APPENDIX 'A'

GEOTECHNICAL REPORT



Geotechnical Investigation

City of Winnipeg Street Investigation 19-R-6 Waverley Street Granular Renewal Winnipeg, Manitoba WX18717 4 March 2019

	2	Environment & Infrastr 140 Dovercourt Drive, Winnipeg I Phone: (204) 4 <u>www.woodp</u> Geotechnical In	Tucture Solutions Manitoba, Canada R3Y 1N4 88-2997 Ic.com								
City of W	innipeg Stre	eet Investigation 19- Wood Project Num	R-6 Waverley Street (ber - WX18717	Granular Renewal							
		Dillon Consulting Limited	1								
Prepared for:		1558 Willson Place									
		Winnipeg, Manitoba R3T	0Y4								
Contact:		Brad Cook, P.Eng.									
Report Distribut	ion:										
Dillon Consulting Limited: Brad Cook, P.Eng.											
Third Party:	y	g.									
Report Classifica	ntion:	Confidential									
		Name	Job Title	Signature							
Prepared by:		Caolan McEvoy, E.I.T., C.E.T. / Jorden Wiwcharyk, P.Eng.	Geotechnical Engineer-in- Training / Geotechnical Engineer	MCE							
Reviewed by:		Brad Wiebe., P.Eng.	Associate Geotechnical Engineer, Branch Manager	BradWit							
Project Manage	r:	Caolan McEvoy, E.I.T., C.E.T.	Geotechnical Engineer-in- Training	MCE							
Other Technical	Contributors										
Rev.	Date		Revision Notes								
0	04 Mar 2019	Issued Final to Client									
	Permit Sta	mp	Engineer	Seal							
1	J.P. WIWCHAR Member 32499 Much 20	AND	Wood Environment & Infr A Division of Wood O No. 68	INEERS SCIENTISTS Introba Inthorization astructure Solutions Canada Limited 34							

Page i of iii



Copyright and non-disclosure notice

The contents and layout of this report are subject to copyright owned by Wood (© Dillon Consulting Limited). save to the extent that copyright has been legally assigned by us to another party or is used by Wood under license. To the extent that we own the copyright in this report, it may not be copied or used without our prior written agreement for any purpose other than the purpose indicated in this report. The methodology (if any) contained in this report is provided to you in confidence and must not be disclosed or copied to third parties without the prior written agreement of Wood. Disclosure of that information may constitute an actionable breach of confidence or may otherwise prejudice our commercial interests. Any third party who obtains access to this report by any means will, in any event, be subject to the Third-Party Disclaimer set out below.

Third Party Disclaimer

Any disclosure of this report to a third party is subject to this disclaimer. The report was prepared by Wood at the instruction of, and for use by, our client named on the front of the report. It does not in any way constitute advice to any third party who is able to access it by any means. Wood excludes to the fullest extent lawfully permitted all liability whatsoever for any loss or damage howsoever arising from reliance on the contents of this report. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.

WX18717| March 2019

Page ii of iii



Table of Contents

1.0	Introduction	1
2.0	Geotechnical Investigation	1
3.0	Closure	2

List of Figures

Figure 1: Test Hole Location Plan	4
-----------------------------------	---

List of Appendicies

Appendix A

Test Hole Summary Tables

Appendix B

Laboratory Test Reports

Appendix C

Test Hole Logs

Page iii of iii



1.0 Introduction

At the authorization of Mr. Brad Cook, P. Eng., of Dillon Consulting Limited (Dillon), Wood Environment & Infrastructure Solutions, a division of Wood Canada Limited (Wood), completed a test hole drilling program related to the evaluation and rehabilitation of an approximant 4.2 km stretch of Waverley Street from Grandmont Boulevard to the City Limit.

The geotechnical investigation was completed in accordance with the Scope of Work and Terms and Conditions outlined in Wood Proposal No. WPG2018.684 dated 19 December 2018.

2.0 Geotechnical Investigation

Prior to initiating drilling, Wood notified public utility providers (i.e. Manitoba Hydro, MTS, Shaw, etc.) of the intent to drill in order to clear public utilities, and where required, met with said representatives onsite.

On 01st and 09th of February 2019, Wood supervised the drilling of a total of fourty-two test holes (TH01 through TH42) on Waverley Street from Grandmont Boulevard to the City Limit. The test hole locations where chosen by Wood based on the City of Winnipeg requirements listed in the RFP No. 833-2018; the test hole locations are described in Appendix A and illustrated in Figure 1. At each test hole location, the offset from shoulder edge and distance from cross street were recorded, measurements where based of a combination of truck oedometer readings and hand measurements (Truck measurements where used when measurements where 0.1 km or greater). All test holes were drilled to a minimum depth of 2.0 m using a truck mounted Mobile B40LX drill rig equipped with 125 mm solid stem augers, owned and operated by Maple Leaf Drilling of Springfield, Manitoba.

During drilling, Wood field personnel visually classified the soil stratigraphy within the test holes in accordance with the RFP No. 833-2018 section F2.2 (d); as well as noted observed seepage and/or sloughing conditions. Soil sampling consisted of grab samples of the auger cuttings obtained at 0.3 m intervals at all test hole locations. All grab samples were retained in sealed plastic bags and shipped to Wood's Winnipeg laboratory for review and selected testing.

Following completion of the field drilling program, a laboratory testing program was conducted on all soil samples obtained from the test holes. The laboratory testing program consisted of moisture content determinations for all samples collected, as well as Atterberg limits particle size distributions (hydrometer method) on selected samples. A summary of the Atterberg limit and particle size distribution are presented in Appendix B. Detailed test hole logs summarizing the sampling, field testing, laboratory test results, and subsurface conditions encountered at the test hole locations are presented in Appendix C.

Actual depths noted on the test hole logs may vary by \pm 0.3 m from those recorded due to the method by which the soil cuttings are returned to the surface. Summaries of the terms and symbols used on the test hole logs and of the Modified Unified Soil Classification System are also presented in Appendix C. A summary of the test hole information, location and lab testing data is also provided in the Appendix A summary tables.

WX18717 | March 2019

Page 1 of 2



3.0 Closure

The findings of this report were based on the results of field and laboratory investigations at test hole locations determined based on the City of Winnipeg requirements.

The site investigation was conducted for the sole purpose of profiling the pavement and subsurface conditions. Although no environmental issues were identified during the fieldwork, this does not indicate that no such issues exist. If the owner or other parties have any concern regarding the presence of environmental issues, then an appropriate level environmental assessment should be conducted.

Soil conditions, by their nature, can be highly variable across a site. The placement of fill and prior construction activities on a site can contribute to the variability especially near surface soil conditions. A contingency should always be included in any construction budget to allow for the possibility of variation in soil conditions, which may result in modification of any potential design and construction procedures which may arise from this factual investigative report.

Respectfully submitted,

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited

WX18717 | March 2019

Page 2 of 2



Figures

WX18717 | March 2019

Page 3 of 5



Figure 1: Test Hole Location Plan



Page 4 of 5





WX18717 | March 2019

Page 5 of 5



Client: Dillion Construction

wood.

Project: City of Winnipeg Waverley Street Investigation

Project No: WX18717

Auger Diameter: 125 mm Solid Stem Auger

Date Drilled: 01-Feb-2019 and 09-Feb-2019

Drilled By: Caolan McEvoy

Test	Test Usis Lesstian	Pavemer	nt Surface		Sampl (I	e Depth m)	Moisture	Gra	ain Size	Analys	sis	At	terberg Lin	nits
No.	Test Hole Location	Туре	Thickness (mm)	Soli Description	Тор	Bottom	(%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid	Plastic	Plasticity Index
		Granular	200	GRANULAR FILL	0.0	0.1	10.3							
		Fill	200	CLAY FILL	0.2	0.3	23.2							
				CLAY	0.5	0.7	33.9							
TH01	18.5 m South of Grandmont Blvd, 3.0 m			CLAY	0.8	1.0	34.5							
	East of west shoulder			CLAY	1.1	1.3	35.3							
				CLAY	1.4	1.6	34.1							
				SILT	1.7	1.9	41.2							
		Granular	300	GRANULAR FILL	0.0	0.1	3.6							
		Fill	300	CLAY	0.3	0.5	25.0							
	140 m South of Grandmont Blvd, 2.5 m West of East shoulder			CLAY	0.5	0.7	26.9							
TH02				CLAY	0.8	1.0	28.2							
				CLAY	1.1	1.3	29.5							
				CLAY	1.4	1.6	26.1							
				CLAY	1.7	1.9	27.8							
		Granular	300	GRANULAR FILL	0.0	0.1	4.4							
		Fill	390	GRANULAR FILL	0.2	0.4	10.7							
	253 m South of Grandmont Blvd. 3.0 m			CLAY	0.5	0.7	28.9							
TH03	East of West shoulder			CLAY	0.8	1.0	30.0							
				CLAY	1.1	1.3	28.7							
				CLAY	1.4	1.6	28.7							
				CLAY	1.7	1.9	29.3							
		Granular	175	GRANULAR FILL	0.0	0.1	3.4							
		Fill	_	CLAY	0.2	0.4	25.2							
	340 m South of Grandmont Blvd 3.0 m			CLAY	0.5	0.7	26.9							
TH04	West of East shoulder			CLAY	0.8	1.0	27.1							
				CLAY	1.1	1.3	27.4							
				CLAY	1.4	1.6	35.2							
				CLAY	1.7	1.9	39.6							

wood.

SUMMARY TABLE

Client: Dillion Construction

Project: City of Winnipeg Waverley Street Investigation

Project No: WX18717

Auger Diameter: 125 mm Solid Stem Auger

Date Drilled: 01-Feb-2019 and 09-Feb-2019

Drilled By: Caolan McEvoy

Test	Testuale Leastice	Pavemer	nt Surface	Quill Du a seis film	Sampl (I	e Depth m)	Moisture	Gra	ain Size	Analys	sis	Att	erberg Lin	nits
Hole No.	lest Hole Location	Туре	Thickness (mm)	Soil Description	Тор	Bottom	(%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid	Plastic	Plasticity Index
		Granular	200	GRANULAR FILL	0.0	0.1	3.8							
		Fill	200	CLAY	0.2	0.4	21.9	0	23.1	43.8	33	50	18	32
				CLAY	0.5	0.7	28.8							
TH05	419 m South of Grandmont Blvd, 3.0 m			CLAY	0.8	1.0	28.4							
	East of west shoulder			CLAY	1.1	1.3	28.9							
				CLAY	1.4	1.6	34.7							
				CLAY	1.7	1.9	37.0							
		Granular	175	GRANULAR FILL	0.0	0.1	4.7							
		Fill	175	CLAY FILL	0.2	0.4	28.2							
	540 m South of Grandmont Blvd, 3.0 m West of East shoulder			CLAY	0.5	0.7	26.6							
TH06				CLAY	0.8	1.0	28.8							
				CLAY	1.1	1.3	27.7							
				CLAY	1.4	1.6	35.2							
				CLAY	1.7	1.9	39.6							
		Granular	200	GRANULAR FILL	0.0	0.1	6.6							
		Fill	200	CLAY	0.2	0.4	18.7							
	619 m South of Grandmont Blvd 3.0 m			CLAY	0.5	0.7	26.4							
TH07	East of West shoulder			CLAY	0.8	1.0	27.1							
				CLAY	1.1	1.3	27.1							
				CLAY	1.4	1.6	28.6							
				CLAY	1.7	1.9	26.1							
		Granular	175	GRANULAR FILL	0.0	0.1	4.1							
		Fill		CLAY FILL	0.2	0.4	25.6							
	740 m South of Grandmont Blvd 3.0 m			CLAY FILL	0.5	0.7	20.4	0	7.2	51.3	39.5	44	15	29
TH08	West of East shoulder			CLAY	0.8	1.0	30.0							
				CLAY	1.1	1.3	26.4							
				CLAY	1.4	1.6	26.6							
				CLAY	1.7	1.9	23.5							

Client: Dillion Construction

wood.

Project: City of Winnipeg Waverley Street Investigation

Project No: WX18717

Auger Diameter: 125 mm Solid Stem Auger

Street: Waverley Street

Date Drilled: 01-Feb-2019 and 09-Feb-2019

Drilled By: Caolan McEvoy

Test		Pavemer	nt Surface		Sample Depth (m)		Moisture	Gra	ain Size	Analys	sis	At	terberg Lin	nits
Hole No.	lest Hole Location	Туре	Thickness (mm)	Soil Description	Тор	Bottom	(%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid	Plastic	Plasticity Index
		Granular	100	GRANULAR FILL	0.0	0.1	6.0							
		Fill	100	CLAY	0.2	0.4	20.2							
				CLAY	0.5	0.7	29.3							
TH09	528.2 m North of Rue Des Trappistes, 3.5			CLAY	0.8	1.0	28.7							
	m East of West shoulder			CLAY	1.1	1.3	28.5							
				CLAY	1.4	1.6	29.6							
				CLAY	1.7	1.9	30.9							
		Granular	150	GRANULAR FILL	0.0	0.1	7.8							
		Fill	150	CLAY	0.2	0.4	21.3							
TH10	413 m North of Rue Des Trappistes, 3.0 m West of East shoulder			CLAY	0.5	0.7	29.0							
				CLAY	0.8	1.0	31.1							
				CLAY	1.1	1.3	31.0							
				CLAY	1.4	1.6	29.4							
				CLAY	1.7	1.9	31.7							
		Granular	200	GRANULAR FILL	0.0	0.1	4.0							
		Fill	200	CLAY	0.2	0.4	26.2							
	382 m North of Rue Des Trannistes 2.9 m			CLAY	0.5	0.7	35.8							
TH11	East of West shoulder			CLAY	0.8	1.0	36.4							
				CLAY	1.1	1.3	33.9							
				CLAY	1.4	1.6	33.0							
				CLAY	1.7	1.9	32.5							
		Granular	250	GRANULAR FILL	0.0	0.1	3.6							
		Fill	230	CLAY	0.2	0.4	17.9							
	212 m North of Rue Dee Transistee 2.0 m			CLAY	0.5	0.7	33.0							
TH12	West of East shoulder			CLAY	0.8	1.0	32.8							
				CLAY	1.1	1.3	31.7							
				CLAY	1.4	1.6	31.8							
	-			CLAY	1.7	1.9	34.4							

Client: Dillion Construction

Project: City of Winnipeg Waverley Street Investigation

Project No: WX18717

Auger Diameter: 125 mm Solid Stem Auger

Date Drilled: 01-Feb-2019 and 09-Feb-2019

Drilled By: Caolan McEvoy

Test		Pavemer	nt Surface		Sampl (I	e Depth m)	Moisture	Gra	ain Size	Analys	sis	Att	erberg Lin	nits	
Hole No.	Test Hole Location	Туре	Thickness (mm)	Soil Description	Тор	Bottom	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid	Plastic	Plasticity Index	
		Granular	150	GRANULAR FILL	0.0	0.1	5.2								
		Fill	150	CLAY FILL	0.2	0.4	22.0								
				CLAY FILL	0.5	0.7	21.6								
TH13	113 m North of Rue Des Trappistes, 3.3 m			CLAY	0.8	1.0	31.2								
	East of West shoulder			CLAY	1.1	1.3	30.0							1	
				SILT	1.7	1.8	21.1								
				CLAY	1.8	2.0	28.5								
		Granular	275	GRANULAR FILL	0.0	0.1	2.6								
		Fill	275	CLAY	0.3	0.4	18.1								
TH14	13 m North of Rue Des Trappistes, 3.0 m West of East shoulder			CLAY	0.5	0.7	28.7								
				CLAY	0.8	1.0	30.2								
				CLAY	1.1	1.3	29.0								
				CLAY	1.4	1.6	29.2								
				CLAY	1.7	1.9	29.0								
		Granular	200	GRANULAR FILL	0.0	0.1	3.7								
		Fill	200	CLAY	0.2	0.4	20.3								
	87 m South of Rue Des Trannistes 35 m			CLAY	0.5	0.7	38.9								
TH15	East of West shoulder			CLAY	0.8	1.0	38.3								
				CLAY	1.1	1.3	36.2								
				CLAY	1.4	1.6	30.7								
				CLAY	1.7	1.9	34.4								
		Granular	225	GRANULAR FILL	0.0	0.1	3.9								
		Fill	220	CLAY	0.2	0.4	19.7								
	137 m South of Ruo Dos Transistos 3.0 m			CLAY	0.5	0.7	29.3								
TH16	West of East shoulder			CLAY	0.8	1.0	28.0								
				CLAY	1.1	1.3	28.4								
				CLAY	1.4	1.6	28.2								
	-	-				CLAY	1.7	1.9	32.4						

Street: Waverley Street

wood.

