APPENDIX 'A' GEOTECHNICAL REPORT



Geotechnical Investigation

City of Winnipeg Street Investigation Winnipeg, Manitoba WX19432 28 September 2021

		woo	od.	
		Environment & Infrastr 440 Dovercourt Drive, Winnipeg I	ucture Solutions Manitoba, Canada R3Y 1N4	
		Phone: (204) 4 www.woodp	88-2997 Ic.com	
		Geotechnical In	vestigation	
		City of Winninea Str	eet Investigation	
		Wood Project Num	ber - WX19432	
		Morrison Hershfield		
Prepared for:		Suite 1 – 59 Scurfield Bou	ulevard	
		Winnipeg, Manitoba R3Y	1V2	
Contact:		Ron Bruce, P.Eng.		
Report Distribut	tion:			
Morrison Hersh	field:	Ron Bruce, P.Eng.		
Third Party:				
Report Classifica	ation:	Confidential		
		Name	Job Title	Signature
Prepared by:		Jorden Wiwcharyk, P.Eng.	Geotechnical Engineer	7. Stubert
Reviewed by:		Brad Wiebe., P.Eng.	Senior Associate Geotechnical Engineer	
Project Manage	r:	Jorden Wiwcharyk, P.Eng.	Geotechnical Engineer	Titutant -
Other Technical	Contributors			
Rev.	Date		Revision Notes	
0	28 Sept 2021	Issued Final to Client		
	Permit Sta	imp	Engineer S	ieal
Real Provide P	J.P. WIWCHA Member 32495 Mu	RYK HIM	Wood Environment & Infr A Division of Wood No. 68	BINEERS SCIENTISTS WITOBA uthorization restructure Solutions. Canada Limited 34



Copyright and non-disclosure notice

The contents and layout of this report are subject to copyright owned by Wood (© Morrison Hershfield). 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.

WX19432| September 2021

Page ii of iv



Table of Contents

1.0	Introduction	5
2.0	Geotechnical Investigation	5
3.0	Pavement Summary	6
3.1 <u>3.2</u> 3.3	Mountain Avenue McGregor Street (South) McGregor Street (North)	6 7 7
4.0	Closure	7





List of Tables

Table 1-1: Street Location and Investigation Scope	5
Table 3-1: Mountain Avenue Pavement Summary	6
Table 3-2: McGregor (South) Pavement Summary	7
Table 3-2. M. Greener (Smith) Parement Summary	7
Tuble 5-5. Medregol (South) Lavement Summary	•••• 1

List of Appendicies

Appendix A

Mountain Avenue

Appendix B

-McGregor South-

Appendix C

McGregor North

WX19432| September 2021

Page iv of iv



1.0 Introduction

At the authorization of Mr. Ron Bruce, P. Eng., of Morrison Hershfield, Wood Environment & Infrastructure Solutions, a division of Wood Canada Limited (Wood), completed a pavement coring and test hole drilling program related to the pavement evaluation and potential asphalt reconstruction and rehabilitation for twenty-five (25) street locations in the City of Winnipeg, Manitoba. Locations and scope are itemized in Table 1-1.

Street Name	Location	Number of Cores	Number of Test Holes	Test Hole Numbers
Mountain Avenue	Arlington Street to McPhillips Street	12	12	Mountain – TH01 to Mountain - TH12
McGregor Street (South)	Mountain Avenue to Church Avenue	6	6	MS1 - MS6
<u>McGregor Street</u> (North)	McAdam Avenue to Seven Oaks Avenue	7	7	MN1 MN7
	Total	25	25	

Table 1-1: Street Location and Investigation Scope

The geotechnical investigation was completed in accordance with the Scope of Work and Terms and Conditions outlined in Wood Proposal No. WPG2021.462Rev01, dated 30 June 2021.

