grosvenor Avenue to Kingsway Avenue), Waterloo St. / Ash St. Alley (Wellington Crescent to Academy Road), Grosvenor Ave. / Dorchester Ave. Alley (Lilac Street to Wentworth Street), Stradbrook Ave. / Wardlaw Ave. Alley (Scott Street to Donald Street) and Krambele Place Alley (Crossgate Road to Whitehall

Boulevard).

#### 3.0 FIELD METHODOLOGY

The subsoils encountered were visually classified to the full extent in the testhole and representative soil samples were recovered at regular depth intervals (every 300mm down to 2.13m). For confirmation, all of the soil samples are tested for moisture contents and selected soil samples (minimum one per street) between the depth of 0.3m and 0.9m were submitted for Atterberg Limit test and Particle Size Analysis test (PSA). The asphalt and concrete cores were measured for thicknesses and assess its condition (poor or good). In addition, each core was photograph. Any groundwater seepage and sloughing encountered in the testholes were noted.

#### 4.0 FIELD TESTING

The field investigation was undertaken on January 7, 2016 and January 28, 2016. A total of 17 testholes (TH1 to TH15, TH37 and TH38) were cored and drilled down to 2.13m depth using a truck-mounted CME rig equipped with 125mm auger. All testholes were backfilled with auger cuttings/bentonite and capped with cold mix asphalt after completion of drilling. The testhole locations and ground elevations were surveyed using a GPS and are shown on the site plan, attached with the Testhole Logs for everyalleys.

Detailed descriptions of the soil profiles in each testhole are shown on the attached logs

### 5.0 TEST RESULTS

The subsurface conditions under the investigated streets are summarized using a Table, Site Plan, Testhole Logs and Photographs. The test results which include a Table, Site Plan, Testhole Logs and Photographs for alley are arranged using Appendices A to F.

#### 6.0 CLOSURE

The findings and recommendations provided in this report were prepared by WSP Inc. (the Consultant) in accordance with generally accepted professional engineering principles and practices. The recommendations are based on the results of field and laboratory investigations and are reflective only of the actual testhole(s) and/or excavation(s) examined. If conditions encountered during construction appear to be different than those shown by the testhole(s) and/or excavation(s) at this site, the Consultant should be notified immediately in order that the recommendations can be reviewed and modified as necessary to address actual site conditions.

This report is limited in scope to only those items that are specifically referenced in this report. There may be existing conditions that were not recorded in this report. Such conditions were not apparent to the Consultant due to the limitations imposed by the scope of work. The Consultant, therefore, accepts no liability for any costs incurred by the Client for subsequent discovery, manifestation or rectification of such conditions.

This report is intended solely for the Client named as a general indication of the visible or reported physical condition of the items addressed in the report at the time of the geotechnical investigation. The material in this report reflects the Consultant's best judgment in light of the information available to it at the time of preparation.

This report and the information and data contained herein are to be treated as confidential and may be used only by the Client and its officers and employees in relation to the specific project that it was prepared for. Any use a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The report has been written to be read in its entirety, do not use any part of this report as a separate entity.

All files, notes, source data, test results and master files are retained by the Consultant and

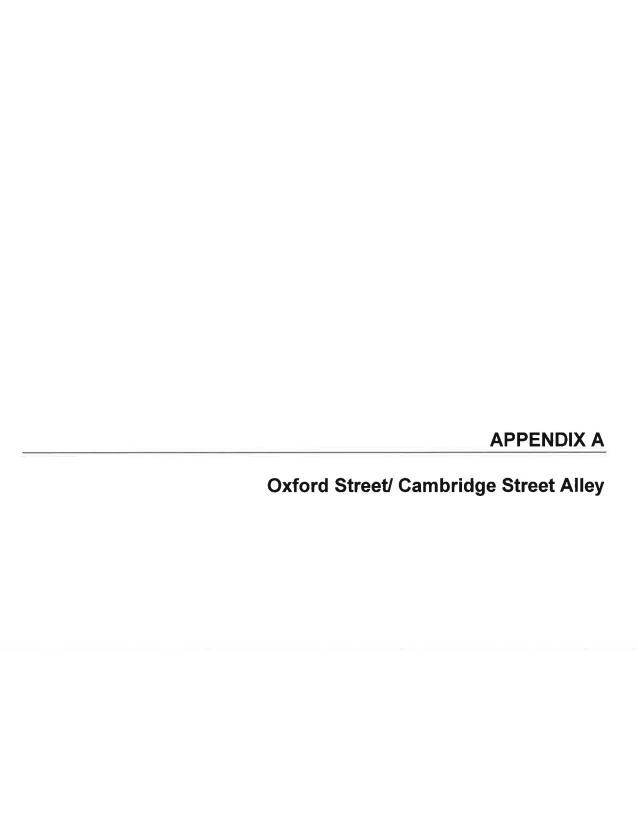
remain the property of the Consultant.

Prepared by: Silvestre S. Urbano Jr., P.Eng.

Reviewed by: Scott Minty, P.Eng.

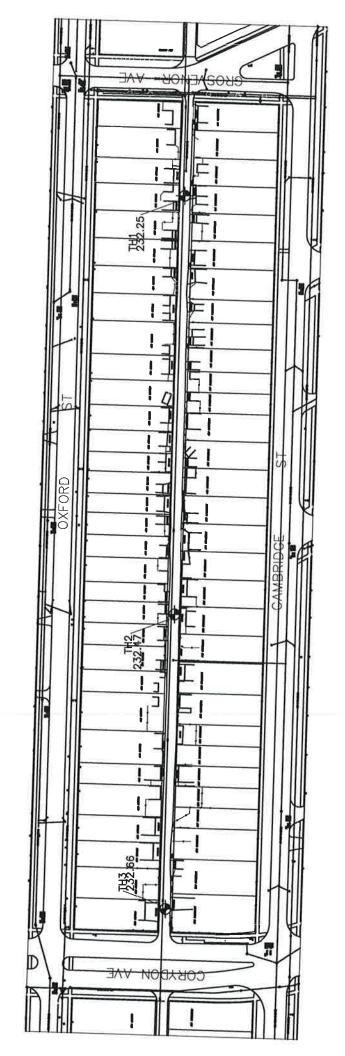






Oxford Street/ Cambridge Street Alley Grosvenor Avenue to Corydon Avenue

Pavement Surface		Pavement Structu Material	Structure	Soil	Sample Depth (m)	Maisture		Particle Size Analysis	Analysis			Atterberg Limits	
Thickness (mm)		Туре	Thickness (mm)			(%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
88 Gr (deteriorated) Fill/	قَ ق	Granular Fill/ Clay Fill	150/ 662,5	20mm down, base course fill/ clay fill	-	1	1	1	1	Ĭ	1	*****	I
162.5 C	O	Clay	2800	Stiff grey- black	9'0	56	II.	Î	ı	ľ	18	28	53
137.5 (disintegrated)		Clay	612.5	Stiff grey- black	1	1	1	i	1	1	I	1	1



	y of Winnipeg	PROJECT NAME				ons
PROJECT N	JMBER _151-13889-00	PROJECT LOCATIO				
DATE STAR	TED1/7/16 COMPLETED1/7/16	GROUND ELEVATION	100 m		HOLI	E <b>SIZE</b> 125 mm
	ONTRACTOR Maple Leaf Drilling					
	ETHOD Continuous Auger	AT TIME OF DRIL				
	Dana Bredin CHECKED BY Silvestre Urbano					
NOTES OX	ford/Cambridge Alley from Grosvenor to Corydon	AFTER DRILLING				
DEPTH (m) GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	A SPT N VALUE A  20 40 60 80  PL MC LL  20 40 60 80  □ FINES CONTENT (%) □
0.5	ASPHALT - 13 mm of intact ASPHALT over 75 mm of STRATIFIED ASPHALT and GRANULAR FILL GRANULAR FILL - 150 mm thick  CLAY FILL - mixed brown and black  Frost to 0.91 m	MC = 37%			37	20 40 60 80
		MC = 26%			26	
1.0	CLAY - brown, stiff, fissured	MC = 27%			33	
1.5		PP = 175 kPa MC = 37% MC = 44%		175	37	
2.0		MC = 47%			47	
3.0	Bottorn of hole at 3.05 m.	PP = 100 kPa MC = 49%		100	49	
GENERAL BH PLOI						