Client: **Dillion Construction**

Project: City of Winnipeg Waverley Street Investigation Project No: WX18717

Auger Diameter: 125 mm Solid Stem Auger

Street: Waverley Street

Date Drilled: 01-Feb-2019 and 09-Feb-2019

Drilled By: Caolan McEvoy

Test		Pavemer	nt Surface		Sampl (i	e Depth m)	Moisture	Gra	ain Size	Analys	sis	At	terberg Lin	nits
Hole No.	Test Hole Location	Туре	Thickness (mm)	Soil Description	Тор	Bottom	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid	Plastic	Plasticity Index
		Granular	200	GRANULAR FILL	0.0	0.1	3.8							
		Fill	200	CLAY FILL	0.2	0.4	27.1							
				CLAY FILL	0.5	0.7	35.5							
TH17	287 m South of Rue Des Trappistes, 3.0 m			CLAY FILL	0.8	1.0	34.2							
	East of West shoulder			CLAY FILL	1.1	1.3	27.5							
				CLAY FILL	1.4	1.6	26.1							
				SILT	1.7	1.9	24.0							
		Granular	200	GRANULAR FILL	0.0	0.1	8.6							
		Fill	200	CLAY FILL	0.2	0.4	27.0							
TH18	337 m South of Rue Des Trappistes, 3.0 m West of East shoulder			SILT	0.6	0.8	29.3							
				SILT	0.8	1.0	25.6	0	5.6	57.3	36.5	41	14	27
				SILT	1.1	1.3	24.5	0	5.8	58.8	35.2	37	14	23
				CLAY	1.5	1.7	25.6							1
				CLAY	1.7	1.9	29.5							1
		Granular	200	GRANULAR FILL	0.0	0.1	4.8							
		Fill	200	CLAY	0.2	0.4	21.7							
	487 m South of Rue Des Transistes 3.3 m			CLAY	0.5	0.7	34.7							
TH19	East of West shoulder			CLAY	0.8	1.0	26.7						1	1
				CLAY	1.1	1.3	27.1							
				CLAY	1.4	1.6	25.8							
				CLAY	1.7	1.9	29.0							
		Granular	250	GRANULAR FILL	0.0	0.1	2.9							
		Fill	250	CLAY	0.2	0.4	31.9							
	FG4 m South of Duo Doo Transistan 2.0 m			SILT	0.5	0.7	26.7							
TH20	West of East shoulder			SILT	0.8	1.0	27.1	0	5	58.3	36.4	36	14	22
				SILT	1.1	1.3	21.8							
				CLAY	1.5	1.7	31.7							
	-	-			CLAY	1.7	1.9	33.3						

wood.

Client: Dillion Construction

wood.

Project: City of Winnipeg Waverley Street Investigation

Project No: WX18717

Auger Diameter: 125 mm Solid Stem Auger

Street: Waverley Street

Date Drilled: 01-Feb-2019 and 09-Feb-2019

Drilled By: Caolan McEvoy

Test	Test Hole Location	Paveme	nt Surface		Sampl (e Depth m)	Moisture	Gra	ain Size	Analys	sis	At	terberg Lin	nits	
Hole No.	Test Hole Location	Туре	Thickness (mm)	Soil Description	Тор	Bottom	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid	Plastic	Plasticity Index	
		Granular	50	GRANULAR FILL	0.0	0.1	7.1								
		Fill	50	CLAY FILL	0.2	0.4	26.4								
				CLAY FILL	0.5	0.7	44.0								
TH21	687 m South of Rue Des Trappistes, 3.0 m			CLAY	0.8	1.0	29.8								
	East of West shoulder			CLAY	1.1	1.3	35.5								
				CLAY	1.4	1.6	30.0								
				CLAY	1.7	1.9	34.0								
		Granular	250	GRANULAR FILL	0.0	0.1	2.1								
		Fill	250	CLAY	0.2	0.4	23.6								
TH22	762 m South of Rue Des Trappistes, 3.0 m West of East shoulder			CLAY	0.5	0.7	40.1								
				CLAY	0.8	1.0	32.2								
				CLAY	1.1	1.3	31.4								
				CLAY	1.4	1.6	30.1								
				CLAY	1.7	1.9	28.8								
		Granular	200	GRANULAR FILL	0.0	0.1	2.9								
		Fill	200	CLAY	0.2	0.4	31.0								
	987 m South of Rue Des Trannistes 3.0 m			CLAY	0.5	0.7	28.2								
TH23	East of West shoulder			CLAY	0.8	1.0	25.7								
				CLAY	1.1	1.3	24.2								
				CLAY	1.4	1.6	24.2								
				CLAY	1.7	1.9	25.6								
		Granular	200	GRANULAR FILL	0.0	0.1	2.6								
		Fill	200	CLAY	0.2	0.4	25.1								
	1097 m South of Ruo Doo Transistoo 2.0 m			CLAY	0.5	0.7	25.5								
TH24	West of Fast shoulder			CLAY	0.8	1.0	28.9								
				CLAY	1.1	1.3	28.6								
				CLAY	1.4	1.6	29.4								
	-		·			CLAY	1.7	1.9	28.1						

Client: **Dillion Construction**

wood.

Project: City of Winnipeg Waverley Street Investigation Project No: WX18717

Auger Diameter: 125 mm Solid Stem Auger

Plasticity

Index

01-Feb-2019 and 09-Feb-2019 Date Drilled:

1387 m South of Rue Des Trappistes, 3.1 m

East of West shoulder

1486 m South of Rue Des Trappistes, 3.0 m

West of East shoulder

Drilled By: Caolan McEvoy

Test

Hole

No.

TH25

TH26

TH27

TH28

				Sampl	e Denth								
Tost Hole Location	Paveme	nt Surface	Soil Description	(I	n)	Moisture	Gra	ain Size	Analys	sis	At	terberg Lir	nits
	Туре	Thickness (mm)	Soli Description	Тор	Bottom	(%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid	Plastic	Plastic Index
	Granular	200	GRANULAR FILL	0.0	0.1	3.5							
	Fill	200	CLAY	0.2	0.4	25.9							
			CLAY	0.5	0.7	27.6							
1187 m South of Rue Des Trappistes, 3.1 m			CLAY	0.8	1.0	27.2							
East of West shoulder			CLAY	1.1	1.3	27.0							
			CLAY	1.4	1.6	28.2							
			CLAY	1.7	1.9	31.0							
	Granular	125	GRANULAR FILL	0.0	0.1	2.8							
	Fill	125	CLAY	0.2	0.4	25.1							
			CLAY	0.5	0.7	26.6							
1286 m South of Rue Des Trappistes, 3.0 m West of East shoulder			CLAY	0.8	1.0	27.5							
			SILT	1.1	1.3	22.2							
			SILT	1.4	1.6	30.2							
			CLAY	1.7	1.9	30.3							

0.0

0.2

0.6

0.8

1.1

1.4

1.7

0.0

0.2

0.5

0.8

1.1

1.4

1.7

0.1

0.4

0.8

1.0

1.3

1.6

1.9

0.1

0.4

0.7

1.0

1.3

1.6

1.9

2.6

22.6

26.2

29.9

30.0

28.4

30.0

3.6

30.4

31.2

30.0

30.9

28.7

27.7

GRANULAR FILL

CLAY FILL

CLAY

CLAY

CLAY

CLAY

CLAY

GRANULAR FILL

CLAY

CLAY

CLAY

CLAY

CLAY

CLAY

Granular

Fill

Granular

Fill

225

125

wood.

SUMMARY TABLE

Client: Dillion Construction

Project: City of Winnipeg Waverley Street Investigation

Project No: WX18717

Auger Diameter: 125 mm Solid Stem Auger

Date Drilled: 01-Feb-2019 and 09-Feb-2019

Drilled By: Caolan McEvoy

Test	T (11) 1 1	Paveme	nt Surface		Sampl (I	e Depth m)	Moisture	Gra	ain Size	Analys	sis	At	terberg Lin	nits
No.	Test Hole Location	Туре	Thickness (mm)	GRANULAR FILL	Тор	Bottom	(%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid	Plastic	Plasticity Index
		Granular	225	GRANULAR FILL	0.0	0.1	2.8							
		Fill	225	CLAY FILL	0.2	0.4	23.3							
				SILT	0.5	0.7	30.3	0	13.2	51.9	34.6	42	15	27
TH29	1587 m South of Rue Des Trappistes, 3.0 m			SILT	0.9	1.1	26.5	0	19.3	57.8	22.8	31	14	17
	East of west shoulder			CLAY	1.2	1.4	30.9							
				CLAY	1.4	1.6	29.3							
				CLAY	1.7	1.9	30.5							
		Granular	200	GRANULAR FILL	0.0	0.1	11.2							
		Fill	200	CLAY	0.2	0.4	27.0							
	1686 m South of Rue Des Trappistes, 3.0 m West of East shoulder			CLAY	0.5	0.7	25.4							
TH30				CLAY	0.8	1.0	26.6							
				CLAY	1.1	1.3	30.2							
				SILT	1.5	1.7	31.2							
				SILT	1.7	1.9	31.9							
		Granular	150	GRANULAR FILL	0.0	0.1	3.8							
		Fill	150	CLAY	0.2	0.4	27.8							
	1787 m South of Rue Des Trappistes 3.0 m			CLAY	0.5	0.7	33.9							
TH31	East of West shoulder			CLAY	0.8	1.0	31.5							
				CLAY	1.1	1.3	34.4							
				CLAY	1.4	1.6	31.6							
				CLAY	1.7	1.9	32.4							
		Granular	150	GRANULAR FILL	0.0	0.1	6.1							
		Fill	150	CLAY	0.2	0.4	27.6							
	1996 m South of Due Dee Transistee 2.0 m			CLAY	0.5	0.7	30.8							
TH32	West of Fast shoulder			CLAY	0.8	1.0	28.4							
				CLAY	1.1	1.3	28.1							
				CLAY	1.4	1.6	27.5							
				CLAY	1.7	1.9	27.7							

Client: Dillion Construction

Project: City of Winnipeg Waverley Street Investigation

Project No: WX18717

Auger Diameter: 125 mm Solid Stem Auger

Date Drilled: 01-Feb-2019 and 09-Feb-2019

Drilled By: Caolan McEvoy

Test	Test Hole Location	Paveme	nt Surface		Sampl (I	e Depth m)	Moisture	Gra	ain Size	Analys	sis	At	terberg Lin	nits
Hole No.	Test Hole Location	Туре	Thickness (mm)	Soil Description	Тор	Bottom	(%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid	Plastic	Plasticity Index
		Granular	150	GRANULAR FILL	0.0	0.1	3.6							
		Fill	150	CLAY	0.2	0.4	26.3							
				CLAY	0.5	0.7	36.1							
TH33	1987m South of Rue Des Trappistes, 3.0 m			CLAY	0.8	1.0	36.8							
	East of West shoulder			CLAY	1.1	1.3	38.5							
				CLAY	1.4	1.6	33.4							
				CLAY	1.7	1.9	34.7							
		Granular	150	GRANULAR FILL	0.0	0.1	6.1							
		Fill	150	CLAY	0.2	0.4	26.5							
	2086 m South of Rue Des Trappistes, 2.5 m West of East shoulder			CLAY	0.5	0.7	24.2							
TH34				CLAY	0.8	1.0	25.2							
				CLAY	1.1	1.3	26.0							
				CLAY	1.4	1.6	23.1							
				CLAY	1.7	1.9	27.0							
		Granular	200	GRANULAR FILL	0.0	0.1	3.1							
		Fill	200	CLAY	0.2	0.4	15.4							
	2187 m South of Rue Des Transistes, 2.5 m			CLAY	0.5	0.7	33.4							
TH35	East of West shoulder			CLAY	0.8	1.0	34.4							
				CLAY	1.1	1.3	35.0							
				CLAY	1.4	1.6	33.8							
				CLAY	1.7	1.9	33.7							
		Granular	100	GRANULAR FILL	0.0	0.1	4.5							
		Fill	100	CLAY	0.2	0.4	27.0							
	2200 m Couth of Due Dee Trennistee 2.0 m			CLAY	0.5	0.7	24.5							
TH36	West of Fast shoulder			CLAY	0.8	1.0	27.5							
				CLAY	1.1	1.3	27.1							
				CLAY	1.4	1.6	28.5							
				CLAY	1.7	1.9	30.3							



Client: Dillion Construction

Project: City of Winnipeg Waverley Street Investigation

Project No: WX18717

Auger Diameter: 125 mm Solid Stem Auger

Date Drilled: 01-Feb-2019 and 09-Feb-2019

Drilled By: Caolan McEvoy

Test	-	Pavemer	nt Surface	ace Soil Description Sa	Sampl (I	e Depth m)	Moisture	Gra	ain Size	Analys	sis	Att	erberg Lin	nits
Hole No.	Test Hole Location	Туре	Thickness (mm)	Soil Description	Тор	Bottom	(%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid	Plastic	Plasticity Index
		Granular	150	GRANULAR FILL	0.0	0.1	4.2							
		Fill	150	CLAY	0.2	0.4	23.4							
				CLAY	0.5	0.7	24.5							
TH37	2386 m South of Rue Des Trappistes, 3.0 m			CLAY	0.8	1.0	25.2							
	East of west shoulder			CLAY	1.1	1.3	24.9							
				CLAY	1.4	1.6	23.8							
				CLAY	1.7	1.9	27.2	0	1.2	22.4	76.5	102	24	78
		Granular	150	GRANULAR FILL	0.0	0.1	4.0							
		Fill	150	CLAY	0.2	0.4	27.4							
				CLAY	0.5	0.7	30.5							
TH38	2486 m South of Rue Des Trappistes, 2.5 m West of Fast shoulder			CLAY	0.8	1.0	30.8							
				CLAY	1.1	1.3	30.8							
				CLAY	1.4	1.6	26.8							
				SILT	1.7	1.9	28.5						Plastic Plastic 24	
		Granular	125	GRANULAR FILL	0.0	0.1	11.3							
		Fill	125	CLAY	0.2	0.4	24.3							
	2586 m South of Rue Des Trappistes 3.0 m			CLAY	0.5	0.7	31.5							
TH39	East of West shoulder			CLAY	0.8	1.0	27.2							
				CLAY	1.1	1.3	31.1							
				CLAY	1.4	1.6	33.9							
				CLAY	1.7	1.9	32.6							
		Granular	150	GRANULAR FILL	0.0	0.1	11.1							
		Fill	150	CLAY FILL	0.2	0.4	20.4							
	2000 m Couth of Due Dee Trennistee 2.0 m			CLAY	0.5	0.7	22.7							
TH40	2000 m South of Rue Des Trappistes, 3.0 m West of East shoulder			CLAY	0.8	1.0	22.8							
				CLAY	1.1	1.3	24.7							
				CLAY	1.4	1.6	22.8							
				SILT	1.8	2.0	20.0							



Client: Dillion Construction

wood.

Project: City of Winnipeg Waverley Street Investigation

Project No: WX18717

Auger Diameter: 125 mm Solid Stem Auger

Street: Waverley Street

Date Drilled: 01-Feb-2019 and 09-Feb-2019

Drilled By: Caolan McEvoy

Т

est		Paveme	nt Surface		Sampl (I	e Depth m)	Moisture	Gra	ain Size	Analys	is	Att	erberg Lin	nits
iole No.	lest Hole Location	Туре	Thickness (mm)	Soil Description	Тор	Bottom	(%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid	Plastic	Plasticity Index
		Granular	150	GRANULAR FILL	0.0	0.1	4.0							
		Fill	150	CLAY	0.2	0.4	28.8							
				CLAY	0.5	0.7	31.4							
H41	2786 m South of Rue Des Trappistes, 3.0 m			CLAY	0.8	1.0	31.2							
	East of west shoulder			CLAY	1.1	1.3	30.6							
				SILT	1.4	1.6	30.1							
				SILT	1.7	1.9	29.1							
		Granular	150	GRANULAR FILL	0.0	0.1	5.7							
		Fill	150	CLAY	0.2	0.4	17.6							
				CLAY	0.5	0.7	21.2							
H42	2886 m South of Rue Des Trappistes, 3.0 m West of Fast shoulder			CLAY	0.8	1.0	24.1							
				CLAY	1.1	1.3	25.0							
				CLAY	1.4	1.6	22.1							
				CLAY	1.7	1.9	19.8							

SUMMARY TABLE

Appendix B Laboratory Test Reports

WX18717 | March 2019

Page 6 of 5





GRAIN SIZE DISTRIBUTION



GRAIN SIZE DISTRIBUTION





WX18717 | March 2019

Page 7 of 5



EXPLANATION OF TERMS AND SYMBOLS

The terms and symbols used on the borehole logs to summarize the results of field investigation and subsequent laboratory testing are described in these pages.

It should be noted that materials, boundaries and conditions have been established only at the borehole locations at the time of investigation and are not necessarily representative of subsurface conditions elsewhere across the site.

TEST DATA

Data obtained during the field investigation and from laboratory testing are shown at the appropriate depth interval.

Abbreviations, graphic symbols, and relevant test method designations are as follows:

*C	Consolidation test	*ST	Swelling test
D _R	Relative density	TV	Torvane shear strength
*k	Permeability coefficient	VS	Vane shear strength
*MA	Mechanical grain size analysis	w	Natural Moisture Content (ASTM D2216)
	and hydrometer test	WI	Liquid limit (ASTM D 423)
N	Standard Penetration Test (CSA A119.1-60)	Wp	Plastic Limit (ASTM D 424)
N _d	Dynamic cone penetration test	E _f	Unit strain at failure
NP	Non plastic soil	γ	Unit weight of soil or rock
рр	Pocket penetrometer strength	γd	Dry unit weight of soil or rock
*q	Triaxial compression test	ρ	Density of soil or rock
q _u	Unconfined compressive strength	ρ _d	Dry Density of soil or rock
*SB	Shearbox test	Cu	Undrained shear strength
SO ₄	Concentration of water-soluble sulphate	\rightarrow	Seepage
	t	<u> </u>	Observed water level

The results of these tests are usually reported separately

Soils are classified and described according to their engineering properties and behaviour.

The soil of each stratum is described using the Unified Soil Classification System¹ modified slightly so that an inorganic clay of "medium plasticity" is recognized.

The modifying adjectives used to define the actual or estimated percentage range by weight of minor components are consistent with the Canadian Foundation Engineering Manual².

