Appendix "A"

The City of Winnipeg Tender No. 1-2023

Template Version: eC2022 12 31 - Const Road Works

APPENDIX 'A' - GEOTECHNICAL REPORT

PAVEMENT CORES FOR:

Alwood Crescent from Egesz Street to Egesz Street – Asphalt Pavement Rehabilitation Benbow Road from Egesz Street to Burrows Avenue – Asphalt Pavement Resurfacing Bunting Street from Church Avenue to Inkster Boulevard – Concrete Pavement Rehabilitation Channing Street from Burrows Avenue to Wendon Bay – Asphalt Pavement Resurfacing Charter Drive from Egesz Street to Benbow Road – Asphalt Pavement Resurfacing Garden Grove Drive from Fairgrove Bay to Fairgrove Bay – Asphalt Pavement Rehabilitation Groverdale Avenue from Garden Grove Drive to Burdick Place – 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 – Alwood Crescent and Various Locations

Stantec Consulting Ltd. (Stantec) was retained to undertake a factual geotechnical investigation for the 2023 Local Street Renewals Program (Alwood Crescent 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 16, 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 – Alwood Crescent 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.

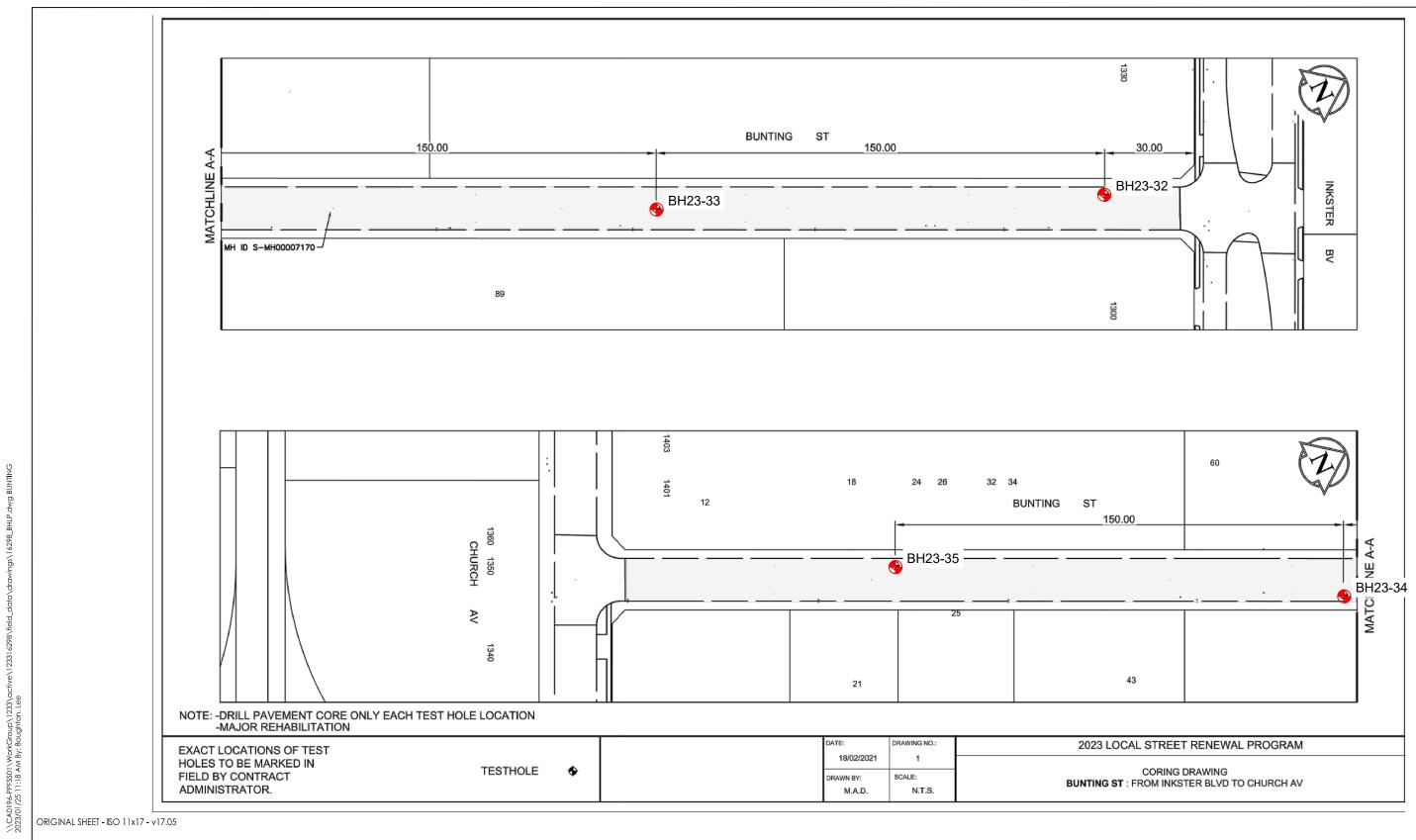
VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments 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



Scale

APPROXIMATE BOREHOLE LOCATION

Legend

CITY OF WINNIPEG

2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

2023-01-24 123316298

Figure No.

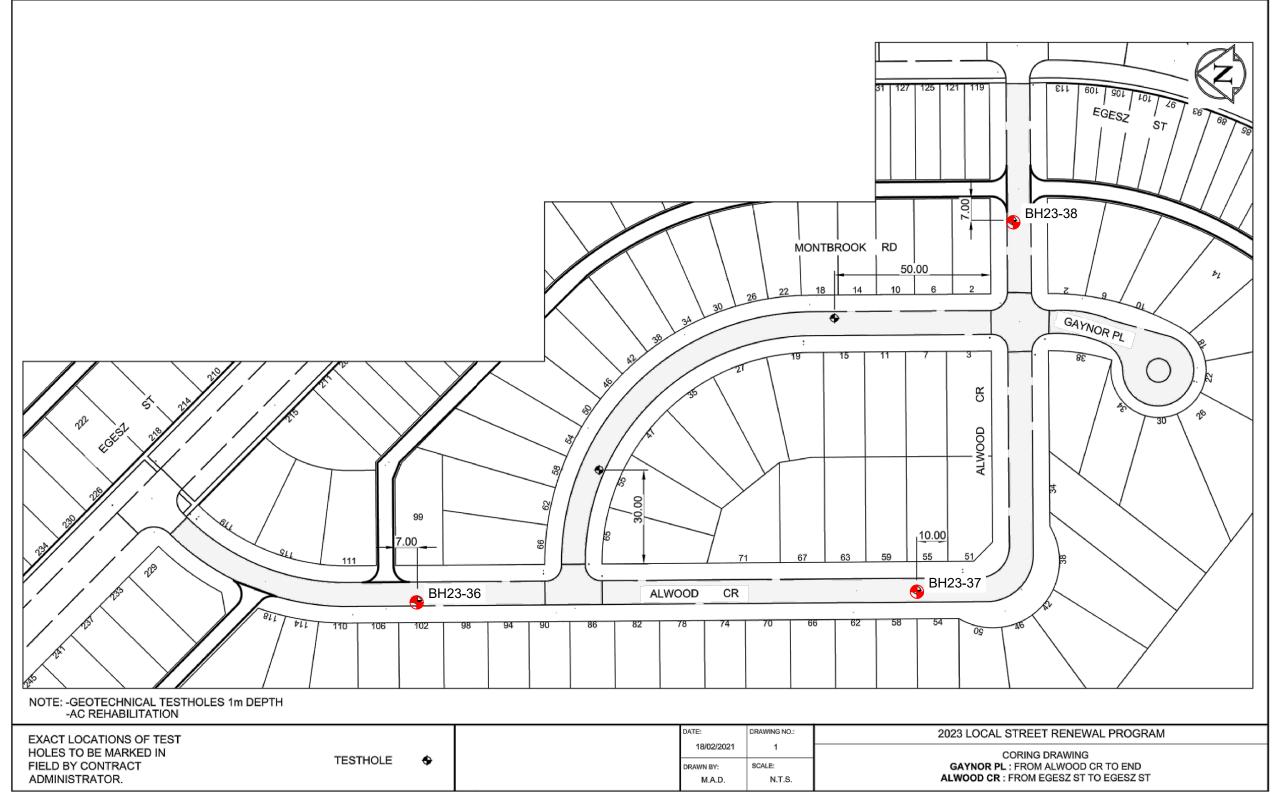
BOREHOLE LOCATION PLAN

Stantec

Stantec Consulting Ltd. Suite 500, 311 Portage Avenue

Winnipeg MB Canada R3B 2B9 Tel. 204.489.5900 Fax. 204.453.9012

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CITY OF WINNIPEG

2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

2023-01-25 123316298

Figure No.