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. Additionally, Wood utilized the services of ATS Traffic to provide traffic control during drilling. All drilling was completed without incident,

Between 4 and 30 August 2021, Wood supervised the drilling and coring of twenty-five test holes along Mountain Avenue and McGregor Street. The test hole locations are illustrated in Figures A1, B1 and C1. All locations were cored using a 150 mm diameter core barrel, while test hole drilling was conducted using a truck mounted Mobile B40LX or Geoprobe drill rig equipped with 125 mm solid stem augers, owned and operated by Maple Leaf Drilling of Springfield, Manitoba. Coring and test hole locations were initially selected by Morrison Hershfield, however underground utilities required some adjustments to the original test hole locations.

During coring, Wood field personnel identified pavement types and thicknesses, as well as underlying granular structure, while during drilling, Wood field personnel visually classified the soil stratigraphy within the test holes in accordance with ASTM D3282 and ASTM D2487, as well as noted observed seepage and/or sloughing conditions where present. Soil sampling consisted of grab samples of the auger cuttings 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. All pavement core samples were shipped to Winnipeg laboratory to be measured and photographed. The core photos and underlying pavement structure information are provided in Appendices A, B and C for Mountain Avenue, McGregor South and McGregor North, respectively.



During drilling, Wood field personnel visually classified the soil stratigraphy within the test holes in accordance with ASTM D2487 – *Standard Practice for Classification of Soils for Engineering Purposes* and recorded observed seepage and/or sloughing conditions. Soil sampling consisted of grab samples of the auger cuttings at all test hole locations at depths of about 0.6 m, 0.9 m, 1.2 m, 1.6 m, 2.0 m, and 2.5 m. Test holes were advanced to a depth of about 3.0 m below the pavement surface. The in-situ relative consistency of cohesive soil (i.e. clay) was evaluated during drilling using a pocket penetrometer.

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 on all samples, as well as Atterberg limits, particle size distributions (hydrometer method), Standard Proctor Testing and California Bearing Ratio (CBR) evaluations on selected samples of the anticipated subgrade soils at approximate depths between 0.6 and 1.2 m below the pavement structure. It should be noted that all the above testing has been completed with the exception of CBR testing, which is currently underway. Laboratory testing results and detailed test hole logs summarizing the sampling, field testing, laboratory test results, and subsurface conditions encountered at the test hole locations are presented in Appendices A, B and C for Mountain Avenue, McGregor South and McGregor North, respectively. CBR results will be issued under separate cover as they become available. 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.

3.0 Pavement Summary

The following sections provide summaries of the pavement structure encountered at each test hole location. Details of the soil structure underlying the pavements observed at each test hole can be found on the test hole logs found in Appendices A, B and C, while laboratory testing result summaries are also provided in Appendices A, B and C.

3.1 Mountain Avenue

Table 3-1 provides a summary of the pavement type and thickness encountered at each of the test locations on Mountain Avenue.

Test Hole Number	Street Location	Asphalt Thickness (mm)	Concrete Thickness (mm)
Mountain – TH01	EB Median, 50m East of McPhillips	150	250
Mountain – TH02	WB Median, 1120 Mountain	175	125
Mountain – TH03	EB Curb, 1084 Mountain	85	200
Mountain – TH04	EB Curb, 1040 Mountain	50	275 (rubble)
Mountain – TH05	EB Median, 1006 Mountain	115	165 (rubble)
Mountain – TH06	EB Median, 972 Mountain	50	175
Mountain – TH07	WB Median, 958 Mountain	200	150
Mountain – TH08	WB Median, 902 Mountain	200	300
Mountain – TH09	WB Median, 862 Mountain	150	200
Mountain – TH10	WB Median, 834 Mountain	175	325
Mountain – TH11	EB Median, 794 Mountain	100	275



Mountain – TH12	WB Median, 772 Mountain	100	200

3.2 McGregor Street (South)

Table 3 provides a summary of the pavement type and thickness encountered at each of the test hole locations on McGregor Avenue (South).