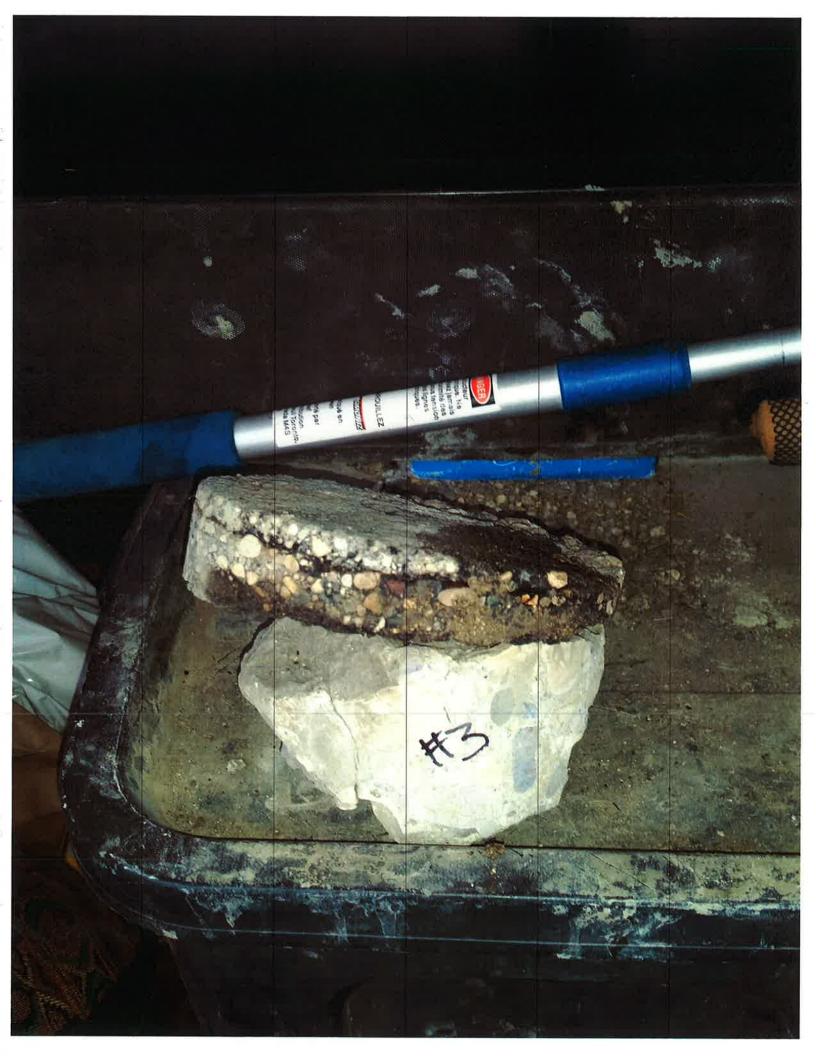


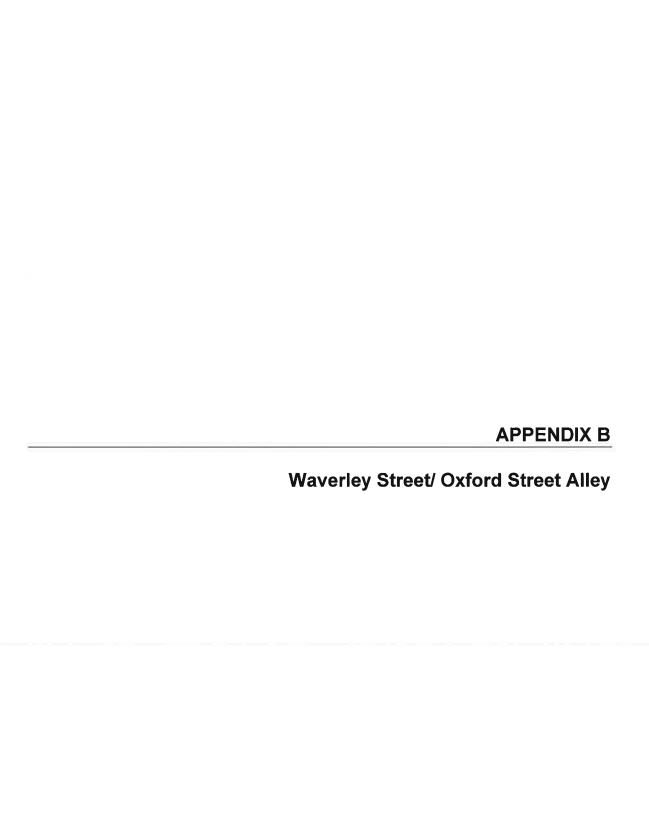
CLIEN	T City	y of Winnipeg	PROJECT NAME				ons
PROJE	ECT NU	IMBER 151-13889-00	PROJECT LOCATIO				
DATE	START	TED 1/7/16 COMPLETED 1/7/16	ROUND ELEVATION	100 m		HOLI	E <b>SIZE</b> 125 mm
DRILL	ING CO	ONTRACTOR Maple Leaf Drilling (	SROUND WATER LEVE	ELS:			
DRILL	ING ME	ETHOD Continuous Auger	AT TIME OF DRIL	LLING			
LOGG	ED BY	Dana Bredin CHECKED BY Silvestre Urbano	AT END OF DRIL	LING			
NOTE	S Oxf	ord/Cambridge Alley from Grosvenor to Corydon	AFTER DRILLING	3			
					Ι.		▲ SPT N VALUE ▲
	0		g	ωÛ	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	20 40 60 80
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	P. (e		PL MC LL
Hi =	[돌의	WATERIAL DESCRIPTION	Ĭ Ā M J	필요>	울송	S F	20 40 60 80
	ا قا		<u> </u>		8	≥8	☐ FINES CONTENT (%) ☐
	4 4 9	CONCRETE - 162.5 mm thick					20 40 60 80
	0 4 0	CONONETE - 102.0 Him whom					
	111	CLAY - grey-black, fissured; brown at 0.91 m; SILTY at 1.83 n	n to				
		2.0 m	MC = 28%			28	
		Frost to 0.61 m					Lander of the form
0.5							
			MC = 26%			26	
L .							and a but being
			MC = 29%			29	
1.0			, MG 2070				
					1		
			MC = 220/			33	
			MC = 33%			33	
÷: ::							
1.5			PP = 150 kPa		450		
1.5			MC = 38%		150	38	
-							HEN GIRLS STEEL ST
0/10							
4			MC = 46%		1	46	warm or to the street
2.0 2.0 4/6/16	11/						
2.0					1		
Š	1//		MC = 46%			46	
0	-///						
5							
25-							
2.5	1//						
ENE	1//						
X -							
ALL							
00 -	1//						
3.0	1//		PP = 100 kPa		100	53	
S	111	Bottom of hole at 3.05 m.	MC = 53%			1	
GENERAL BH PLOTS - WSP COW ALLEY RENEWALS.GPJ GINT STD G		20.00 2					
H							
RAL							
SEN							

MATERIAL DESCRIPTION   Page		ty of Winnipeg	PROJECT NAME 2016 A	-		ons
DRILLING CONTRACTOR   Maple Leaf Drilling   GROUND WATER LEVELS:	PROJECT NU					
DRILLING METHOD   Continuous Auger   CHECKED BY   Silvestre Urbano   AT FIND OF DRILLING				n	HOL	E <b>SIZE</b> 125 mm
ASPHALT - 25 mm thick   GRANULAR FILL - 50 mm thick   CLAY - stiff, tan-brown, moist to wet   CLAY - stiff, brown, fissured			_			
NOTES   Oxford/Cambridge Alley from Grosvenor to Corydon   AFTER DRILLING   AFTER DRILLING   ASPHALT - 25 mm thick   GRANULAR FILL - 50 mm thick   CONCRETE - 62.5 mm thick   CONCRET						
### ASPHALT - 25 mm thick GRANULAR FILL - 50 mm thick CONCRETE - 62.5 mm thick CLAY - grey-black down to 0.61 m, fissured Frost to 0.61 m  MC = 36%  CLAY - stiff, brown, fissured  PP = 150 kPa MC = 41%  MC = 41%  MC = 41%  ASPHALT - 25 mm thick 20 40 60  FILL - 60 CINES CONTENT (2) 40 60  FILL - 60 mm thick 20 40 60  FILL - 60 mm thick 20 40 60  FILL - 60 mm thick 20 40 60  FILL - 60 mm thick 36 60  FILL		A				
### ASPHALT - 25 mm thick GRANULAR FILL - 50 mm thick CONCRETE - 62.5 mm thick CLAY - grey-black down to 0.61 m, fissured Frost to 0.61 m   MC = 36%  CLAY - stiff, brown, fissured  PP = 150 kPa MC = 41%  MC = 60  PI	NOTES Oxf	ford/Cambridge Alley from Grosvenor to Corydon	AFTER DRILLING			
ASPHALT - 25 mm thick GRANULAR FILL - 50 mm thick CONCRETE - 62.5 mm thick CLAY - grey-black down to 0.61 m, fissured Frost to 0.61 m  MC = 42%  SILT - soft, tan-brown, moist to wet  MC = 22%  CLAY - stiff, brown, fissured  MC = 36%  To MC = 42%  MC = 36%  MC = 42%  MC = 42%  MC = 44%  MC = 41%  MC = 41%				_,	<u></u>	▲ SPT N VALUE ▲
ASPHALT - 25 mm thick GRANULAR FILL - 50 mm thick CONCRETE - 62.5 mm thick CLAY - grey-black down to 0.61 m, fissured Frost to 0.61 m  MC = 42%  SILT - soft, tan-brown, moist to wet  MC = 22%  CLAY - stiff, brown, fissured  PP = 150 kPa MC = 40%  MC = 41%  MC = 41%	EPTH (m)	MATERIAL DESCRIPTION	ESTS AND MARKS	VALUE) KET PEN (kPa)	ISTURE TENT (%	PL MC LL
CRANULAR FILL - 50 mm thick   CONCRETE - 62.5 mm thick   CLAY - grey-black down to 0.61 m, fissured   MC = 36%	Q R			S 00	₹S	☐ FINES CONTENT (%) ☐
CONCRETE - 62.5 mm thick CLAY - grey-black down to 0.61 m, fissured Frost to 0.61 m  MC = 42%  MC = 42%  SILT - soft, tan-brown, moist to wet  MC = 36%  MC = 36%  A2  CLAY - stiff, brown, fissured  MC = 36%  MC = 36%  A2  MC = 36%  MC = 42%  MC = 36%  A2  A2  MC = 36%  MC = 42%  MC = 36%  A36  CLAY - stiff, brown, fissured  MC = 36%  A6  MC = 36%  A7  A8  A8  A8  A8  A8  A8  A8  A8  A8	2500					
CLAY - grey-black down to 0.61 m, fissured Frost to 0.61 m  MC = 36%  MC = 22%  SILT - soft, tan-brown, moist to wet  MC = 22%  CLAY - stiff, brown, fissured  MC = 36%  The stiff is the s	111		<del>/</del> /-			
Frost to 0.61 m  MC = 42%  SILT - soft, tan-brown, moist to wet  MC = 22%  CLAY - stiff, brown, fissured  PP = 150 kPa MC = 40%  MC = 41%  MC = 41%			MC = 36%		36	1 1
SILT - soft, tan-brown, moist to wet  MC = 42%  MC = 22%  MC = 36%  CLAY - stiff, brown, fissured  PP = 150 kPa MC = 40%  MC = 41%  MC = 41%		Frost to 0.61 m	1110 0070			
SILT - soft, tan-brown, moist to wet  MC = 22%  MC = 36%  CLAY - stiff, brown, fissured  PP = 150 kPa MC = 40%  MC = 41%  MC = 41%	0.5					
SILT - soft, tan-brown, moist to wet  MC = 22%  MC = 36%  CLAY - stiff, brown, fissured  PP = 150 kPa MC = 40%  MC = 41%  MC = 50%  MC = 50%			MC = 42%		42	
MC = 22%  MC = 36%  MC = 36%  MC = 41%  MC = 41%  MC = 50%			1110 4270			
1.5 CLAY - stiff, brown, fissured    MC = 22%	4/4	SILT - soft tan-brown moist to wet				
1.5  CLAY - stiff, brown, fissured  MC = 36%  PP = 150 kPa MC = 40%  MC = 41%  MC = 50%  MC = 50%		SIZ. COM, and Sichni, Moor to Mor	MC = 22%	- 1	22	
1.5 CLAY - stiff, brown, fissured  PP = 150 kPa MC = 40%  MC = 41%  MC = 50%  50	1.0		100 2270			
1.5 CLAY - stiff, brown, fissured  PP = 150 kPa MC = 40%  MC = 41%  MC = 50%  MC = 50%						
1.5 CLAY - stiff, brown, fissured  PP = 150 kPa MC = 40%  MC = 41%  MC = 50%  MC = 50%			MC = 36%		36	
MC = 40%  MC = 41%  MC = 50%  50	11/2	CLAY - stiff, brown, fissured	1010 - 30 /6		30	
MC = 40%  MC = 41%  MC = 50%  50						
MC = 40%  MC = 41%  MC = 50%  50	1.5			150	40	
2.0 MC = 50%  50			MC = 40%	130	40	
2.0 MC = 50%  50					l	
2.0 MC = 50%  50			NAC - 419/		44	
2.5			IVIC - 4176		"'	
2.5	2.0					
2.5			NO - 500/		E0.	
			IVIC - 50%		30	
	2.5					
3.0 PP = 100 kPa 100 50	3.0		PP = 100 kPa	1.00		
MC = 50% 100 30	1//	D-W	MC = 50%	100	50	
Bottom of hole at 3.05 m.		Bottom of hole at 3.05 m.				