ALWOOD

Stantec

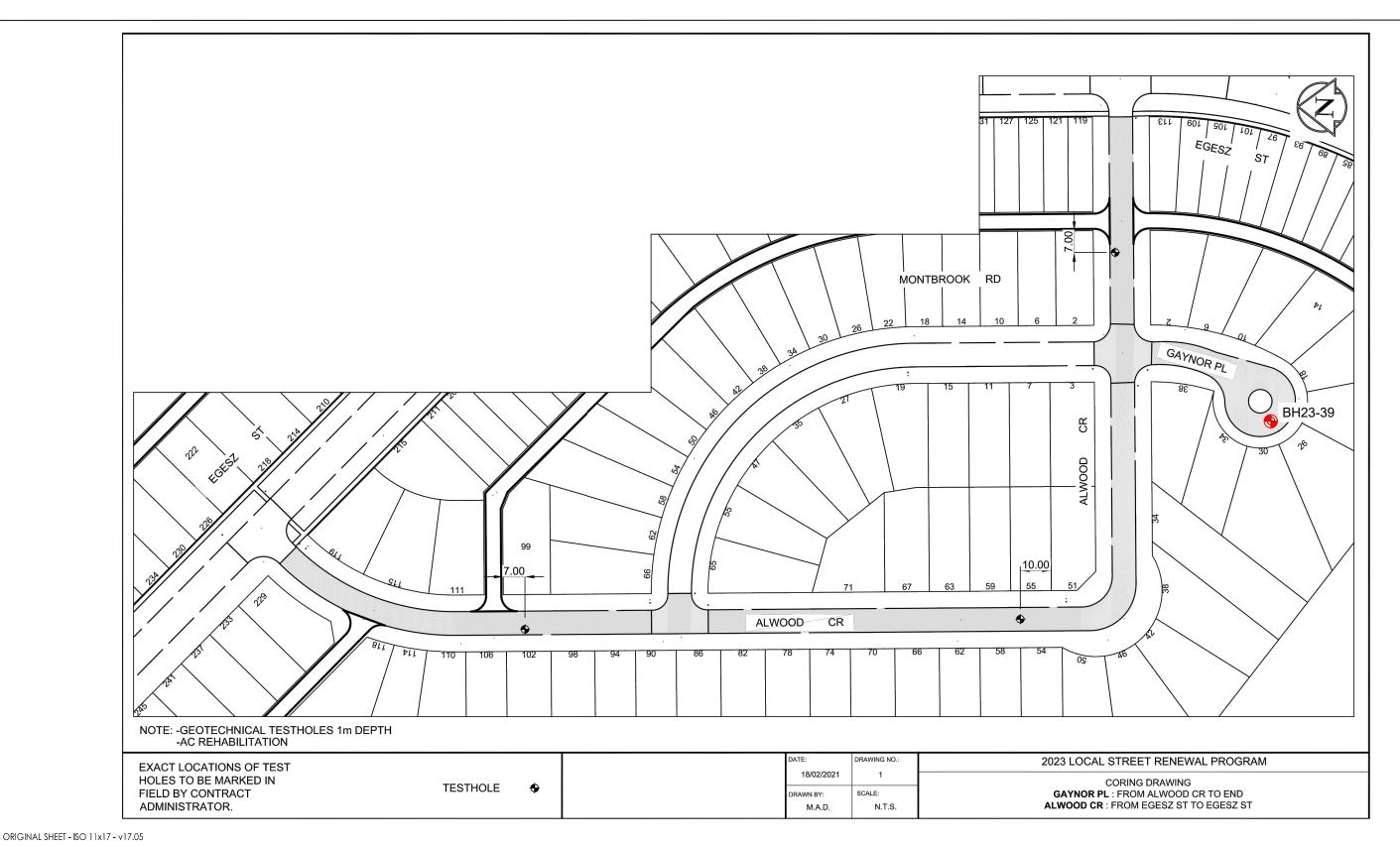
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APPROXIMATE BOREHOLE LOCATION

Legend

Scale

BOREHOLE LOCATION PLAN



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Legend

APPROXIMATE BOREHOLE LOCATION

Scale

Client/Project

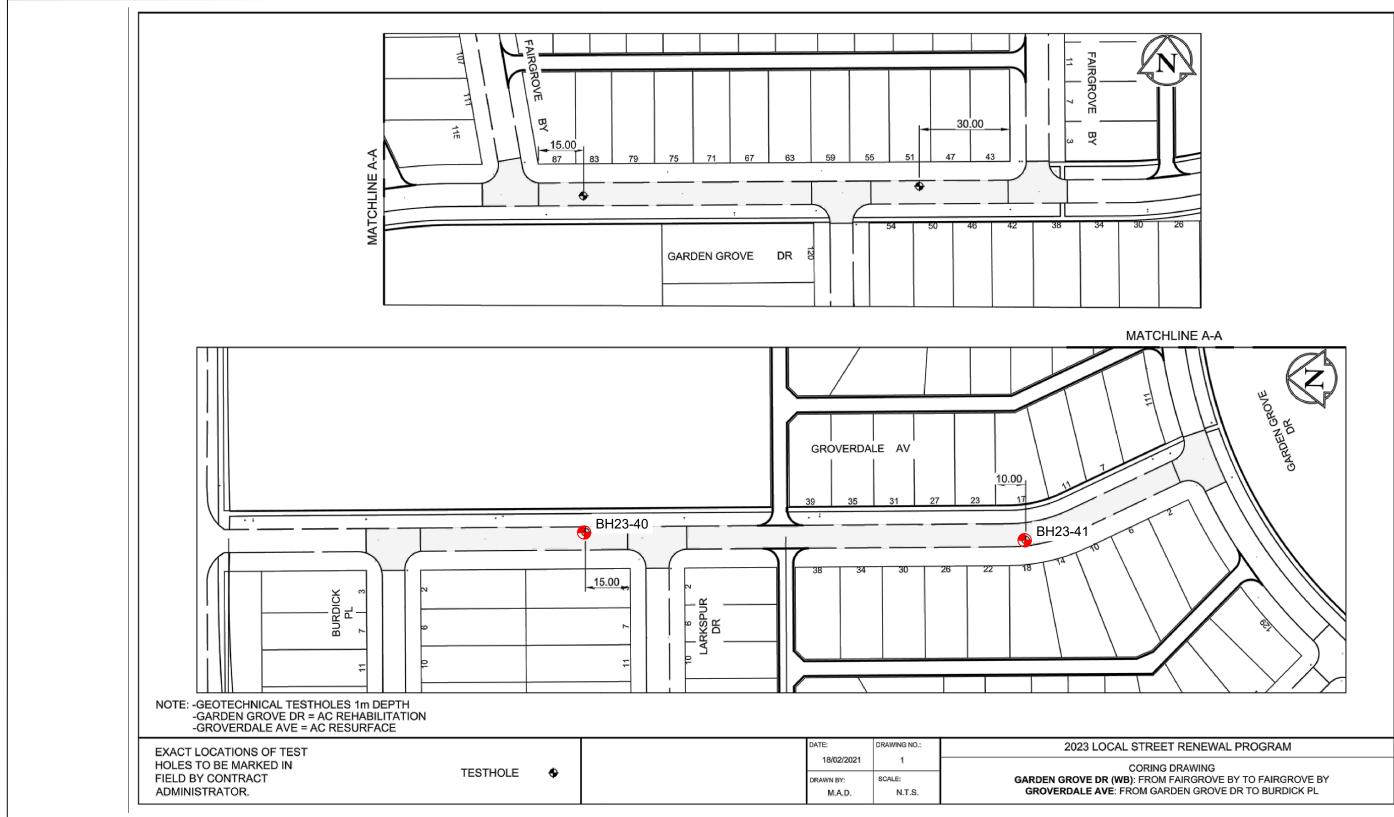
CITY OF WINNIPEG

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Figure No.

