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APPENDIX 'A' - GEOTECHNICAL REPORT

PAVEMENT CORES FOR:

Bronx Avenue from Henderson Highway to Roch Street – Concrete Pavement Rehabilitation Helmsdale Avenue from Henderson Highway to Brazier Street – Concrete Pavement Rehabilitation Hazel Dell Avenue from Henderson Highway to Brazier Street – Concrete Pavement Rehabilitation Linden Avenue from Henderson Highway to Roch Street – Concrete Pavement Rehabilitation Oakview Avenue from Henderson Highway to Brazier Street – Concrete Pavement Rehabilitation Raleigh Street from Gilmore Avenue to Glenway Avenue – Asphalt Pavement Resurfacing

The geotechnical report is provided to aid in the Contractor's evaluation of the existing pavement structure and/or soil conditions. The information presented is considered accurate at the locations shown on the Drawings and at the time of drilling. However, variations in pavement structure and/or soil conditions may exist between test holes and fluctuations in groundwater levels can be expected seasonally and may occur as a result of construction activities. The nature and extent of variations may not become evident until construction commences.



Stantec Consulting Ltd. 199 Henlow Bay Winnipeg MB R3Y 1G4

January 31, 2023

Project/File: 123316298

Erik Hansen City of Winnipeg 1155 Pacific Avenue Winnipeg, MB R3B 1B9

Good day Erik,

Reference: 2023 Local Street Renewals Program - Bronx Avenue and Various Locations

Stantec Consulting Ltd. (Stantec) was retained to undertake a factual geotechnical investigation for the 2023 Local Street Renewals Program (Bronx Avenue and Various Locations) located in Winnipeg, MB. Use of this report is subject to the Statement of General Conditions provided in **Appendix A**.

The subsurface coring and drilling sampling program was conducted from January 6 to January 13, 2023. Pavement coring was performed by Stantec geotechnical personnel, and drilling services were provided by Maple Leaf Drilling Ltd. under Stantec's supervision. The borehole locations are shown on the attached Borehole Location Plan provided in **Appendix B**. The pavement cores were sampled with a 150 or 100 mm bit and boreholes were drilled with 125 mm solid stem augers. Geotechnical drilling boreholes were terminated at a depth of 1.0 m below pavement, and soil samples were obtained directly from the auger flights at 0.3 m intervals. Upon completion of drilling, the testholes were examined for evidence of sloughing and groundwater seepage. The soil classification used in the borehole records is as per ASTM D2487 – *Standard Practice for Classification of Soils for Engineering Purposes.* The borehole records are provided in **Appendix C** and core photographs are provided in **Appendix D**.

The following laboratory tests were conducted on select soil samples:

- ASTM D2216 Laboratory Determination of Water (Moisture) Content of Soil by Mass
- ASTM D4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D7928 Particle-Size Distribution of Fine-Grained Soils Using The Sedimentation Analysis
- CSA A23.2-14C Obtaining and testing drilled cores for compressive strength testing

The concrete compressive strength tests were conducted under wet conditions. The moisture content results are shown on the borehole records, and the laboratory test reports are provided in **Appendix E**.

We appreciate the opportunity to assist you on this project. Please contact the undersigned if you have any questions regarding this report.

Reference: 2023 Local Street Renewals Program – Bronx Avenue and Various Locations

Regards,

STANTEC CONSULTING LTD.

Guillaume Beauce P.Eng.

Field Supervisor, Materials Testing Services

Phone: 204-928-7618 Mobile: 204-898-8290

guillaume.beauce@stantec.com

Attachment: Appendix A – Statement of General Conditions Appendix B – Borehole Location Plan

Appendix B – Borehole Location Plan Appendix C – Borehole Records Appendix D – Core Photographs Appendix E – Laboratory Test Reports **Jason Thompson** C.E.T.

Manager, Materials Testing Services

Phone: 204-928-4004 Mobile: 204-981-8445

jason.thompson@stantec.com

APPENDIX A

Statement of General Conditions

STATEMENT OF GENERAL CONDITIONS

USE OF THIS REPORT: This report has been prepared for the sole benefit of the Client or its agent and may not be used by any third party without the express written consent of Stantec and the Client. Any use which a third party makes of this report is the responsibility of such third party.

BASIS OF THE REPORT: The information, opinions, and/or recommendations made in this report are in accordance with Stantec's present understanding of the site-specific project as described by the Client. The applicability of these is restricted to the site conditions encountered at the time of the investigation or study. If the proposed site-specific project differs or is modified from what is described in this report or if the site conditions are altered, this report is no longer valid unless Stantec is requested by the Client to review and revise the report to reflect the differing or modified project specifics and/or the altered site conditions.

STANDARD OF CARE: Preparation of this report, and all associated work, was carried out in accordance with the normally accepted standard of care in the state or province of execution for the specific professional service provided to the Client. No other warranty is made.

INTERPRETATION OF SITE CONDITIONS: Soil, rock, or other material descriptions, and statements regarding their condition, made in this report are based on site conditions encountered by Stantec at the time of the work and at the specific testing and/or sampling locations. Classifications and statements of condition have been made in accordance with normally accepted practices which are judgmental in nature; no specific description should be considered exact, but rather reflective of the anticipated material behavior. Extrapolation of in situ conditions can only be made to some limited extent beyond the sampling or test points. The extent depends on variability of the soil, rock, and groundwater conditions as influenced by geological processes, construction activity, and site use.

VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments of the report conclusions or recommendations are required. Stantec will not be responsible to any party for damages incurred as a result of failing to notify Stantec that differing site or sub-surface conditions are present upon becoming aware of such conditions.

PLANNING, DESIGN, OR CONSTRUCTION: Development or design plans and specifications should be reviewed by Stantec, sufficiently ahead of initiating the next project stage (property acquisition, tender, construction, etc.), to confirm that this report completely addresses the elaborated project specifics and that the contents of this report have been properly interpreted. Specialty quality assurance services (field observations and testing) during construction are a necessary part of the evaluation of sub-subsurface conditions and site preparation works. Site work relating to the recommendations included in this report should only be carried out in the presence of a qualified geotechnical engineer; Stantec cannot be responsible for site work carried out without being present.



APPENDIX B

Borehole Location Plan

2023-01-24 123316298



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Stantec Consulting Ltd.
Suite 500, 311 Portage Avenue
Winnipeg MB Canada R3B 2B9
Tel. 204.489.5900 Fax. 204.453.9012
www.stantec.com