Relative Density and Consistency:

<u>Cohesion</u>	less Soils		Cohesive Soils	
Relative Density	SPT (N) Value	Consistency	Undrained Shear Strength c _u (kPa)	Approximate SPT (N) Value
Very Loose	0-4	Very Soft	0-12	0-2
Loose	4-10	Soft	12-25	2-4
Compact	10-30	Firm	25-50	4-8
Dense	30-50	Stiff	50-100	8-15
Very Dense	>50	Very Stiff	100-200	15-30
-		Hard	>200	>30

Standard Penetration Resistance ("N" value)

The number of blows by a 63.6kg hammer dropped 760 mm to drive a 50 mm diameter open sampler attached to "A" drill rods for a distance of 300 mm after an initial penetration of 150 mm.

"Unified Soil Classification System", Technical Memorandum 36-357 prepared by Waterways Experiment Station, Vicksburg, Mississippi, Corps of Engineers, U.S. Army. Vol. 1 March 1953.

"Canadian Foundation Engineering Manual", 3rd Edition, Canadian Geotechnical Society, 1992.

²

			M	ODIFIED	UNIFI	ED C	LASSIFIC	ATION S	YSTEM FOR SOILS	6		
					SYM	BOLS	;	TVDIO				
	MAJOR D		5	USCS	GR	APH	COLOUR	TYPICA	AL DESCRIPTION	CRITERIA		
	ШлЕ	CLEAN		GW	444	444	RED	WELL GRADED G MIXTURES, LITTL	RAVELS, GRAVEL-SAND E OR NO FINES	$\begin{split} & C_{\rm u}{=}D_{\rm 60}/D_{\rm 10}>4;\\ & C_{\rm c}{=}(D_{\rm 30})^2/(D_{\rm 10}xD_{\rm 60})=1 \mbox{ to } 3 \end{split}$		
AN 75um)	VELS N HALF TI FRACTIOI IAN 4.75n	FIN	NES)	GP			RED	POORLY GRADED MIXTURES, LITTL	D GRAVELS, GRAVEL-SAND E OR NO FINES	NOT MEETING ABOVE REQUIREMENTS		
OILS RGER TH	GRA DRE THAN COARSE F RGER TH		GRAVELS	GM			YELLOW	SILTY GRAVELS,	GRAVEL-SAND-SILT MIXTURES	ATTERBERG LIMITS BELOW "A" LINE OR PI LESS THAN 4		
AINED SC IGHT LAF	MO	MORE	FINES)	GC			YELLOW	CLAYEY GRAVEL	S, GRAVEL-SAND-CLAY MIXTURES	ATTERBERG LIMITS ABOVE "A" LINE AND PI MORE THAN 7		
ARSE GR F BY WE	ШлЕ	CLEAN	I SANDS	SW			RED	WELL GRADED S OR NO FINES	ANDS, GRAVELLY SANDS, LITTLE	$G_u = D_{ee}/D_{10} > 6;$ $G_e = (D_{30})^2/(D_{10}xD_{eo}) = 1 \text{ to } 3$		
CO/ HAN HAL	JDS N HALF TI FRACTIOI HAN 4.75	FIN	NES)	SP			RED	POORLY GRADED	D SANDS, GRAVELLY SANDS, NES	NOT MEETING ABOVE REQUIREMENTS		
(MORE T	SAN SALLER TI	DIRTY	SANDS	SM			YELLOW	SILTY SANDS, SA	ND-SILT MIXTURES	ATTERBERG LIMITS BELOW "A" LINE OR PI LESS THAN 4		
	M M M	MORE	FINES)	SC			YELLOW	CLAYEY SANDS, S	SAND-CLAY MIXTURES	ATTERBERG LIMITS ABOVE "A" LINE AND PI MORE THAN 7		
5um)	TS 'A" LINE GIBLE ANIC FENT	W _L <	< 50%	ML			GREEN	INORGANIC SILTS FLOUR, SILTY SA	S AND VERY FINE SANDS, ROCK NDS OF SLIGHT PLASTICITY			
R THAN 7	SIL BELOW ORGLI CON	WL>	> 50%	МН			BLUE	INORGANIC SILTS DIATOMACEOUS,	S, MICACEOUS OR FINE SAND OR SILTY SOILS			
SOILS	CLAYS 30VE "A" LINE NEGLIGIBLE ORGANIC CONTENT	WL	< 30%	CL			GREEN	INORGANIC CLAY GRAVELLY, SANE	YS OF LOW PLASTICITY, DY OR SILTY CLAYS, LEAN CLAYS	CLASSIFICATION IS BASED UPON PLASTICITY CHART (SEE BELOW)		
RAINED SOILS WEIGHT SMALI		30% < \	N _L < 50%	CI			GREEN- BLUE	INORGANIC CLAY CLAYS	'S OF MEDIUM PLASTICITY, SILTY			
FINE-C	ABA	WLS	> 50%	СН			BLUE	INORGANIC CLAY CLAYS	/S OF HIGH PLASTICITY, FAT			
RE THAN	IC SILTS LAYS "A" LINE	WL	< 50%	OL			GREEN	ORGANIC SILTS A LOW PLASTICITY	AND ORGANIC SILTY CLAYS OF	WHENEVER THE NATURE OF THE FINES CONTENT HAS NOT BEEN DETERMINED, IT IS DESIGNATED		
IOW)	ORGAN & Cl BELOW	WLS	> 50%	ОН			BLUE	ORGANIC CLAYS	OF HIGH PLASTICITY	BY THE LETTER "F", E.G. SF IS A MIXTURE OF SAND WITH SILT OR CLAY		
	HIGHLY ORG	ANIC SOILS	S	PT			ORANGE	PEAT AND OTHEF	R HIGHLY ORGANIC SOILS	STRONG COLOUR OR ODOUR, AND OFTEN FIBROUS TEXTURE		
		П	SPECIAL S	SYMBOLS			0000000000		PLASTICITY SOILS PASSIN	CHART FOR G 425µm SIEVE		
	LIMESTONE			OILS	SAND		000000000000000000000000000000000000000	60				
	SANDSTONE			SH	ALE			50	++++			
	SILTSTONE		••••••••••••••••••••••••••••••••••••••	FILL (UNDIFF	ERENTIAT	ED)				СН		
			SOIL COM	PONENTS				(% 40	+ + + + + + + + +			
F	RACTION	U.S. ST/ METRIC S	ANDARD SIEVE SIZE	C PE M	EFINING F RCENT BY MINOR COI	RANGES WEIGHT WPONEN	OF I OF TS			OH & MH		
GRAVEL	L	PASSING	RETAINED	PERCEN	т	D	ESCRIPTOR	<u>a</u> 20 — — ·				
C	OARSE	76mm	19mm	05 50				10	cL			
SAND	INE	19mm	4.75mm	35 - 50			AND	4	CL - ML OL & ML			
С	OARSE	4.75mm	2.00mm	30 - 35			Y / EY	00	10 20 30 40 5 LIQUID	0 60 70 80 90 100 IMIT (%)		
M		2.00mm	425μm	10 - 20			SOME	NOTES: 1. ALL SIEVE SIZE	ES MENTIONED ARE U.S. STANDAR	0 ASTM E.11.		
FINES (S BASED	SILT OR CLAY ON PLASTICITY)	42.5μm	7.5μπ	1 - 10			TRACE	2. COARSE GRAII GW-GC IS A W 3. DUAL SYMBOL	NED SOILS WITH TRACE TO SOME F ELL GRADED GRAVEL SAND MIXTUF S ARE USED TO INDICATE BORDER	INES GIVEN COMBINED GROUP SYMBOLS, E.G. RE WITH TRACE TO SOME CLAY. LINE SOIL CLASSIFICATIONS.		
			OVERSIZED	MATERIAL		·						
ROUND	ED OR SUBROUND	ED:		NOT ROUNDED					Wood Environment & I	nfrastructure Solutions		
COE BOU	BLES 76mm to 200 JLDERS > 200mm	mm		ROCK FRAG ROCKS > 0.7	MENTS ? 76 CUBIC I	76mm VIETRE IN	VOLUME		a Division of Woo	a Canada Limited		

PRO	JECT: City of \	Ninnipeg Waverley	Street	Investigation	DRILLE	R: Maple Leaf	f Drilling Lto	J.			TEST	HOLE ID: TH01	
CLIE	NT: Dillon Con	sulting Limited			DRILL R	RIG: Mobile B4	OLX Truck	Mounted			PROJ	ECT No: WX18717	
LOC	ATION: Waver	ley Street			DRILL M	IETHOD: 125	mm SSA				ELEV	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)	E	Grab Sample			Split-Pe	en Core	
BAC	KFILL TYPE	Bentonite		Pea Grave	el	Drill Cutting	js 🚦	Grout			Slough	<u>َثْنُ</u> Sand	_
DEPTH (m)	▲ UNCONFINED 100 200 ⊠ POCKET PEN 100 200 PLASTIC 20 40	COMPRESSION (kPa) ▲ 0 300 400 NETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID 0 60 80	MUSCS		D	SOIL ESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•		GP	GRANULAR F poorly graded	ILL (200 mi fine graine	m thick) - 20 mm d, frozen, brown	crushed gran	ular A-Base,		1			-
-	•		СН	CLAY (FILL) -	silty, trace	gravel, high plasti frozen to 1 7m gr	c, frozen, dar rev	k grey		2			-
-				GEAT - Silty, I	igii piasuc,	1102en 10 1.711, g	icy						-
-										3			-
,													-
01ECH LOG	•		сн							4			1
1 (WPG - GE										5			-
3/04 03:03 PN											-		
ET.GPJ 19/0	•									6			-
VERLY STRE				SILT - trace cl	ay, trace sa	nd, low plastic, m	ioist, soft, ligh	t brown		7			-
SATION - WA	-2			TEST HOLE 1	ERMINATE	ED AT 2.0m BELC	OW EXISTING	GRADE					2
G STREET INVESTI				Notes: - No sloughing - No seepage - Test hole rer - Test hole wa	was obser was observ nained oper s backfilled	ved during drilling ed during drilling. n to 2.0m below g with auger cutting	rade prior to t gs, bentonite,	packfilling. and sand					-
													-
STRUCTION - (-
1 CON CON													_
17 D		Wood Envir	onme	ent & Infrastr	ucture S	olutions	LOGGED B	SY: CM			CC	OMPLETION DEPTH: 2 m	0040
X187	/000.	a divis	ion o	f Wood Cana	ida Limit	ed		IRI: JM				JWIFLE HON DATE: 1 February	2019 at 1 of 1
≤					Figure No.							Shee	דרו טו ו

PRO	JECT: City of V	Vinnipeg Waverley S	treet	Investigation	DRILLE	R: Maple Leaf	Drilling Ltd.				TEST	Hole ID: TH02	
CLIE	NT: Dillon Con	sulting Limited			DRILL F	RIG: Mobile B4	OLX Truck	Mounted			PROJ	ECT No: WX18717	
LOC	ATION: Waverl	ey Street			DRILL N	METHOD: 125r	nm SSA				ELEVA	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)		Grab Sample			Split-Pe	n Core	
BAC	KFILL TYPE	Bentonite		Pea Grave	el	Drill Cuttings	5 - T	Grout		\square	Slough	ैःै Sand	
DEPTH (m)	▲ UNCONFINED 0 100 200 ⊠ POCKET PEN 100 200 PLASTIC 20 40	COMPRESSION (kPa) ▲ 300 400 ETROMETER (kPa) ⊠ 300 400 KC. LIQUID 60 80	MUSCS		C	SOIL	ON	-	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
UCITION - CITY OF WINNIPEG STREET INVESTIGATION - WAVERLY STREET.GPJ 19/03/04 03:03 PM (WPG - GEOTECH LOG 1)			GP	GRANULAR F poorly graded, CLAY - silty, tr - below 0.6m, - below 1.4m, - below 1.4m, - below 1.5m, TEST HOLE T Notes: - No sloughing - No seepage - Test hole rer - Test hole rer - Test hole wa	ILL (300 m fine grains ace sand, frequent si brown mot grey ERMINAT y was obsen mained ope s backfillec	Im thick) - 20 mm c ad, frozen, light brown high plastic, frozen It inclusions It inclusions	rushed granul: wn to 2.0m, dark	grey GRADE ckfilling. nd sand		1 2 3 4 5 6 7			
DILLON CONSTR							LOGGED BY	: CM				MPLETION DEPTH: 2 m	-
8717	hoov	Wood Enviro	nme	nt & Infrastr	ucture S	olutions	REVIEWED B	BY: JW			CC	MPLETION DATE: 9 February 2	2019
MX1		a divisi	on o	r wood Cana	ida Limi	tea	Figure No.					Shee	t 1 of 1

PRO	JECT: City of V	Vinnipeg Waverley Stre	eet Investigati	on DRILLI	ER: Maple Leaf	Drilling Ltd.			TEST	HOLE ID: TH03					
CLIE	NT: Dillon Con	sulting Limited		DRILL	RIG: Mobile B4	0LX Truck N	/lounted		PROJ	IECT No: WX18717					
LOC/	ATION: Waverl	ey Street		DRILL	METHOD: 125	mm SSA			ELEV	ATION: Not Surveyed					
SAM	PLE TYPE	Shelby Tube	No Re	covery	SPT (N)		Grab Sample		Split-Pe	en Core					
BAC	KFILL TYPE	Bentonite	Pea G	avel	Drill Cutting	S 🚺	Grout		Slough	Sand Sand					
DEPTH (m)	▲ UNCONFINED 0 100 200 ⊠ POCKET PEN 100 200 PLASTIC 20 40	COMPRESSION (kPa) ▲) 300 400 IETROMETER (kPa) ⊠) 300 400 IETROMETER (kPa) ⊠	MUSCS	I	SOIL DESCRIPT	ION		SAMPLE TYPE SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)				
- GEOTECH LOG 1)			GRANULA poorly grac	R FILL (390 ed, fine grair y, high plasti	mm thick) - 20 mm o ned, frozen, brown c, frozen to 1.5m, da	rrushed granula	r A-Base,	1 2 3 4							
ATION - WAVERLY STREET.GPJ 19/03/04 03:03 PM (WPG -	•		CH - from 1.5n	n to 2.0m, sti	ff, moist			5 6 7							
			IEST HOL Notes: - No slougi - No seepa - Test hole - Test hole	E TERMINA ing was obse remained op was backfille	IED AI 2.0m BELC erved during drilling. rved during drilling. en to 2.0m below g ed with auger cutting	ade prior to bac s, bentonite, an	kfilling. d sand								
(18717	vood.	Wood Environ a division	ment & Infra	structure : Inada I im	Solutions iited	REVIEWED B	Y: JW		C	OMPLETION DATE: 1 February	2019				
× ·		4 41413101		Genada Limited Figure No.						COMPLETION DATE: 1 February 2019 Sheet 1 of 1					

PRO	JECT: City of W	Vinnipeg Waverley	Stree	t Investigation	DRILLEF	R: Maple Leaf	Drilling Ltd.			TEST	HOLE ID: TH04		
CLIE	NT: Dillon Cons	sulting Limited			DRILL R	IG: Mobile B4	OLX Truck Mo	ounted		PROJ	IECT No: WX18717		
LOC	ATION: Waverle	ey Street			DRILL N	IETHOD: 125r	nm SSA			ELEV	ATION: Not Surveyed		
SAM	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)	G	rab Sample		Split-Pe	en Core		
BAC	KFILL TYPE	Bentonite		Pea Grave	el	Drill Cuttings	G	rout	Γ	Slough	ैः Sand		
DEPTH (m)	▲ UNCONFINED C 100 200 ⊠ POCKET PEN: 100 200 PLASTIC 4 20 40	COMPRESSION (kPa) ▲ 300 400 ETROMETER (kPa) ⊠ 300 400 M.C. LIQUID €0 90	SUIL SYMBUL MUSCS		D	SOIL	ON		SAMPLE TYPE SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)	
on construction - city of winniped street investigation - waverLy street.cpJ 19/03/04 03:03 PM (WPG - GEOTECH LOG 1)			GF	GRANULAR F poorly graded CLAY - silty, h - below 0.8m, - below 1.1m, - below 1.1m, - No sloughing - Test hole rer - Test hole rer - Test hole wa	TILL (175 mr fine grained igh plastic, i grey, occasi brown mottl FERMINATE was observen nained oper s backfilled	n thick) - 20 mm c d, frozen, light bro frozen to 2.0m, da ional silt ed grey ED AT 2.0m BELO ved during drilling. ed during drilling. n to 2.0m below gr with auger cutting	rushed granular / wn rk grey W EXISTING GF ade prior to backt s, bentonite, and	A-Base, A-Base,					
WX18717 DILI	vood.	Wood Envi a divi	ent & Infrastr of Wood Cana	tructure Solutions nada Limited LOGGED BY: CM REVIEWED BY: JW Figure No.						COMPLETION DEPTH: 2 m COMPLETION DATE: 9 February 2019 Sheet 1 of 1			