GAYNOR



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Legend

APPROXIMATE BOREHOLE LOCATION

Scale

Client/Project

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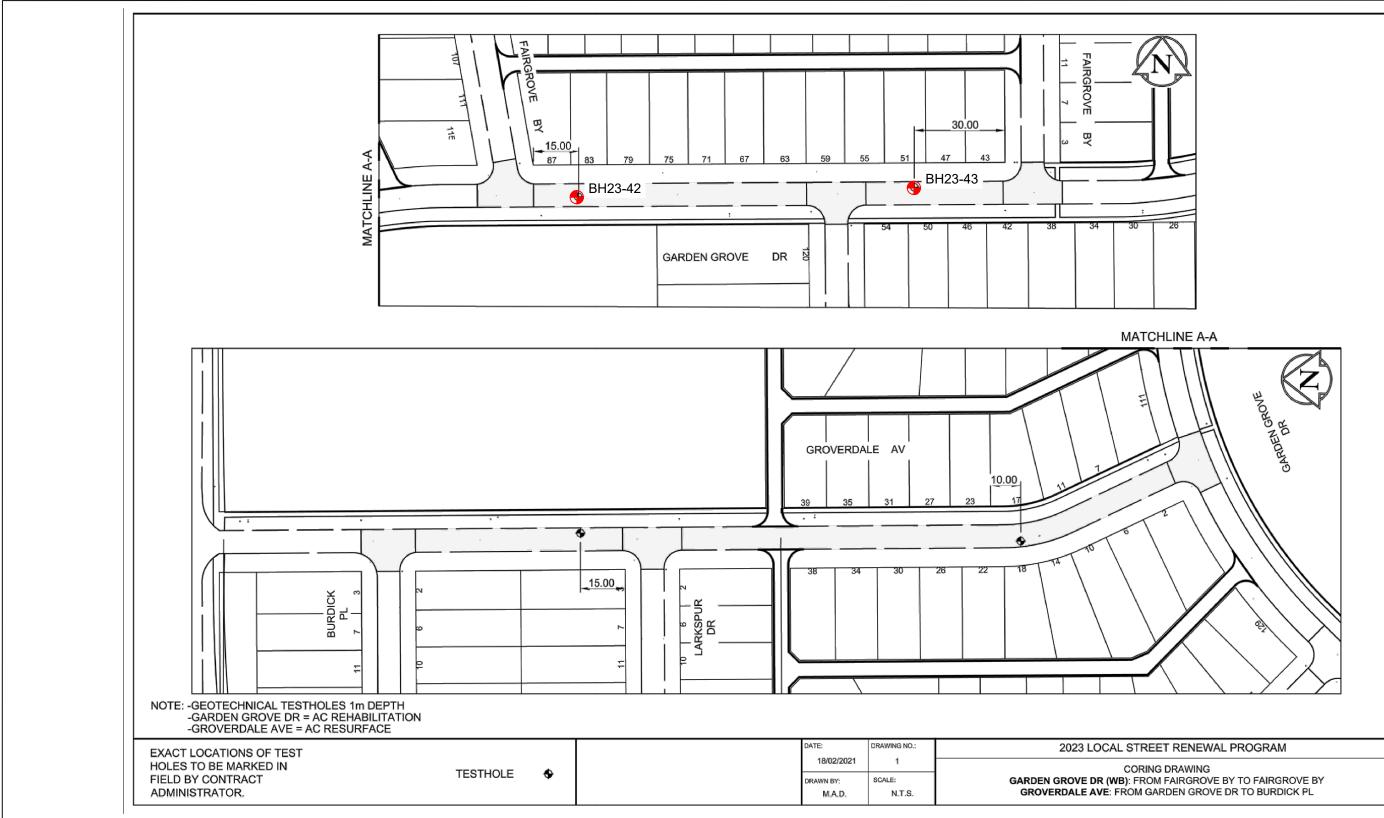
2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

Figure No.

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BOREHOLE LOCATION PLAN

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2023-01-24 123316298



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Legend

APPROXIMATE BOREHOLE LOCATION

Scale

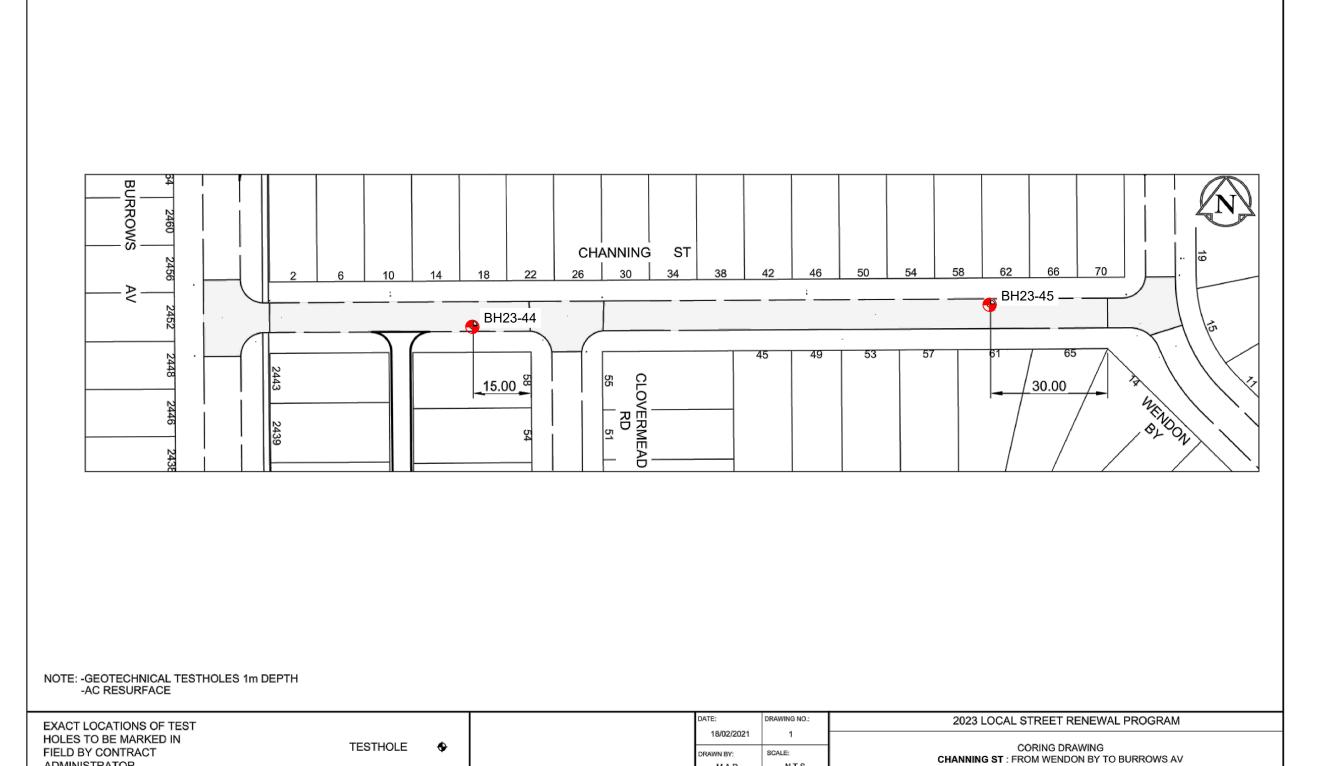
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CITY OF WINNIPEG

2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

Figure No.

GARDEN GROVE



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ADMINISTRATOR.

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APPROXIMATE BOREHOLE LOCATION

Scale

N.T.S.

CITY OF WINNIPEG

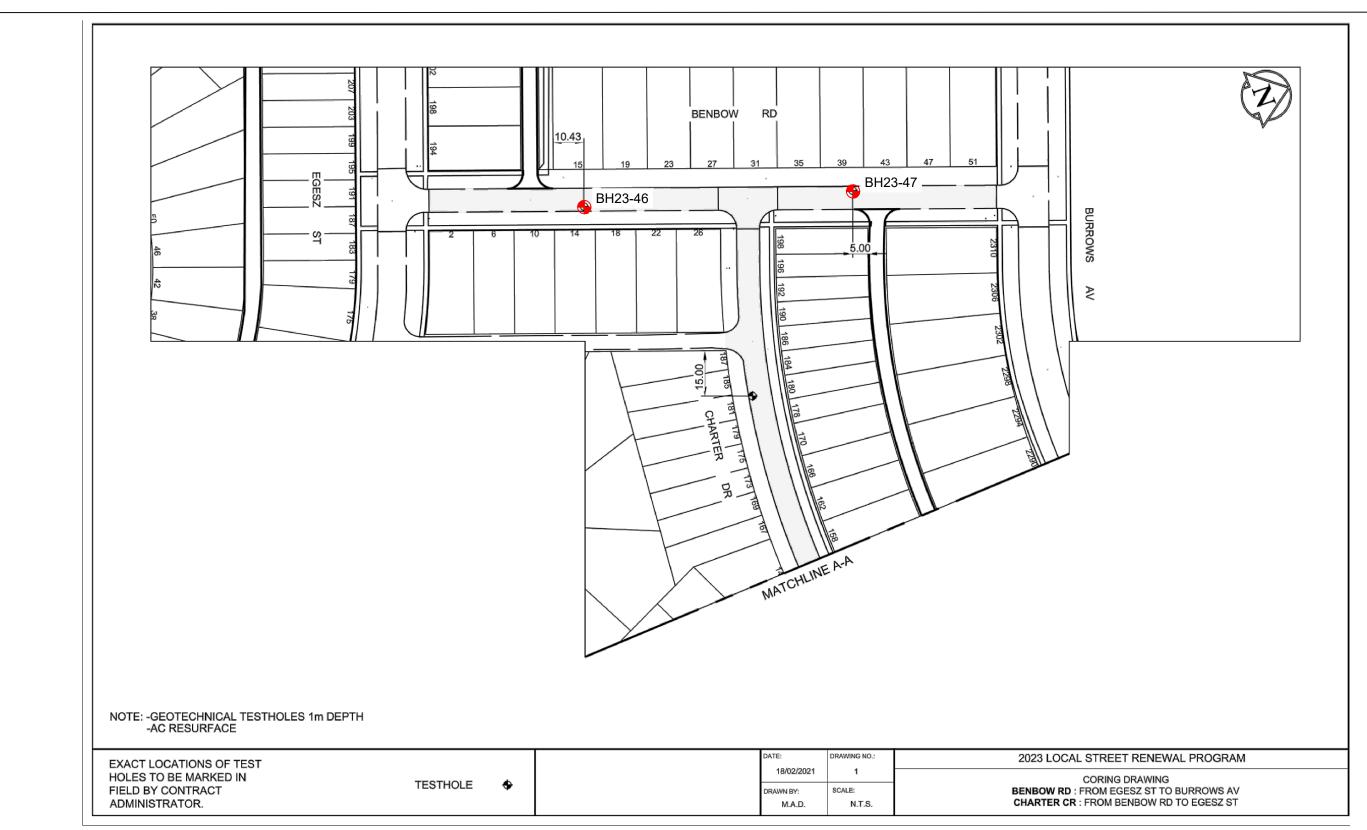
2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

Figure No.