Table 3-2: McGregor (South) Pavement Summary

Test Hole Number	Street Location	Asphalt Thickness (mm)	Concrete Thickness (mm)
MS1	NB Median, 394 McGregor	100	100
MS2	NB Median, 410 McGregor	50	175
MS3	NB Median, 416 McGregor	100	175
MS4	SB Median, 442 McGregor	175	125
MS5	SB Median, 453 McGregor	150	150
MS6	SB Median, 463 McGregor	140	160

3.3 McGregor Street (North)

Table 3-3 provides a summary of the pavement type and thickness encountered at each of the test hole locations on McGregor Avenue (North).

Table 3-3: McGregor (North) Pavement Summary

Test Hole Number	Street Location	Asphalt Thickness (mm)	Concrete Thickness (mm)
MN1	NB Curb, 682 McGregor	165	225
MN2	SB Curb, 692 McGregor	90	215
MN3	NB Curb, 696 McGregor	90	135 (rubble)
MN4	SB Curb, 3m North of Rupertsland	60	215
MN5	SB Median, 20m South of Enniskillen	90	200 (rubble)
MN6	NB Curb, 20m North of Enniskillen	120	205
MN7	SB Curb, 5m South of Enniskilen	90	225

4.0 Closure

The findings of this report were based on the results of field and laboratory investigations at test hole locations determined based on the requirements provided by Morrison Hershfield.

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

WX19432 | September 2021





Mountain Avenue

- Test and Core Hole Location Plan
- Core Photos
- Test Hole Logs
- Laboratory Summary



		CHURCH AVENUE	REET
S Schulter (Street (St	RADFORD ST RADFORD ST	Carrswork S Carrswork S Carrs	GALLOWAY S
		COLLEGE AVENUE BOYD AVENUE	
		REDWOOD AVENUE ABERDEEN AVENUE	
0m 40 80 120 160 200 1:2500 1:2500 1:2500 1:2500 1:2500 LEGEND: TEST HOLE Image: Colspan="2">Image: Colspan="2">Image: Colspan="2">Colspan="2"Co	REVISION BY DATE CLIENT: CLIENT: CLIENT: CLIENT: CLIENT: CLIENT: CLIENT:	440 DOVERCOURT DRIVE WINNIPEG, MANITOBA R3Y 1N4 PHONE: 204.488.2997 FAX:204.489.8261	(McPH



TEST HOLE LOCATION PLAN



	1 2 6 9 1 2 3 4 5	270 271 272 273 27 6 7 8 96901 2 3 4 5 1	4. 275. 276 7. B. 97001 2. 3	27 278 279 280 281 28 4 5 6 7 8 97101 2 3 4 5 6	2 283 284 7 0 97201 2
	Asphalt Th	hickness (mm)		150	
	Concrete	nickness (mm)		250	
Wood E Infrastru	ood.	PAVE	CORE P MENT CORE WINNIP	HOTOGRAPHS SAMPLE MOUNTAIN-TH EG, MANITOBA	-11
Drawn: JW	Scale: N/A	Date: 13 September	2021	Project No.: WX19432	Figure: A2





1 2 3 4 5 7 9 20	
Asphalt Thickness (mm) 85	
Concrete Thickness (mm) 200	
Wood Environment and Infrastructure Solutions Date: 12 September 2021 Drainet No : WY40422 Figure 1	

		Ba 269 270 Ba 269 270 Ja 3 4 5 6 7	271 272 273 2 a 90001 2 3 4 5 INTAIN-TH4	74 275 276 277 278 6 7 8 97004 2 3 4 5 6 7	
	Asphalt T	hickness (mm)		50	
	Concrete 1	hickness (mm)	275 (rubbl	e only – no sample)	
wo	od.	PAV	CORE EMENT CORE WINNIF	PHOTOGRAPHS E SAMPLE MOUNTAIN-T PEG, MANITOBA	H4
Wood Enviro Infrastructur	onment and re Solutions				
Drawn: JW	Scale: N/A	Date: 13 Septembe	r 2021	Project No.: WX19432	Figure: A5