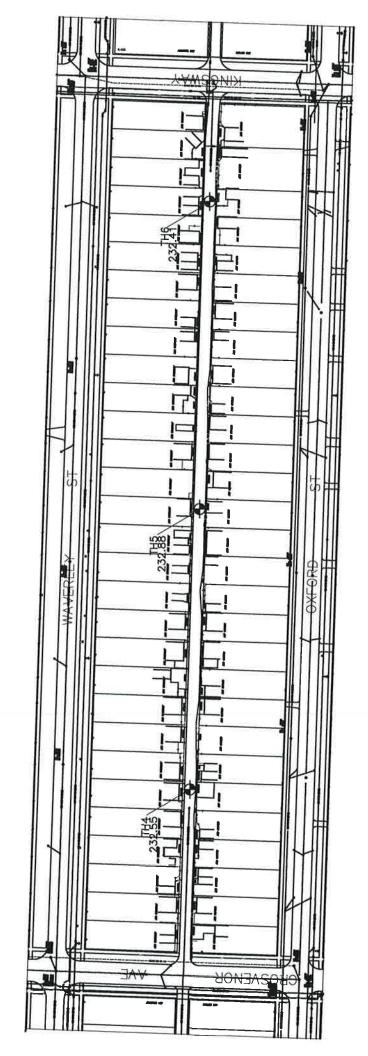






Waverley Street/Oxford Street Alley Grosvenor Avenue to Kingsway Avenue

Testhole Location Pavement Surface Trickn	Pavement Surface Type Thicl	Thic	Ê	Pavement Stn. Tvpe	John Material	Soil	Sample Depth (m)	Moisture	loverS	Particle Siz	Particle Size Analysis	ш	1,000		
	ess (mm)		(mm)	(mm)				(%)	(%)	(%)	(w) 1110	§ %		Plastic Limit	Plasticity
See site plan Concrete 150 Granular 50/2800 Fill/ Clay	Granular Fill/ Clay	Granular Fill/ Clay		50/2800		20mm down granular fill/ Stiff grey- black	I	l)	ľ	Ī	I	Ĭ	1	Ĭ	1
See site plan Asphalt/Concrete (deteriorated) 25/100 Fill/ Clay Fill 150/600	Granular Fill/ Clay Fill	Granular Fill/ Clay Fill		150/600		20mm down granular fill/ clay fill	9.0	32	1	11.	412	ı	75	28	47
See site plan Concrete(Intact) 200 Clay 700/150	Clay Fill/Clay	Clay Fill/Clay		700/150		Mixed clay fill/ Stiff brown clay	1	ĵ	1	Î	ı	1	j	1	t



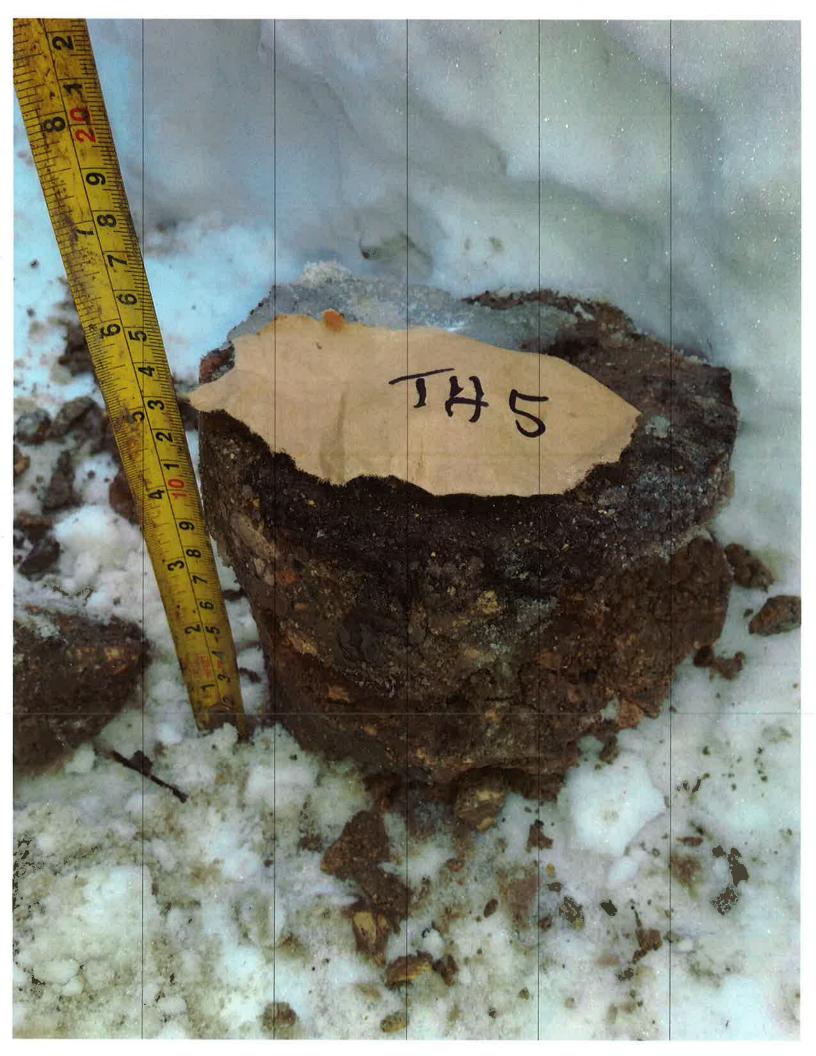
CLIENT	City	of Winnipeg			PROJECT NAME	2016 Alley	Recon	structio	ons
		MBER 151-13889-00			PROJECT LOCATION	ON Winnip	oeg, MI	В	
DATE ST	TART	ED 1/7/16	COMPLETED	1/7/16	GROUND ELEVATION	100 m		HOLI	E <b>SIZE</b> _ 125 mm
ı		NTRACTOR Maple Le				ELS:			
DRILLIN	IG ME	THOD Continuous Au	iger		AT TIME OF DRI	LLING			
LOGGE	D BY	Dana Bredin	CHECKED BY	Silvestre Urbano	AT END OF DRII	LLING			
NOTES	Wav	verley/Oxford Alley from	Kingsway to Grosve	nor	AFTER DRILLIN	G			
	T						<u> </u>		▲ SPT N VALUE ▲
DEPTH (m)	007 007	М	IATERIAL DESCRIP	PTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	20 40 60 80  PL MC LL 20 40 60 80  □ FINES CONTENT (%) □ 20 40 60 80
3	1 0 1 0 1 0	CONCRETE - 150 n	nm thick						
-	1, 0	CDANIH AD EILL	EO mm thick trace of	of clay					
	7/4	GRANULAR FILL - S CLAY - grey-black, f			A40 - 400'			40	
		Frost to 0.76 m			MC = 48%			48	
0.5									
					MC = 41%			41	
	1/							''	
	4				MC = 35%			35	
1.0									
					MC = 36%			36	
	1/								
1.5	11				PP = 175 kPa MC = 44%		175	44	•
					1910 - 44 70				$-i\omega + i\frac{1}{2}\psi + i\omega $
/					MC = 46%			46	• • • • • • • • • • • • • • • • • • • •
2.0	11						-		
-X 5-	1/				MC = 50%			50	
20 IA									
	1/								
2.5	10								
3.0					PP = 100 kPa				
0.0	11		D		MC = 55%		100	55	
2.5			Bottom of hole at 3	ว.บฮ (11.					