CHANNING

BOREHOLE LOCATION PLAN





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Legend

APPROXIMATE BOREHOLE LOCATION

Scale

CITY OF WINNIPEG

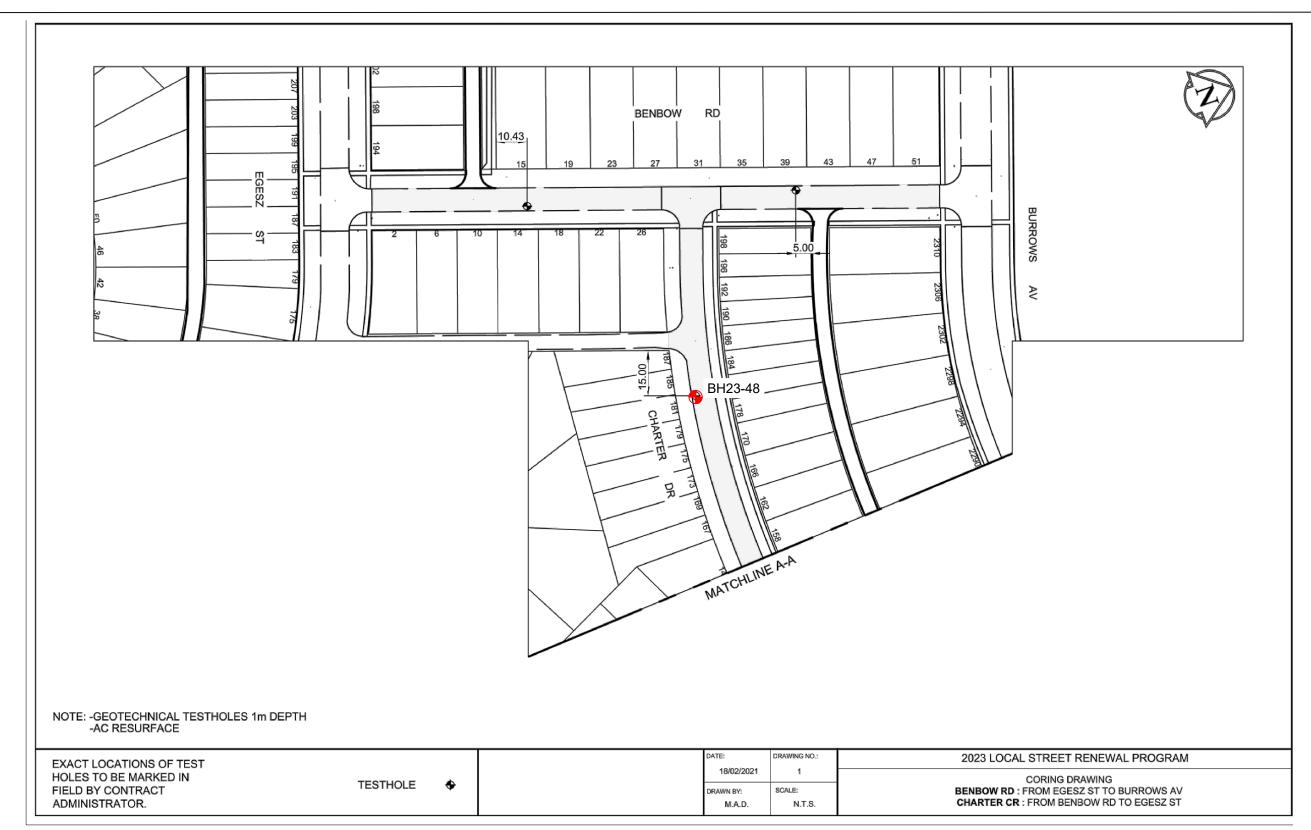
2023 LOCAL STREET RENEWALS PROGRAM

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Legend

APPROXIMATE BOREHOLE LOCATION

Scale

CITY OF WINNIPEG

2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

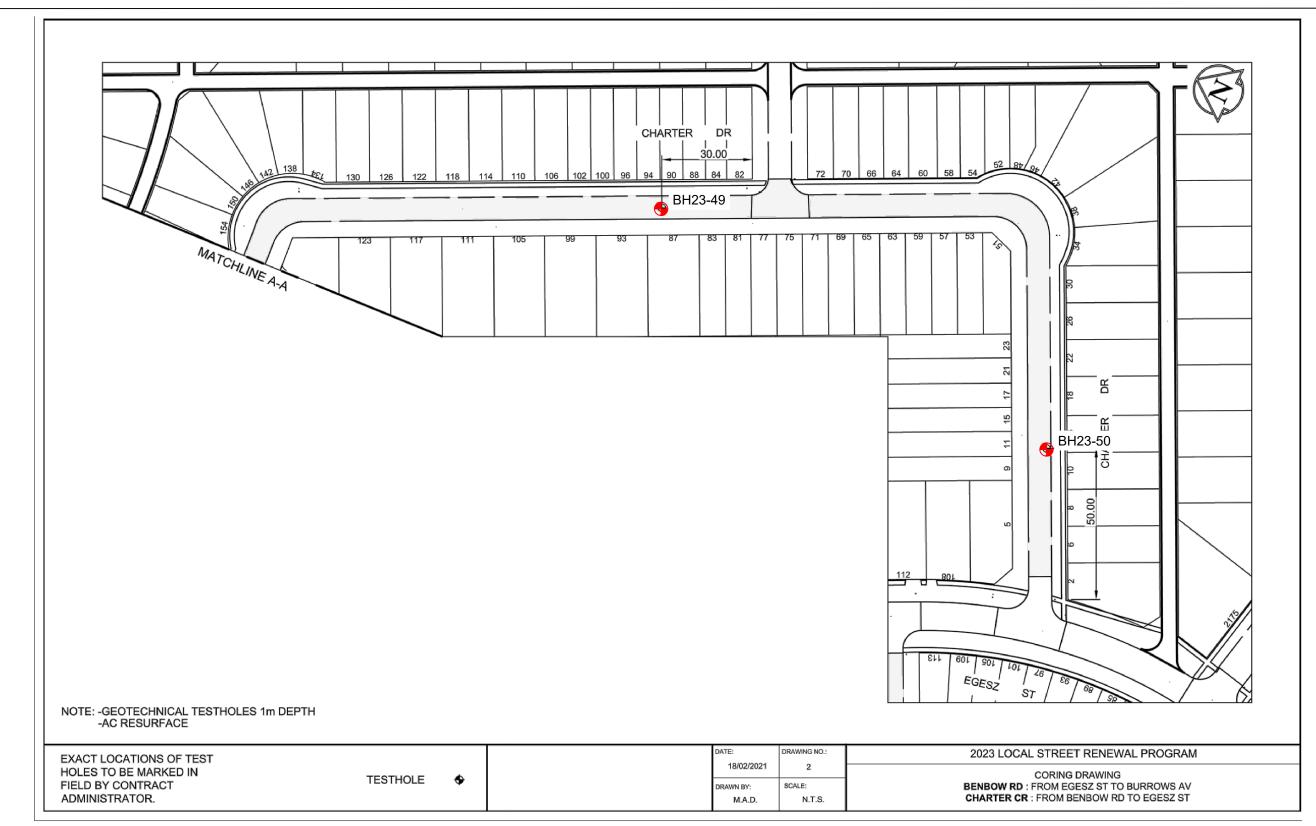
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Client/Project

CHARTER (1OF 2)

BOREHOLE LOCATION PLAN





2023-01-24 123316298



APPROXIMATE BOREHOLE LOCATION

Legend

Scale

Client/Project

CITY OF WINNIPEG

2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

Figure No.