PRO	JECT: City of V	Vinnipeg Waverley	Street	Investigation DRI	LLER: Maple Lea	Drilling Ltd.			-	TEST	HOLE ID: TH05			
CLIE	NT: Dillon Con	sulting Limited		DRI	LL RIG: Mobile B4	OLX Truck M	ounted			PROJE	ECT No: WX18717			
LOCA	ATION: Waverle	ey Street		DRI	LL METHOD: 125	mm SSA				ELEVA	TION: Not Surveyed			
SAMF	PLE TYPE	Shelby Tube		No Recovery	SPT (N)		Grab Sample		<u> </u>	Split-Pe	n Core			
BACK	FILL TYPE	Bentonite		Pea Gravel	Drill Cutting	ls 🚺 🤅	Grout		<u> </u>	Slough	:: Sand			
DEPTH (m)	▲ UNCONFINED C 100 200 ⊠ POCKET PEN 100 200 PLASTIC ↓ 20 40	COMPRESSION (kPa) ▲ 300 400 ETROMETER (kPa) ⊠ 300 400 C M.C. LIQUID 60 80	AUIL STIMBUL MUSCS		SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)		
0	•		GP	GRANULAR FILL (2 poorly graded, fine g	00 mm thick) - 20 mm rained, frozen, brown	crushed granular	A-Base,		1			_		
-	ŀ	-	Ŷ	CLAY - silty, sandy, organic inclusions	high plastic, frozen to	1.5m, dark grey, d	occasional		2		Particle Size Analysis - Sample	-		
-	•			- below 0.5m, trace s	sand, grey				3		2 @ 0.2m: Gravel= 0.0% Sand= 23.1% Silt= 43.8% Clay= 33.0%	-		
GEOTECH LOG 1)	•								4			- - 1		
04 03:03 PM (WPG -	•		СН						5			_		
STREET.GPJ 19/03/	•			- below 1.5m, stiff, moist, brown mottled grey					6			-		
ION - WAVERLY									7			-		
S STREET INVESTIGAT	2			TEST HOLE TERMI Notes: - No sloughing was of - No seepage was of - Test hole remained - Test hole was back	NATED AT 2.0m BELC observed during drilling, bserved during drilling, l open to 2.0m below g filled with auger cutting	DW EXISTING Gi rade prior to back gs, bentonite, and	RADE (filling. I sand					2 		
												-		
												- - -		
8717	hoo	Wood Envi	onme	ent & Infrastructur	re Solutions	REVIEWED BY	': JW				MPLETION DATE: 1 February 2	019		
WX1		a divis	sion o	r wood Canada L	imitea	REVIEWED BY: JW Figure No.					Sheet 1 of			

PRO	JECT: City of W	/innipeg Waverley	Stree	t Investigation	DRILLE	R: Maple Leaf	Drilling Lt	d.			TEST	HOLE ID: TH06	
CLIE	NT: Dillon Cons	sulting Limited			DRILL F	RIG: Mobile B4	OLX Truck	Mounted			PROJ	ECT No: WX18717	
LOCA	ATION: Waverle	ey Street			DRILL N	IETHOD: 125	mm SSA				ELEV	ATION: Not Surveyed	
SAMF	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)	[Grab Sample			Split-Pe	en Core	
BACK	(FILL TYPE	Bentonite		Pea Grave	el	Drill Cutting	IS	Grout		\square	Slough	👬 Sand	
DEPTH (m)	▲ UNCONFINED C 100 200 ⊠ POCKET PENE 100 200 PLASTIC 20 40	COMPRESSION (kPa) ▲ 300 400 ETROMETER (kPa) ⊠ 300 400 COMPARIANCE END ETROMETER (kPa) ⊠ 300 400 COMPARIANCE END ETROMETER (kPa) ⊠ 50 400 ETROMETER (kPa) ∑ 50 400 ETROMETE	AUL SYMBUL MUSCS		D	SOIL ESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•		GF	GRANULAR F poorly graded	ILL (175 m fine graine	m thick) - 20 mr d, frozen, light bro	n crushed gr own	anular A-Base,		1			-
-			⊗ сн	CLAY (FILL) -	silty, trace	sand, high plastic	, frozen, darł	(grey		2			-
-				CLAY - silty, to	ace sand, h	high plastic, frozer	n to 2.0m, da	ırk grey,	_				_
_	•			occasional org	anic inclusi	ions				3			_
÷				- below 0.8m,	no organic	inclusions							-
	•							4			1		
VPG - GEO													-
1.03 PM ()				l - below 1.2m,	trace sand,	grey				5			-
19/03/04 (- below 1.4m,	no sand, fre	equent silt inclusic	ons, brown m	ottled grey					-
REET.GPJ	••••••••••••••••••••••••••••••••••••••									6			_
AVERLY ST										7			-
		•		TEST HOLE 1	ERMINATE	ED AT 2.0m BELC	OW EXISTIN	G GRADE	_				2
S STREET INVESTIC				Notes: - No sloughing - No seepage - Test hole rer - Test hole wa	was obser was observ nained oper s backfilled	ved during drilling red during drilling. n to 2.0m below g with auger cutting	rade prior to gs, bentonite	backfilling. , and sand					-
													_
ON - CITY (_
													-
8717	hoo	Wood Envi	ronm	ent & Infrastr	ucture S	olutions	REVIEWE	DBY: JW				OMPLETION DATE: 9 February 2	2019
WX1	000.	a divi	of Wood Cana	ida Limit	ed	Figure No.					Shee	t 1 of 1	

PROJ	IECT: City of V	Vinnipeg Waverley	Street	Investigation	DRILLE	ER: Maple Le	af Drilling	Ltd.			TEST	HOLE ID: TH07	
CLIEN	NT: Dillon Con	sulting Limited			DRILL I	RIG: Mobile	B40LX Tru	uck Mounted			PROJ	ECT No: WX18717	
LOCA	TION: Waver	ley Street			DRILL I	METHOD: 12	25mm SS	٩			ELEV	ATION: Not Surveyed	
SAMF	PLE TYPE	Shelby Tube		No Recove	ery	SPT (N)		Grab Sample	•		Split-Pe	en Core	
BACK	FILL TYPE	Bentonite		Pea Grave	el	Drill Cutti	ings	Grout			Slough	<u>ः</u> Sand	
, DEPTH (m)	▲ UNCONFINED 100 200 ⊠ POCKET PEN 100 200 PLASTIC ↓ 20 40	COMPRESSION (kPa) ▲ 0 300 400 VETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID 60 80	MUSCS		[SOIL DESCRIP	TION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•		GP	GRANULAR F poorly graded,	ILL (200 n fine grain	nm thick) - 20 m ed, frozen, brow	m crushed g n	ranular A-Base,		1			-
-				CLAY - silty, h	igh plastic	c, frozen to 2.0m,	grey		_				-
-	•									2			_
-													_
-										3			_
06 1)													-
										4			1
WPG - GE			СН										-
3:03 PM (5			-
19/03/04 0													_
ET.GPJ	•			- below 1.5m,	brown mot	ttled grey				6			-
													_
DN - WAVE										7			-
G STREET INVESTIGATIC		C		TEST HOLE T Notes: - No sloughing - No seepage 1 - Test hole ren - Test hole was	ERMINAT was obser was obser nained ope s backfiller	FED AT 2.0m BE erved during drilli ved during drillin en to 2.0m below d with auger cutt	LOW EXIST ng. g. grade prior ings, bentor	ING GRADE to backfilling. ite, and sand					2 - -
													-
N - CITY C													_
													_
ON CONS													-
	<u> </u>	<u> </u>				Na la d'	LOGGED BY: CM			COMPLETION DEPTH: 2 m			
1871 M	ood.	wood Envir a divis	ion o	nt & Intrastri f Wood Cana	ucture S Ida Limi	bolutions	REVIEV	VED BY: JW			CC	OMPLETION DATE: 1 February 2	2019
š i		a division of Wood Ca					Figure N	lo.				Shee	t 1 of 1

CLEUNC Dillin Consulting Limited ORILL RIC: Mobile 84/02.17 tack. Mounted PROJECT No: WK18717 LOCATION: Wavefey Street Dellu METHOD: 125mm SSA ELEVATION: Not Surveyed SAMPLE TYTYE Stell tack Deltu METHOD: 125mm SSA ELEVATION: Not Surveyed RACCELL TYTE Stell tack Deltu METHOD: 125mm SSA ELEVATION: Not Surveyed RACCELL TYTE Stell tack Deltu METHOD: 125mm SSA ELEVATION: Not Surveyed RACCELL TYTE Stell tack Deltu METHOD: 125mm SSA ELEVATION: Not Surveyed RACCELL TYTE Stell tack Deltu METHOD: 125mm SSA ELEVATION: Not Surveyed RACCELL TYTE Stell tack Deltu METHOD: 125mm SSA ELEVATION: Not Surveyed RACCELL TYTE Stell tack Deltu METHOD: 125mm SSA ELEVATION: Not Surveyed RACCELL TYTE Stell tack Deltu METHOD: 125mm SSA ELEVATION: Not Surveyed RACCELL TYTE Stell tack Deltu METHOD: 125mm SSA SOIL RACCELL TYTE Stell tack Deltu METHOD: 125mm SSA Soil tack RACCELL TYTE Stell tack Deltu METHOD: 125mm SSA Soil tack RACCELL TYTE Stell tack Soil tack Soil tack Soil tack RACCELL TYTE Stell tack Soil tack Soil tack Soil tack RACC	PRO	JECT: City of V	Vinnipeg Waverley	Street	Investigation DRIL	LER: Maple Lea	f Drilling Ltd.			TES	ST HO	DLE ID: TH08	
LOCATION: Wavefey Street DRILL METHOD:: 126m BSA ELEVATION: Not Surveyed SAMPLE TYPE Barbonic Comments Co	CLIE	NT: Dillon Con	sulting Limited		DRIL	L RIG: Mobile B	10LX Truck N	lounted		PR	OJEC	T No: WX18717	
SAME ETYPE Serie Pro Income	LOCA	ATION: Waverl	ey Street		DRIL	L METHOD: 125	imm SSA			ELE	VATI	ON: Not Surveyed	
	SAM	PLE TYPE	Shelby Tube		No Recovery	SPT (N)		Grab Sample		Split	-Pen	Core	
ALXCOMESCOR PRATE COMPLETION REFERENCES OF PRATE STOLES ANALYSIS OF A COMPLETION REFERENCES OF PRATE STOLES ANALYSIS OF A COMPLETION REFERENCES OF A CO	BAC	KFILL TYPE	Bentonite		Pea Gravel	Drill Cuttine	js [Grout		Slou	gh	👬 Sand	
0 GRANULAR FIL (175 mm thick) - 20 mm cutabed granular A Base. 1 0 Start Fill (1) - clayer, frace sand, medium pletic, frazen, dark grey 2 1 Start Fill (1) - clayer, frace sand, medium pletic, frazen, dark grey 2 1 - below 0.5m, abundant elit indusions 3 1 - below 0.5m, abundant elit indusions 3 1 - below 0.5m, abundant elit indusions 3 1 - below 1.1m, grey, frequently sit inclusions, no organic inclusions 5 - below 1.1m, grey, frequently sit inclusions, no organic inclusions 5 - below 1.1m, grey, frequently sit inclusions, no organic inclusions 5 - below 1.1m, grey, frequently sit inclusions, no organic inclusions 6 1 - below 1.1m, grey, frequently sit inclusions, no organic inclusions 6 1 - below 1.1m, grey, frequently sit inclusions, no organic inclusions 6 1 - below 1.4m, brown matted grey 7 7 1 - below 1.4m, brown matted grey 7 7 1 - below 1.4m, brown matted grey 7 7 1 - below 1.4m, brown matted grey 7 7 1 - below 1.4m, brown matted grey	DEPTH (m)	▲ UNCONFINED 0 100 200 ⊠ POCKET PEN 100 200 PLASTIC 4 20 40	COMPRESSION (kPa) ▲) 300 400 IETROMETER (kPa) ⊠) 300 400 ECROMETER (kPa) ⊠) 300 400 ECROMETER (kPa) ⊠ 5 60 80	MUSCS		SOIL DESCRIPT	ION		SAMPLE TYPE	SPT (N)		COMMENTS	DEPTH (m)
	0	•		GP	GRANULAR FILL (17) poorly graded, fine gra	'5 mm thick) - - 20 m ained, frozen, light br	m crushed granul own	ar A-Base,					_
	-	•		ML- CI	SILT (FILL) - clayey, t - below 0.5m, abunda	trace sand, medium p Int silt inclusions	lastic, frozen, dai	'k grey		2			-
Company CH - below 1.1m, grey, frequently silt inclusions, no organic inclusions Image: ds.97% CH - below 1.1m, grey, frequently silt inclusions, no organic inclusions Image: ds.97% CH - below 1.4m, brown mottled grey Image: ds.97% TEST HOLE TERMINATED AT 2.0m BELOW EXISTING GRADE Image: ds.97% No segage was observed during driling. - No segage was observed during driling. No segage was observed during driling. - Test hole emained gren to 2.0m below grade prior to backfilling. - Test hole emained gren to 2.0m below grade prior to backfilling. - Test hole emained gren to 2.0m below grade prior to backfilling. - Test hole of the image was observed during driling. - Test hole emained gren to 2.0m below grade prior to backfilling. - Test hole of the image was observed during below grade prior to backfilling. - Test hole mained gren to 2.0m below grade prior to backfilling. - Test hole of the image was observed during below grade prior to backfilling. - Test hole mained gren to 2.0m below grade prior to backfilling. - Test hole of the image of the i	1	•	'		CLAY - silty, high plas	stic, frozen to 2.0m, d	ark grey, frequen	t organic		3	Pa 3 (Sa Sil	article Size Analysis - Sample @ 0.5m: and= 7.2% It= 51.3%	-
	- GEOTECH LOG				- below 1.1m, grey, fre	equently silt inclusion	s, no organic incl	usions		1	Cla	ay= 39.5%	1
1 -	3/04 03:03 PM (WPG	•		сн	- below 1.4m, brown r	mottled grey				5			-
1 -	STREET.GPJ 19/0	•								3			-
3 Wood Environment & Infrastructure Solutions a division of Wood Canada Limited LOGGED BY: CM COMPLETION DEPTH: 2 m	ation - waverly					IATED AT 2 0m REI (OW EXISTING G	RADE		7			2
3 Wood Environment & Infrastructure Solutions a division of Wood Canada Limited LOGGED BY: CM COMPLETION DEPTH: 2 m REVIEWED BY: JW COMPLETION DATE: 9 February Figure No. She	IPEG STREET INVESTIG				Notes: - No sloughing was ob - No seepage was obs - Test hole remained of - Test hole was backfi	bserved during drilling served during drilling open to 2.0m below g illed with auger cuttin	j. Irade prior to bac gs, bentonite, and	kfilling. d sand					-
3 Wood Environment & Infrastructure Solutions a division of Wood Canada Limited LOGGED BY: CM COMPLETION DEPTH: 2 m REVIEWED BY: JW COMPLETION DATE: 9 February Figure No	JCTION - CITY OF WINN												-
Wood Environment & Infrastructure Solutions a division of Wood Canada Limited COMPLETION DEPTH: 2 m Image: Completion of Wood Canada Limited Reviewed BY: UM COMPLETION DATE: 9 February								CM					_
a division of Wood Canada Limited	7171	(aad	Wood Envir	onme	nt & Infrastructure	e Solutions	REVIEWED BY:	CM (· .IW			COMP	LETION DEPTH: 2 m	019
	WX18	1000.	a divis	sion o	f Wood Canada Lii	mited	Figure No.				50101	Sheel	t 1 of 1

PRO	JECT: City of V	Vinnipeg Waverley	Street	Investigation	DRILLE	ER: Maple Lea	f Drilling l	_td.			TEST	Hole ID: TH09	
CLIE	NT: Dillon Con	sulting Limited			DRILL	RIG: Mobile B	40LX Tru	ck Mounted			PROJ	ECT No: WX18717	
LOC	ATION: Waverl	ey Street			DRILL	METHOD: 125	imm SSA				ELEV	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube	9	No Recove	ery	SPT (N)		Grab Sample			Split-Pe	en Core	
BAC	KFILL TYPE	Bentonite		Pea Grave	el	Drill Cutting	gs	Grout			Slough	ैःै Sand	
DEPTH (m)	▲ UNCONFINED 0 100 200 ⊠ POCKET PEN 100 200 PLASTIC ↓ 20 40	COMPRESSION (kPa) ▲) 300 400 IETROMETER (kPa) ⊠) 300 400 M.C. LIQUID 60 80	SOIL SYMBOL MUSCS		[SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•		🕅 GP	GRANULAR F	ILL (100 r	mm thick) - 20 mm	crushed gra	anular A-Base,		1			
on construction - city of winniped street investigation - waverLy street.GPJ 19/03/04 03:03 PM (WPG - GEOTECH LOG 1)			CH	 below 0.5m, 1 below 0.5m, 1 below 1.7m, 1 TEST HOLE T Notes: No sloughing No seepage 1 Test hole ren Test hole wat 	fine grain igh plastic grey brown mo ERMINAT was obser nained opp s backfille	ttled grey FED AT 2.0m BEL erved during drilling en to 2.0m below d with auger cuttin	DW EXISTI g. grade prior t gs, bentonit	n NG GRADE o backfilling. ie, and sand		1 2 3 4 5 6 7			
		Wood Env	ironmo	nt & Infractr	uctura	Solutions	LOGGED	BY: CM			CC	MPLETION DEPTH: 2 m	·
X187	/000 .	a div	ision o	f Wood Cana	ida Limi	ited	REVIEW	ED BY: JW			CC	OMPLETION DATE: 1 February 2	2019
≥							I rigure No	J.				Shee	ιι OΓ Ί