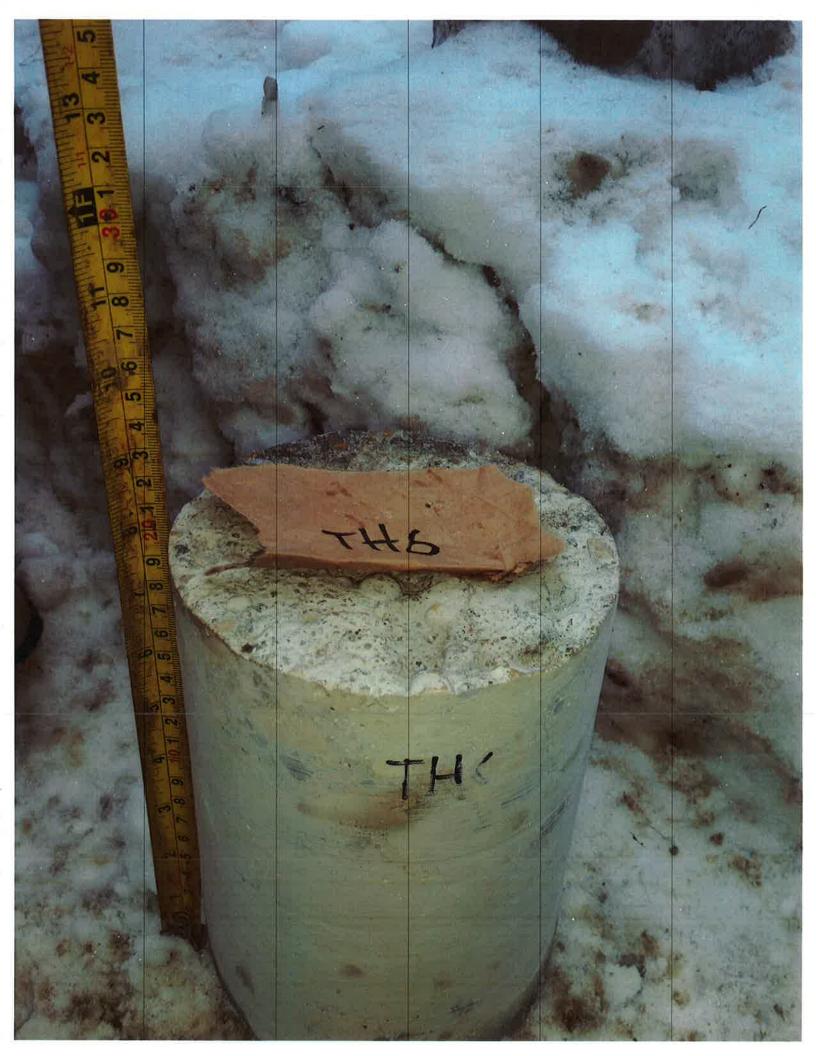
PAGE 1 OF 1

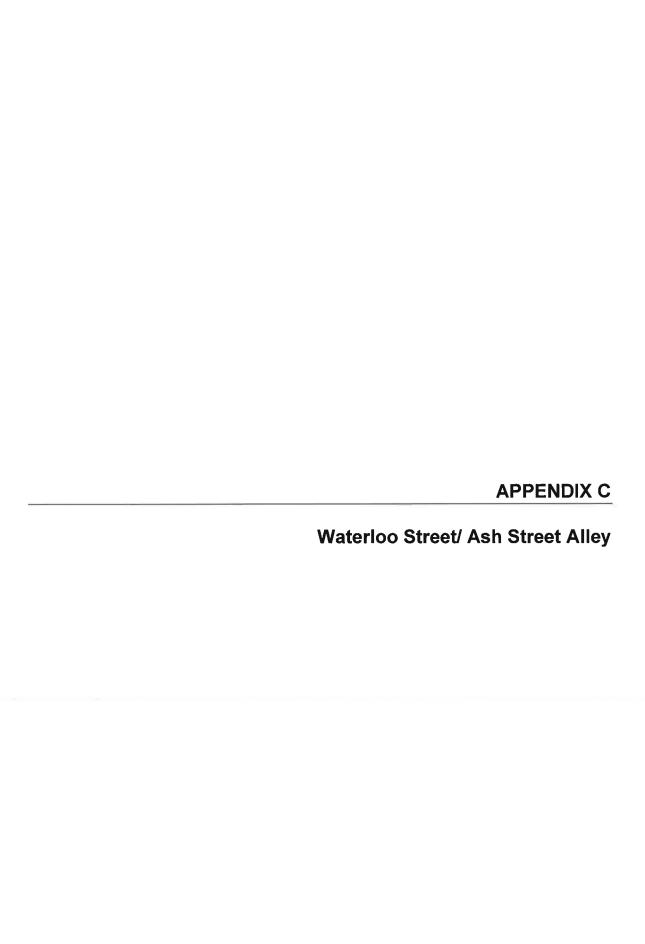
CLIEN	T Cit	y of Winnipeg	PROJECT NAME	2016 Alley	Recon	structio	ons
PROJE	ECT N	JMBER 151-13889-00	PROJECT LOCATION	ON Winnig	oeg, Mi	3	
DATE	STAR	TED <u>1/7/16</u> COMPLETED <u>1/7/16</u>	GROUND ELEVATION	100 m		HOLI	E SIZE 125 mm
DRILL	ING C	ONTRACTOR Maple Leaf Drilling	GROUND WATER LEVI	ELS:			
DRILL	ING M	ETHOD Continuous Auger	AT TIME OF DR	LLING			
LOGG	ED BY	Dana Bredin CHECKED BY Silvestre Urbano	AT END OF DRIL	LING			
		averley/Oxford Alley from Kingsway to Grosvenor	AFTER DRILLING	G			
_							▲ SPT N VALUE ▲
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	20 40 60 80  PL MC LL 20 40 60 80  □ FINES CONTENT (%) □ 20 40 60 80
	PATRICES	ASPHALT - 25 mm thick					
1		CONCRETE - 100 mm thick, disintegrated					
-	500	GRANULAR FILL - 150 mm thick, trace of clay					
-	$\otimes \otimes$	CLAY FILL - 600 mm thick, mixed clay, brown to black	MC = 36%			36	
	$\infty$	Frost to 0.91 m					
0.5	$\otimes\!\!\!\otimes\!\!\!\!\otimes$						
	$\otimes\!\!\!\otimes\!\!\!\!\otimes$		MC = 32%			32	
	$\otimes \otimes$						
	$\otimes \otimes$				1		
L .	$\otimes\!\!\otimes\!$		MC = 29%			29	
1.0	11/	CLAY - brown, stiff, fissured					
	111	CILT to begin out moint to wat					
		SILT - tan-brown, soft, moist to wet	MC = 23%			23	
			IVIC - 23 /6			23	
1.5	1111						
1.0	777	CLAY - brown, stiff, fissured	MC = 34%			34	
			PP = 200 kPa		200		
3		SILT - tan-brown, soft, moist to wet			1		
-			MC = 23%			23	
2.0							neukiemikaanimeninen
2.0	111						
	-		MC = 34%			34	
5 -	-						
5 -	111	CLAY - brown, stiff, fissured					
5		CEAT - BOWII, Suit, IISSUICU	PP = 250 kPa		250		
2.5							
	11						
č	1//						
777	111						
5							ananjaran kanakamilan
3.0	///		PP = 150 kPa		150	52	
	111	Bottom of hole at 3.05 m.	MC = 52%		150	JZ	
3		III CU.C 18 SHOT TO ITRUIUG					
E C							
35							
GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD GENERAL BH PLOIS - WSP COW ALLEY RENEWALS, GD G GO G							
5							

		y of Winnipeg	PROJECT NAME				ons
PROJE	ECT N	JMBER 151-13889-00	PROJECT LOCATION	ON Winnig	peg, Mi	В	
DATE	STAR	TED _1/7/16 COMPLETED _1/7/16	GROUND ELEVATION	_100 m		HOLI	E <b>SIZE</b> 125 mm
DRILL	ING C	ONTRACTOR Maple Leaf Drilling	GROUND WATER LEV	ELS:			
DRILL	ING M	ETHOD Continuous Auger	AT TIME OF DRI	LLING			
LOGG	ED BY	Dana Bredin CHECKED BY Silvestre Urbano	AT END OF DRIL	LING			
NOTES	s Wa	verley/Oxford Alley from Kingsway to Grosvenor	AFTER DRILLING	G			
				2			
				_	z	<b>™</b> ⊗	▲ SPT N VALUE ▲
lE_	GRAPHIC LOG		TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	20 40 60 80 PL MC LL
DEPTH (m)	ľgŠ∣	MATERIAL DESCRIPTION	MA AN	258	쥬졼	[발합]	20 40 60 80
10	છે		" "	_oz	8	₽ĕ	☐ FINES CONTENT (%) ☐
					<u> </u>	٥	20 40 60 80
		CONCRETE - 200 mm thick, intact					
	4 4 0						
		CLAY FILL - 700 mm thick, brown and black mixed					I I I I I I I I I I I I I I I I I I I
	$\otimes \otimes$	Frost to 0.91 m	MC = 38%			38	•
	$\otimes\!\!\otimes\!\!$						
0.5	$\otimes \otimes$						
-V =	$\otimes \otimes$		MC = 39%			39	
	$\bowtie$						
	$\otimes \otimes$						
	$\otimes \otimes$		MC = 32%			32	
1.0		CLAY - stiff, brown, fissured					
	44	SILT - tan-brown, soft, moist to wet					The second second
		SILT - tait-brown, sort, moist to wet	MC = 25%			25	
	11/	CLAY - stiff, brown, fissured	IVIC - 25 /6			20	
1.5			PP = 300 kPa				
1.0			MC = 40%		300	40	
4/6/16							
4		OUT	MC = 35%			35	
CANADA.GDT		SILT - tan-brown, soft, moist to wet					
2.0					-		
			MC = 41%			41	
TST -							
N -		OLAY I					
GPJ		CLAY - brown, stiff, fissured	PP = 175 kPa		175		
2.5					'''		
Ä.							1 1 1
RE							
G T							
W.							
ŭ	11		BD 40015				
3.0	1//		PP = 100 kPa MC = 53%		100	53	
STS.		Bottom of hole at 3.05 m.					
GENERAL BH PLOTS - WSP COW ALLEY RENEWALS,GPJ GINT STE							
A B							
NER							
GE							