CHARTER (2 OF 2)

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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	ear Strength	Approximate
Consistency	kips/sq.ft.	kPa	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
₽	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
Y	Falling head permeability test using well point or piezometer

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						REC							itent (%) an	d Blow Count		•		
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-		Brown, moist, silty CLAY (CL-ML)																				
-		BOWN, MOSS, Siny CE VI (CE ME)		AS								Ö										
				N																		
_				Å AS								O:										
-				X as														0				
1 -																						_
				X 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	⊥: ntra	acto	or: I	∷∐ Ma	::: ple	Le	af [Drillina	i Lita.	L		Lc	gae	d By: LB
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PR	IENT: OJEC	City of Winnipeg 2023 Local Street Renew		Prog				OLE RECO	_								BH E	LEV.	ATIO	D. : <u>12</u> N: _	3H23- 233162 N/A
	CATION TE BO	ON: <u>Alwood Cr, Winnipeg, MI</u> DRED: <u>January 6, 2023</u> to		nuar	v 10	20	23		_ w	ΔTF	R I	FV	FI·	N/	Δ		DAT	UM:	_N	/ A	
	(IL DC				SAM				_				_			GTH,	Cu (kPc	a)			
легін (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER		N-VALUE or RQD %	OTHER TESTS / REMARKS	PO WA	CK	50 50	PEN kPo H	TENT	1 & A	★ 00 k 	Pa Pa	IELD VAI OCKET S 150 k ————————————————————————————————————	SHEA «Pa W	R VA	00 kPa	BACKFILL/ MONITOR WELL/ PIEZOMETER
0 -		ASPHALT: 120 mm	**							10		20		Vater C	40		Blow Count 60 60		70	80	
			25.50																		
		Tan, moist, sandy SILT (ML)		X AS					.0												
-																					
-																					
				AS					O												
				X as				Sieve/Hydro at 0.8 m G S M C 4% 82% 10% 5%	.0	H											
۱ -																					
				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. 																			
1					<u> </u>			Drilling Cor	1:::: ntract	or:	M	apl	e L	L::: eaf	Dril	ling	Ltd.		1:::	Logge	El ed By: LE
AC.	KFILL S	ymbol R asphalt	GR	OUT	. />	CON	NCRE UGH														wed By:

	IENT:	Stantec City of Winnipeg T: 2023 Local Street Renew	/als	Prog			OLE RECO	_	,). : _1	BH23- 233162 N/A	29
		ON: Alwood Cr, Winnipeg, M																				
				nua	ry 10	, 2023			WA	ATER	LEV	EL:	N/	A								
			March Marc			1																
DEРТН (m)	ELEVATION (m)			IEAR	VA		CKFILL/ TOR WELL	CIVILL														
DE	ELEV,	(0303)		W _L	BA MONI	-																
0 -		ASPHALT: 105 mm																				
_																						
		SPT (New July Block) 2																				
-				AS					:0													
-		Brown, moist, silty CLAY (CL-ML)		-																		
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			Alwood Cr. Winnipeg. JMB January 6, 2023 to Johnson Soil DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) JAN JAN JAN JAN JAN JAN JAN JA																			
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		Tan, moist, sandy SILT (ML)		_																		
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1		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	<u> </u>	I					Drilling Co	u: ntro	acto	or: N	:1: 1ар	ie L	L::: eaf	نا: Drill	ing	Ltd.	:1::	: : :	H	:::: Logg	ed By: LI	Ц В
) A C	/FILL	Symbol Rasphalt	GF	OUT	<u>:</u> َ	CONCRE															ewed By:	

PRO	IENT: OJEC	Stantec City of Winnipeg CT: 2023 Local Street Renew ON: Gaynor Pl, Winnipeg, MB	,		ram			OLE RECO	_ 						ВН	ELEV.	ATION	: <u>12</u> : <u> </u> 1	H23- 33162 N/A
DA	TE BC	DRED: <u>January 6, 2023 to</u>	o Ja	nua	_		23		_						0 //				
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	1	N-VALUE or RQD %	OTHER TESTS / REMARKS	LA PC	BORATI OCKET F 50	ORY T PEN. kPa H	NT &	▲ ★ 100 ATTE	F <pa :RBER</pa 	, Cu (kF FIELD V, POCKET 150 RG LIMIT	ANE TE T SHEA) kPa + TS "	R VANI	kPa 	BACKFILL/ MONITOR WELL/ PIEZOMETER
0 +		ASPHALT: 110 mm								10	20	30	40				70	30	
		Granular FILL	a x	X AS						>									
}		Brown, moist, lean CLAY (CL)																	
				V															
				AS						O.									
1																			
				AS				Sieve/Hydro at 0.8 m G S M C 0% 11% 73% 17%		(Đ		- - - - - - - - - -							
1 -																			
				AS								Э :							
		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.																	
		symbol 📆 asphalt 📗	-	OUT	<u> </u>]C01	1055	Drilling Cor Drilling Met					ıf Dr	illing	Ltd.				d By: Li ved By:

PR	IENT: OJEC	Stantec City of Winnipeg CT: 2023 Local Street Renew ON: Groverdale Ave, Winnip						OLE RECOF	_						ВН	ELEV	ATION	: <u>12</u> :	H23- 33162 N/A
					ry 10), 20:	23		_ _ w.	ater i	_EVE	EL: _ _	N/A		<i>DF</i>	110/71.	IN/_		
DЕРТН (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	_	N-VALUE or RQD %	OTHER TESTS / REMARKS	PO WA	BORAT OCKET F 50 ATER C	ORYPEN. kPc	TEST	100 & AT \$/0.3	kPa H TERBE	FIELD V POCKE 150 RG LIMI	T SHEA D kPa T SHEA T S	R VAN	kPa 	BACKFILL/ MONITOR WELL/ PIEZOMETER
0 -		ASPHALT: 100 mm								10	20	30)	40			70	80	
		Granular FILL																	
-		Brown, moist, fat CLAY (CH)		X AS							D								
-																			
				X as).						
_				V / ·															
			SPT (N-value) BLOWS/0.3m Water Content (%) and Blow Count 10 20 30 40 50 60 70 80																
_				AS				Sieve/Hydro at 0.8 m G S M C 0% 7% 38% 54%			l 	-:0					1		
1 -																			†
-				X 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.																	
_				Ш				Drilling Cor	l:::: ntract	or: M	apl	∷∐ e Le	eaf [::: Drilling	:: :::: g Ltd.	1:::		ogge	 d By: LE
ACI	<fill :<="" td=""><td>symbol Rasphalt</td><td>GR</td><td>OUT</td><td>. 12</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></td><td>ved By:</td></fill>	symbol R asphalt	GR	OUT	. 12	CO1 SLO1	NCRE							`	_				ved By:

CLIE	NT:	City of Winnipeg	wal-	Dra ==			OLE RECO										:_12	
					ram			_										
			_	VID.				— W <i>A</i>	ATER L	EVEL:	N/A		D	/AIU	/vi	14/1		
Т					SAM	PLES		_					l, Cu ((kPa)				
DEFIN (M)	ELEVATION (m)	SOIL DESCRIPTION	# BIT ELEVATION: N/A DATUS: MATERIAL CONTROL & MATE															
	ELEVA	(USCS)																
\downarrow																		
		ASPHALT: 100 mm																
t		Granular FILL																
-				V ~														
F		Brown, moist, fat CLAY (CH)	SAMPLES SAMP															
						MPLES COLUMN N/A												
1					BH ELEVATION: N/A DATUM: N/A													
				V				PROJECT NO.: 1233162 BH ELEVATION: N/A DATUM: N/A WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, CU (kPa) LABORATORY TEST A FIELD VANE TEST OF POCKET SHEAR VANE SPI (N-vaule) BLOWS/0.3m WATER CONTENT & ATTERBERG LIMITS PI (N-vaule) BLOWS/0.3m 10 20 30 40 50 50 00 70 80 OC.										
4				AS AS														
			BH ELEVATION: N/A DATUM: N/A WAIER LEVEL: N/A WAIER LEVEL: N/A WAIER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (N°D) LABORATORY TEST A FIED VAN TEST ON POCKET SFEAR VAN E IN ON POCKET SFEAR VAN															
						PROJECT NO.: 123316298 BH ELEVATION: N/A DATUM: N/A WATER LEVEL: N/A WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (kPa) LABORATORY TEST A FIELD VANE TEST POCKET PEN. * POCKET SHEAR VANE POCKET SHEAR VANE SO kPa 100 kPa 150 kPa 200 kPa WATER CONTENT & ATTERBERG LIMITS POCKET (N-value) BLOWS/0.3m Water Content (S) and Blow Count 10 20 30 40 50 60 70 80												
1			AS A															
				BH ELEVATION: _M/A DATUM: _M/A WATER LEVEL: _M/A WATER LEVEL: _M/A WATER LEVEL: _M/A WATER LEVEL: _M/A UNDRAINED SHEAR STRENGTH, Cu (RPG) LABORATORY TEST														
+			DATUM:															
1																		
			AVE. WINNIPES IN 10, 2023 SAMPLES JOUNNAMED SHEAR STRENGTH, Cu (RFC) LABORATORY TEST 1 / REMARKS FINON AND															
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				M				DATUM: N/A WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (kPa) LABORATORY TEST A FIELD VANE TEST POCKET PEN. POCKET SHEAR VANE WATER CONTENT & ATTERBERG LIMITS POCKET SHEAR VANE WATER CONTENT & ATTERBERG LIMITS POCKET SHEAR VANE Water Content (%) and Blow Count 10 20 30 40 50 60 70 80										
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		m.	'															
-		sloughing was observed upon																
		 Borehole stopped at a depth of 1.2 																
		m.			L_													
-							Drilling Co	ntract	or: M	aple L	.eaf C	rilling	Ltd.			Lo	ogge	d By: LB
		ymbol R asphalt	Serencies As Serencies Serence Serence	ved By:														
	101	IITE DRILL CUTTINGS																