		270 271 272 4 5 6 7 8 96901 2	273 274 275 3 4 5 6 7 8 9 TH5		281 2 3 A 5
	Asphalt Tl	hickness (mm)		115	
	Concrete T	'hickness (mm)	165 (rubble	e only – no sample)	
Wood E Infrastru	ood.	PAVE	CORE F MENT CORE WINNIP	PHOTOGRAPHS SAMPLE MOUNTAIN-T EG, MANITOBA	Ή5
Drawn: JW	Scale: N/A	Date: 13 September	2021	Project No.: VVX19432	Figure: A6

<image/>			28
Asphalt Th	nickness (mm)	50	
Concrete T	hickness (mm)	175	
Wood Environment and Infrastructure Solutions	C PAVEMENT V Date: 13 September 2021	ORE PHOTOGRAPHS CORE SAMPLE MOUNTAIN-TH6 /INNIPEG, MANITOBA	e: A7



be to be the second sec		TOTAL 21	280 281 22 7101 2 3 4 5 6	22 283 284 285 286 28 1 8 972 1 2 3 4 5 6 7 8 5 7	724-288 24 289 24 290 29 0 29 0 29 0 29 0 29 0 29 0 2
	Asphalt Th	nickness (mm)		200	
	Concrete T	hickness (mm)		150	
Wood Env	vironment and	PAVE	CORE F MENT CORE WINNIP	PHOTOGRAPHS SAMPLE MOUNTAIN- EG, MANITOBA	TH7
Infrastruct	ture Solutions	Dete: 12 Contembor	2024	Dreiget No. ; WV10422	



		271 272 273 274 7 8 9690.1 2 3 4 5 6 3			972,041 2 3 A
		MOUNTAIN-TH	8		
	Asphalt TI	nickness (mm)		200	
	Concrete T	hickness (mm)	300 (rubbl samp	e – only portion of ble collected)	
W	ood.	PAVE	CORE P MENT CORE WINNIP	PHOTOGRAPHS SAMPLE MOUNTAIN-T EG, MANITOBA	H8
Wood E Infrastru	nvironment and cture Solutions				
Drawn: JW	Scale: N/A	Date: 13 September	2021	Project No.: WX19432	Figure: A9





	68 269 270 271 272 1 2 3 4 5 6 7 8 96901	273.274.275.275.277.278 2 3 4 5 6 7 8 97001 2 3 4 5 6 7 OUNTAIN-TH10	279 280 281 282 283 284 285 8 97101 2 3 4 5 6 7 8 97201 2 3 4	
	Asphalt T	hickness (mm)	175	
	Concrete T	hickness (mm)	325	
Wood E Infrastru	nvironment and	C PAVEMENT (W	ORE PHOTOGRAPHS CORE SAMPLE MOUNTAIN- 'INNIPEG, MANITOBA	TH10
Drawn: JW	Scale: N/A	Date: 13 September 2021	Project No.: WX19432	Figure: A11



			TAIN-TH11		
	Asphalt T	nickness (mm)	100		
	Concrete T	hickness (mm)	275		
Wood Er Infrastru	ood. nvironment and cture Solutions	PAVEME	CORE PHOTO IT CORE SAMP WINNIPEG, M	OGRAPHS PLE MOUNTAIN-TH ANITOBA	i11
Drawn: JW	Scale: N/A	Date: 13 September 202	1 Proje	ct No.: WX19432	Figure: A12



				2777 278 279 280 22 2 3 4 5 6 7 8 97101 2 3	8 <u>11 282</u> 4 5 6 7
	Asphalt T	nickness (mm)		100	
	Concrete T	hickness (mm)		200	
Wood Et	ood.	PAVE	CORE F MENT CORE WINNIP	PHOTOGRAPHS SAMPLE MOUNTAIN-TH EG, MANITOBA	112
Infrastru	cture Solutions		0004		Figure 110
Drawn: JW	Scale: IN/A	Date: 13 September	2021	Project No.: WX19432	Figure: A13