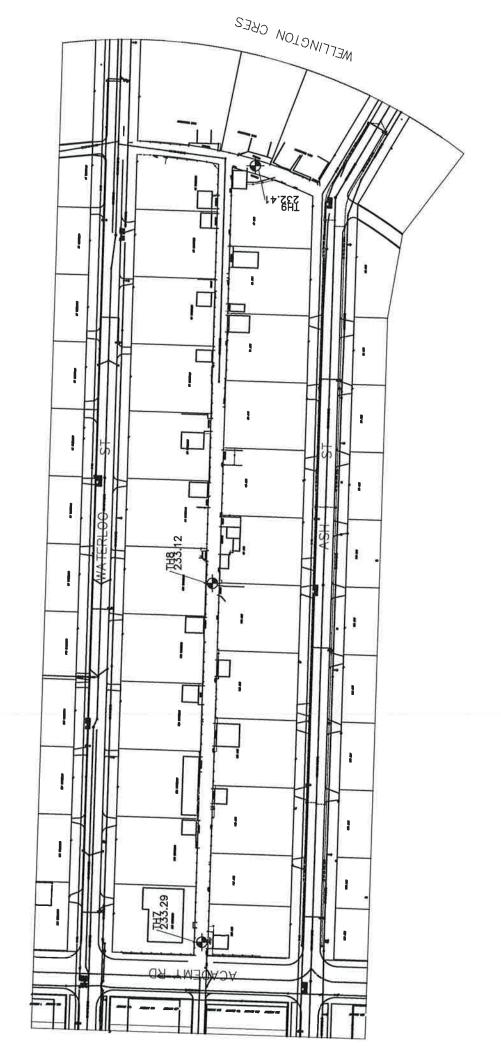






Waterloo Street Ash Street Alley Wellington Crescent to Academy Road

~				1
	Plasticity Index	ij.	41	1
Atterberg Limits	Plastic Limit	Ē	81	1
	Liquid Limit		32	î
	Clay (%)	100	52	1
e Analysis	Silt (%)	ľ	40	1
Particle Size Analysis	Sand (%)	I	35	1
	Gravel (%)	<b>L</b> i	į	1
Moisture Content	(%)	ľ	26	Ĭ
Sample Depth (m)		0	9.0	Î
Soil Description		50mm down, limestone fill/ Clay fill, mixed	50mm down Limestone/ Silt	Clay Fill
ment Structure Material	Thickness (mm)	425/300	225/770	300
Pavement Structure Material	Туре	Granular Fill/Clay Fill	Granular fill/ Silt	Clay Fill
ırface	Thickness (mm)	25	225	50/400
Pavement Surface	Туре	Asphalt(Intact)	Concrete(Intact)	Asphalt(Intact)/ Concrete (Broken)
Testhole Location		See site plan	See site plan	See site plan
Testhole ID		TH7	ТН8	6번

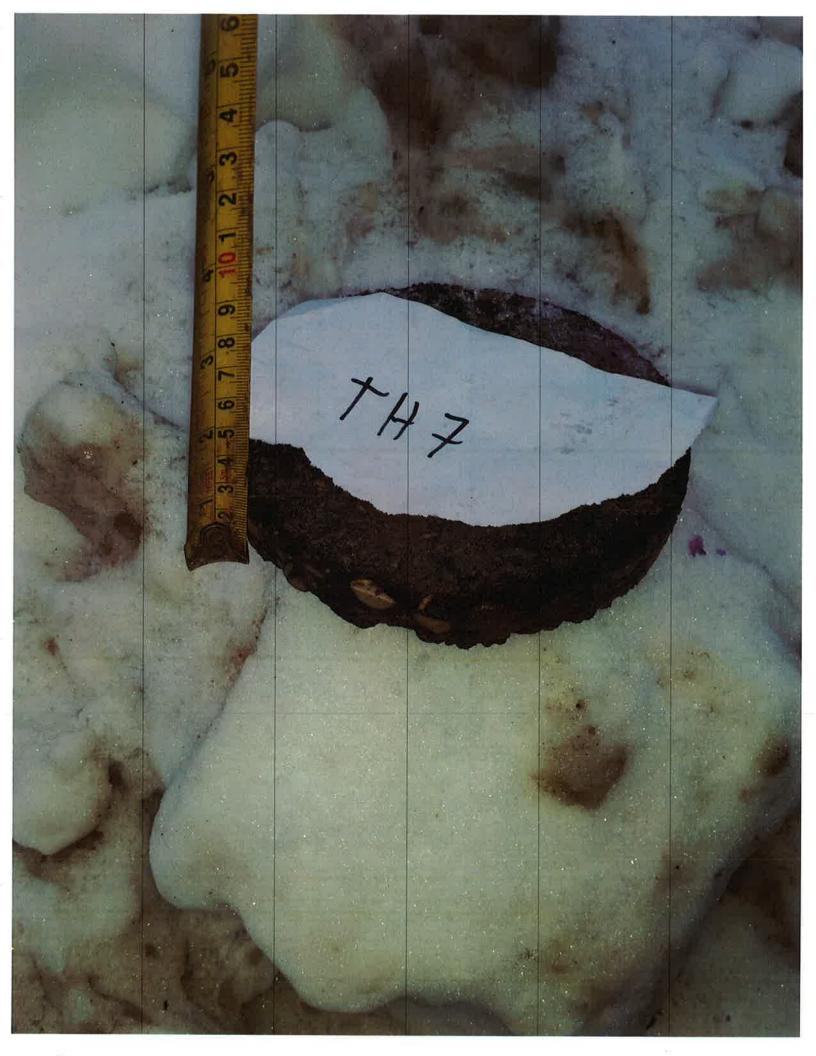


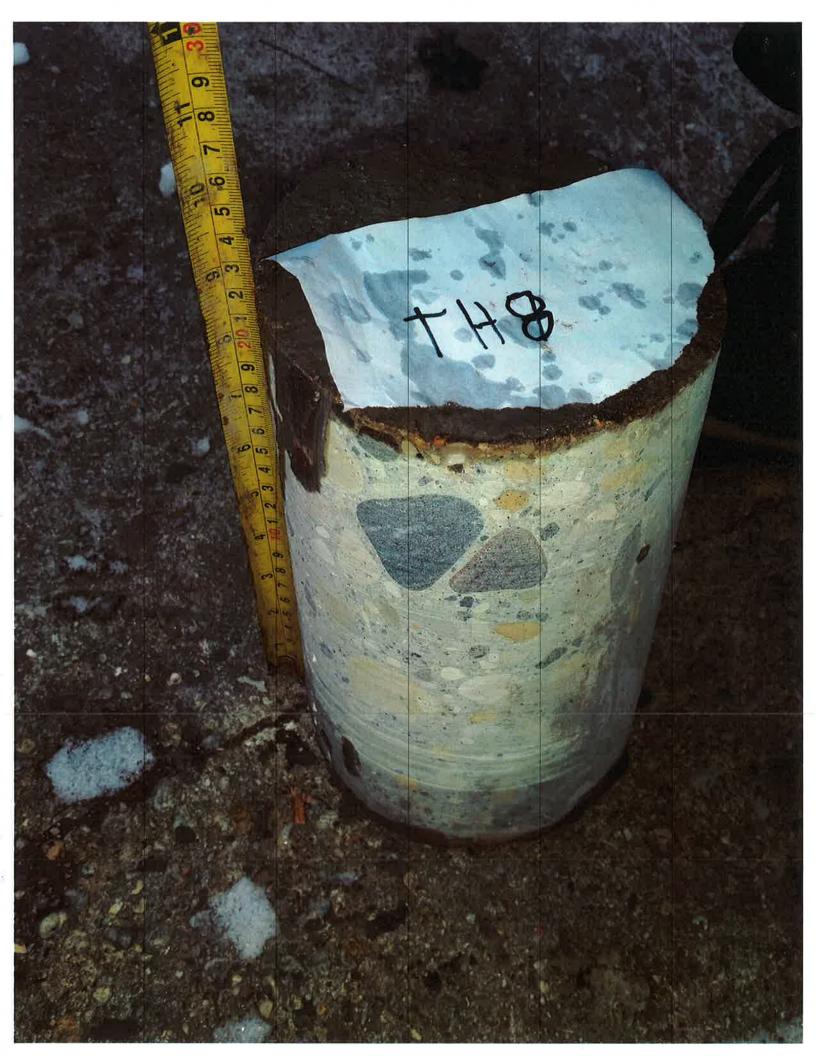
GRANULAR FILL - 425 mm thick, limestone Frost to 0.46 m  CLAY FILL - 300 mm thick, mixed, brown and black  SILT - tan-brown, soft, moist to wet	MC = 9%  MC = 22%  MC = 24%		9	
SILT - tan-brown, soft, moist to wet			22	
- = 1	MC = 24%		ll il	
			24	
CLAY - stiff, brown, fissured	MC = 32%		32	
1.5	PP = 100 kPa MC = 35%	100	35	•
2.0	MC = 34%		34	
2.5 3.0 Bottom of hole at 3.05 m.	MC = 40%		40	
3.0 Bottom of hole at 3.05 m.	PP = 100 kPa MC = 41%	100	41	

		y of Winnipeg  JMBER _151-13889-00	PROJECT NAME _ PROJECT LOCATE				ons
DRILL DRILL LOGG	ING CO ING MI ED BY	TED _1/12/16	GROUND WATER LEVE AT TIME OF DRIE	ELS: LLING .LING			
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	20 40 60 80  PL MC LL 20 40 60 80  PINES CONTENT (%)  20 40 60 80
0.5		GRANULAR FILL - 225 mm thick, limestone Frost to 0.46 m SILT - tan-brown, soft, moist to wet	MC = 25%			25	
	•		MC = 26% MC = 22%			26	
1.0		CLAY - firm, fissured, SILTY; clayey below 2.29 m, stiff	MC = 22%			22	
1.5			PP = 50 kPa MC = 25%		50	25	
2.0			MC = 22%			22	
2.5							
3.0		Bottom of hole at 3.05 m.	PP = 250 kPa MC = 38%		250	38	
2.5							