PRC	JECT: City of \	Winnipeg Waverley	Street	Investigation	DRILLI	ER: Maple Leaf	Drilling L	td.			TEST	HOLE ID: TH10	
CLIE	ENT: Dillon Cor	sulting Limited			DRILL	RIG: Mobile B4	OLX Truc	k Mounted			PROJ	ECT No: WX18717	
LOC	ATION: Waver	ley Street			DRILL	METHOD: 125	mm SSA				ELEV	ATION: Not Surveyed	
SAM	IPLE TYPE	Shelby Tube		No Recov	ery	SPT (N)		Grab Sample			Split-Pe	n Core	
BAC	KFILL TYPE	Bentonite		Pea Grave	el	Drill Cutting	S	Grout			Slough	ંઁાઁ Sand	
DEPTH (m)	▲ UNCONFINED 100 20 ⊠ POCKET PEI 100 20 PLASTIC 20 40	COMPRESSION (kPa) ▲ 0 300 400 NETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID 0 60 80	AUL STIMBUL MUSCS		I	SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•		GP	GRANULAR F poorly graded,	ILL (150 fine grain	mm thick) - 20 mm (ned, frozen, light bro	crushed gra	nular A-Base,		1			
-			Ž	CLAY - silty, h	igh plasti	c, frozen to 2.0m, gr	rey to brown	I	-				_
-										2			_
-													_
-													_
-	•									3			_
-				- below 1.8m,	frequent s	silt inclusions							_
L0G 1)					·				=	1			_
										4			-1
PG - GE			СН										_
M M	•									5			-
4 03:03													-
19/03/0				- below 4.3m,	brown mc	ottied grey							_
ET.GPJ	•									6			_
Y STRE													_
VAVERL	•									7			_
- NOIT													-
TREET INVESTIGA				IEST HOLE T Notes: - No sloughing - No seepage - Test hole ren - Test hole wa	ERMINA was obse was obse nained op s backfille	TED AT 2.0m BELC erved during drilling rved during drilling. en to 2.0m below g d with auger cutting	rade prior to gs, bentonite	lG GRADE backfilling. e, and sand					-
AIPEG S												_	
OF WIN												_	
I- CITY													_
													_
CONSTR													_
NOT 3													
17 DI		Wood Envi	onme	ent & Infrastr	ucture	Solutions	LOGGED	BY: CM			CC	OMPLETION DEPTH: 2 m	
X187	vood.	a divis	sion o	f Wood Cana	ida Lim	ited		d by: Jw				OMPLETION DATE: 9 February 2	2019
≥												Shee	נוטרו

PRO	JECT: City of V	Vinnipeg Waverley S	treet	Investigation	DRILLE	ER: Maple Lea	f Drilling	Ltd.			TEST	HOLE ID: TH11	
CLIEI	NT: Dillon Con	sulting Limited			DRILL	RIG: Mobile B	40LX Tru	ck Mounted			PROJ	ECT No: WX18717	
LOCA	ATION: Waverl	ey Street			DRILL	METHOD: 12	5mm SSA	١			ELEV	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)		Grab Sample			Split-Pe	en Core	
BAC	KFILL TYPE	Bentonite		Pea Grave	el	Drill Cuttin	gs	Grout			Slough	ै <u>ः</u> Sand	_
DEPTH (m)	▲ UNCONFINED 0 100 200 ⊠ POCKET PEN 100 200 PLASTIC ↓ 20 40	COMPRESSION (kPa) ▲) 300 400 IETROMETER (kPa) ⊠) 300 400 M.C. LIQUID 60 80	MUSCS]	SOIL DESCRIPT	ΓΙΟΝ		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
-	•		GP	GRANULAR F poorly graded,	ILL (200 r fine grain	mm thick) - 20 mm ned, frozen, brown	I crushed gr	anular A-Base,		1			-
_				CLAY - silty, tr	ace sand,	, high plastic, froze	en to 1.5m,	dark grey	_				-
_										2			_
-													-
-										3			-
1 FIC 1)										4			-
CEOTECH				holow 1.1m		araviah bravna							-1
M (WPG -	•		СП	- Delow 1. III,	no sanu, į	greyisii biowii				5			-
/04 03:03 P													_
GPJ 19/03	•			- below 1.5m,	very stiff,	brown mottled gre	у			6			-
Y STREET.													-
- WAVERL										7			_
2-7				TEST HOLE T	ERMINA	TED AT 2.0m BEL	OW EXIST	NG GRADE					-2
G STREET INVES				 No sloughing No seepage Test hole ren Test hole was 	was observas observ Nastra observas observ	erved during drillin rved during drilling en to 2.0m below ed with auger cuttir	g. J. grade prior Igs, bentoni	to backfilling. te, and sand					-
DF WINNIPE													_
													_
													-
3													_
17 DI		Wood Envir	onme	nt & Infrastr	ucture 9	Solutions	LOGGE	DBY: CM			CC	OMPLETION DEPTH: 2 m	
X187	/00 0 .	a divis	on o	f Wood Cana	da Lim	ited	REVIEW	ED BY: JW			CC	DMPLETION DATE: 1 February 2	2019
≥							∣ ⊢igure N	υ.				Sheet	u i of i

PRO	JECT: City of Winnipeg	Waverley Stre	et Investigation C	RILLER: Maple Leaf [Drilling Ltd.			TEST	Hole ID: TH12	
CLIE	NT: Dillon Consulting L	imited	C	RILL RIG: Mobile B40	LX Truck Mounted			PROJE	ECT No: WX18717	
LOC/	ATION: Waverley Stree	et	C	RILL METHOD: 125m	nm SSA			ELEVA	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube	No Recovery	/ SPT (N)	Grab Sample	9		Split-Pe	n Core	
BAC	KFILL TYPE	Bentonite	Pea Gravel	Drill Cuttings	Grout			Slough	ैःै Sand	
DEPTH (m)	▲ UNCONFINED COMPRESS 100 200 300 ⊠ POCKET PENETROMETE 100 200 300 PLASTIC M.C. L 20 40 60	ION (kPa) ▲ 400 ION (kPa) ▲ 400 ION (kPa) ▲ 400 ION (kPa) ▲ 108 K (kPa) ▲ 400 ION (kPa) ▲ 108 K (kPa) ▲ 400 ION (kPa) ▲ 100 ION (kPa) (kPa) ▲ 100 ION (kPa)	COCOM	SOIL DESCRIPTI	ON	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0 - -	•	G	GRANULAR FILI poorly graded, fir	L (250 mm thick) - 20 mm cr ne grained, frozen, light brow	ushed granular A-Base, /n		1			-
-	•		CLAY - silty, trac	æ sand, high plastic, frozen f	to 2.0m, dark grey		2			-
-	•••••••••••••••••••••••••••••••••••••••						3			_
TECH LOG 1)	•		- below 0.8m, gre inclusions	ey, occasional sulphate inclu	sions, occasional silt		4			-
PM (WPG - GEO	•	c	н				5			-
U 19/03/04 03:03	•		- below 1.4m, bro	own mottled grey			6			-
RLY STREET.GF										-
GATION - WAVE	•		TEST HOLE TEP	RMINATED AT 2.0m BELOV	V EXISTING GRADE		7			2
EG STREET INVEST			- No sloughing w - No sloughing w - No seepage wa - Test hole remai - Test hole was b	as observed during drilling. Is observed during drilling. Ined open to 2.0m below gra packfilled with auger cuttings	de prior to backfilling. , bentonite, and sand					-
CITY OF WINNIP										-
										-
IOT 3										
17 D.		Vood Environ	nent & Infrastruc	ture Solutions	LOGGED BY: CM			CO	OMPLETION DEPTH: 2 m	
×187	/00 0 .	a division	of Wood Canad	a Limited	REVIEWED BY: JW			CO	OMPLETION DATE: 9 February 2	019
ŝ					⊢igure No.				Sheet	t 1 of 1



PRO	JECT: City of V	Ninnipeg Waverley	Street	Investigation	DRILLE	R: Maple Leaf	Drilling Lto	ł.			TEST	Hole ID: TH14	
CLIE	NT: Dillon Con	sulting Limited			DRILL F	RIG: Mobile B4	0LX Truck	Mounted			PROJ	ECT No: WX18717	
LOC	ATION: Waver	ley Street			DRILL I	METHOD: 125	mm SSA				ELEV	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)		Grab Sample			Split-Pe	n Core	
BAC	KFILL TYPE	Bentonite		Pea Grave	el	Drill Cutting	s .	Grout			Slough	ै <u>ः</u> Sand	
DEPTH (m)	▲ UNCONFINED 100 200 ⊠ POCKET PEN 100 200 PLASTIC 20 40	COMPRESSION (kPa) ▲ 0 300 400 NETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID 60 80	SOIL SYMBOL MUSCS		C	SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•		\otimes	GRANULAR F	ILL (275 n	nm thick) - 20 mm (crushed granu	ular A-Base,		1			
DNSTRUCTION - CITY OF WINNIPEG STREET INVESTIGATION - WAVERLY STREET.GPJ 19/03/04 03:03 PM (WPG - GEOTECH LOG 1)			GP	CLAY - silty, h - below 0.5m, - below 0.9m, - below 0.9m, TEST HOLE T Notes: - No sloughing - Test hole rer - Test hole rer - Test hole wa	igh plastic, grey, occa grey mottle <u>FERMINAT</u> y was obser nained ope s backfilled	ED AT 2.0m BELC rved during drilling with auger cutting	ark grey ark grey s WEXISTING rade prior to b s, bentonite,	G GRADE		1 2 3 4 5 6 7			
NO													F
3 DIF								V: CM					
212	hood	Wood Envi	ronme	nt & Infrastr	ucture S	Solutions		BY: JW				MPLETION DEPTH: 2 M	2019
VX18	1000.	a divi	sion o	f Wood Cana	ada Limi	ted	Figure No					Shee	t 1 of 1
												,	

PRO	JECT: City of V	Vinnipeg Waverley	Street	Investigation DRIL	LER: Maple Lea	Drilling Ltd.			-	TEST I	HOLE ID: TH15	
CLIE	NT: Dillon Cons	sulting Limited		DRIL	L RIG: Mobile B4	IOLX Truck	Vounted		I	PROJE	ECT No: WX18717	
LOCA	ATION: Waverle	ey Street		DRIL	L METHOD: 125	mm SSA				ELEVA	TION: Not Surveyed	
SAMF	PLE TYPE	Shelby Tube		No Recovery	SPT (N)		Grab Sample			Split-Per	n Core	
BACK	FILL TYPE	Bentonite		Pea Gravel	Drill Cutting	js	Grout		<u> </u>	Slough	<u>ُث</u> ُ Sand	
DEPTH (m)	▲ UNCONFINED C 100 200 ⊠ POCKET PEN 100 200 PLASTIC ▲ 20 40	COMPRESSION (kPa) ▲ 300 400 ETROMETER (kPa) ⊠ 300 400 M.C. LIQUID 60 80	MUSCS		SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•		\otimes	GRANULAR FILL (20 graded fine grained	0 mm thick) - 20 mm frozen brown	crushed limesto	ne, poorly		1			
JCTION - CITY OF WINNIPEG STREET INVESTIGATION - WAVERLY STREET.GPJ 19/03/04 03:03 PM (WPG - GEOTECH LOG 1)			GP	 CLAY - silty, trace gragrey - below 0.5m, no grav - below 1.7m, brown to the second sec	mottled grey, moist, s vel, grey	plastic, frozen to iiff DW EXISTING (, rade prior to bac gs, bentonite, ar	D 1.7m, dark		1 2 3 4 5 6 7			
	l					100055 5						-
717 L	and	Wood Envi	ronme	ent & Infrastructur	e Solutions		CM				MPLETION DEPTH: 2 m	010
X18	000.	a divi	sion o	f Wood Canada Li	imited	Figure No.	JI. UVV					t 1 of 1
~						1 0. 21101					61166	- · ·

PRO	JECT: City of W	Vinnipeg Waverley	Street	Investigation	DRILLE	R: Maple Leaf	Drilling Ltd.				TEST	HOLE ID: TH16	
CLIEI	NT: Dillon Cons	sulting Limited			DRILL F	RIG: Mobile B4	0LX Truck	Mounted			PROJ	ECT No: WX18717	
LOCA	ATION: Waverle	ey Street			DRILL N	METHOD: 125r	nm SSA				ELEV	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)	E	Grab Sample			Split-Pe	n Core	
BAC	(FILL TYPE	Bentonite		Pea Grave	el	Drill Cuttings	6	Grout		\square	Slough	<u>ُبْ</u> Sand	
DEPTH (m)	▲ UNCONFINED C 100 200 ⊠ POCKET PENI 100 200 PLASTIC 20 40	COMPRESSION (kPa) ▲ 300 400 ETROMETER (kPa) ⊠ 300 400 M.C. LIQUID 60 80	AUL STMBUL MUSCS		D	SOIL DESCRIPTI	ON		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
-	•		GP	GRANULAR F poorly graded	ILL (225 m fine graine	nm thick) - 20 mm c ed, frozen, light bro	rushed granula wn	ar A-Base,		1			-
_				CLAY - silty, t	race sand, I	high plastic, frozen	to 2.0m, dark	grey					_
_	•									2			_
-				- below 0.5m,	grey, occas	sional silt inclusions	3			2			_
-										3			_
ECH LOG 1)										4			_
1-1 - 0 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1			СН										1 -
:03 PM (WI	•									5			_
19/03/04 03				- below 1.4m,	brown moti	tled grey							-
REET.GPJ										6			_
	•									7			-
2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -				TEST HOLE 1	ERMINATI	ED AT 2.0m BELO	W EXISTING	GRADE					2
				Notes: - No sloughing - No seepage - Test hole rer - Test hole wa	was obserwas observ was observ nained ope s backfilled	rved during drilling. /ed during drilling. n to 2.0m below gr I with auger cutting	ade prior to ba s, bentonite, a	ckfilling. nd sand					-
													_
ION - CITY													
													_
NON													F
							LOGGED BY	: CM				DMPLETION DEPTH: 2 m	
18717 M	hoo	Wood Envi	ronme	ent & Infrastr	ucture S	olutions	REVIEWED E	BY: JW			CC	OMPLETION DATE: 9 February 2	2019
× V		a divis				leu	Figure No.					Shee	t 1 of 1

PRO	JECT: City of \	Ninnipeg Waverley	Stre	et Investigation	DRILLEF	R: Maple Leaf [Drilling Ltd.				TEST	Hole ID: TH17	
CLIEI	NT: Dillon Cor	sulting Limited			DRILL R	IG: Mobile B40	LX Truck	Mounted			PROJI	ECT No: WX18717	
LOCA	ATION: Waver	ley Street			DRILL M	IETHOD: 125m	nm SSA				ELEVA	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube			very	SPT (N)	E	Grab Sample			Split-Pe	n Core	
BAC	KFILL TYPE	Bentonite		Pea Grav	el	Drill Cuttings	1000 1000	Grout			Slough	ैःै Sand	
DEPTH (m)	▲ UNCONFINED 100 20 ⊠ POCKET PEI 100 20 PLASTIC 40 20 40	COMPRESSION (kPa) ▲ 0 300 400 NETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID ↓ 0 60 80	SOIL SYMBOL	COCOM	D	SOIL ESCRIPTI	ON		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•		G	GRANULAR poorly graded	FILL (200 mr , fine grained	n thick) - 20 mm cr d, frozen, brown	ushed granu	ar A-Base,		1			-
-				CLAY (FILL) dark grey	silty, trace s	sand, trace gravel,	high plastic, ∶	rozen to 1.7m,		2			-
-	•									3			-
CH LOG 1)	•		Ж С	H - below 0.9m,	dark grey wi	ith large brown poc	kets (~50mr	ı diameter)		4			-
1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-													-1
/03/04 03:03 PM										5			-
STREET.GPJ 16	•			SILT - some of	clay, trace sa	ind, low plastic, ver	y moist, soft,	light brown		6			-
ION - WAVERLY	•		N	IL						7			-
G STREET INVESTIGA				TEST HOLE Notes: - No sloughin - No seepage - Test hole re - Test hole wa	TERMINATE g was observe was observe mained open as backfilled	D AT 2.0m BELOV ved during drilling. ed during drilling. to 2.0m below gra with auger cuttings	V EXISTING de prior to ba , bentonite, a	GRADE ackfilling. ind sand					
- CITY OF WINNIPE													-
													-
								· CM					
8717	hoo	Wood Envi	ronn	nent & Infrast	ucture So	olutions	REVIEWED	BY: JW				MPLETION DATE: 1 February	2019
TXN VX		a divi	sion	of wood Can	ada Limite	ed	Figure No.					She	et 1 of 1