Г





PR	QJECT: City of V	Vinnipeg 2021 Stre	ets Inv	estigation	DRILLER: Maple Leaf Drilling				T	TEST HOLE ID: Mountain - TH03				
СЦ	ENT: Morrison H	lershfield			DRILL	RIG: Geoprobe				F	PROJECT No: WX19432			
LO	CATION: EB Cur	b, 1084 Mountain			DRILL	VIETHOD: 125m	m Solid St	em Auger		E	ELEVA	ATION: Not Surveyed		
SA	VIPLE TYPE	Shelby Tube		No Recove	ery	SPT (N)	E	Grab Sample		∭S	plit-Per	n Core		
BAC	CKFILL TYPE	Bentonite		Pea Grave	ł	Drill Cuttings	•	Grout		Πs	Blough	<u>ژ، کا Sand</u>		
DEPTH (m)	UNEONFINED COM 100 200 POSICKET PENETR 100 200 PLASTIC 	PRESSION (KPa) ▲ 300 400 OMETER (kPa) ⊠ 300 400 MC. LIQUID €0 80	MUSCS		SOIL DESCRIPTION				SAWFLEINU	SPT (N)	COMMENTS	DEPTH (m)		
 	3 4 5 ∞ 1 20 ∞		SPH CONC	ASPHALT (85 CONORETE (2 GRAVEL (HIL compact (infen CLAY - sandy, grey	mm thick) 200mm thia .) - poorly g red), brown some silt,	ck) graded, fine to mediu n high plastic, damp to	m grained, c o moist, soft	lamp to moist, f		1 2 3 4				
	-2					, silty, moist				5		Particle Size Analysis - Sample 4 @ 1.2m Gravel=0.7% Sand=56.3% Silt=15.2% Clay=27.8%	2	
		•		TEST HOLE T NOTES: Neither slough Test hole rema Test hole back repaired with a	ERMINAT ing nor sea ined open filled with a sphalt.	ED AT 3.0M BELOW epage observed durir to full depth and was auger cuttings and be	PAVEMEN ng drilling s dry prior to entonite, pav	T SURFACE backfilling. ement surface						
01/20 2/20 2/20 2/20 2/20 2/20 2/20 2/20													5 6 6	
													- - - - - - - - - - - - - - - -	
10											-			
32 M		Wood Environm	ent &	Infrastructur	e Soluti	ons		: JW				MPLETION DEPTH: 3 m	101	
	NOOQ .	a division	of Wo	ood Canada I	_imited	F	igure No. A	16				Sheet 1	of 1	