Legend

APPROXIMATE BOREHOLE LOCATION

Scale

CITY

CITY OF WINNIPEG

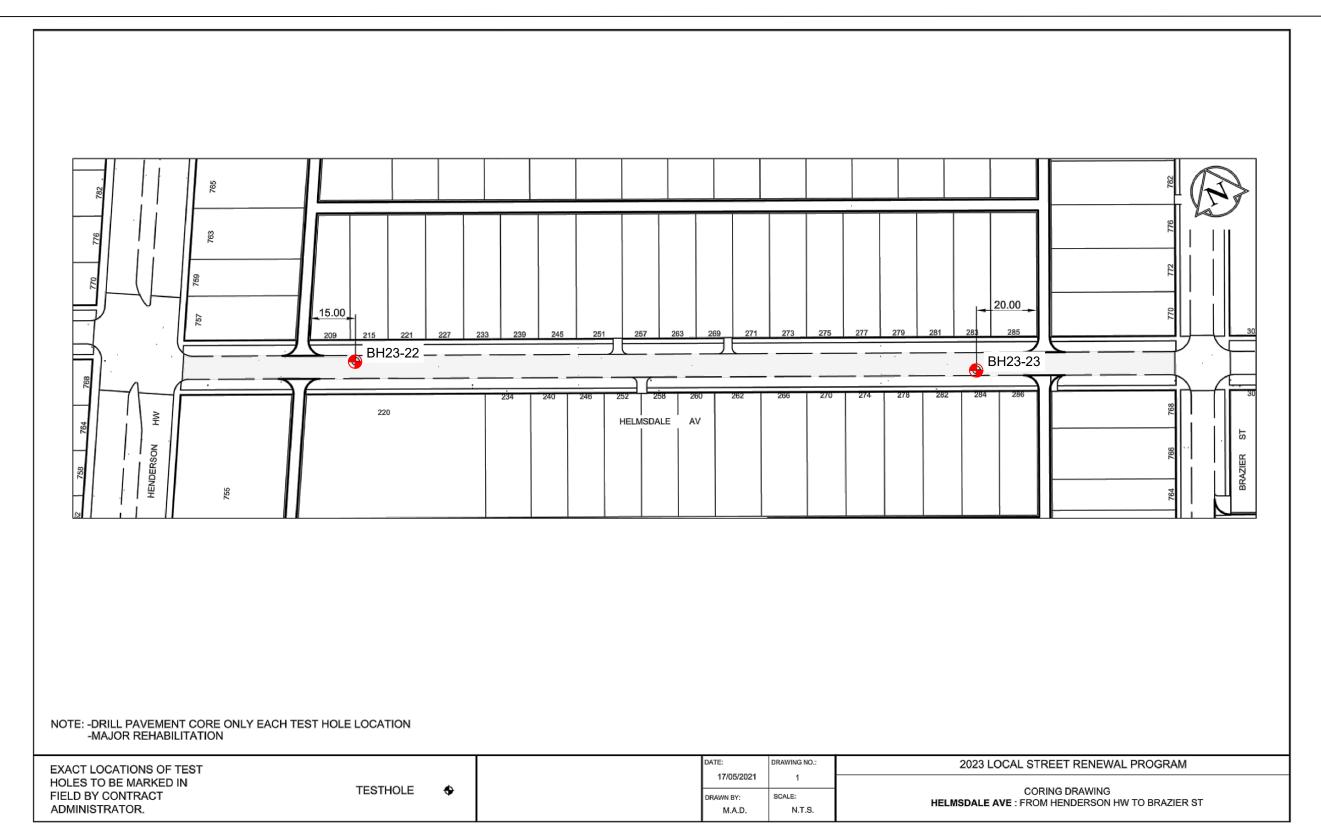
2023 LOCAL STREET RENEWALS PROGRAM

WINNIPEG, MB

Figure No.

BRONX

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ORIGINAL SHEET - ISO 11x17 - v17.05

2023-01-25 123316298

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APPROXIMATE BOREHOLE LOCATION

Scale

Client/Project

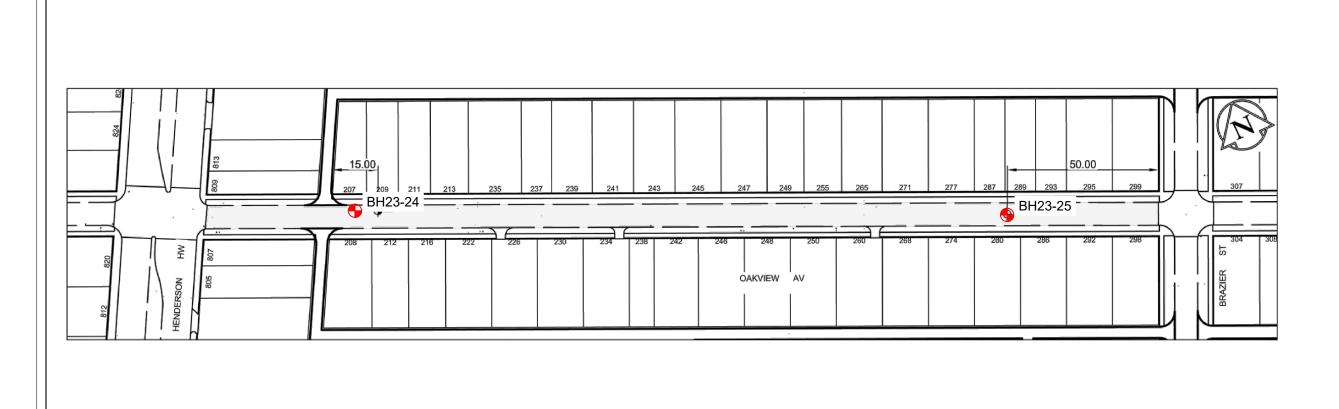
CITY OF WINNIPEG

2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

Figure No.

HELMSDALE





NOTE: -DRILL PAVEMENT CORE ONLY EACH TEST HOLE LOCATION -MINOR REHABILITATION

EXACT LOCATIONS OF TEST HOLES TO BE MARKED IN FIELD BY CONTRACT ADMINISTRATOR.

TESTHOLE •

17/05/2021 N.T.S. M.A.D.

Scale

2023 LOCAL STREET RENEWAL PROGRAM

CORING DRAWING

OAKVIEW AVE: FROM HENDERSON HW TO BRAZIER ST

ORIGINAL SHEET - ISO 11x17 - v17.05

2023-01-24 123316298



APPROXIMATE BOREHOLE LOCATION

Legend

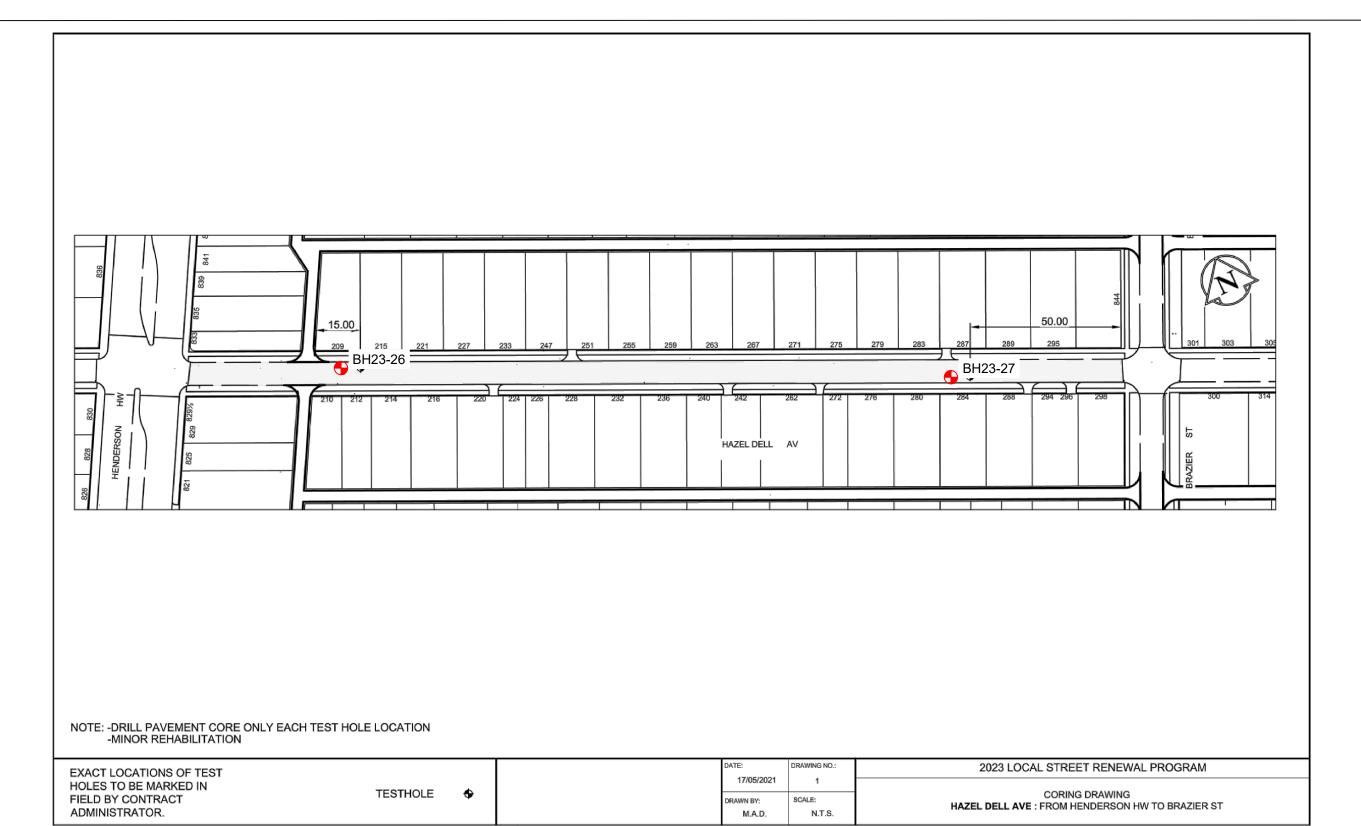
CITY OF WINNIPEG 2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

Figure No.