PROJ	ECT: City of	Winnipeg Waverle	y St	reet	Investigation	DRILLE	ER: Maple Lea	i Drilling L	_td.			TEST	HOLE ID: TH18	
CLIEN	NT: Dillon Cor	nsulting Limited				DRILL	RIG: Mobile B4	40LX True	ck Mounted			PROJ	ECT No: WX18717	
LOCA	TION: Waver	rley Street				DRILL	METHOD: 125	mm SSA				ELEV	ATION: Not Surveyed	
SAMF	PLE TYPE	Shelby Tub	е		No Recove	ery	SPT (N)		Grab Sample			Split-Pe	n Core	
BACK	FILL TYPE	Bentonite			Pea Grave	I	Drill Cutting	js	Grout		\square	Slough	ં ે Sand	
DEPTH (m)	▲ UNCONFINED 100 20 ⊠ POCKET PE 100 20 PLASTIC ↓ 20 44	COMPRESSION (kPa) ▲ 00 300 400 NETROMETER (kPa) ⊠ 300 400 M.C. LIQUID 0 0 60 80	SOIL SYMBOL	MUSCS		[SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
	•			GP	GRANULAR Fipoorly graded,	LL (200 r fine grain	mm thick) - 20 mm led, frozen, light br	crushed gra	anular A-Base,		1			_
-			X		CLAY (FILL) - :	silty, trace	e sand, frozen, darl	grey			2			_
-			\bigotimes	СН							2			-
-			\bigotimes											_
-	•				SILT - clayey, f	race sand	d, trace clay, mediu	im plastic, f	rozen, light brown		3			_
)G 1)														-
	I	1									4		Particle Size Analysis - Sample	-1
PG - GEC				MI									Sand= 5.6% Silt= 57.3% Clay= 36.5%	_
03 PM (V											5		Particle Size Analysis - Sample	_
/03/04 03:1													5 @ 1.1m: Sand= 5.8% Silt= 58.8%	_
T.GPJ 19	•				CLAY - silty, hi silt inclusions	gh plastic	c, frozen to 2.0m, b	rown mottle	ed grey, frequent		6		Clay= 35.2%	-
Y STREE	•													_
WAVERL	•			GI							7			_
- 2 2 2 2 2					TEST HOLE T	ERMINAT	TED AT 2.0m BELO	OW EXISTI	NG GRADE	_				-2
EG STREET INVESTI	2				Notes: - No sloughing - No seepage v - Test hole rem - Test hole was	was obse vas obser ained op backfille	erved during drilling rved during drilling. en to 2.0m below g d with auger cuttin	rade prior te gs, bentonit	o backfilling. e, and sand					-
TY OF WINNIF														-
TRUCTION - CI														-
ON CONS														-
	<u> </u>	<u> </u>					. :	LOGGED	BY: CM				DMPLETION DEPTH: 2 m	
1871	boo	Wood Env	/Irol /iei/	nme on of	nt & Infrastru Wood Cana	ICTURE S da Limi	50IUTIONS ited	REVIEW	ED BY: JW			CC	OMPLETION DATE: 9 February 2	2019
×		a un	1310					Figure No).				Shee	t 1 of 1

PRO	JECT: City of Wi	nnipeg Waverley S	Street	Investigation DRILLER: Maple Lea	f Drilling Ltd.			TEST	HOLE ID: TH19	
CLIEI	NT: Dillon Consu	ulting Limited		DRILL RIG: Mobile B4	10LX Truck Mounted			PROJ	ECT No: WX18717	
LOCA	ATION: Waverley	y Street		DRILL METHOD: 125	mm SSA			ELEV	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube		No Recovery SPT (N)	Grab Sampl	e	\square	Split-Pe	en Core	
BAC	KFILL TYPE	Bentonite		Pea Gravel Drill Cutting	js 🚺 Grout			Slough	ै़ःै Sand	
DEPTH (m)	▲ UNCONFINED CC 100 200 ⊠ POCKET PENET 100 200 PLASTIC M 20 40	MPRESSION (kPa) ▲ 300 400 IROMETER (kPa) ⊠ 300 400 I.C. LIQUID 60 80	MUSCS	SOIL DESCRIPT	ION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
DITY OF WINNIPEG STREET INVESTIGATION - WAVERLY STREET GPU 19/03/04 03:03 PM (WPG - GEOTECH LOG 1)			GP	GRANULAR FILL (200 mm thick) - 20 mm poorly graded, fine grained, frozen, brown CLAY - silty, trace sand, trace gravel, high grey - below 0.8m, grey, no sand, no gravel - below 0.8m, grey, no sand, no gravel - below 1.7m, stiff, moist TEST HOLE TERMINATED AT 2.0m BELO Notes: - No sloughing was observed during drilling. - No seepage was observed during drilling. - Test hole remained open to 2.0m below g - Test hole was backfilled with auger cutting	crushed granular A-Base, plastic, frozen to 1.7m, dark		1 2 3 4 5 6 7			
										-
		<u></u>			LOGGED BY: CM			C) OMPLETION DEPTH: 2 m	l
8717	hoov	Wood Envir	onme	ent & Infrastructure Solutions	REVIEWED BY: JW				OMPLETION DATE: 1 February 2	2019
TXN V		a divis	ion c	or wood Canada Limited	Figure No.				Sheet	t 1 of 1



F	PROJ	ECT: City of V	Ninnipeg Waverle	ey St	reet	Investigation DRILLER: Maple Lea	of Drilling	Ltd.			TEST	Hole ID: TH21	
C	LIEN	NT: Dillon Con	sulting Limited			DRILL RIG: Mobile B	40LX Tru	ck Mounted			PROJI	ECT No: WX18717	
L	OCA	TION: Waver	ley Street			DRILL METHOD: 12	5mm SSA	۱			ELEVA	ATION: Not Surveyed	
S	SAMF	PLE TYPE	Shelby Tul	be		No Recovery SPT (N)		Grab Sample			Split-Pe	n Core	
E	BACK	FILL TYPE	Bentonite			Pea Gravel Drill Cuttin	gs	Grout		\square	Slough	ैर्े Sand	
	DEPTH (m)	▲ UNCONFINED 100 200 ⊠ POCKET PEN 100 200 PLASTIC 20 40	COMPRESSION (kPa) ▲ 0 300 400 VETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID ↓ 60 80	SOIL SYMBOL	MUSCS	SOIL DESCRIPT	ΓΙΟΝ		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
	0	•		\boxtimes	GP	GRANULAR FILL (50 mm thick) - 20 mm	crushed gra	nular A-Base,		1			
-		•				\poorly graded, fine grained, frozen, brown CLAY (FILL) - silty, trace sand, high plasti	c, frozen, da	ark grey		2			-
-					СН	- at 0.5m, gravel layer (~50mm thick)				3			-
OG 1)						CLAY - silty, high plastic, frozen to 1.5m, s	grey			Ū			-
PG - GEOTECH L	1	•								4			-1
9/03/04 03:03 PM (WI		•			СН					5			-
ERLY STREET.GPJ 1		CF				- below 1.5m, moist, stiff				6			-
STIGATION - WAV	2	•				TEST HOLE TERMINATED AT 2.0m BEL Notes:	OW EXIST	ING GRADE		7			2
IPEG STREET INVE						 No soughing was observed during drilling No seepage was observed during drilling Test hole remained open to 2.0m below Test hole was backfilled with auger cutting 	y. grade prior ıgs, benton	to backfilling. te, and sand					_
N - CITY OF WINN													-
	3			R.									-
	J	-	<u> </u>				LOGGE	DBY: CM				MPLETION DEPTH: 2 m	L
8717	W	boo	Wood En	viro	nme	nt & Infrastructure Solutions	REVIEW	ED BY: JW			CC	OMPLETION DATE: 1 February 2	019
WX1	• •		a di	VISIC	0 110	I WOOD GANADA LIMITED	Figure N	0.				Sheet	t 1 of 1

PRO	JECT: City of \	Ninnipeg Waverley	Stree	Investigation	DRILLE	ER: Maple Leaf	Drilling Ltd.				TEST	HOLE ID: TH22	
CLIE	NT: Dillon Con	sulting Limited			DRILL	RIG: Mobile B40	DLX Truck	Mounted			PROJI	ECT No: WX18717	
LOCA	ATION: Waver	ley Street			DRILL	METHOD: 125r	nm SSA				ELEVA	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube)	No Recov	ery	SPT (N)		Grab Sample			Split-Pe	en Core	
BAC	KFILL TYPE	Bentonite		Pea Grave	el	Drill Cuttings		Grout			Slough	<u>ُ ثنً</u> Sand	
DEPTH (m)	▲ UNCONFINED 100 200 ⊠ POCKET PEN 100 200 PLASTIC 20 40	COMPRESSION (kPa) ▲ 0 300 400 NETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID 0 60 80	SOIL SYMBOL MUSCS		[SOIL DESCRIPTI	ON		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•			GRANULAR F poorly graded	ILL (250 r fine grain	mm thick) - 20 mm c ied, frozen, light brow	rushed granula wn	ar A-Base,		1			_
-				0.01									-
-	•			- from 0.3m to	ace sand, 0.5m, free	, high plastic, frozen quent organic inclusi	to 2.0m, dark ons	grey		2			-
-													_
-										2			_
-										3			_
<u> </u>													_
, LOG										4			_
				- below 0.9m,	grey, freqi	uent oxidation inclus	ions from silt			4			1
- GEO													_
(WPG													_
3 PM				- below 1.2m,	brown mo	ttled grey				5			
04 03:0													
19/03/													_
T.GPJ	•									6			_
STREE													_
										7			_
- WA										ŕ			_
			4	TEST HOLE T	ERMINAT	TED AT 2.0m BELO	W EXISTING (GRADE	-				-2
ESTIG				Notes:	was obse	erved during drilling							_
N L				- No seepage	was obser	ved during drilling. en to 2 0m below gr	ade prior to ba	ckfilling					
STREE				- Test hole wa	s backfille	d with auger cutting	s, bentonite, ar	nd sand					
PEG													-
MIN													-
7 OF													-
N - CI													-
ICTIO													-
NSTRL													-
N CO													-
3 JILLO								CM					
87171	hood	Wood Env	ironm	ent & Infrastr	ucture	Solutions	REVIEWED F	BY: JW				DWPLETION DEPTH: 2 m DMPLETION DATE: 9 February 2	2019
NX1		a div	ision o	of Wood Cana	ida Lim	ited	Figure No.					Shee	et 1 of 1

PRO	IECT: City of V	Vinnipeg Waverley	Stree	t Investigation	DRILLE	R: Maple Leaf D	Filling Ltd.			TES	THOLE ID: TH23	
CLIE	NT: Dillon Con	sulting Limited			DRILL F	RIG: Mobile B40	LX Truck Mou	inted		PRO	JECT No: WX18717	
LOCA	TION: Waverl	ey Street			DRILL N	METHOD: 125m	m SSA			ELE\	ATION: Not Surveyed	
SAMF	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)	Gral	b Sample		Split-F	Pen Core	
BACK	FILL TYPE	Bentonite		Pea Grav	el	Drill Cuttings	Gro	ut		Sloug	າ ໍ້ຳໍ່ Sand	
DEPTH (m)	▲ UNCONFINED 0 100 200 ⊠ POCKET PEN 100 200 PLASTIC 20 40	COMPRESSION (kPa) ▲) 300 400 IETROMETER (kPa) ⊠) 300 400 M.C. LIQUID 60 20	SUIL SYMBUL MUSCS		C	SOIL	ON		SAMPLE TYPE	SPT (N)	COMMENTS	DEPTH (m)
TION - CITY OF WINNIPEG STREET INVESTIGATION - WAVERLY STREET.GPU 19/03/04 03:03 PM (WPG - GEOTECH LOG 1)			o Gf	GRANULAR I poorly graded CLAY - silty, f - below 0.8m, - below 1.2m, - below 1.2m, - below 1.5m, - below 1.5m, - No seepage - Test hole rei - Test hole rei - Test hole rei	ILL (200 m fine graine igh plastic, grey clay ir grey moist, stiff ERMINAT was obsen nained ope s backfillec	ED AT 2.0m BELOV rved during drilling. in to 2.0m below grad with auger cuttings.	ushed granular A-I	Base,				
												_
717 L		Wood Envi	ronm	ent & Infrastr	ucture S	olutions		/1			COMPLETION DEPTH: 2 m	2100/0010
X181	000.	a divi	sion	of Wood Can	da Limi	ted		JVV			UMPLETION DATE: 1 Febr	Sheet 1 of 1
3	w000.						iyui c 110.					

PRO	JECT: City of V	Vinnipeg Waverley	Street	Investigation	DRILLE	R: Maple Leaf	f Drilling L	td.			TEST	HOLE ID: TH24	
CLIE	NT: Dillon Con	sulting Limited			DRILL F	RIG: Mobile B4	10LX Truc	k Mounted			PROJ	ECT No: WX18717	
LOCA	ATION: Waverl	ey Street			DRILL N	/IETHOD: 125	mm SSA				ELEV	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)		Grab Sample		\square	Split-Pe	en Core	
BAC	KFILL TYPE	Bentonite		Pea Grave	el	Drill Cutting	js	Grout		\square	Slough	ै़ःै Sand	
DEPTH (m)	▲ UNCONFINED 0 100 200 ⊠ POCKET PEN 100 200 PLASTIC ↓ 20 40	COMPRESSION (kPa) ▲ 300 400 ETROMETER (kPa) ⊠ 300 400 M.C. LIQUID €0 80	MUSCS		D	SOIL	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
struction - city of winniped streat investigation - waverty streat.GPJ 19/03/04 03:03 PM (wPg - GEOTECH LOG 1)			GP	GRANULAR F poorly graded, CLAY - silty, tr - below 0.5m, - below 1.1m, - below 1.1m, Notes: - No sloughing - No seepage - Test hole rer - Test hole wa	ILL (200 m fine graine ace sand, I grey, freque brown mott	Im thick) - 20 mm id, frozen, light broch high plastic, frozen ent silt inclusions tied grey ED AT 2.0m BELC ved during drilling red during drilling i with auger cutting	crushed gra own n to 2.0m, d DW EXISTIN	IG GRADE		1 2 3 4 5 6 7			
8717 DILLON CON	/ood	Wood Envir	onme	nt & Infrastr	ucture S	olutions	LOGGED	BY: CM id By: Jw			CC	OMPLETION DEPTH: 2 m OMPLETION DATE: 9 February 2	2019
X V		a divis	ion o	r wood Cana	ida Limit	ea	Figure No					Sheet	t 1 of 1

PRO	JECT: City of V	Vinnipeg Waverley	Street	Investigation	DRILLE	R: Maple Leaf	Drilling Ltd.				TEST	Hole ID: TH25	
CLIEI	NT: Dillon Con	sulting Limited			DRILL F	RIG: Mobile B4	0LX Truck I	Mounted			PROJ	ECT No: WX18717	
LOCA	ATION: Waverl	ey Street			DRILL N	METHOD: 125r	nm SSA				ELEV	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)		Grab Sample			Split-Pe	n Core	
BAC	KFILL TYPE	Bentonite		Pea Grave	el	Drill Cuttings	6	Grout		\square	Slough	ैःै Sand	
DEPTH (m)	▲ UNCONFINED 0 100 200 ⊠ POCKET PEN 100 200 PLASTIC ↓ 20 40	COMPRESSION (kPa) ▲ 0 300 400 IETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID 60 80	AUL ST MBUL MUSCS		۵	SOIL DESCRIPTI	ON		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0 - - -	•		GP	GRANULAR F poorly graded CLAY - silty, t	ILL (200 m fine graine race sand,	nm thick) - 20 mm c ed, frozen, brown high plastic, frozen	rushed granula	ar A-Base, grey		1			-
-	•••••									3			-
GEOTECH LOG 1)	•			- below 0.8m,	grey, no sa	and				4			- 1
03/04 03:03 PM (WPG -	•		СП							5			-
VAVERLY STREET.GPJ 19/	•			- below 1.7m,	brown mot	tled grey, moist, sti	ff			6 7			-
STREET INVESTIGATION - V				TEST HOLE T Notes: - No sloughing - No seepage - Test hole rer - Test hole wa	ERMINAT was observation was observation observation was observation observatio	ED AT 2.0m BELO rved during drilling. ved during drilling. en to 2.0m below gr d with auger cutting	W EXISTING (ade prior to ba s, bentonite, a	GRADE ckfilling. nd sand					- 2 -
CONSTRUCTION - CITY OF WINNIPEG													-
3		Wood Envir	ronme	ont & Infrastr	ucture 9	Solutions	LOGGED BY	: CM				DMPLETION DEPTH: 2 m	
×187	/00 d .	a divis	sion o	of Wood Cana	ida Limi	ted	REVIEWED E	BY: JW			00	MPLETION DATE: 1 February 2	2019
ŝ							Figure No.					Shee	t 1 of 1



PRO	JECT: City of \	Winnipeg Waverley	Street	Investigation	DRILLE	R: Maple Leaf	Drilling Lte	d.			TEST	HOLE ID: TH27	
CLIE	NT: Dillon Con	sulting Limited			DRILL F	RIG: Mobile B4	0LX Truck	Mounted			PROJ	ECT No: WX18717	
LOC	ATION: Waver	ley Street			DRILL N	METHOD: 125r	mm SSA				ELEV	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube		No Recove	ery	SPT (N)		Grab Sample			Split-Pe	en Core	
BAC	KFILL TYPE	Bentonite		Pea Grave		Drill Cutting	S .	Grout		\square	Slough	ંઁાઁ Sand	
DEPTH (m)	▲ UNCONFINED 100 200 ⊠ POCKET PEN 100 200 PLASTIC 20 40	COMPRESSION (kPa) ▲ 0 300 400 NETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID 0 60 80	SUIL SYMBUL MUSCS		D	SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•		\otimes	GRANULAR F	ILL (225 m	m thick) - 20 mm c	rushed gran	ular A-Base,		1			
-			GP	CLAY (FILL) -	silty, trace	sand, high plastic,	frozen, dark	grey		2			-
-			СН										-
_	•			CLAY - silty, tr	ace sand, l	high plastic, frozen	to 1.7m, da	rk grey		3			_
				- below 0.8m, ı	no sand								_
HLOG				- below 0.9m /	arov					4			-
					gicy								-1
/PG - G													-
N L	•									5			-
04 03:04			СН										
19/03/(_
ET.GPJ										0			_
-Y STRE				- below 1.7m, i	moist, stiff								-
VAVERI	•									7			-
V - V													-
2 2 2				TEST HOLE T Notes:		ED AT 2.0m BELO	W EXISTIN	G GRADE					-2
STREET INVE				- No seepage v - Test hole rem - Test hole was	was observ nained ope s backfilled	ved during drilling. n to 2.0m below gr I with auger cutting	ade prior to s, bentonite,	backfilling. and sand					_
NIPEG													
OF WIN													_
- CITY (_
CTION													_
NSTRU													_
ON CO													-
3 DIF							LOGGED F	BY: CM				 DMPLETION DEPTH: 2 m	<u> </u>
18717	lood	Wood Envi	ronme	nt & Infrastru	ucture S	olutions	REVIEWE	DBY: JW			CC	OMPLETION DATE: 1 February 2	2019
Ň		a ulvi	51011 0				Figure No.					Shee	t 1 of 1