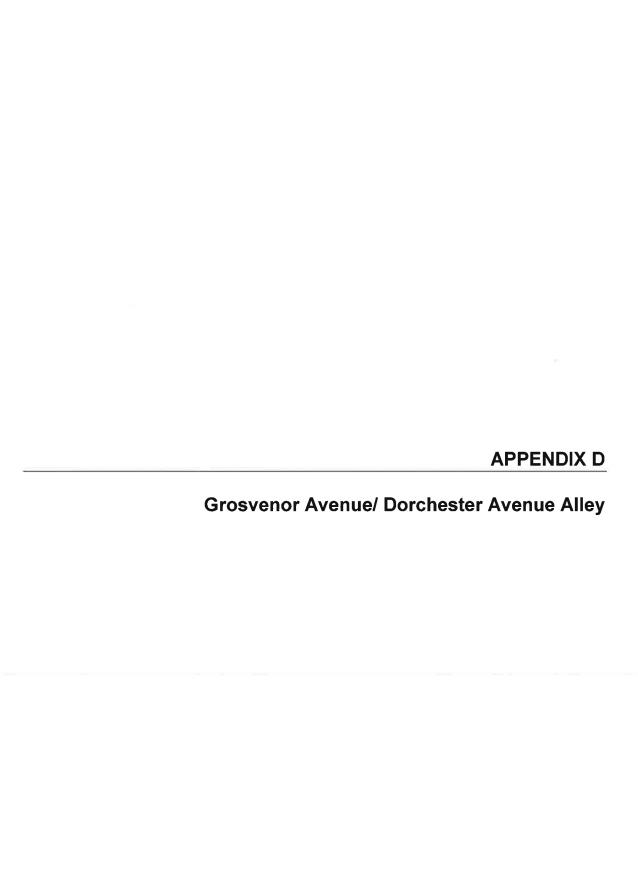
PAGE 1 OF 1

CLIENT City of Winnipeg	PROJECT NAME 2016 Alley Reconstructions PROJECT LOCATION Winnipeg, MB						
PROJECT NUMBER151-13889-00							
DATE STARTED _1/12/16 COMPLETED _1/12/16	GROUND ELEVATION 100 m HOLE SIZE 125 mm						
DRILLING CONTRACTOR Maple Leaf Drilling	GROUND WATER LEV	ELS:					
DRILLING METHOD Continuous Auger	AT TIME OF DRI	ILLING					
LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano	AT END OF DRILLING						
NOTES Waterloo/Ash Alley from Wellington Cres to Academy	AFTER DRILLING						
(m) (m) GRAPHIC COGNITION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	A SPT N VALUE A  20 40 60 80  PL MC LL  20 40 60 80		
			P.	-8	☐ FINES CONTENT (%) ☐  20 40 60 80		
ASPHALT - 50 mm thick					1 1		
CONCRETE - 400 mm thick, disintegrated	MC = 28%			28	•		
0.5 CLAY FILL - 300 mm thick, mixed, brown and black							
Frost to 0.46 m	MC = 32%			32			
CLAY - stiff, brown, fissured							
1.0	MC = 37%			37			
	MC = 41%			41			
1.5	PP = 175 kPa MC = 42%		175	42	-		
	MC = 41%			41			
	MC = 42%			42			
2.5							
3.0	PP = 100 kPa		100	50			
	MC = 50%		100				



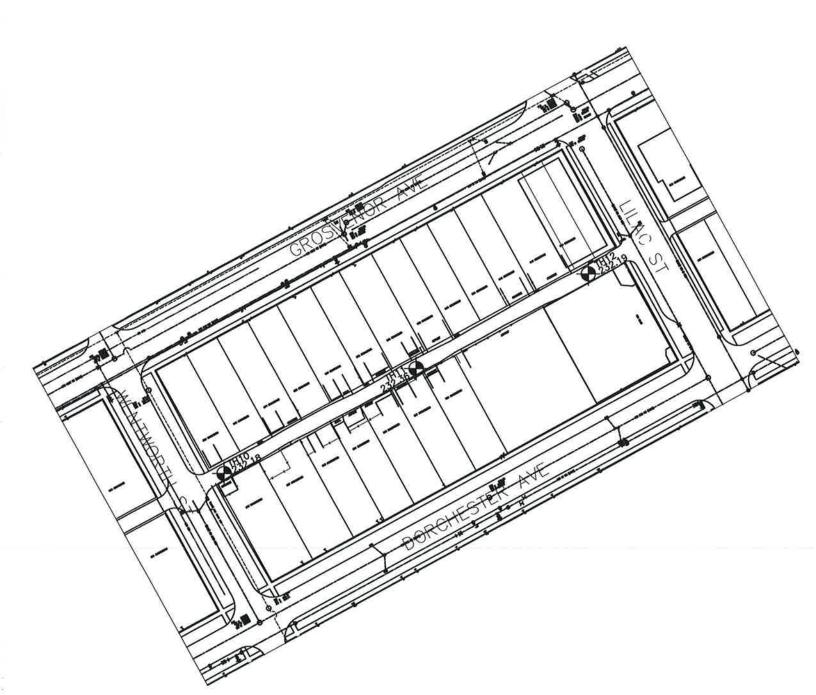






Grosvenor Avenue/ Dorchester Avenue Alley Lilac Street to Wentworth Street

v==				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Atterbert Limits	Plasticity Index	Ì	1	E.	
	Plastic Limit	J	1	ľ	
	Liquid Limit	ì	ı	1)	
Particle Size Analysis	Clay (%)	25	ı	I	
	Silt (%)	28	I	ı	
	Sand (%)	15	I	ľ	
	Gravel (%)	-		ľ	
Moisture Content (%)		30	I	ı	
Sample Depth (m)		0.3	Î	Ü	
Soil Description		20mm down Granular Fill/Clay Fill	Clay Fill, mixed	Clay Fill, mixed	
Pavement Structure Material	Thickness (mm)	150/900	1500	425	
	Туре	Granular Fill/ Clay Fill	Clay Fill	Clay Fill	
Pavement Surface	Thickness (mm)	37,5/112.5	137.5	175	
	Туре	Asphalt(Broken) / Concrete(Intact)	Concrete(Intact)	Concrete(intact)	
Testhole Location		See site plan	See site plan	See site plan	
Testhole ID		TH10	TH11	TH12	



		ty of Winnipeg UMBER 151-13889-00	PROJECT NAME PROJECT LOCATE				ons
		COMPLETED 1/12/16 COMPLETED 1/12/16 CONTRACTOR Maple Leaf Drilling	GROUND ELEVATION	100 m			<b>E SIZE</b> _ 125 mm
DRILL LOGG	ING MI ED BY	IETHOD Continuous Auger  Y Dana Bredin CHECKED BY Silvestre Urbano cosvenor/Dorchestor Alley from Wentworth to Lilac	AT TIME OF DRI AT END OF DRII AFTER DRILLIN	ILLING			
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	A SPT N VALUE A  20 40 60 80  PL MC LL  1 0 40 60 80  □ FINES CONTENT (%) □
	10 % A	ASPHALT - 37.5 mm thick CONCRETE - 112.5 mm thick GRANULAR FILL - 150 mm thick  CLAY FILL - 900 mm thick, mixed, brown and black Frost to 0.61 m	MC = 41%		u.	41	20 40 60 80
			MC = 30%			30	
1.0			MC = 27%			27	
		CLAY - stiff, brown, fissured	MC = 29%			29	
1.5			PP = 125 kPa MC = 31%		125	31	
2.0			MC = 42%			42	
2.0			MC = 41%			41	
2.5			PP = 125 kPa				
0.0		Bottom of hole at 3.05 m.	MC = 46%		125	46	