OAKVIEW

BOREHOLE LOCATION PLAN

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Legend

APPROXIMATE BOREHOLE LOCATION

Scale

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CITY OF WINNIPEG

2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

Figure No.

HAZEL DELL

BOREHOLE LOCATION PLAN

2023 LOCAL STREET RENEWAL PROGRAM CORING DRAWING LINDEN AVE: FROM HENDERSON HW TO ROCH ST

2023-01-24 123316298



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APPROXIMATE BOREHOLE LOCATION

Scale

N.T.S.

17/05/2021

M.A.D.

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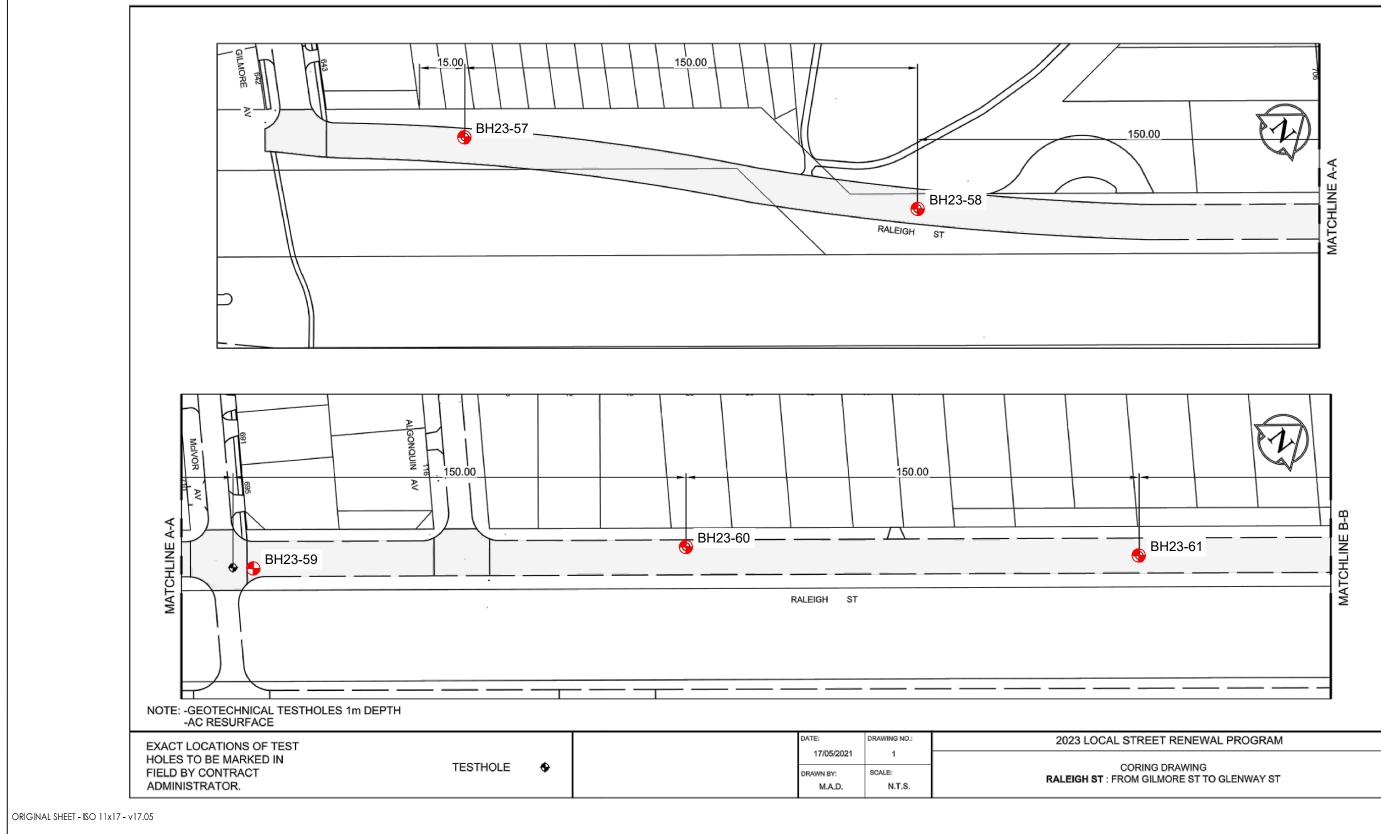
Client/Project CITY OF WINNIPEG

> 2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

Figure No.

BH23-29

BOREHOLE LOCATION PLAN



2023-01-24 123316298



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APPROXIMATE BOREHOLE LOCATION

Scale

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2023 LOCAL STREET RENEWALS PROGRAM

WINNIPEG, MB

Figure No.

RALEIGH (1_OF 2)

BOREHOLE LOCATION PLAN

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APPROXIMATE BOREHOLE LOCATION

Scale

Client/Project

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2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

Figure No.

RALEIGH (2 OF 2)

BOREHOLE LOCATION PLAN

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APPENDIX C

Borehole Records

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Terminology describing common soil genesis:

Rootmat	 vegetation, roots and moss with organic matter and topsoil typically forming a mattress at the ground surface
Topsoil	- mixture of soil and humus capable of supporting vegetative growth
Peat	- mixture of visible and invisible fragments of decayed organic matter
Till	- unstratified glacial deposit which may range from clay to boulders
Fill	- material below the surface identified as placed by humans (excluding buried services)

Terminology describing soil structure:

Desiccated	- having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
Fissured	- having cracks, and hence a blocky structure
Varved	- composed of regular alternating layers of silt and clay
Stratified	- composed of alternating successions of different soil types, e.g. silt and sand
Layer	- > 75 mm in thickness
Seam	- 2 mm to 75 mm in thickness
Parting	- < 2 mm in thickness

Terminology describing soil types:

The classification of soil types are made on the basis of grain size and plasticity in accordance with the Unified Soil Classification System (USCS) (ASTM D 2487 or D 2488) which excludes particles larger than 75 mm. For particles larger than 75 mm, and for defining percent clay fraction in hydrometer results, definitions proposed by Canadian Foundation Engineering Manual, 4th Edition are used. The USCS provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification.

Terminology describing cobbles, boulders, and non-matrix materials (organic matter or debris):

Terminology describing materials outside the USCS, (e.g. particles larger than 75 mm, visible organic matter, and construction debris) is based upon the proportion of these materials present:

Trace, or occasional	Less than 10%
Some	10-20%
Frequent	> 20%

Terminology describing compactness of cohesionless soils:

The standard terminology to describe cohesionless soils includes compactness (formerly "relative density"), as determined by the Standard Penetration Test (SPT) N-Value - also known as N-Index. The SPT N-Value is described further on page 3. A relationship between compactness condition and N-Value is shown in the following table.

Compactness Condition	SPT N-Value
Very Loose	<4
Loose	4-10
Compact	10-30
Dense	30-50
Very Dense	>50

Terminology describing consistency of cohesive soils:

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by *in situ* vane tests, penetrometer tests, or unconfined compression tests. Consistency may be crudely estimated from SPT N-Value based on the correlation shown in the following table (Terzaghi and Peck, 1967). The correlation to SPT N-Value is used with caution as it is only very approximate.