				•							1L01	HOLLID. THE	
С	LIENT: Dillon Cor	sulting Limited			DRILL RIG	: Mobile B401	X Truck Mount	ted			PROJE	ECT No: WX18717	
LC	OCATION: Waver	ley Street			DRILL ME	THOD: 125mi	m SSA				ELEVA	ATION: Not Surveyed	
S	AMPLE TYPE	Shelby Tube		No Recove	ery	SPT (N)	Grab	Sample			Split-Pe	n Core	
B	ACKFILL TYPE	Bentonite		Pea Grave		Drill Cuttings	Grout				Slough	ैः Sand	
	€ UNCONFINED 100 20 № POCKET PEI 100 20 PLASTIC 20 40	COMPRESSION (kPa) ▲ 0 300 400 NETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID 0 60 80	SUIL SYMBUL MUSCS		DE	SOIL SCRIPTIC	ON		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•		🕅 GP	GRANULAR F	ILL (125 mm t	hick) - 20 mm cru frozen light brown	shed granular A-Ba	ase,		1			
-		×		CLAY - silty, tr	ace sand, high	n plastic, frozen to	2.0m, dark grey						-
-	•									2			_
-													_
-	•			- below 0 6m	arev occasion	al silt inclusions				3			-
-					9.09,00000.0.								-
L0G 1)													-
HOJECH										4			-1
PG - GE			СН										_
M (N	•									5			-
/04 03:04				- below 1.4m,	brown mottled	grey							-
PJ 19/03	•									6			-
TREET.G													_
VERLY S										7			Ę
4W - NC													-
STREET INVESTIGATI				TEST HOLE T Notes: - No sloughing - No seepage - Test hole ren - Test hole wa	ERMINATED was observed was observed nained open to s backfilled wit	AT 2.0m BELOW d during drilling. during drilling. o 2.0m below grac th auger cuttings,	EXISTING GRADE le prior to backfilling bentonite, and sand	E g. d					-2
VINNIPEG													_
CITY OF /													_
ICTION -													_
N CONSTRL													_
3						· · · · · ·	00055 51/ 01:						
7171	wood	Wood Envi	ronm	ent & Infrastr	ucture Solu	utions		V)/VIPLETION DEPTH: 2 m)/MPLETION DATE: 9 February 2	019
WX18	w0000.	a divi	sion o	of Wood Cana	ida Limited		igure No.	•				Sheet	t 1 of 1

PRO	JECT: City of \	Winnipeg Waverley	/ Str	eet	Investigation	ORILLEF	R: Maple Lea	i Drilling L	td.			TEST	Hole ID: TH29	
CLIE	NT: Dillon Con	sulting Limited			[ORILL R	RIG: Mobile B4	10LX Truc	k Mounted			PROJ	ECT No: WX18717	
LOC	ATION: Waver	ley Street			[ORILL N	IETHOD: 125	mm SSA				ELEV	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube	e		No Recover	у	SPT (N)		Grab Sample		\prod	Split-Pe	n Core	
BAC	KFILL TYPE	Bentonite			Pea Gravel		Drill Cutting	js	Grout			Slough	ి:ి Sand	
DEPTH (m)	▲ UNCONFINED 100 200 ⊠ POCKET PEN 100 200 PLASTIC ↓ 20 40	COMPRESSION (kPa) ▲ 0 300 400 NETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID 60 80	SOIL SYMBOL	MUSCS		D	SOIL ESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
ITY OF WINNIPEG STREET INVESTIGATION - WAVERLY STREET.GPJ 19/03/04 03:04 PM (WPG - GEOTECH LOG 1)				GP CH CL- ML	GRANULAR FIL poorly graded, fi CLAY (FILL) - si grey SILT - clayey, tra SILT - clayey, sc CLAY - silty, hig lenses - below 1.7m, m TEST HOLE TE Notes: - No sloughing v - No sloughing v - Test hole rema - Test hole was l	L (225 mi ine grained ilty, some ace sand, ome sand, ome sand, h plastic, ioist, stiff RMINATE vas observained oper backfilled	m thick) - 20 mm d, frozen, brown sand, some grav medium plastic, frozen to 1.7m, g	crushed gra	nular A-Base, tic, frozen, dark greyish brown ish brown h, frequent silt IG GRADE backfilling. e, and sand		1 2 3 4 5 6 7		Particle Size Analysis - Sample 3 @ 0.5m: Sand= 13.2% Silt= 51.9% Clay= 34.6% Particle Size Analysis - Sample 4 @ 0.9m: Sand= 19.3% Silt= 57.8% Clay= 22.8%	
LLON CONSTRUCTION - C														-
					at 0	-	alutiona	LOGGED	BY: CM			CC	MPLETION DEPTH: 2 m	1
1871	lood	Wood Env	iron	imei n of	No od Canad	cture So la Limit	olutions	REVIEWE	D BY: JW			CC	MPLETION DATE: 1 February	2019
××		a div	1510				cu	Figure No					She	et 1 of 1

PROJ	IECT: City of V	Vinnipeg Waverley	y Sti	reet	Investigation [DRILLE	R: Maple Lea	f Drilling	Ltd.			TEST	HOLE ID: TH30	
CLIEN	NT: Dillon Con	sulting Limited			C	orill f	RIG: Mobile B	40LX Tru	ck Mounted			PROJ	ECT No: WX18717	
LOCA	TION: Waver	ey Street			[ORILL N	METHOD: 12	5mm SSA	١			ELEV	ATION: Not Surveyed	
SAMF	PLE TYPE	Shelby Tub	е		No Recovery	y	SPT (N)		Grab Sample			Split-Pe	en Core	
BACK	FILL TYPE	Bentonite			Pea Gravel		Drill Cuttin	gs	Grout			Slough	Sand .	
DEPTH (m)	▲ UNCONFINED 100 200 ⊠ POCKET PEN 100 200 PLASTIC 40 20 40	COMPRESSION (kPa) ▲) 300 400 IETROMETER (kPa) ⊠) 300 400 M.C. LIQUID 60 80	SOIL SYMBOL	MUSCS		D	SOIL DESCRIPT	TION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0 - -	•			GP	GRANULAR FIL poorly graded, fi	L (200 m ne graine	nm thick) - 20 mm ed, frozen, light b	crushed gr own	anular A-Base,		1			-
-	•				CLAT - Silly, Ital	je sano, i	nigri piasuc, iroze	in lo 2.0m,	uaik giey		2			-
-	•				- below 0.5m, gr	ey, occas	sional silt inclusic	ns			3			-
1														-
	•			СН							4			1
M (WPG - GI	•				- below 1.2m. br	own mott	tled arev				5			-
19/03/04 03:04 F					,_									_
STREET.GPJ					SILT - trace clay	r, trace sa	and, low plastic, v	ery moist, s	soft, light brown		6			-
ON - WAVERLY	•			ML							7			_
					TEST HOLE TE Notes: - No sloughing w - No seepage wa - Test hole rema - Test hole was l	RMINATE vas observ as observ ined oper backfilled	ED AT 2.0m BEL rved during drilling rved during drilling n to 2.0m below I with auger cuttir	OW EXIST g. grade prior igs, benton	ING GRADE to backfilling. te, and sand					2
N - CITY OF WINNIPE														-
			dere		nt 0 f		alutions	LOGGE	DBY: CM	1	1	CC	DMPLETION DEPTH: 2 m	1
W	rood.	wood Env a div	viror	ime n of	nt & Infrastruo f Wood Canad	cture S la Limit	olutions ted	REVIEW	/ED BY: JW			CC	OMPLETION DATE: 9 February 2	2019
× · ·		a UIV	1310					Figure N	0.				Shee	et 1 of 1

PRO	JECT: City of V	Vinnipeg Waverley	Street	Investigation	DRILLE	R: Maple Leaf	Drilling Ltd.				TEST	Hole ID: TH31	
CLIE	NT: Dillon Con	sulting Limited			DRILL F	RIG: Mobile B4	OLX Truck N	lounted			PROJI	ECT No: WX18717	
LOCA	TION: Waverl	ey Street			DRILL N	METHOD: 125r	nm SSA				ELEVA	ATION: Not Surveyed	
SAMF	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)		Grab Sample		\square	Split-Pe	n Core	
BACK	(FILL TYPE	Bentonite		Pea Grave	el	Drill Cuttings	;	Grout		\square	Slough	ંું Sand	
DEPTH (m)	▲ UNCONFINED 0 100 200 ⊠ POCKET PEN 100 200 PLASTIC ■ 20 40	COMPRESSION (kPa) ▲ 300 400 ETROMETER (kPa) ⊠ 300 400 M.C. LIQUID €0 90	SULL ST MBUL MUSCS		D	SOIL DESCRIPTI	ON		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•		GP	GRANULAR F poorly graded	ILL (150 m fine graine	nm thick) - 20 mm c ed, frozen, brown	rushed granular	A-Base,	E	1			_
-		×		CLAY - silty, ti	race sand, I	high plastic, frozen	to 1.7m, dark g	rey					-
_	•									2			_
_				- below 0.4m,	occasional	organic inclusions							_
-	•									3			-
_													_
ECH LOG	•									4			-
1-1 - 0 - 0 - 0			сн										1 -
T (WP	•									5			-
03/04 03:0													_
T.GPJ 19/(•			- below 1.5m,	grey, no sa	and				6			-
-Y STREE				- below 1.7m,	stiff, moist,	brown mottled gre	y						_
- WAVERI	•									7			_
TIGATION -2				TEST HOLE 1 Notes:	ERMINATI	ED AT 2.0m BELO	W EXISTING G	RADE					-2
3 STREET INVES				- No sloughing - No seepage - Test hole rer - Test hole wa	was observ was observ nained ope s backfilled	rved during drilling. ved during drilling. n to 2.0m below gr l with auger cutting.	ade prior to bac s, bentonite, and	kfilling. d sand					-
													_
N - CITY O													_
													_
LON CONS													_
	-) () () () () () () () () () (unt 0 lunt 1		alutiona	LOGGED BY:	СМ	1			MPLETION DEPTH: 2 m	1
1871	/ood	wood Envi a divi	sion o	f Wood Can	ucture S Ida Limit	ted	REVIEWED BY	Y: JW			CC	DMPLETION DATE: 1 February 2	2019
š ľ		a uivi	50110				Figure No.					Shee	t 1 of 1

PRO	JECT: City of \	Winnipeg Waverley	Street	Investigation	DRILLE	R: Maple Leaf	Drilling L	.td.			TEST	Hole ID: TH32	
CLIE	NT: Dillon Con	sulting Limited			DRILL F	RIG: Mobile B4	OLX Truc	ck Mounted			PROJ	ECT No: WX18717	
LOC	ATION: Waver	ley Street			DRILL N	METHOD: 125	mm SSA				ELEV	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)		Grab Sample			Split-Pe	en Core	
BAC	KFILL TYPE	Bentonite		Pea Grave	el	Drill Cutting	S	Grout			Slough	ै <u>ः</u> Sand	
DEPTH (m)	▲ UNCONFINED 100 200 ⊠ POCKET PEN 100 200 PLASTIC 20 40	COMPRESSION (kPa) ▲ 0 300 400 NETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID ■ 0 60 80	SOIL SYMBOL MUSCS		C	SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•			GRANULAR F	ILL (150 m	m thick) - 20 mm	crushed gra	anular A-Base,	E	1			
-			S GP	poony graded,	inie granie	ed, nozen, light bit							-
-				CLAY - silty, ti	ace sand,	high plastic, frozer	n to 2.0m, c	lark grey					-
-	•									2			-
				- below 0.6m,	grey, trace	silt inclusions				3			
() (-)													-
HL00	•									4			-
													-1
- GEC			СН										_
(WPG													
MA	•			- below 1.4m,	brown mot	tled grey				5			
03:04													-
03/04													-
19/0										6			-
T.GP													_
TREE													
SLY S													
AVEF	•									7			-
> Z													-
			4	TEST HOLE 1	ERMINAT	ED AT 2.0m BELC	W EXISTI	NG GRADE	-				-2
				Notes: - No sloughing - No seepage - Test hole rer - Test hole wa	was obser was observ nained ope s backfilled	rved during drilling ved during drilling. n to 2.0m below g I with auger cutting	rade prior to gs, bentonit	o backfilling. e, and sand					_
PEG													
													-
10F													F
ED-													_
NOIT													Ļ
IRUC													
SNO													
ONC													F
		·····					LOGGED	BY: CM				DMPLETION DEPTH: 2 m	<u> </u>
1871	lood	Wood Envi a divi	ronmo sion c	ent & Infrastr	ucture S Ida Limit	olutions	REVIEW	ED BY: JW			CC	OMPLETION DATE: 9 February 2	2019
× ·							Figure No).				Shee	et 1 of 1

PRO	JECT: City of W	Vinnipeg Waverley	Street	Investigation	DRILLE	R: Maple Leaf	Drilling Ltd.				TEST	HOLE ID: TH33	
CLIEI	NT: Dillon Cons	sulting Limited			DRILL F	RIG: Mobile B4	OLX Truck	Nounted			PROJ	ECT No: WX18717	
LOCA	ATION: Waverle	ey Street			DRILL N	METHOD: 125r	nm SSA				ELEV	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)		Grab Sample		\square		n Core	
BAC	KFILL TYPE	Bentonite		Pea Grave	el	Drill Cuttings		Grout		\square	Slough	ैःः Sand	
DEPTH (m)	▲ UNCONFINED C 100 200 ⊠ POCKET PEN: 100 200 PLASTIC ■ 20 40	COMPRESSION (kPa) ▲ 300 400 ETROMETER (kPa) ⊠ 300 400 ETROMETER (kPa) ⊠ 300 400 M.C. LIQUID €0 90	AUL 31 MBUL		D	SOIL DESCRIPTI	ON		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•		GP	GRANULAR F poorly graded,	ILL (150 m fine graine	nm thick) - 20 mm c ed, frozen, brown	rushed granula	ar A-Base,		1			-
-			X	CLAY - silty, to	ace sand, I	high plastic, frozen	to 1.7m, dark g	grey					-
-	•									2			-
-													_
-				- below 0.6m,	grey, no sa	and				3			-
CH LOG 1)										4			-
			СН										1
4 PM (WPC										5			-
/03/04 03:0													
ET.GPJ 19	•									6			-
ERLY STRE				- below 1.7m,	brown mott	tled grey, stiff, mois	t						
ION - WAVE	•									7			-
S STREET INVESTIGAT				TEST HOLE 1 Notes: - No sloughing - No seepage - Test hole rer - Test hole wa	ERMINATE was observ was observ nained oper s backfilled	ED AT 2.0m BELO rved during drilling. /ed during drilling. n to 2.0m below gra I with auger cutting:	W EXISTING (ade prior to bac s, bentonite, ar	GRADE ckfilling. nd sand					2
													-
TION - CITY													-
													-
3 DIF								CM					
8717	lood	Wood Envi	onme	ent & Infrastr	ucture S	olutions	REVIEWED B	BY: JW				OMPLETION DATE: 1 February 2	2019
NXII	000.	a divis	sion o	t Wood Cana	ida Limit	ted	Figure No.	-				Shee	et 1 of 1

PROJ	ECT: City of V	Vinnipeg Waverley	Street	Investigation	DRILLE	R: Maple Leaf	Drilling L	d.			TEST	HOLE ID: TH34	
CLIEN	NT: Dillon Con	sulting Limited			DRILL F	RIG: Mobile B4	10LX Truc	k Mounted			PROJ	ECT No: WX18717	
LOCA	TION: Waverl	ey Street			DRILL N	NETHOD: 125	mm SSA				ELEV	ATION: Not Surveyed	
SAMF	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)		Grab Sample			Split-Pe	en Core	
BACK	FILL TYPE	Bentonite		Pea Grave	el	Drill Cutting	js	Grout			Slough	: : Sand	_
DEPTH (m)	▲ UNCONFINED 0 100 200 ⊠ POCKET PEN 100 200 PLASTIC 20 40	COMPRESSION (kPa) ▲ 300 400 ETROMETER (kPa) ⊠ 300 400 M.C. LIQUID 60 80			D	SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	•			GRANULAR F poorly graded	ILL (150 m fine graine	m thick) - 20 mm ed, frozen, light bro	crushed gra	nular A-Base,		1			
-				CLAY - silty, ti	ace sand, I	high plastic, frozer	n to 2.0m, da	ark grey	_				-
-	•									2			-
				- below 0.5m,	grey, occas	sional silt inclusior	IS						_
-	•									3			-
-													-
L0G 1)										4			-
										-			-1
(WPG - G													
3:04 PM				- below 1.2m,	brown mott	tled grey				5			_
9/03/04 0													-
T.GPJ 1	•									6			-
- Y STREE													_
WAVERI	•									7			-
- 2				TEST HOLE 1	ERMINATE	ED AT 2.0m BELC	OW EXISTIN	G GRADE					2
STREET INVESTI				Notes: - No sloughing - No seepage - Test hole rer - Test hole wa	was observ was observ nained oper s backfilled	ved during drilling ved during drilling. n to 2.0m below g I with auger cutting	i. rade prior to gs, bentonite	backfilling. e, and sand					-
													-
CTION - C													-
ONSTRU													_
3							1000-						-
717 L	and	Wood Envi	onmo	ent & Infrastr	ucture S	olutions		BA: CW D BA: 'IM				UMPLETION DEPTH: 2 m	2019
WX18	000.	a divi	sion o	of Wood Cana	da Limit	ted	Figure No.					Shee	et 1 of 1