## WSP Canada Inc. 1600 Buffalo Place Winnipeg, MB R3T 6B8 Telephone: (204)-477-6650

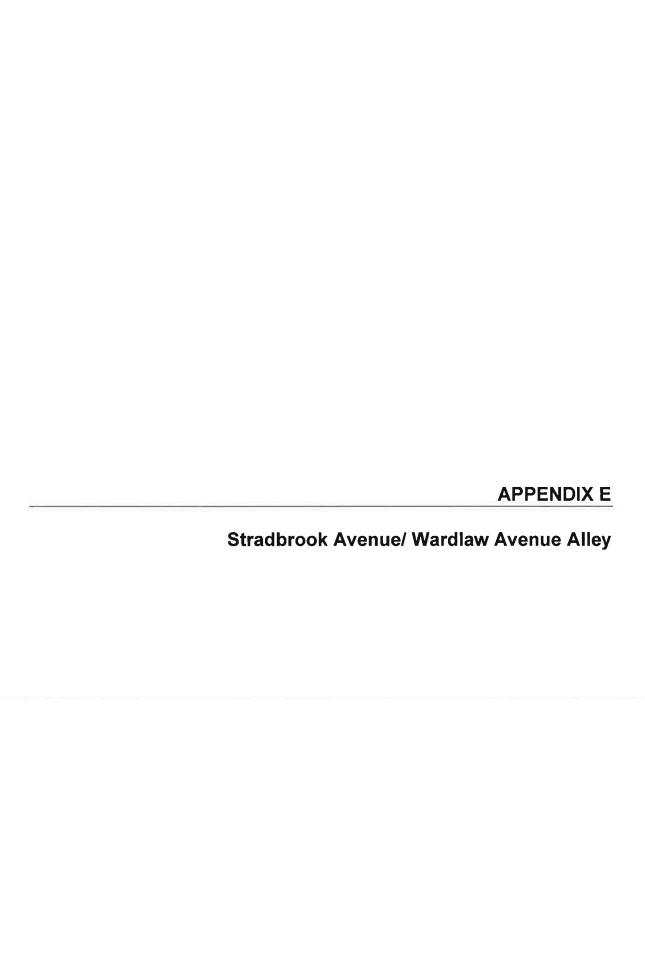
Telephone: (204)-477-6650 PROJECT NAME 2016 Alley Reconstructions CLIENT City of Winnipeg PROJECT LOCATION Winnipeg, MB PROJECT NUMBER 151-13889-00 GROUND ELEVATION 100 m HOLE SIZE 125 mm DATE STARTED 1/12/16 COMPLETED 1/12/16 **GROUND WATER LEVELS:** DRILLING CONTRACTOR Maple Leaf Drilling AT TIME OF DRILLING \_--DRILLING METHOD Continuous Auger AT END OF DRILLING \_\_\_\_ CHECKED BY Silvestre Urbano LOGGED BY Dana Bredin AFTER DRILLING \_\_\_\_ NOTES Grosvenor/Dorchestor Alley from Wentworth to Lilac ▲ SPT N VALUE ▲ MOISTURE CONTENT (%) POCKET PEN. (kPa) DEPTH (m) GRAPHIC LOG 40 80 MATERIAL DESCRIPTION 80 40 60 ☐ FINES CONTENT (%) ☐ CONCRETE - 137.5 mm thick CLAY FILL - mixed, brown and black Frost to 0.61 m MC = 30% 0.5 36 MC = 36%MC = 30%30 1.0 MC = 31%31 PP = 100 kPa MC = 31% 1.5 100 31 CLAY - stiff, brown, fissured, trace of silt GENERAL BH PLOTS - WSP COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/6/16 MC = 25%25 2.0 MC = 24%24 2.5 PP = 200 kPa 3.0 36 200 MC = 36%Bottom of hole at 3.05 m.

DATE START DRILLING CO DRILLING ME LOGGED BY	MBER 151-13889-00  TED 1/12/16 COMPLETED 1/12/16  ONTRACTOR Maple Leaf Drilling  ETHOD Continuous Auger  Dana Bredin CHECKED BY Silvestre Urbano svenor/Dorchestor Alley from Wentworth to Lilac  MATERIAL DESCRIPTION	GROUND WATER LEVELS AT TIME OF DRILLI AT END OF DRILLII AFTER DRILLING	Winnipeg, M 00 m S: ING NG	HOL	E <b>SIZE</b> _125 mm
		Re	POO'N POO'N	CON	□ FINES CONTENT (%) □ 20 40 60 80
1.0	CLAY FILL - 425 mm thick, mixed, brown and black Frost to 0.61 m  CLAY - stiff, brown, fissured, SILTY; clayey below 1.05 m	MC = 32%  MC = 22%  MC = 23%  MC = 27%  PP = 175 kPa MC = 29%  MC = 42%	175	22 23 27 29	
2.5	Bottom of hole at 3.05 m.	MC = 42%  PP = 125 kPa MC = 49%	125	42	



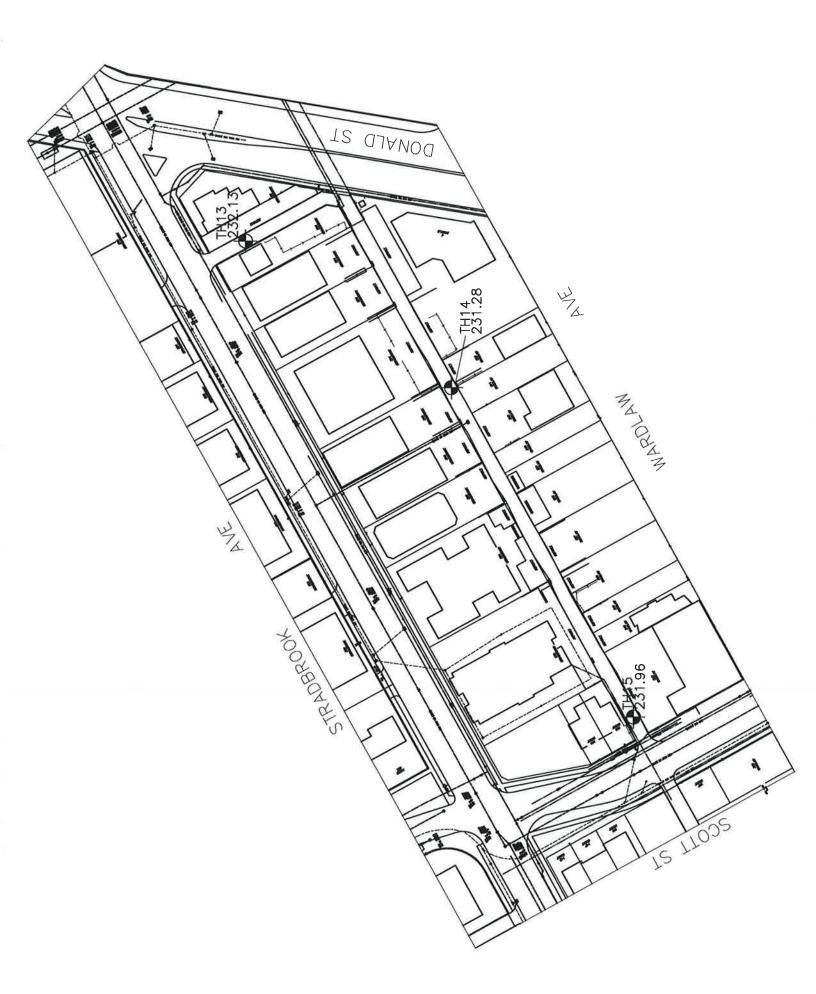






Stradbrook Avenue/ Wardlaw Avenue Alley Scott Street to Donald Street

Testhole ID	Testhole Location	Pavem	Pavement Surface	Pavement Structure Material	Structure	Soil Description	Sample Depth (m)	Moisture Content		Particle Size Analysis	e Analysis			Atterberg Limits	
		Туре	Thickness (mm)	Туре	Thickness (mm)			(%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Liquid Limit Plastic Limit	Plasticity Index
TH13	See site plan	Concrete (Intact)	175	Clay Fill	725	Clay Fill, mixed	ı	ı	1	1	1	Ĭ	1	1	-
TH14	See site plan	Asphalt (Intact)/ Concrete (Intact)	25/ 175	Clay Fill	400	Clay Fill, mixed	I	I	I	I,	ı	Í	1	Ĭ	Ì
TH15	See site plan	Asphalt (Intact)/ Concrete (Broken)	25/137.5	Clay Fill	437.5	Clay Fill, mixed	1.2	23	I	ı	8	8	Í		ľ





		y of Winnipeg	PROJECT NAME				J115
ı		MBER 151-13889-00	PROJECT LOCATION		0 200		
			GROUND ELEVATION		_	HOL	E <b>SIZE</b> 125 mm
		ONTRACTOR Maple Leaf Drilling	GROUND WATER LEVE				
		ETHOD Continuous Auger	AT TIME OF DRI				
		Dana Bredin CHECKED BY Silvestre Urbano					
NOTES	S Stra	adbrook/Wardlaw Alley from Scott to Stradbrook	AFTER DRILLING	3	0 0		
					ż	ତ	▲ SPT N VALUE ▲
l =	ୁ		TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	20 40 60 80 PL MC LL
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	AAND WAFE	A S S S	쥬종	[한번	PL MC LL 20 40 60 80
□	[윤기		H	mo'z	8	88	☐ FINES CONTENT (%) ☐
					<u> </u>	0	20 40 60 80
	1 1 1	CONCRETE - 175 mm thick					
	$\times\!\!\times\!\!\times$	CLAY FILL - 725 mm thick, mixed, brown to black	100 400/			40	
	$\otimes\!\!\otimes$	Frost to 0.91 m	MC = 40%			40	
0.5	$\otimes\!\!\otimes$						
0.0	$\otimes \otimes$						
-	$\otimes \otimes$		MC = 40%			40	
	$\otimes \otimes$						
-	$\otimes \otimes$						
	***	CLAY - stiff, brown, fissured	MC = 40%			40	
1.0							
- 7			MC = 37%			37	
			DD 0051D				
1.5			PP = 225 kPa MC = 34%		225	34	•
-: :					1		
-	111						
			MC = 30%			30	• • • • • • • • • • • • • • • • • • • •
2.0	1//						
2.0	11/						
			MC = 23%			23	
	- 111	SILT - tan-brown, soft, moist to wet					
	-						
	-						
2.5		CLAY - stiff, brown, fissured					
	1//						
L .							
-	1//						
3.0			PP = 150 kPa		150	47	
	111	Bottom of hole at 3.05 m.	MC = 47%				
2.5							
á							
É							
E C							