Consistency	Undrained Sh	Undrained Shear Strength									
Consistency	kips/sq.ft.	SPT N-Value									
Very Soft	<0.25	<12.5	<2								
Soft	0.25 - 0.5	12.5 - 25	2-4								
Firm	0.5 - 1.0	25 - 50	4-8								
Stiff	1.0 - 2.0	50 – 100	8-15								
Very Stiff	2.0 - 4.0	100 - 200	15-30								
Hard	>4.0	>200	>30								

STRATA PLOT

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols. The dimensions within the strata symbols are not indicative of the particle size, layer thickness, etc.























Boulders Cobbles Gravel

Clay

Organics Asphalt

Igneous Bedrock morphic Bedrock

Sedimentary Bedrock

SAMPLE TYPE

SS	Split spoon sample (obtained by performing the Standard Penetration Test)
ST	Shelby tube or thin wall tube
D.B.	Direct-Push sample (small diameter tube
DF	sampler hydraulically advanced)
PS	Piston sample
BS	Bulk sample
HQ, NQ, BQ, etc.	Rock core samples obtained with the use
TIQ, NQ, BQ, EIC.	of standard size diamond coring bits.

WATER LEVEL MEASUREMENT



measured in standpipe, piezometer, or well



inferred

RECOVERY

For soil samples, the recovery is recorded as the length of the soil sample recovered. For rock core, recovery is defined as the total cumulative length of all core recovered in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

N-VALUE

Numbers in this column are the field results of the Standard Penetration Test: the number of blows of a 140 pound (63.5 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (300 mm) into the soil. In accordance with ASTM D1586, the N-Value equals the sum of the number of blows (N) required to drive the sampler over the interval of 6 to 18 in. (150 to 450 mm). However, when a 24 in. (610 mm) sampler is used, the number of blows (N) required to drive the sampler over the interval of 12 to 24 in. (300 to 610 mm) may be reported if this value is lower. For split spoon samples where insufficient penetration was achieved and N-Values cannot be presented, the number of blows are reported over sampler penetration in millimetres (e.g. 50/75). Some design methods make use of N-values corrected for various factors such as overburden pressure, energy ratio, borehole diameter, etc. No corrections have been applied to the N-values presented on the log.

DYNAMIC CONE PENETRATION TEST (DCPT)

Dynamic cone penetration tests are performed using a standard 60 degree apex cone connected to 'A' size drill rods with the same standard fall height and weight as the Standard Penetration Test. The DCPT value is the number of blows of the hammer required to drive the cone one foot (300 mm) into the soil. The DCPT is used as a probe to assess soil variability.

OTHER TESTS

S	Sieve analysis
Н	Hydrometer analysis
k	Laboratory permeability
Υ	Unit weight
Gs	Specific gravity of soil particles
CD	Consolidated drained triaxial
CU	Consolidated undrained triaxial with pore
CU	pressure measurements
UU	Unconsolidated undrained triaxial
DS	Direct Shear
С	Consolidation
Qυ	Unconfined compression
	Point Load Index (Ip on Borehole Record equals
Ιp	I_p (50) in which the index is corrected to a
	reference diameter of 50 mm)

Ţ	Single packer permeability test; test interval from depth shown to bottom of borehole
	Double packer permeability test; test interval as indicated
, o	Falling head permeability test using casing
	Falling head permeability test using well point or piezometer

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CONCRETE: 155 mm Solid Barehole So	DA	ATE BC	DRED: <u>January 12, 20</u>)23						_												_
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CONCRETE: 155 mm		ELE		STRA	TYP	NUME	RECOVER or TCF	N-VA or RQI					ie) BLO	WS/0.3r	n				W _P W	W L	MON	
End of Borehole	0 +		CONCRETE: 155 mm								10) 2	20	30	40	50	· · · · ·	50 : : :	70	80		_
End of Borehole				\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \																		
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Drilling Contractor: Stantec Logged By: LB			Life of porelione																			
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Logged by. Lb									Drilling Co.	ntra	oto	ır. St	antec							Logge	d By: LB	_
ACKFILL SYMBOL ASPHALT GROUT CONCRETE Drilling Method: Coring Reviewed By:	3ACk	KFILL S	symbol Masphalt	∭GR	OUT	·.~	JCON	ICRETE											\dashv			

	LIENT:	Stantec City of Winnipeg 2023 Local Street Ren	iewals l	Prog				OLE RECO	_												H23- 331629 N/A	
		ON: <u>Hemsdale Ave, Winni</u>		В					_							D	ATU	IM:	N/	Ά		_
DA	ATE BO	DRED: <u>January 12, 202</u>	23			D. 50			_			SHE			NGTH	. Cu I	(kPa))				_
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	<u>"</u>	SAM		"IUE ID %	OTHER TESTS / REMARKS	LA	BOF		RY T N.	EST	▲	F	POCK	VAN	IE TES HEAR	200	◆ E □ O kPa	BACKFILL/ MONITOR WELL/ PIEZOMETER	
•	919		STR	TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %					NTEI e) BLC	DWS/	0.3m	ERBER			W _F	• W	W _L →	MO	
o –		CONCRETE: 160 mm							:::	10	20) :::	30	4	0	50	60		0	80		Г
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		End of Borehole	, V \																			
		and or potential																				
_																						
		S.P.			_			Drilling Co					2								d By: LB	
	KFILL : ENTOI	SYMBOL ASPHALT NITE DRILL CUTTINGS	GR ∴ SAI		<i>≥</i>	CO1	NCRET	Drilling Me Completio					<u> </u>							eviev age	ved By:	G

PR	LIENT:	City of Winnipeg 2023 Local Street Ren ON: Oakview Ave, Winnip		_				OLE RECO									BH	H ELI	EVA	1OIT	: <u>12</u> :	H23- 331629 N/A	8
		ORED: January 12, 20								WA	TER	LEV	EL:	N/	Δ_		יט	~10 <i>i</i>	VI	111/			
DЕРТН (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	J.	SAM	RECOVERY (mm) 31 or TCR %	11UE 1D %	OTHER TESTS / REMARKS		LAB(ORAT CKET I	OR'	Y TES	ST A		FI P		/ANI	E TES IEAR	VAN 200	♦ E □) kPa	BACKFILL/ MONITOR WELL/ PIEZOMETER	
	EE		STR	TYPE	NUMBER	ECOVE or TC	N-VALUE or RQD %				ER C N-val					BERG	G LIM	NITS	W _P	₩ •	W _L	MO	
0 -						~			ļ	. 10)	20	3		ontent ((%) and	Blow Co	60	70	<u>) </u>	80		_
		CONCRETE: 185 mm																					
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			V V V																				_
			D Q																				
		End of Borehole																					-
1		1			1			Drilling Co	ntro	icto	or: St	ant	tec	· ·						L	ogge	d By: LB	-
	KFILL S ENTOI	SYMBOL ASPHALT NITE DRILL CUTTINGS	GR .∵.SAI		D	CO1	NCRET UGH	Drilling Me Completio												-	eviev age	ved By:	(

PR	IENT: OJEC	City of Winnipeg 2023 Local Street Ren		_				OLE RECO	_								вн Е	LEVA	10IT/	. : <u>12</u> √:		8
		ON: <u>Oakview Ave, Winnip</u> DRED: <u>January 12, 20</u> 2							_ v	V A T	ER LI	E\/EI	. .	I / A			DATI	JM:	_N/	<u>'A</u>		_
		DRED: <u>January 12, 20</u> 2			SAM				UN L	IDR.		O SHI	EAR :	STRE	NGTH	FIELD) VAI	NE TE		+	L/ /ELL/ ER	
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %	OTHER TESTS / REMARKS			50	kPa 	NT 8	100	kPa ERBEI		150 k	Pa w	20	D kPa	BACKFILL/ MONITOR WELL/ PIEZOMETER	
					Z	RECO	Ζō		SF	PT (N	-valu	e) BL				and Plan	u Count	•	•	•		
0 -		CONCRETE: 155 mm								10	2	0	30		ent (%) ai 10	50	6C) 7	70	80		-
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1		I	l		1		1 1	Drilling Co	ntrac	ctor	: Stc	ınte	il: C				:::1		: : : L	.ogge	d By: LB	-
ACI		SYMBOL ASPHALT NITE ØDRILL CUTTINGS	∭GR .∵ SAI		D	CO1	NCRET														ved By:	G