PRO.	JECT: City of V	Vinnipeg Waverley	Street	Investigation DRI	ILLER: Maple Lea	f Drilling Ltd				TEST	Hole ID: TH35			
CLIE	NT: Dillon Con	sulting Limited		DRI	ILL RIG: Mobile B	40LX Truck	Mounted			PROJI	PROJECT No: WX18717			
LOCA	ATION: Waverl	ey Street		DRI	ILL METHOD: 12	5mm SSA				ELEVA	ATION: Not Surveyed			
SAMF	PLE TYPE	Shelby Tube		No Recovery	SPT (N)		Grab Sample			Split-Pe	n Core			
BACK	FILL TYPE	Bentonite		Pea Gravel	Drill Cuttin	gs 🚺	Grout			Slough	ैःैं Sand			
DEPTH (m)	▲ UNCONFINED 0 100 200 ⊠ POCKET PEN 100 200 PLASTIC ↓ 20 40	COMPRESSION (kPa) ▲) 300 400 IETROMETER (kPa) ⊠) 300 400 ECROMETER (kPa) ⊠) 300 400 ECROMETER (kPa) ⊠ 5 60 80	MUSCS		SOIL DESCRIPT	TION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)		
0 - - -			GP	GRANULAR FILL (200 mm thick) - 20 mm crushed granular A-Base, poorly graded, fine grained, frozen, brown CLAY - silty, trace sand, high plastic, frozen to 1.7m, brown					1			-		
-	•			- below 0.5m, grey - below 0.6m, dark g	јгеу				3			-		
ECHLOG 1)	•			- below 0.9m, grey					4			-		
04 03:04 PM (WPG - GEOT	•		СН						5			-		
AVERLY STREET.GPJ 19/03	•			- below 1.5m, brown mottled grey - below 1.7m, stiff, moist					6			-		
STREET INVESTIGATION - W				TEST HOLE TERM Notes: - No sloughing was - No seepage was o - Test hole remained - Test hole was back	GRADE ackfilling. and sand					2				
ONSTRUCTION - CITY OF WINNIPEG												-		
	rood.	Wood Envir a divis	onme sion o	nt & Infrastructu f Wood Canada L	re Solutions .imited	LOGGED B REVIEWED Figure No.	/: CM BY: JW			CC CC	MPLETION DEPTH: 2 m MPLETION DATE: 1 February 2 Sheet	2019 t 1 of 1		

PRO	JECT: City of V	Winnipeg Waverley	Stree	t Investigation	DRILLER: Maple Leaf Drilling Ltd.					TEST HOLE ID: TH36					
CLIE	NT: Dillon Con	sulting Limited			DRILL RIG: Mobile B40LX Truck Mounted F						PROJ	ROJECT No: WX18717			
LOCA	ATION: Waverl	ley Street			DRILL N	VIETHOD: 125r	mm SSA				ELEV	ATION: Not Surveyed			
SAM	PLE TYPE	Shelby Tube)	No Recov	ery	SPT (N)		Grab Sample		\square	Split-Pe	en Core			
BAC	KFILL TYPE	Bentonite		Pea Grave	əl	Drill Cutting	s [Grout		\square	Slough	ैःै Sand			
DEPTH (m)	▲ UNCONFINED 100 200 ⊠ POCKET PEN 100 200 PLASTIC 20 40	COMPRESSION (kPa) ▲ 0 300 400 VETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID 60 80	SOIL SYMBOL MIISCS		۵	SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)		
0	20 40		🕅 GI	GRANULAR F	FILL (100 m	nm thick) - 20 mm c	crushed grar	nular A-Base,		1					
ITY OF WINNIPEG STREET INVESTIGATION - WAVERLY STREET.GPJ 19/03/04 03:04 PM (WPG - GEOTECH LOG 1)			G	 below 0.6m, below 0.9m, below 1.1m, below 1.1m, below 1.1m, rosepage Test hole rer Test hole rer Test hole wat 	ERMINAT gvas obsemained ope s backfillec	ED AT 2.0m BELO rved during drilling. en to 2.0m below gr d with auger cutting	s s s s wn to 2.0m, da s s wn to 2.0m, da	G GRADE backfilling.		1 2 3 4 5 6 7					
													-		
7 DI		Wood En	ironm	ont & Infract-	ucture C	olutions	LOGGED	BY: CM	·		CC	DMPLETION DEPTH: 2 m			
1871	/00d	vvoou Env a div	ision	of Wood Cana	ada Limi	ted	REVIEWED BY: JW				CC	COMPLETION DATE: 9 February 2019			
× · ·		a aiv				Figure No.					Sheet 1 of 1				

PRC	PROJECT: City of Winnipeg Waverley Street Investigation DRILLER: Maple Leaf Drilling Ltd. TEST HOLE ID: TH37													
CLIE	ENT: Dillon Cons	sulting Limited		DRILI	RIG: Mobile B4	0LX Truck Mou	nted		PROJ	PROJECT No: WX18717				
LOC	ATION: Waverle	ey Street		DRILI	METHOD: 125	mm SSA		_	ELEV	ATION: Not Surveyed				
SAM	IPLE TYPE	Shelby Tube		No Recovery	SPT (N)	Grat	b Sample		Split-Pe	en Core				
BAC	KFILL TYPE	Bentonite	_	Pea Gravel	Drill Cutting	s Grou	ut	Ш	Slough	<u></u> Sand				
DEPTH (m)	▲ UNCONFINED C 100 200 ⊠ POCKET PEN 100 200 PLASTIC ▲ 20 40	COMPRESSION (kPa) ▲ 300 400 ETROMETER (kPa) ⊠ 300 400 M.C. LIQUID 60 80	MUSCS		SOIL DESCRIPT	ION		SAMPLE IYPE SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)			
0	•		GP	GRANULAR FILL (150 poorly graded, fine gra) mm thick) - 20 mm o ained, frozen, brown	crushed granular A-E	Base,	1						
			×	CLAY - silty, trace san	d, high plastic, frozen	to 1.7m, dark grey								
_							E	▤			_			
_	•										-			
-				- below 0.5m, brown							-			
-							E	3			-			
-							F				-			
1)											-			
CH LOG	•							4			-			
							F				-1			
0 - 0d/											-			
N N	•			- below 1.2m, brown n	nottled grey			5			-			
4 03:04											-			
19/03/0														
T.GPJ	•							6						
STREE				- below 1.7m, some si	lt, stiff, moist						-			
/ERLY				,,	-,,			– ,			-			
NA - WA		102					Ē	= ′		Particle Size Analysis - Sample 7 @ 1.7m:	-			
			2	TEST HOLE TERMIN	ATED AT 2.0m BELC	W EXISTING GRAI	DE			Gravel= 0.0% Sand= 1.2%	-2			
				Notes: - No sloughing was ob - No seepage was obs - Test hole remained o - Test hole was backfil	served during drilling. erved during drilling. pen to 2.0m below gr led with auger cutting	ade prior to backfilli s, bentonite, and sa	ng. Ind			Silt= 22.4% Clay= 76.5%	-			
											-			
- CI											-			
RUCTI														
CONST														
NOT 3														
717 Di		Wood Envi	onme	ent & Infrastructure	Solutions	LOGGED BY: CN	1		CC	OMPLETION DEPTH: 2 m	010			
VX18:	v000.	a divi	sion o	f Wood Canada Lir	nited	Figure No.	JVV			COMPLETION DATE: 1 February 2019 Sheet 1 of 1				



PRO	JECT: City of W	/innipeg Waverley	Street	Investigation	DRILLE	R: Maple Leaf	Drilling Ltd.				TEST	Hole ID: TH39			
CLIE	NT: Dillon Cons	sulting Limited			DRILL RIG: Mobile B40LX Truck Mounted					PROJI	PROJECT No: WX18717				
LOCA	ATION: Waverle	ey Street			DRILL I	METHOD: 125	mm SSA				ELEVA	ATION: Not Surveyed			
SAMF	PLE TYPE	Shelby Tube		No Recov	ery	SPT (N)		Grab Sample			Split-Pe	n Core			
BACK	FILL TYPE	Bentonite		Pea Grave	el	Drill Cutting	S 🚺	Grout		\square	Slough	ैःः Sand			
DEPTH (m)	▲ UNCONFINED C 100 200 ⊠ POCKET PENI 100 200 PLASTIC ↓ 20 40	COMPRESSION (kPa) ▲ 300 400 ETROMETER (kPa) ⊠ 300 400 COMPRESSION (kPa) ▲ COMPRESSION (AUL ST MBUL MUSCS		[SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)		
0	20 40			GRANULAR F	ILL (125 n	nm thick) - 20 mm c	crushed granu	lar A-Base,		1					
- CITY OF WINNIPEG STREET INVESTIGATION - WAVERLY STREET.GPJ 19/03/04 03:04 PM (WPG - GEOTECH LOG 1)			GP	GRANULAR F poorly graded, CLAY - silty, h - below 1.4m, - below 1.4m, Notes: - No sloughing - Test hole rer - Test hole rer - Test hole wa	ILL (125 n fine grain igh plastic igh plastic grey ERMINAT was obser nained ope s backfilled	TED AT 2.0m BELC rved during drilling. en to 2.0m below gr d with auger cutting	wexushed granu grey WEXISTING ade prior to ba s, bentonite, a	GRADE ackfilling. and sand		1 2 3 4 5 7					
													-		
			I			.	LOGGED BY	/: CM				MPLETION DEPTH: 2 m	1		
N N	hoo	Wood Environment & Infra				Solutions	REVIEWED	BY: JW			CC	COMPLETION DATE: 1 February 2019			
WX1		a divis	sion C	ion of Wood Canada Limited		Figure No.					Sheet 1 of 1				

PRO	JECT: City of \	Winnipeg Waverley	Street	Investigation DRILLER: Maple Lea	f Drilling Ltd.			TEST	HOLE ID: TH40	
CLIEI	NT: Dillon Con	sulting Limited		DRILL RIG: Mobile B4	DRILL RIG: Mobile B40LX Truck Mounted F					
LOCA	ATION: Waver	ley Street		DRILL METHOD: 125	imm SSA			ELEV	ATION: Not Surveyed	
SAM	PLE TYPE	Shelby Tube		No Recovery SPT (N)	Grab Sample			Split-Pe	en Core	
BAC	KFILL TYPE	Bentonite		Pea Gravel	gs Grout		Ш	Slough	ै्ः Sand	
DEPTH (m)	▲ UNCONFINED 100 200 ⊠ POCKET PEN 100 200 PLASTIC 20 400	COMPRESSION (kPa) ▲ 0 300 400 NETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID ↓ 60 80	MUSCS	SOIL DESCRIPT	ION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0	20 40	;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	8	GRANULAR FILL (150 mm thick) - 20 mm	crushed granular A-Base,	=	1			
-			GP	cLAY (FILL) - silty, trace sand, trace grave grey	own I, high plastic, frozen, dark	_				-
-	•		К				2			-
-				CLAY - silty, high plastic, frozen, grey						-
_										_
							3			
G 1)										_
	•			- below 0.9m, brown mottled grey			4			-
1-1 GEOTE										1
- MPG			СН				_			
A PM							5			
1 03:0										_
PJ 19/03							6			-
IREET.G										-
HERLY S										_
- WAI			Тм	SILT - trace clay, trace sand, low plastic, fr	ozen to 2.0m, light brown		7			_
NOIL O							Ĺ			2
				Notes: - No sloughing was observed during drilling. - No seepage was observed during drilling. - Test hole remained open to 2.0m below g - Test hole was backfilled with auger cuttin	JW EXISTING GRADE I. Irade prior to backfilling. gs, bentonite, and sand					-
WINNIPEC										-
										-
CTION -										ŀ
DNSTRU										-
DN CC										-
3 DIF										
8717	hoov	Wood Envir	onme	nt & Infrastructure Solutions	REVIEWED BY: JW				OMPLETION DATE: 9 February 2	2019
WX1		a divis	ion o	t Wood Canada Limited	Figure No.				Sheet	t 1 of 1

PRO	JECT: City of	Winnipeg Waverley S	Street	Investigation	DRILLI	ER: Maple Leat	f Drilling l	_td.			TEST	Hole ID: TH41			
CLIE	NT: Dillon Cor	nsulting Limited			DRILL	DRILL RIG: Mobile B40LX Truck Mounted					PROJ	PROJECT No: WX18717			
LOC	ATION: Waver	ley Street			DRILL	METHOD: 125	imm SSA				ELEV	ATION: Not Surveyed			
SAM	PLE TYPE	Shelby Tube		No Recove	ery	SPT (N)		Grab Sample			Split-Pe	n Core			
BAC	KFILL TYPE	Bentonite		Pea Grave		Drill Cutting	js	Grout		\square	Slough	ં <u>ૈ</u> Sand			
DEPTH (m)	▲ UNCONFINED 100 20 ⊠ POCKET PEI 100 20 PLASTIC 20 40	COMPRESSION (kPa) ▲ 0 300 400 NETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID 0 60 80	MUSCS		[SOIL DESCRIPT	ION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)		
0	•		GP	GRANULAR F poorly graded.	ILL (150) fine grair	mm thick) - 20 mm ned. frozen. brown	crushed gra	anular A-Base,		1					
-				CLAY - silty, th	ace sand	, high plastic, froze	n to 1.5m, c	lark grey		2			-		
-													-		
-				- below 0.5m, (grey					3			-		
,			СН										-		
1LOG										4			-		
													-1		
GEO															
- DAPG															
M	•									5			-		
3:04													-		
3/04 0													F		
19/03															
.GPJ			Ĩ	SILT - trace cla	ay, trace s	sand, low plastic, ve	ery moist to	wet, soft, light							
REET				DIOWN						6					
- X STI			M										-		
VERI										7			-		
- WA													Ļ		
1 ION			Ц	TEAT HOLE T									2		
G STREET INVESTIGA				Notes: - No sloughing - No seepage v - Test hole rem - Test hole was	was obso was obso was obse nained op s backfille	red Al 2.0m BELC erved during drilling rved during drilling. en to 2.0m below g ed with auger cutting	j. Irade prior t gs, bentonit	o backfilling. ie, and sand					-		
INIPE.													Ļ		
NIN .															
jo L															
													F		
CIO													-		
STRU													F		
CON															
TON															
		Wood Envir		nt & Infractr	icture	Solutions	LOGGED	BY: CM			CC	OMPLETION DEPTH: 2 m	I		
×1871	vood.	a divis	ion o	f Wood Cana	da Lim	ited	REVIEW	REVIEWED BY: JW				COMPLETION DATE: 1 February 2019			
ŝ			-					D.				Sheet 1 of 1			

PROJ	IECT: City of V	Ninnipeg Waverley	Stree	t Investigation	DRILL	ER: Maple Leaf Drilling Ltd.					TEST HOLE ID: TH42				
CLIEN	NT: Dillon Con	sulting Limited			DRILL RIG: Mobile B40LX Truck Mounted					PROJ	PROJECT No: WX18717				
LOCA	TION: Waver	ley Street			DRILL	METHOD: 125m	m SSA				ELEVA	ATION: Not Surveyed			
SAMF	PLE TYPE	Shelby Tube)	No Recov	ery	SPT (N)	G	rab Sample		\square	Split-Pe	n Core			
BACK	FILL TYPE	Bentonite		Pea Grav	el	Drill Cuttings	G	rout		\square	Slough	<u>ُ ثنَ</u> Sand	_		
DEPTH (m)	▲ UNCONFINED 100 200 ⊠ POCKET PEN 100 200 PLASTIC ↓ 20 40	COMPRESSION (kPa) ▲ 0 300 400 NETROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID 0 60 80	SOIL SYMBOL			SOIL DESCRIPTIO	ON		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)		
0	•		X		FILL (150	mm thick - 20 mm cru	shed granular A	-Base,		1					
-													-		
-				OLAT - Silty, t	Tace Sano	i, nigri piastic, nozeri t	o 2.011, daik gie	, y					-		
-	•								E	2			-		
-													-		
-													-		
-	•									3			-		
-													-		
Ê				- below 0.8m,	grey, occ	asional silt inclusions							-		
901 H	•									4			-		
													-1		
В			CI	1									_		
WPC /										5			_		
04 PM										J			_		
/04 03:													_		
19/03													_		
T.GPJ				- below 1.5m,	below 1.5m, brown mottled grey					6			_		
STREE													_		
ERLY															
- WAVI										7					
NOIL				7507 1101 5											
STIGA				TEST HOLE Notes:	ERMINA	TED AT 2.0m BELOV	VEXISTING GR	ADE					-2		
				- No sloughing - No seepage	y was obs was obse	erved during drilling. erved during drilling.							-		
TREET -				- Test hole rei - Test hole wa	nained op is backfille	ed with auger cuttings	de prior to backt , bentonite, and	sand					-		
EGS													-		
													-		
Y OF V													F		
- CIT													-		
ICTIO													-		
ISTRU													-		
N CO													-		
10 11 0 11 0				T.											
37171	hood	Wood Env	ironm	ent & Infrastr	ucture	Solutions		JW				DIVIPLETION DEPTH: 2 m DMPLETION DATE: 9 February	2019		
WX18	000.	a div	ision	of Wood Cana	ada Lim	nited	Figure No.					COMPLETION DATE: 9 February 2019 Sheet 1 of 1			