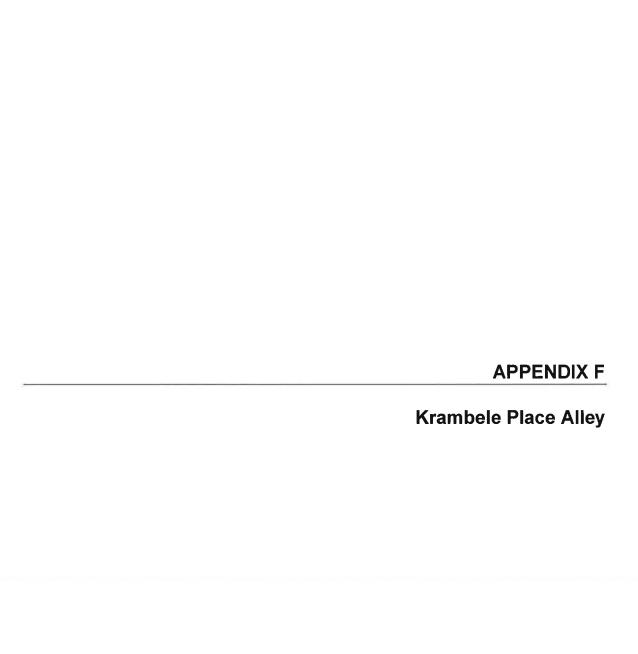
CLIENT _	City of Winnipeg	PROJECT NAME _2	2016 Alley F	Recons	structio	ons
	NUMBER _151-13889-00	PROJECT LOCATIO				
DATE STA	ARTED 1/15/16 COMPLETED 1/15/16	GROUND ELEVATION	100 m		HOLI	E SIZE 125 mm
DRILLING	CONTRACTOR Maple Leaf Drilling	GROUND WATER LEVE	LS:			
	METHOD Continuous Auger	AT TIME OF DRIL	LING			
LOGGED	BY Dana Bredin CHECKED BY Silvestre Urbano	AT END OF DRILL	LING			
NOTES _	Stradbrook/Wardlaw Alley from Scott to Stradbrook	AFTER DRILLING				
DEPTH (m) GRAPHIC	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	△ SPT N VALUE △  20 40 60 80  PL MC LL  20 40 60 80
		α	- UE	O O	<b>≥</b> 0	☐ FINES CONTENT (%) ☐ 20 40 60 80
0.5	ASPHALT - 25 mm thick CONCRETE - 175 mm thick  CLAY FILL - 400 mm thick, mixed, brown and black Frost to 0.91 m	MC = 33%			33	•
	CLAY - stiff, brown, fissured	MC = 37%			37	
1.0		MC = 31%			31	
		MC = 30%			30	
1.5		PP = 300 kPa MC = 34%		300	34	
2.0		MC = 34%			34	
		MC = 42%			42	
2.5						
3.0		PP = 125 kPa MC = 51%		125	51	
GENERAL BH PLOTS - WSP COW ALLEY RENEWALS GPJ GIMT STD C.	Bottom of hole at 3.05 m.					

CLIEN	T Cit	y of Winnipeg	PROJECT NAME	2016 Alley	Recon	structio	ons
PROJE	CT N	JMBER _151-13889-00	PROJECT LOCATI	ON Winnip	eg, M	В	
DATE	STAR	TED _1/15/16 COMPLETED _1/15/16	GROUND ELEVATION	100 m		HOL	E SIZE 125 mm
DRILLI	ING C	ONTRACTOR Maple Leaf Drilling	GROUND WATER LEV	ELS:			
DRILLI	NG M	ETHOD Continuous Auger	AT TIME OF DR	ILLING			
LOGG	ED BY	Dana Bredin CHECKED BY Silvestre Urbano	AT END OF DRI	LLING			
NOTES	Str.	adbrook/Wardlaw Alley from Scott to Stradbrook	AFTER DRILLIN	G			
							▲ SPT N VALUE ▲
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	20 40 60 80  PL MC LL 20 40 60 80  □ FINES CONTENT (%) □ 20 40 60 80
	g & 4	ASPHALT - 25 mm thick					
1	9 4 4	CONCRETE - 137.5 mm thick					1 1 1 1
0.5		CLAY FILL - 437.5 mm thick, mixed, brown to black	MC = 40%			40	
			MC = 41%			41	
		CLAY - brown, fissured	IVIC - 41%			41	
		Frost to 0.91 m					
			MC = 31%			31	
1.0		SILT - tan-brown, soft, moist to wet	IVIC - 31%			31	
							I II (I D
			140 000/				
			MC = 23%			23	
(R) 3E							
1.5			PP = 75 kPa				
1.0			MC = 24%		75	24	•
			MC = 24%			24	
2.0							Harrison Kennado I var deserv
2.0							
			MC = 25%			25	
<u>}</u>	100	CLAY - stiff, grey-brown, trace of fine gravel					
		CLAT - Still, grey-brown, trace of fine graver					
5							
2.5							
-							
-							
3							
3.0			PP = 125 kPa MC = 50%		125	50	•
0		Bottom of hole at 3.05 m.	1810 - 5076				
3							
2.5 2.5 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0							
E C							
ם ב							



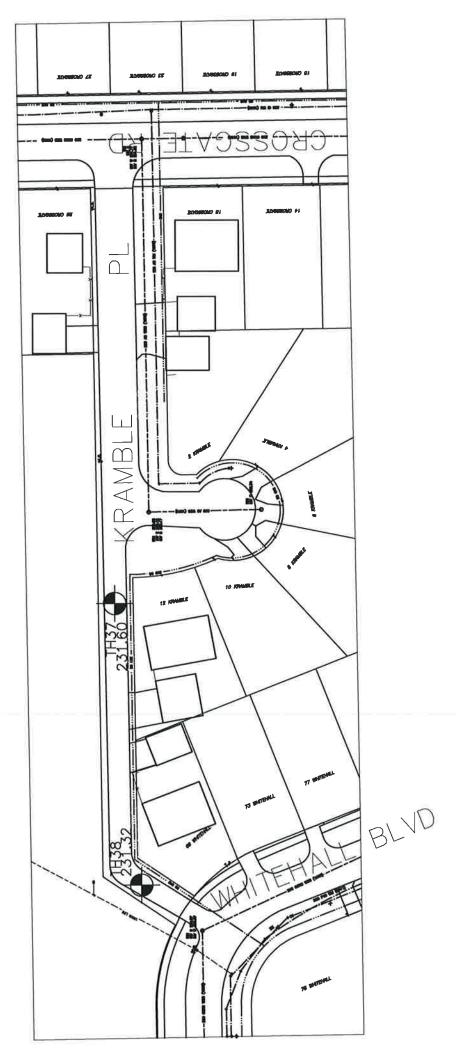






Krambele Place Alley Crossgate Road to Whitehall Boulevard

Testhole ID	Testhole Location	Paveme	Pavement Surface	Pavement Structure Material	Structure	Soil Description	Sample Depth (m)	Moisture Content		Particle Size Analysis	Analysis			Atterberg Limits	
		Туре	Thickness (mm)	Туре	Thickness (mm)			(%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Liquid Limit Plastic Limit	Plasticity Index
ТН37	See site plan	Concrete (Intact)	137.5	Clay Fill/ Clay	162.5/ 2700	Clay Fill, mixed/ Stiff clay	1	1	1	1	I	I	ı	1	
ТН38	See site plan	Concrete (Intact)	150mm (intact)	Clay	2850	Stiff clay	9.0	36		f	Ĭ.	I	92	22	8



.

		ty of Winnipeg	PROJECT NAME				ons			
		UMBER 151-13889-00	PROJECT LOCATION					OF ::		
1		TED1/28/16         COMPLETED1/28/16           ONTRACTORMaple Leaf Drilling	GROUND ELEVATION  GROUND WATER LEV			HOLI	E SIZE _1	25 mm		_
		ETHOD Continuous Auger	AT TIME OF DRI							
		/ Dana Bredin CHECKED BY Silvestre Urbano								
		ey from Whitewall to Kramble	AFTER DRILLIN							
								SPTN	/ALLIE 4	
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	20 PL J- 20	40 MI 40 NES COM	60 60 TENT (9	80 LL -1 80 %) □
	9 9	CONCRETE - 137.5 mm thick			$\vdash$	-	20	40	60	80
		CLAY FILL - 162.5 mm thick, mixed, grey and brown								
0.5		CLAY - olive-grey, fissured; stiff below 1.07 m, brown Frost to 1.07 m	MC = 29%			29				
			MC = 36%			36		•		
1.0			MC = 36%			36		•		1
			MC = 36%			36		•		
1.5			PP = 125 kPa MC = 37%		125	37		•		
			MC = 44%			44		•		
2.0			140 544							1
2.5			MC = 54%			54				
3.0			PP = 100 kPa MC = 52%		100	52	ans-time		•	
2.00 ZONA STEEL ST		Bottom of hole at 3.05 m.								

		y of Winnipeg	PROJECT NAME 201			ons
		JMBER 151-13889-00	PROJECT LOCATION			F 9175 405
DRILL DRILL LOGG	ING CO ING MI ED BY	TED 1/28/16 COMPLETED 1/28/16  ONTRACTOR Maple Leaf Drilling  ETHOD Continuous Auger  Dana Bredin CHECKED BY Silvestre Urbano by from Whitewall to Kramble	GROUND ELEVATION _10 GROUND WATER LEVELS AT TIME OF DRILLIN AT END OF DRILLIN AFTER DRILLING	: NG IG		
DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS BLOW	COUNTS (N VALUE) POCKET PEN. (kPa)	MOISTURE CONTENT (%)	A SPT N VALUE A  20 40 60 80  PL MC LL  20 40 60 80  □ FINES CONTENT (%) □  20 40 60 80
0.5		CONCRETE - 150 mm thick  CLAY - olive-grey, fissured; brown below 0.91 m, stiff  Frost to 0.91 m	MC = 20%		20	
			MC = 36%		36	
1.0			MC = 39%		39	
			MC = 40%		40	
1.5			PP = 100 kPa MC = 46%	100	46	
0.5 4/6/16			MC = 51%		51	
GENERAL BH PLOTS - WSP COW ALLEY RENEWALS.GPJ GINT STD CANA			MC = 39%		39	
3.0			PP = 100 kPa MC = 50%	100	50	
GENERAL BH PLOTS		Bottom of hole at 3.05 m.				