	JENT: OJEC	tantec City of Winnipeg 2023 Local Street Rev	newals	Prog			HOLE RECO	_											H23-: 331629 N/A	
		DN: <u>Hazel Dell Ave, Winn</u> i		_															•	_
DA	ATE BO	PRED: <u>January 13, 20</u>	23									N/A			". "				1 1	=
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (mm) and or TCR % N-VALUE	OTHER TESTS / REMARKS	LA		ATO	RY TES N.	R STRE		FIELD POC	AN (NE TES	200	kPa 	BACKFILL/ MONITOR WELL/ PIEZOMETER	
	ä		STR	Ţ	NON	RECOVE Or TC	5				BLOV	& ATT VS/0.3n	n			W _F	• W	W _L	MO	
0 -		CONCRETE: 160 mm	·D.					:::	10	20	3	0 4	10	50	60	7	O 8	30		_
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							Drilling Co	ntrac	tor:	Star	ntec						L	ogge	d By: LB	_
BACI	KFILL S	YMBOL ASPHALT IITE ØDRILL CUTTINGS	GR	OUT	·D	CONCF SLOUGI	ETE Drilling Me												ved By:	

	IENT:	City of Winnipeg 2023 Local Street Rei	newals	Proa			OLE RECO	_								: <u>12</u>	H23-2 331629 N/A	8
		ON: <u>Hazel Dell Ave, Winn</u>		_				_									-,,,,	
DA	TE BC	DRED: <u>January 13, 20</u>	23						ATER LI			I O TI I	0 // 5					_
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT		SAM		OTHER TESTS / REMARKS	LAE	ORATO	ORY TES	R STREN ST ▲ *	FI P	ELD VA	ANE TES	R VANI	♦ E □) kPa	BACKFILL/ MONITOR WELL/ PIEZOMETER	
	ELE		STRA	TYPE	NUMBER	RECOVERY (mm) or TCR % N-VALUE or RQD %		SPT	(N-value	e) BLOV	VS/0.3m	nt (%) and	Blow Cour	nt .	•	₩ _L	MOI PI	
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		End of Borehole	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\															
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1				. !	•		Drilling Co	ntract	or: Sto	intec					L	ogge	d By: LB	
BACI	(FILL : ENTOI	SYMBOL ASPHALT WITE DRILL CUTTINGS	∭GR ∭SAI	OUT	D	CONCRET SLOUGH	Drilling Me Completio								_	eview age	ved By:	3

LC		City of Winnipeg						OLE RECO	_									: <u>12</u>	H23-: 331629	98
		CT: 2023 Local Street Ren ON: Linden Ave, Winnipeg		Prog	<u>ram</u>				_								ATION N _		N/A	—
		ORED: January 13, 202							_ v	VATER	R LEV	EL:_	N/A			10/11.	_11/_			
					SAM	PLES							R STREN		-		F0T			_
DЕРТН (m)	ELEVATION (m)	SOIL DESCRIPTION	PLOT			mm.		OTHER TESTS /		ABORA OCKET			1 ▲ ★ 100 k	Р			R VAN	◆ E ■) kPa	BACKFILL/ MONITOR WELL/ PIEZOMETER	FI FVATION (m)
DEP	ELEVA	(USCS)	STRATA PLOT	TYPE	NUMBER	COVERY (N-VALUE or RQD %	REMARKS					& ATTE /S/0.3m	RBER	G LIMIT	s v	V _P W	W _L	BAC MONIT	FI FVA
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Ü		CONCRETE: 147 mm	D																	
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3ACI	<fill s<="" td=""><td>symbol Masphalt</td><td>∭GR</td><td>OUT</td><td>. 1></td><td>CO1</td><td>NCRET</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>ved By:</td><td></td></fill>	symbol M asphalt	∭GR	OUT	. 1>	CO1	NCRET												ved By:	

	LIENT:							OLE RECO	_								: <u>12</u>	H23-	8
		CT: 2023 Local Street Ren ON: Linden Ave, Winnipeg		Prog	<u>ram</u>				_							ATION _ N/ _		N/A	
		DRED: January 13, 202							_ w	ater L	EVEL:	N/A							
					SAM	PLES								Cu (kPc		ст	_	,	-
Ξ	E z		ō.			٤				BORATO OCKET P		>I ▲		OCKET S			. □	ILL/ Weli eter	
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	ш	E.	چ ج	JE 8	OTHER TESTS / REMARKS		50	kPa 	100 k	Pa	150 k	(Pa	200	kPa 	BACKFILL/ MONITOR WELL/ PIEZOMETER	Ì
_	H		STRA	TYPE	NUMBER	RECOVER or TCI	N-VALUE or RQD %				e) BLOV	WS/0.3m		G LIMITS	W F	P W	W _L	MOR	i
0 -		CONCRETE: 140 mm	1			_			1::::	10 2		Vater Conten 30 40		50 60) 7	70 8	30 : : : :		-
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3AC	KFILL	symbol : asphalt	∭GR	OLIT]CO1	NCRET	Drilling Cor E Drilling Me										d By: LB ved By:	
	ENTO!	NITE DRILL CUTTINGS	IA2		Ŀ <i>⊵</i>	SLO	UGH	Completio								_	age		

PR	IENT:	City of Winnipeg 2023 Local Street Ren ON: Linden Ave, Winnipeg		Prog				OLE RECO	_							ВІ	H ELI	EVA	IION	: <u>12</u> :	H23- 331629 N/A	78
		DRED: January 13, 20 2							_ v	VAT	ER L	EVE	L: <u>N</u>	I/A								
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (mm) ST or ICR %	N-VALUE or RQD %	OTHER TESTS / REMARKS	L/ Pi	ABC OCI	RATC (ET P 50	DRY TEN. kPa	TEST	★ 100		FIELD POCK	VANI ET SH 50 kP	E TES HEAR	200	kPa	BACKFILL/ MONITOR WELL/ PIEZOMETER	
					Z	ZECO.	Żδ				-valu		OWS,	/0.3m	1				•	'		
0 -		CONCRETE: 150 mm	12.5							10	2	0 	30		ent (%) ar 0	d Blow C	60	70	3 (30 		F
		CONCRETE: 150 mm																				
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-			D A																			
			7 00																			
		End of Borehole																				
	<u> </u>	I			1	1		Drilling Co	ntrac	ctor	: Stc	ı::: ante	c_		L::::	1:::	:l: 		Lo	ogge	d By: LB	_
ACI	KFILL S	SYMBOL ASPHALT NITE DRILL CUTTINGS	∭GR ⊡ SAI	OUT	D	CO1	NCRET UGH	E Drilling Me Completio											R	eviev	ved By:	G

PR	LIENT: ROJEC	Stantec City of Winnipeg CT: 2023 Local Street Ren ON: Linden Ave, Winnipeg		Prog				OLE RECO									ВН	ELE	/ATIO	ON:	<u>12</u>	H23- 331629 N/A	98
		ORED:							— V	۷AT	TER L	.EVE	EL:	N/A	١		DA	(IUIVI		N/A	\		
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	ш	SAM		LUE D %	OTHER TESTS / REMARKS	UN L.	NDR ABC	AINE DRATO KET F	D SH ORY	TEST	STRI	ENG ⁻	FIE	Cu (ki ELD V DCKE 150	ANE	AR V.	200 k	кРа	BACKFILL/ MONITOR WELL/ PIEZOMETER	
_	ELE		STR	TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %				ER Co N-valu		LOW	\$/0.3	m		E LIMI	15	W _P	w ∨ •	H	MO	
0 -		CONCRETE: 150 mm							1::	10	1	20	30		40	50 50	Blow Cou	int 60 : : :	70	80) :::::		F
		CONCRETE: 130 Hilli																					
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	KFILL : ENTOI	Symbol Masphalt Nite Ødrill Cuttings	∭GR ∏SAI	OUT	<i>⊵</i>	CO1 si 0	NCRET UGH	E Drilling Me Completio					m									/ed By:	_