PROJ	JECT: City of \	Minnipeg 2021 St	reets l	Inve	stigation DRILLER:	DRILLER: Maple Leaf Drilling				TEST HOLE ID: Mountain - TH04		
CLIEN	vT: Morrison I	lershfield			DRILL RIG	à: Geoprobe				PROJE	CT No: WX19432	
LOCA	ATION: EB Cu	rb, 1040 Mountair	า		DRILLME	THOD: 125mm S	olid Stem Auger			ELEVA	TION: Not Surveyed	
SAMF	PLETYPE	Shelby Tut	be		No Recovery	SPT (N)	Grab Sample	e	\square	Split-Pen	Core	
BACK	FILL TYPE	Bentonite			Pea Gravel	Drill Cuttings	Grout			Slough	Sand [
DEPTH (m)		PRESSION (kPa) ▲ 0 300 400 ROMETER (kPa) ⊠ 0 300 400 M.C. LIQUID ↓ 0 00 00	SOIL SYMBOL	SUCUM	DES	SOIL CRIPTION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0 1	≥ ~~ ⊴ •34 ⊡16	 52		PH_ NC	ASPHALT (50mm thick) CONCRETE (275mm thick) CLAY - silty, high plastic, mc silt layers - At 0.9m: 150mm thick silt la	bist, soft, grey mottled ayer	brown, frequent soft		1 2 3			1
2	⊠ • 30	5		ж	- below 2.1m, firm, no silt lay	vers, occasional oxida	tion		4 5			- - - - - - - - - - - - - - - - - - -
3	⊠ ● ³⁰			_	TEST HOLE TERMINATED NOTES: Neither sloughing nor seepa Test hole remained open to 1	AT 3.0M BELOW PA ge observed during dr full depth and was dry	VEMENT SURFACE illing 1 prior to backfilling.		6			3
4					Test hole backfilled with aug repaired with asphalt.	er cuttings and bento	rite, pavement surfac	9				- - - - - - -
												- - - - - - -
												6 - - - - -
												- 7 - - - - - -
8												
												-9 - - - - - - -
		Wood Environ	ment	& I	nfrastructure Solution	s LOG	GED BY: JW				MPLETION DEPTH: 3 m	
	wood Environment & li a division of Wo		a division of Wood Canada Limited		REV	REVIEWED BY: BW			00	MPLETION DATE: August 4, 1	2021	
\$ **						Figur	e No. A17				Sheet	1 of 1



PROJ	JECT: City of V	Vinnipeg 2021 Str	reets Inv	estigation	DRILLER: Maple Leaf Drilling				T	TEST HOLE ID: Mountain - TH06			
CLIEN	VT: Morrison H	lershfield			DRILL	RIG: Geoprobe				P	PROJECT No: WX19432		
LOCA	ATION: EB Me	dian, 972 Mounta	in		DRILL	VIETHOD: 125m	m Solid Ste	m Auger		E	LEVA	TION: Not Surveyed	
SAMF	PLE TYPE	Shelby Tub	e	No Recove	əry	SPT (N)	Ŭ	Grab Sample		s	plit-Per	n Core	
BACK	FILLTYPE	Bentonite		Pea Grave	ķ	Drill Outtings	· · · · · ·	Grout		∭S	lough	Sand	
DEPTH (m)	UNCONFINED COM 100 200 PØ20KET PENETR 100 200 PLASTIC 20 40	RESSION (kPa) ▲ 300 400 OMETER (kPa) ⊠ 300 400 MC LIQUID 60 80	SOIL SYMBOL MUSCS		DE	SOIL SCRIPTIO	N		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
- 0	•11 •10 •7 •8 ⊠		GP	ASPHALT (50 CONCRETE (GRAVEL (FILL damp to moist	mm thick) 175mm thia .) - poorly g , brown	ck) graded, medium grai	ned, compact	/ (inferred),		1 2 3 4			- - - - - - - - - - - - - - - - - - -
2 		41 ,44	сн	CLAY - silty, h	igh plastic,	moist, stiff, brown				6			-2
				TEST HOLE T NOTES: Neither slough Test hole rem Test hole back repaired with a	ERMINAT ained open filled with a sphalt.	ED AT 3.0M BELOW epage observed durin to full depth and wa auger cuttings and b	/PAVEMENT ng drilling s dry prior to b entonite, pave	SURFACE ackfilling. ment surface					3 4
													-
6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7													6
8													
													9
	<u> </u>	Wood Environ	ment &	Infrastructur	e Soluti	ons	OGGED BY:	JW			0	MPLETION DEPTH: 3 m	
	000 .	a divisio	on of We	ood Canada	Limited	- F	REVIEWED B	r: BW			00	MPLETION DATE: August 4, 2 Sheet	021 1 of 1