PR	IENT: OJEC	Stantec City of Winnipeg T: 2023 Local Street Renew ON: Garden Grove Dr, Winni						OLE RE		_						ВН	ELEV	'ATIC	ON:	<u>12:</u> N	H23- 33162 N/A
		ORED: January 10, 2023								_ W.A	ATER I	EVE	L: <u>N</u>	/ A							
DEPTH (m)	-	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE		_	-VALUE RQD %	OTHER TE REMAR	STS / CS	LAB PO	ORAT CKET I	ORY PEN.) kPa 	TEST	▲ ★ 100	F P kPa	IELD VA OCKET 150	ANE T SHEA kPa	AR V	200 k	Pa	BACKFILL/ MONITOR WELL/ PIEZOMETER
			-		z	RECO	2 5			SPT	(N-val	Je) BL				d Blow Cou	at	•	•	•	
0 -		ASPHALT: 140 mm	SAMPLES SAMPLES UNDRAINED SHEAR STRENGTH, Cu (kPa) LABORATORY TEST A FIELD VANE TEST POCKET PEN. * POCKET SHEAR VANE DOWN NO																		
_			377.7																		
-		Brown, moist, lean CLAY (CL)		X AS									 Ο:								
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-				AS								. C); ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;								
_				V AC				Sieve/Hydro at 1).8 m												
								3 N 1% 10% 619	28%												
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-				AS								о В									
		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.																			
J								Drillin	a Cor	l:::::	or. w	anle	:: : : -	af Dr	illina	Itd.	Liii	: <u> </u>	100	age	 d By: Li
۵۵	(FILL :	symbol M asphalt	GR	OUT	·:_	100l	NCRE UGH							ات	19						ed By:

	IENT:	City of Winnipeg 2023 Local Street Renev	wals I	Prog		OLE RECO								:_12	H23- 33162' N/A
		ON: Garden Grove Dr, Winni		_			_								
DA	ATE BC	ORED: <u>January 10, 2023</u>					_ WA	TER L	EVEL:	N/A					
DEPIH (m)	ELEVATION (m)	SOIL DESCRIPTION	AS A		CKFILL/ ITOR WELL/ ZOMETER										
5	ELEV	(4005)													
o 🕇		ASPHALT: 135 mm													
-			REACH												
-		Granular FILL		X AS			:0:								
		Brown, moist, lean CLAY (CL)													
_				AS					O						
				W											
				Y AS					0						
				As					C						
		End of Borehole		3											
		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.													
•							ntracto	or: M	aple L	eaf D	rilling	g Ltd.			
۸ (C)	KFILL S	symbol 📆 asphalt 📗	135 mm 10 20 30 40 50 60 70 80 131LL 131LL 13 AS 1 O . 14 AS 15 AS 16 O . 17 AS 18 AS 19 O . 18 AS 19 O . 19 AS 10 O . 10 AS 10 O . 10 AS 10 O . 11 AS 12 O . 13 AS 14 O . 15 AS 15 O . 16 O . 17 AS 18 O . 18 O	ed By:											

CLIE	NT:	1tec <u>City of Winnipeg</u> 2023 Local Street Rene	wals	Prog				OLE RECOF	_									BH2 12331 _N/A	1629
LOC	CATION: _	Channing St, Winnipeg,							_					D	ATU	M: _	N/A		
DATE	E BORED:	<u>January 10, 2023</u>																	_
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE		_	.VALUE RQD %	OTHER TESTS / REMARKS	PO	ORAT CKET F 50	ORY TE PEN. kPa	ST ★ 100	I I kPa	FIELD T POCK 1.5	VANI ET SH 50 kP	E TEST HEAR V	200 k	D D D D D D D D D D D D D D D D D D D	MONITOR WELL/ PIEZOMETER
					Z	S P	Żδ									•	•		`
\downarrow		September Sept																	
	ASPHA	SPHALT: 95 mm 10 20 30 40 50 60 0 80																	
-	Granu	lar FILL		V															
-	Brown	, moist, fat CLAY (CH)		AS AS							. O :								
-																			
			DATUM: NA WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH. CU. (IPPO) LASORATORY TEST A FIELD VANIE TEST POCKET FIRM. A FIELD VANIE TEST WATER CONTENT & ATTERBERG UMITS TO																
				V				Sieve/Hydro at 0.7 m											
				AS				G S M C 0% 7% 40% 53%			H : O :					: !			
				AS								0							
	• The s m. • No g	soil was frozen to a depth of 0.9 groundwater seepage or soil																	
	com	pletion of drilling.																	
L				Ц			I	Drilling Cor	ntract	or: M	aple I	_eaf D	rillinc	Ltd Ltd	:1:	:::1:	Loc	gaed By	 v: I R
	ill symbc	DL ASPHALT		OUT	[:·		√RF							,					

10		City of Winnipeg T: 2023 Local Street Renew ON: Channing St, Winnipeg,		Prog															LEVA	OITA	N:	N/A	
		ORED: <u>January 6, 2023 †</u>		nuar	y 11	, 20:	23			WA	TER	LE	VEI	_:_I	N/A			D/ (10					
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION	LOT		SAM	£		OTHER TESTS /			OR <i>A</i> CKET	TO PE	RY 1 N.		*		FIE	Cu (kPa	, NE TE SHEAI	IAV S		FILL/ R WELL/	METER
DEPTI	ELEVATI	(USCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (m	N-VALUE or RQD %	REMARKS			ER		NTE	OW:	& AT \$/0.3	m	ERG	150 k	w F		W _L	BACKFILL/ MONITOR WELL/	PIEZO/
0 +		ASPHALT: 80 mm	26.5							10)	20		30	lier Cor	40	50	low Count) 60	7	70	80		
ł		Granular FILL	77						:														
-				AS						Ċ													
=_		Brown, moist, fat CLAY (CH)																					
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				AS											О								
		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.																					_
		symbol M asphalt	GR			_	NCRETI	Drilling Cor Drilling Me							af [Drillin	g L	.td.				ged By: ewed By	

PR	IENT: OJEC	Stantec City of Winnipeg CT: 2023 Local Street Renewood ON: Benbow Rd, Winnipeg, MB		Prog				OLE RECOF	_						BH E	ELEVA	NOITA	: <u>123</u> : <u>N</u>	H23- 33162 N/A
DA	ATE BO	DRED: January 6, 2023 to	Ja	nuai			23		_	ATER L				TIL C	/I-D	\			
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	_	N-VALUE or RQD %	OTHER TESTS / REMARKS	PO WA	ORAINE ORATI CKET F 50 TER CO	ORY TEN. kPa ONTEN	1 1 1 & 7 WS/0	▲ ★ 00 kP¢	FIEL PO a BERG	LD VA CKET 150 LIMIT:	SHEAF kPa	200	kPa 	BACKFILL/ MONITOR WELL/ PIEZOMETER
0 -		ASPHALT: 80 mm	2						1	0 :	20	30	40	50			70 8	30	
-		Tan, moist, sandy SILT (ML)	3.7 2	X as															
-				V ^S						V									
-																			
-				X AS					0.										
-																			
-																			
				X AS				Sieve/Hydro at 0.7 m G S M C 2% 76% 14% 8%	O	H									
-																			
1 -				X as					0										
-				X					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.																	
]								Drilling Cor	::::: ntract	or: M	:::: aple	l::: Leaf	Drilli	ii na L	td.		Lo) ::::: Dage o	By: LE
BACI	<fill :<="" td=""><td>Symbol Asphalt</td><td>GR</td><td>OUT</td><td></td><td>]C01</td><td>NCRE</td><td></td><td></td><td></td><td></td><td></td><td></td><td><u> </u></td><td></td><td></td><td></td><td></td><td>ed By:</td></fill>	Symbol Asphalt	GR	OUT]C01	NCRE							<u> </u>					ed By:

	IENT:	Stantec City of Winnipeg 2023 Local Street Renew	<u>vals</u>	<u>Prog</u>					_											. : <u>12</u>	331629	9
		ON: Benbow Rd, Winnipeg, M																				
DA	ATE BO	ORED: January 6, 2023 t	MATERIAL PROPERTY OF THE PROPE																			
(m)	(m) N		ĮŌ.		SAM				L	ABC	ORATO	ORY		•	F	FIELD	VAI	NE TE		• E •	IIL/ WELL/ ETER	
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	PROJECT NO.: 1233162 BH ELEVATION: N/A DATUM: N/A To January 11, 2023 WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (PPc) LABORATORY TEST A FIELD VANE IST POCKET SHEAR VANA WATER CONTENT & ATTERBERG UNITS M- W-	BACKF MONITOR PIEZOM																		
0 -		70	N.			~				10	2	0) ::::	70	80		ļ
		ASPHALT: 70 mm	3																			١
		Granular FILL	SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) WATER LEVEL: N/A SOIL DESCRIPTION (USCS) WATER CEVEL: N/A OTHER TESTS / REMARKS OTHER TESTS / REMARKS OTHER TESTS / REMARKS OTHER TESTS / REMARKS WATER CEVEL: N/A UNDRAINED SHEAR STRENGTH, CU kPa POCKET PEIN, * POCKET SHEAR VANE IS N/A WATER CENTERN * POCKET SHE																			
-		Brown, moist, silty CLAY (CL-ML)	SOIL DESCRIPTION (USCs) SOIL DESCRIPTION (USCs) ATTERMENT AND A SUPERATION (USCs) WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (RPa) LABORATORY TEST																			
			SOIL DESCRIPTION (USCS) WATER CEVELS: N/A WATER CEVELS: N/A WATER CEVELS WATER CEVELS WATER CEVELS WATER CEVELS SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) WATER CENTERS (USCS) SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS)																			
-			SOIL DESCRIPTION (USC.) WATER LEVEL NAME (USC.) WATER CONTENT IS A PIELD VANE (USC.) WATER CONTENT IS A PIELD VANE (USC.) WATER CONTENT IS A PIELD VANE (USC.) SOIL DESCRIPTION (USC.) WATER CONTENT IS A PIELD VANE (USC.) WATER CONTENT IS A PIELD VANE (USC.) WATER LEVEL NAME (USC.) WATER LEVEL NAME (USC.) POCCET PERM. * PIELD VANE (USC.) WATER LEVEL NAME (USC.) WATER LEVEL NAME (USC.) POCCET PERM. * PIELD VANE (USC.) WATER LEVEL NAME (USC.) WATER LEVEL NAME (USC.) POCCET PERM. * PIELD VANE (USC.) WATER LEVEL NAME (USC.) WATER CONTENT IS A PIELD VANE (USC.) WATE	I																		
			SAMPLE S	ı																		
-			BH ELEVATION: N/A DATUM: N/A																			
																						ı
							## NOTHER TESTS / REMARKS OTHER TESTS / REMARKS OTHER TOTAL PROPERTY OF THE															
-				M																		ı
				Å AS							PROJECT NO.: 123314 BH ELEVATION: N/A DATUM: N/A ATER LEVEL: N/A PRAINED SHEAR STRENGTH, Cu (kPq) FOR ATORY TEST POCKET SHEAR VANE STRENGTH PEN. POCKET SHEAR VANE POCKET PEN. ATTERBERG LIMITS POCKET PEN. ATTERBERG LIMITS POCKET PEN. POCKET PEN. POCKET PEN. POCKET PEN. POCKET SHEAR VANE POCKET PEN. POCKET PEN. POCKET PEN. POCKET SHEAR VANE POCKET PEN. POCKET PE		ı									
_																	PROJECT NO.: 123 BH ELEVATION: _N DATUM: _N/A Cu (kPa) IELD VANE TEST OCKET SHEAR VANE		ı			
			PROJECT NO.: _123316298 BH ELEVATION: _N/A DATUM: _N/A SAMPLES SAMPLES OTHER TESTS / REMARKS																			
																						١
						MATER LEVEL; N/A WATER LEVEL; N/A UNDRAINED SHEAR STRENGTH, Cu (RPa) LABORATORY TEST A FIELD VANE TEST POCKET PEN. *POCKET SHEAR VANE WATER CONTENT & ATTERBERG LIMITS *POCKET SHEAR VANE SPT (N-value) BLOWS/0.3m Wother Content PER and silve Clears 10 20 30 40 50 60 70 80 Q Q Q Q Q Q Q Q Q Q Q Q Q																
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			PROJECT NO.: 12331629: BH ELEVATION: N/A DATUM: N/A WATER CONTENTS & A FIELD VANE TEST WATER CONTENTS & A FIELD VANE TEST WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST ON POCKET PEN, W W. WATER CONTENTS & A FIELD VANE TEST O																			
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-		End of Borehole	- 121									1 : :		::		1::						l
		The soil was frozen to a depth of 0.9 m.																				۱
_		No groundwater seepage or soil sloughing was observed upon																				ļ
		completion of drilling. • Borehole stopped at a depth of 1.2																				۱
		m.																				۱
	<u> </u>	1		Ц	1	1		Drilling Co	ntrad	::L cto	r: Mo	ı:: əlqr	::L:: Lea	∷⊥ f Dri	illing	Ltd	::L .		1::::	.u:::::	d By: LB	1
٩C	<fill :<="" td=""><td>symbol Asphalt</td><td>GR</td><td>OUT</td><td>·~</td><td>CON</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></td><td></td><td>ved By:</td><td>_</td></fill>	symbol Asphalt	GR	OUT	·~	CON	NCRET								· · · · ·						ved By:	_
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PR	IENT: OJEC	City of Winnipeg 2023 Local Street Renew		Prog				OLE RECOI	_								вн Е	LEVA	OITA). : <u>12</u> √: _	331629 N/A				
		ON: <u>Charter Dr, Winnipeg, M</u> DRED: <u>January 6, 2023</u> t		nuar	v 11	20	23		_	WA	TFR	ΙFV	/FΙ:	N/	Δ		DATU	JM:	_N	/A					
	(12.00				SAM				_							TH, C	iu (kPc	a)							
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	1	N-VALUE or RQD %	OTHER TESTS / REMARKS		LABORATORY TEST FIE						PO a ERG		SHEAI Pa	♦ NE □ 0 kPa + W _L	BACKFILL/ MONITOR WELL/ PIEZOMETER					
0 -		ASPHALT: 120 mm	24							10) :::	20		Water C BO	ontent (%	50	ow Count) 7	70 : : :	80					
-		Brown, moist, sandy lean CLAY (CL)																							
_		Brown, most, sandy lean CEAT (CE)		X AS););););													
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-				X AS				Sieve/Hydro at 0.8 m G S M C 1% 35% 41% 24%) -	0													
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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.																							
					<u> </u>	1		Drilling Cor							Drillir	ng L	td.		Logged By: LB						
_			∷ GR ∵ SAI		<i>₽</i>	1001 _[NCRE UGH	TE Drilling Me						4					_	Reviewed By: (

PR LC	IENT: OJEC CATI	City of Winnipeg T:2023 Local Street Renew ON:Charter Dr, Winnipeg, M	В		ram				_ _ _								ВН	ELE	VA	101).:_ 12 √: _	3H23 233162 N/A				
DA	ATE BO	DRED:							_																	
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	1	N-VALUE or RQD %	OTHER TESTS / REMARKS	50 kPa 100 kPa					ELD VA OCKET 150	ELD VANE TEST OCKET SHEAR VANE 150 kPa 200 kPa				BACKFILL/ MONITOR WELL/ PIEZOMETER							
						REC			SPT (N-value) BLOWS/0.3m Water Content (%) and f																	
0 -		ASPHALT: 135 mm								10		20	3	0	40	5	60 <i>e</i>	60	70		80					
		Backfilling sand FILL		X AS							0:															
-				V																						
1		End of Borehole		AS						Ö																
-		The soil was frozen to a depth of 0.6 m. No groundwater seepage or soil sloughing was observed upon completion of drilling. Borehole stopped at 0.6 m at two seperate locations due to potential																								
-		seperate locations due to potentia underground utilities nearby.																								
1 -																										
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		SYMBOL ASPHALT NITE DRILL CUTTINGS [GR SAI	OUT	<i>.</i> ∠		NCRET UGH	E Drilling Me Completio		hod: 125 mm SSA										_	Reviewed By: Page 1 of 1					