	IENT:	Stantec City of Winnipeg 2023 Local Street Renew	/als	Proa				DLE RECO	_												123	123- 31629 /A
		ON: Raleigh St, Winnipeg, ME																				,,,
DA	ATE BO	ORED: January 6, 2023 to	o Ja	nuai	y 11	, 20	23			WA	TER	LE	√EL:	_ N _	/A							
DЕРТН (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT		SAM	1	1 %	OTHER TESTS / REMARKS			ORA CKET	TOF	RY TE N.	EST	▲	F	Cu (kP) HELD VA OCKET 150	ANE 1 SHE	AR VA	ANE 200 ki	♦ □ Pa	BACKFILL/ MONITOR WELL/ PIEZOMETER
DE	ELEV,	(0303)	STRAT	TYPE	NUMBER	RECOVERY or TCR	N-VALUE or RQD %	KEMPANO		SPT (I	N-vc	ılue)	BLC	WS/(0.3m Conte	nt (%) and	G LIMIT	nt	_	v w	L	BA MONI PIEZ
0 -		ASPHALT: 150 mm								10)	20		30	40	0 (50 6	0	70	80		
-			2000																			
-		Granular FILL		X AS						O												
-		Black, moist, fat CLAY FILL (CH)																				
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		End of Borehole • The soil was frozen to a depth of 0.9 m.																				
		No groundwater seepage or soil sloughing was observed upon completion of drilling. Borehole stopped at a depth of 1.2 m.																				
									<u> </u>						<u> </u>	<u> </u>	<u> </u>					
					-	٦.		Drilling Co							t Dr	illing	Ltd.		\dashv			By: LB
AC			GR SAI		D XXX	1001 10:-	NCRET UGH	Drilling Me Completic						А					_		yiewe ge 1	ed By:

	IENT:	Stantec City of Winnipeg T: 2023 Local Street Reney	wals	Proa				OLE RECO											D.: <u>12</u>	33162 N/A
		ON: Raleigh St, Winnipeg, M							_											
DA	ATE BO	DRED: <u>January 6, 2023</u>	lo Ja	nuai	ry 16	, 20	23		_				_							
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	_	N-VALUE or RQD %	OTHER TESTS / REMARKS	LA PC	BOI OCK	RATO ET P 50 R CO	ORY EN. kPc H	TES I ENT	T ▲ 100	k I 0 kPa 	I, Cu (kPr FIELD VA POCKET 150 	SHEA kPa	AR VA	00 kPa W _L	BACKFILL/ MONITOR WELL/ PIEZOMETER
						E.			SP				W		ntent (%) ar	nd Blow Coun		-		
0 -		ASPHALT: 190 mm								10	2	20	30)	40	50 61	0	70	80	
		Granular FILL	23	V AS					.0											
-		Black, moist, fat CLAY FILL (CH), trace organics																		
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1 -																				
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-		End of Borehole The soil was frozen to a depth of 0.9 m. No groundwater seepage or soil sloughing was observed upon completion of drilling. Borehole stopped at a depth of 1.2 m.																		
		1116																		
								Drilling Co	ntrac	tor:	Mo	aple	e Le	eaf [Drilling	g Ltd.			Logge	d By: LE
ACI	KFILL :		GR SAI		D	CO1	NCRET UGH	Drilling Me	thod:	12	5 m	nm	SSA						Reviev	ved By:

	IENT:	Stantec City of Winnipeg T: 2023 Local Street Renew	als	Prog				OLE RECOI	_									123	H23- 31629 /A
		ON: <u>Raleigh St, Winnipeg, MB</u>							_					D	۸U۸	۸: _	N/A		
DA	ATE BO	DRED: <u>January 6, 2023 to</u>	o Ja	nuar			23		_			.: N/ EAR STR		1 Cu /	(Pal				
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	_	N-VALUE or RQD %	OTHER TESTS / REMARKS	PO WA	SORAT CKET I 50 ATER C	ORY TEN. KPa ONTE	10 NT & AT	0 kPa TERBEI	FIELD \ POCKI 15 RG LIM	/ANE ET SHI 0 kPc	EAR \	/ANE 200 W	◆ □ «Pa	BACKFILL/ MONITOR WELL/ PIEZOMETER
0 -		ASPHALT: 140 mm				_				10	20	30		50	60	70	8) ::::::	
-			****																
-		Granular FILL		AS					0										
-		Black, moist, fat CLAY FILL (CH), trace organics																	
				M															
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-				X AS				Sieve/Hydro at 0.8 m G S M C 0% 1% 32% 67%			: : : : : : : : : : : : : : : : : : :	-0							
-		Grey, moist, silty CLAY (CL-ML)																	
1 -																			
				AS							0								
		End of Borehole • The soil was frozen to a depth of 0.9 m. • No groundwater seepage or soil sloughing was observed upon																	
		completion of drilling. • Borehole stopped at a depth of 1.2 m.																	
			-		ŗ-	1_		Drilling Cor					Orilling	g Ltd.					By: LB
ACI		SYMBOL 🙀 ASPHALT NITE 🔯 DRILL CUTTINGS 🖸	GR Sai	OUT	. <u>/</u>		NCRE UGH	TE Drilling Met Completio									Ke	viewe	of 1

	IENT:	Stantec City of Winnipeg T: 2023 Local Street Renew	rals !	Dro -				OLE RECO													: <u>12</u>	331629
		ON: Raleigh St, Winnipeg, ME		_					_													N/A
		ORED: <u>January 12, 2023</u>							_ _ w	ATE	R LE	VEI	L: <u>N</u>	N/A			<i>D</i> ,	(107	* 1.	-11/		
					SAM	PLES			UNI	ORA	INEC	SHI	EAR	STRE	NGT	H, C	ù (kl	Pa)				
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	VERY (mm)	N-VALUE or RQD %	OTHER TESTS / REMARKS	PC	OCKE	50 I	N. Pa				PC	150	T SH) kPc	EAR	VAN	kPa 	BACKFILL/ MONITOR WELL/ PIEZOMETER
			-	'	z	RECO	Z &		SP1	(N-\	/alue	e) BL		i/0.3r	n tent (%)	and B	ow Cou	unt	·	•	•	
0 -		ASPHALT: 159 mm							:::	10	2) :::	30		40	50		60	7	0	80	
			3555																			
_		Granular FILL		AS																		
-		Black, moist, fat CLAY FILL (CH), trace																				
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-		End of Borehole • The soil was frozen to a depth of 0.9 m. • No groundwater seepage or soil																				
		sloughing was observed upon completion of drilling. • Borehole stopped at a depth of 1.2 m.																				
-				•	•	•		Drilling Co	ntrac	tor:	Мс	ıple	Le	af C	rillin	ng L	td.	•		L	ogge	d By: LB
ΔΟΙ	(FILL :	SYMBOL ASPHALT NITE DRILL CUTTINGS	GR	OUT	D	CO1 SLOI	ICRET	Drilling Me	thod:	12	5 m	m S	SA		_					R	eviev	ved By:

	IENT:	Stantec City of Winnipeg T: 2023 Local Street Renew	rale !	Pro c				OLE RECO												. : <u>12</u>	331629
		ON: Raleigh St, Winnipeg, ME		_					_												N/A
		DRED: <u>January 12, 2023</u>							_ v	VAT	ER L	EVEI	.: N /	Α							
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	_	N-VALUE or RQD %	OTHER TESTS / REMARKS	LA PC	ABO OCI 'ATE	RATO KET P 50 ER CO	ORY 1 EN. kPa H	1 NT & A	▲ ★ 00 ki	F P Pa	IELD OCK	VAN ET S 50 kl	IE TE: HEAF	R VAN 20	◆ UE □ D kPa	BACKFILL/ MONITOR WELL/ PIEZOMETER
						REC			35	1 (10		е) вы 10	OWS/0. Water C 30			d Blow C	Count 60	-	70	80	
0 -		ASPHALT: 165 mm	2000 E										30								
-		Granular FILL		As						· · · · · · · · · · · · · · · · · · ·											
-		Black, moist, fat CLAY FILL (CH), trace organics																			
_				AS									0								
_																					
_				AS										D:							
-		Grey, moist, silty CLAY (CL-ML)		<u> </u>																	
1 -																					
-				AS): : 							
-		End of Borehole • The soil was frozen to a depth of 0.9 m. • No groundwater seepage or soil sloughing was observed upon completion of drilling.																			
		Borehole stopped at a depth of 1.2 m.						Drilling Co	ntrac	ctor	: Mr	aple	Leaf	Dril	lina	Ltd				oane	d By: LB
	(FILL '	symbol M asphalt	GR	OUT	. 12	CO1 SLO1	NCRET								· <u>9</u>						ved By:

	JENT:	Stantec City of Winnipeg						OLE RECO	_										: 12	H23-
		CT: 2023 Local Street Renew		_					<u> </u>											N/A
		ON: <u>Raleigh St, Winnipeg, MI</u> DRED: <u>January 12, 2023</u>	5						— W	ater i	FVF	· N/	Δ.		DA	NUN	۷: _	N/ <i>F</i>	١	
<i>D</i> /	TIL DO				SAM	PIFS				RAINE				STH, (Cu (k	Pa)				
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	_	N-VALUE or RQD %	OTHER TESTS / REMARKS	PO	SORAT CKET F 50 TER C	PEN. I kPa	1	★ 00 kP	PC 'a	150	T SHE	EAR \	VANE 200 W	kPa	BACKFILL/ MONITOR WELL/ PIEZOMETER
			-		z	RECO	2 b		SPT	(N-valu	ue) BL		.3m Content (7) and l	Plant Co.	unt	•	•	•	
0 -		ASPHALT: 190 mm		_						0 : : : :	20 : : :	30	40	50 50		60	70	8	0	
			838888																	
-		Granular FILL	2	X AS					o											
				¥																
		Black, moist, fat CLAY FILL (CH), trace organics																		
				AS									φ:							
_				AS) : : : : : : : : : : : : : : : : : : :						
1 –																				
-																				
-		End of Borehole • The soil was frozen to a depth of 0.9		AS										O: :						
-		No groundwater seepage or soil sloughing was observed upon completion of drilling. Borehole stopped at a depth of 1.2 m.																		
								D 1111 C			<u> </u>					1::		T ,		-I.D. : -
	VE	0/4/POL 1 1000	.] ~ -	○ ··=	<u> </u>	1~~		Drilling Co					Drilli	ing l	Ltd.					d By: LB
_			GR SAI		<i>⊵</i>	SLOI	NCRET	E Drilling Me Completio										_		/ed By:

	IENT:	Stantec City of Winnipeg 2023 Local Street Renew	/als	Prog				OLE RECOF	_								. : <u>12</u>	331629 N/A
		ON: Raleigh St, Winnipeg, ME		_					_									
DA	ATE BO	ORED: <u>January 12, 2023</u>							WATER LEVEL: N/A									
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	_	N-VALUE or RQD %	OTHER TESTS / REMARKS	LAB PO	ORAT CKET F 50 TER C	ORY 1 PEN. kPa H ONTE	EST A	NO kPa		'ANE T SHE O kPa	AR VAN	◆ IE □ O kPa	BACKFILL/ MONITOR WELL/ PIEZOMETER
0 -		ASPHALT: 171 mm				~			1	0	20	Water Co	40	50	60	70	80	
-			88888															
		Granular FILL		AS					0									
		Black, moist, fat CLAY FILL (CH), trace	///															
-		organics																
				X AS								Ö						
-																		
_																		
-				Å AS				Sieve/Hydro at 0.8 m G S M C 0% 3% 24% 74%				I C					1	
1 -																		
-				AS								Ö						
-		End of Borehole • The soil was frozen to a depth of 0.9 m. • No groundwater seepage or soil																
		sloughing was observed upon completion of drilling. Borehole stopped at a depth of 1.2 m.																
1		I.		<u> </u>	1		1 1	Drilling Cor	tract	or: M	aple	Leaf	Drilling	g Ltd.			ogge	d By: LB
ACI	<fill :<="" td=""><td>symbol Rasphalt</td><td>GR</td><td>OUT</td><td>. 1></td><td>CO1 SLO1</td><td>NCRE</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>ved By:</td></fill>	symbol Rasphalt	GR	OUT	. 1>	CO1 SLO1	NCRE											ved By:

PR	IENT:	Stantec City of Winnipeg 2023 Local Street Renew		Prog				OLE RECO	_					ВН	ELE,	OITAV	0. :_ 12 √:	H23- 33162 N/A
		ON: <u>Raleigh St, Winnipeg, MB</u> DRED: <u>January 12, 2023</u>	3							TED	E\/EI ·	N/A		DA	ATUM	1: <u>N</u>	<u>/A</u>	
DF	AIE DO	DRED: <u>January 12, 2023</u>			SAM	DIEC	I		_			AR STRE		, Cu (k	Pa)			
легін (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	1	N-VALUE or RQD %	OTHER TESTS / REMARKS	LAB PO	ORAT CKET I	ORY TE PEN.) kPa 	EST ▲ ★ 100	F F kPa	FIELD V POCKE 150	'ANE T SHE O kPa	AR VAN	♦ NE □ 0 kPa	BACKFILL/ MONITOR WELL/ PIEZOMETER
	⊞		ST	F	Ň	ECOVI or T	9 N					IT & ATT WS/0.3r		'G LIM	ITS	•	— I	×
) –				1		~			1 1	0		Water Cont			unt 60	70	80	
		ASPHALT: 159 mm																
-			2828															
_		Granular FILL		X as						O								
-		Black, moist, fat CLAY FILL (CH), trace organics		-														
-																		
-				X AS							0							
-																		
-				X AS														
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				AS								Ö: ::						
-		End of Borehole • The soil was frozen to a depth of 0.9 m. • No groundwater seepage or soil sloughing was observed upon																
		completion of drilling. • Borehole stopped at a depth of 1.2 m.																
-								Drilling Co					rilling	Ltd.				d By: LE
٩CI		SYMBOL ASPHALT NITE DRILL CUTTINGS	GR SAI	OUT	P	CON	NCRET JGH	Drilling Me Completio				Α					Reviev Page	ved By:

PR	IENT: OJEC	City of Winnipeg 2023 Local Street Renew		Prog			HOLE RECO								ВН	ELEV	ATION	. : <u>_12</u> √:	3H23- 33162 N/A
		ON: Raleigh St, Winnipeg, MB DRED: January 12, 2023					Datum: water level: n/a												
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (mm) THE OT TCR % N-VALUE	OTHER TESTS / REMARKS	UND LAB PO	RAINE ORAT CKET I	ORYPEN.	HEAR TEST	10 & A	ENGT	FIE PC	LD V/ OCKET 150	ANE TE SHEA kPa	R VAN 200	◆ E □ O kPa W _L	BACKFILL/ MONITOR WELL/ PIEZOMETER
0 -		ASPHALT: 171 mm	22.22			<u> </u>		1	0	20	30	ater Co	40 (%)	50	low Coul	nt 50	70	80	
-		Granular FILL	888																
7		Director and in fact CLAV FILL (CLI) through		AS				Ö											
-		Black, moist, fat CLAY FILL (CH), trace organics																	
_				V as															
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-																			
				X AS							C): ::							
1 -																			
-																			
-		End of Borehole • The soil was frozen to a depth of 0.9		AS			_						5						
		M. No groundwater seepage or soil sloughing was observed upon completion of drilling. Borehole stopped at a depth of 1.2 m.																	
1							Drilling Co	ntract	or. w	lani	ele	eaf I	:: ::: Drillir	na I	td			oaae	d By: Li
	ZEILL (symbol Rasphalt	GR	OUT	<u> </u>	CONC							ווווויט	ıy L	u.				ved By:

APPENDIX D

Core Photographs







Figure 3 – Core No. 20 (Bronx Ave)



Figure 2 – Core No. 19 (Bronx Ave)



Figure 4 – Core No. 21 (Bronx Ave)





Figure 5 – Core No. 22 (Hemsdale)



Figure 7 – Core No. 24 (Oakview Ave)



Figure 6 – Core No. 23 (Hemsdale)



Figure 8 – Core No. 25 (Oakview Ave)







Figure 11 – Core 28 (Linden Ave)





Figure 12 – Core 29 (Linden Ave)







Figure 15 – Core 57 (Raleigh St)





Figure 16 – Core 58 (Raleigh St)





Figure 17 – Core 59 (Raleigh St)



Figure 19 – Core 61 (Raleigh St)



Figure 18 – Core 60 (Raleigh St)



Figure 20 – Core 62 (Raleigh St)







Figure 23 – Core 65 (Raleigh St)



Figure 22 – Core 64 (Raleigh St)

APPENDIX E

Laboratory Test Reports



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

City of Winnipeg, Public Works Department

104 - 1155 Pacific Avenue Winnipeg, Manitoba

R3E 3P1

ATTN: Erik Hansen

PROJECT 2023 Local Streets Renewals Program

PROJECT NO. 123316298

REPORT NO. 1

DATE SAMPLED: 2023.Jan.17 DATE RECEIVED: 2023.Jan.17 DATE TESTED: 2023.Jan.27 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Larry Presado

SAMPLE ID: BH23-59, 2.8' (Raleigh St)

LIQUID LIMIT

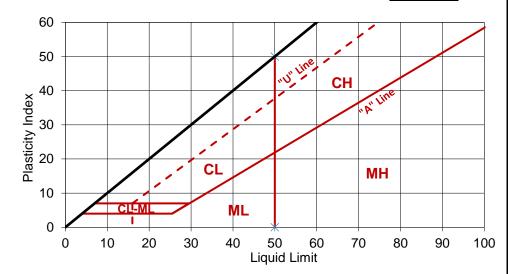
TRIAL BLOWS MC (%) Corr. MC (%)

LIQUI	D LIIVII I
1	2
25	25
87	87
87	87

	PLASTIC LIMIT							
TRIAL	1	2						
MC (%)	21	21						

LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI AS REC'D MC (%)

87 21 1 66 30.2



COMMENTS:

REPORT DATE 2023.Jan.30

REVIEWED BY Guill

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided on written request. The data presented is for sole use of client stipulated above. Stantec is not responsible, nor can be held liable, for the use of this report by any other party, with or without the knowledge of Stantec.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

City of Winnipeg, Public Works Department

104 - 1155 Pacific Avenue Winnipeg, Manitoba

R3E 3P1

ATTN: Erik Hansen

PROJECT 2023 Local Streets Renewals Program

PROJECT NO. 123316298

REPORT NO. 2

DATE SAMPLED: 2023.Jan.17 DATE RECEIVED: 2023.Jan.17 DATE TESTED: 2023.Jan.26 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Blair Dawson

SAMPLE ID: BH23-63, 2.9' (Raleigh St)

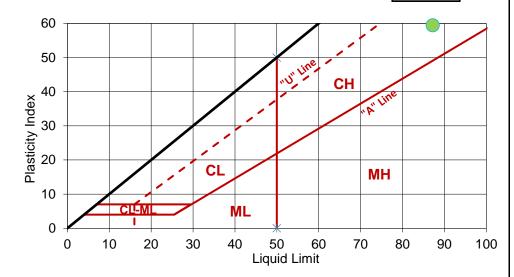
LIQUID LIMIT

TRIAL BLOWS MC (%) Corr. MC (%)

1	2
25	27
87	87
87	88

	PLASTIC LIMIT								
TRIAL	1	2							
MC (%)	28	28							

LIQUID LIMIT, LL
PLASTIC LIMIT, PL
PLASTICITY INDEX, PI
AS REC'D MC (%)



COMMENTS:

REPORT DATE 2023.Jan.30

REVIEWED BY (

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services

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199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Department **PROJECT**

2023 Local Streets Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

DATE SAMPLED: 2023.Jan.17

PROJECT NO.

123316298

1

ATTN: Erik Hansen

100

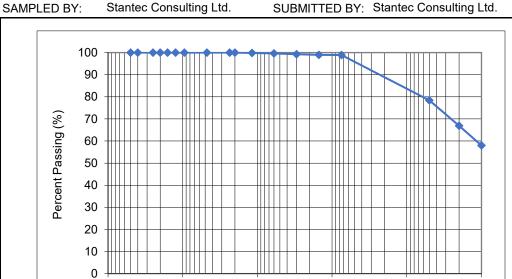
REPORT NO.

DATE TESTED: 2023.Jan.23

SUBMITTED BY: Stantec Consulting Ltd.

DATE RECEIVED 2023.Jan.17

Donald Eliazar TESTED BY:



Gravel		Sand		Silt	Clay	Colloids	
Graver	Coarse	Medium	Fine	5111	Clay	Collolus	
0.0	0.0	0.4	0.7	32.0	66.9	58.0	

Particle Size (mm)

0.1

SIEVE SIZE	%
(mm)	PASSING
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	100.0
1.18	99.8
0.600	99.6
0.300	99.3
0.150	99.0
0.075	98.9
0.005	78.4
0.002	66.9
0.001	58.0

COMMENTS:

Material tested was identified as BH23-59, 2.8' (Raleigh St).

10

REPORT DATE 2023.Jan.30 REVIEWED BY

0.01

0.001

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services

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199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Department

PROJECT

2023 Local Streets Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

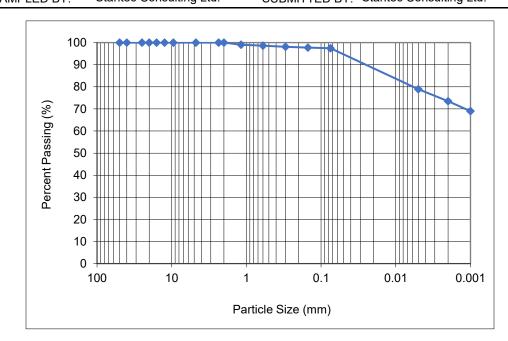
PROJECT NO.

123316298

ATTN: Erik Hansen

REPORT NO. 2

DATE SAMPLED: 2023.Jan.17 DATE RECEIVED 2023.Jan.17 DATE TESTED: 2023.Jan.23 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Donald Eliazar



Gravel		Sand		Silt	Clay	Colloids	
Glavei	Coarse	Medium	Fine	5111	Clay	Colloius	
0.0	0.0	1.4	1.2	23.9	73.5	69.0	

SIEVE SIZE (mm)	% PASSING
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	100.0
1.18	99.0
0.600	98.6
0.300	98.1
0.150	97.7
0.075	97.4
0.005	78.9
0.002	73.5
0.001	69.0

COMMENTS:

Material tested was identified as BH23-63, 2.9' (Raleigh St).

REPORT DATE 2023.Jan.30

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services

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Table 1 - Compressive Strength Test Data

Test	Core Identification	Diameter	Length	L/D Ratio	Correction	Peak Load	Compressive Strength (MPa)		
No.	identification	(mm)	(mm)		Factor	(kN)	Measured	Corrected	
1	BH-23-19	100	168	1.68	0.974	435.73	53.8	52.4	
2	BH-23-23	100	172	1.72	0.978	334.62	41.3	40.4	
3	BH-23-24	100	192	1.92	0.994	482.12	59.5	59.1	
4	BH-23-26	100	169	1.69	0.975	505.25	62.3	60.8	
5	BH-23-30	100	158	1.58	0.966	524.69	64.7	62.5	