PRO.	JECT: City of \	Ninnipeg 2021 S	tree	s Inv	estigation DRILL	ER: Maple Leaf Drillin	ŋg			TEST	HOLE ID: Mountain - TH1	10		
CLIE	NT: Morrison H	lershfield			DRILL	RIG: Geoprobe				PROJ	PROJECT No: WX19432			
LOCA	ATION: WB Me	edian, 834 Mouni	ain		DRILL	METHOD: 125mm S	olid Stem Auger			ELEV	ATION: Not Surveyed			
SAM	PLETYPE	Shelby Tu	be		No Recovery	SPT (N)	Grab Sample		\square	Split-Pe	en Core			
BACK	(FILL TYPE	Bentonite			Pea Gravel	Drill Cuttings	Grout			Slough	Sand			
DEPTH (m)	UNCONFINED COM 100 200 POSOKET PENETIF 100 200 PLASTIC L 20 40	PRESSION (kPa) ▲ 300 400 ROMETER (kPa) ⊠ 300 400 M.C. LIQUID 60 80	SOIL SYMBOL	MUSCS	D	SOIL ESCRIPTION		SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)		
_ 0				SPH	ASPHALT (175mm thic CONCRETE (325mm t	ck) thick)						-		
- - - - - - - - - - - - - - - - - - -	24 •21	_ 54		CH ML	CLAY - silty, high plast indusions SILT - low plastic, mois	iic, moist, friable, dark grey, st, soft, brown	occasional organic		1 2 3			- - - - - - - - - - - - - - - - - - -		
- - - - - - - - - - - - - - - - - - -				сн	CEAT ⁻ Sity, high past	ic, most, suit, brown			5		Particle Size Analysis - Sample 4 @ 1.5m Gravel= 0.0% Sand= 0.5% Silt= 14.5% Clay= 85.0%	- - - - - - -		
		41			TEST HOLE TERMINA NOTES: Neither sloughing nor s	ATED AT 3.0M BELOW PAV	/EMENT SURFACE		6			3		
4 					Test hole terrained op Test hole backfilled with repaired with asphalt.	en to ruil depun and was dry th auger cuttings and bentor	prior to backnilling. lite, pavement surface					- - 4 - -		
M) MY 01:30 92:160/17												5 5 		
												6		
												- 7 - 7 		
0 0 0 0 0 0 0 0 0 0 0 0 0 0												-9 9 		
32 W		Wood Enviro	nme	nt &	Infrastructure Solu					α		101		
	wood. a division of			a division of Wood Canada Limited			d REVI	REVIEWED BY: BW COMPLETION DATE: August 5, 2021 Figure No. A23 Sheet 1 of 1					of 1	





PARTICLE SIZE ANALYSIS



Report Date:	28 September 2021						
Client		Project					
Name:	Morrison Hershfield	Name:	City of Winnipeg 2021 Streets Investigation				
Address:		Address:	Mountain Avenue / McGregor Street				
Attention:		Project No.:	WX19432				
PO Number:		Manager:	JW				

Gradation Specification:



Sample ID		mUSCS	МС	D100	D60	D30	D10	LL	PL	% Gravel	% Sand	% Fines
•	Mountain - TH02, 1.2 m	СН	33.1	2				81	22	0	2	21 (Silt) : 77 (Clay)
	Mountain - TH03, 1.2 m	SC	20.1	9.5	0.5	0		53	15	1	56	15 (Silt) : 28 (Clay)
	Mountain - TH05, 0.9 m	СН	20.9	4.8	0	0		21	17	0	14	73 (Silt) : 13 (Clay)
*	Mountain - TH07, 1.2 m	СН	37.9	2				67	21	0	2	24 (Silt) : 74 (Clay)
\odot	Mountain - TH08, 2.1 m	СН	43.4	2				79	22	0	1	24 (Silt) : 75 (Clay)
٥	Mountain - TH10, 1.5 m	СН	53.7	2				91	25	0	1	15 (Silt) : 85 (Clay)

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request. Wood Environment & Infrastructure Solutions - 440 Dovercourt Drive - Winnipeg, MB - R3Y 1N4