	LIENT:	Stantec City of Winnipeg 2023 Local Street Renew	/als	Prog				OLE RECO	_											:_12	8 H23- 331629 N/A	9
		ION: Charter Dr, Winnipeg, M		ilog					_												N/A	
		ORED: <u>January 10, 2023</u>		anuc	ary 1	1, 20	023		W.	ATER	LE\	/EL:	N/A	١								
					SAM	PLES			UNI	DRAIN	ED :	SHEA	R STR	ENGT	H, C	u (kF	Pa)					Γ
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	/ERY (mm) TCR %	N-VALUE or RQD %	OTHER TESTS / REMARKS	PC	BORAT OCKET 5 ATER C	PEN 0 kF	I. Pa	10	r 0 kPa	PO	150	kPa	AR \	√ANE	kPa 	BACKFILL/ MONITOR WELL/ PIEZOMETER	
	-		-		ž	RECO/	żō			(N-val		BLOV		m				-	•		<	
0 -		ASPHALT: 105 mm	於							10	20			40	50		50	70	8	80 : : : :		ļ
			*																			l
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		Granular FILL	- ////																			l
		Brown, moist, sandy lean CLAY (CL)		X AS																		l
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		End of Borehole • The soil was frozen to a depth of 0.9																				١
		m. • No groundwater seepage or soil																				١
-		sloughing was observed upon completion of drilling.																				ŀ
		Borehole stopped at a depth of 1.2 m.																				١
_																						l
								Drilling Co	ntrac	or: N	1ap	ole L	eaf [Drillin	ıg Li	td.			Lo	ogge	d By: LB	3
_			GR		·D]CO1	NCRET	Drilling Me	thod:	125 ı	mn	n SS/	4						Re	eviev	ved By:	(
_	ENTO		SAI		$\overline{\otimes}$	SLOI	IGH	Completic	n Do	ath:	1 0	m									1 of 1	_

APPENDIX D

Core Photographs





Figure 1 – Core No. 32 (Bunting St)



Figure 3 – Core No. 34 (Bunting St)



Figure 2 – Core No. 33 (Bunting St)



Figure 4 – Core No. 35 (Bunting St)







Figure 7 – Core No. 38 (Alwood Cr)





Figure 8 – Core No. 39 (Gaynor PI)





Figure 9 – Core 40 (Groverdale Ave)



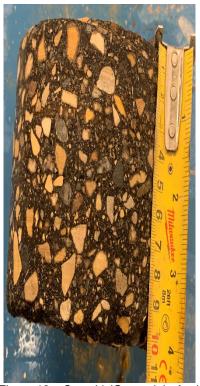


Figure 10 – Core 41 (Groverdale Ave)



Figure 12 – Core 43 (Garden Grove Dr)





Figure 13 – Core 44 (Channing St)



Figure 15 – Core 46 (Benbow Rd)





Figure 16 – Core 47 (Benbow Rd)







Figure 19 – Core 50 (Charter Dr)



Figure 18 – Core 49 (Charter Dr)

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: BH23-37, 2.7' (Alwood Cr)

LIQUID LIMIT

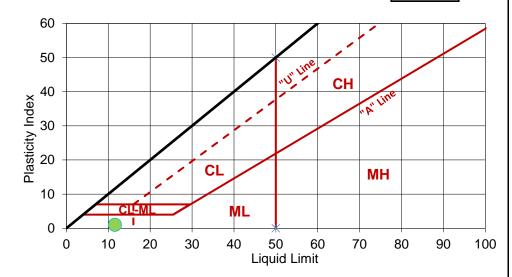
TRIAL BLOWS MC (%) Corr. MC (%)

LIQUID LIMIT				
1	2			
21	20			
12	12			
12	12			

	PLASTI	C LIMIT
TRIAL	1	2
MC (%)	11	11

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

12 11 1 3.8



COMMENTS:

REPORT DATE 2023.Jan.30

REVIEWED BY

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.25 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Donald Eliazar

SAMPLE ID: BH23-39, 2.7' (Gaynor PI)

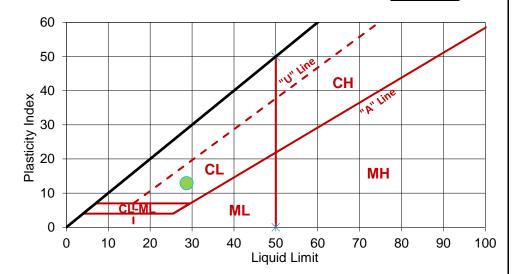
LIQUID LIMIT

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

LIQUID LIMIT				
1	2			
25	27			
29	29			
29	29			

	PLASTI	C LIMIT
TRIAL	1	2
MC (%)	16	16

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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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. 3

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: BH23-40, 2.6' (Groverdale Ave)

LIQUID LIMIT

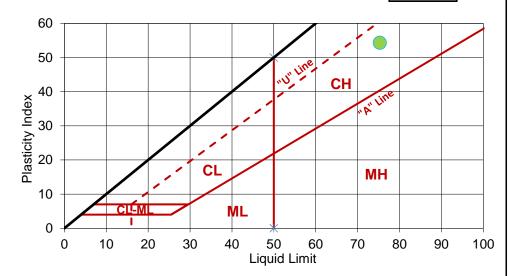
TRIAL BLOWS MC (%) Corr. MC (%)

EIGOID EIMIT				
1	2			
26	27			
75	75			
75	76			

	PLASTI	C LIMIT
TRIAL	1	2
MC (%)	21	21

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

75
21
54
29.8



COMMENTS:

REPORT DATE 2023.Jan.30

REVIEWED BY Guillaume Beauce, P.Eng.

Samualio Bodaco, Fizing.

Geotechnical Engineer - Materials Testing Services

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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. 4

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: BH23-42, 2.8' (Garden Grove Dr)

LIQUID LIMIT

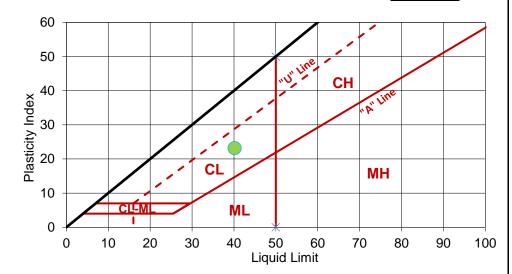
TRIAL BLOWS MC (%) Corr. MC (%)

EIQOID EIIIIII				
1	2			
25	26			
40	40			
40	40			

	PLASTI	C LIMIT
TRIAL	1	2
MC (%)	17	17

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

	40
	17
ΡI	23
	24.5



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 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. 5

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: BH23-44, 2.6' (Channing St)

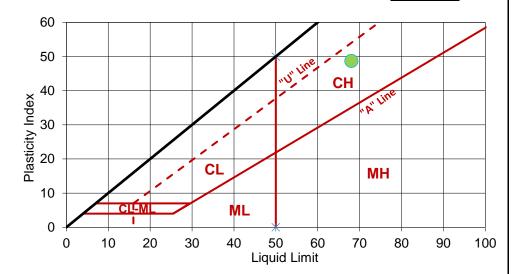
LIQUID LIMIT

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

EIQOID ZIIVIII				
1	2			
26	27			
67	68			
68	68			

	PLASTIC LIMIT			
TRIAL	1	2		
MC (%)	19	19		

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



COMMENTS:

REPORT DATE 2023.Jan.30

REVIEWED BY Guill

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 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. 6

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: BH23-46, 2.6' (Benbow Rd)

LIQUID LIMIT

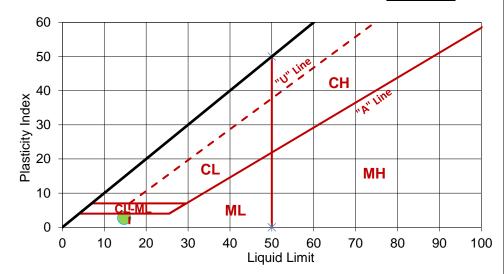
TRIAL BLOWS MC (%) Corr. MC (%)

EIGOID EIIIIII				
1	2			
29	29			
14	15			
15	15			

	PLASTIC LIMIT			
TRIAL	1	2		
MC (%)	12	12		

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

15 12 3 4.9



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 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. 7

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: BH23-48, 2.7' (Charter Dr)

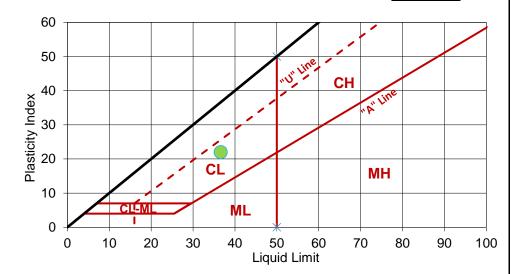
LIQUID LIMIT

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

1	2
23	24
37	37
37	37

	PLASTIC LIMIT				
TRIAL	1	2			
MC (%)	15	15			

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

PROJECT NO.

123316298

ATTN: Erik Hansen

1 REPORT NO.

DATE SAMPLED: 2023.Jan.17

DATE RECEIVED 2023.Jan.17

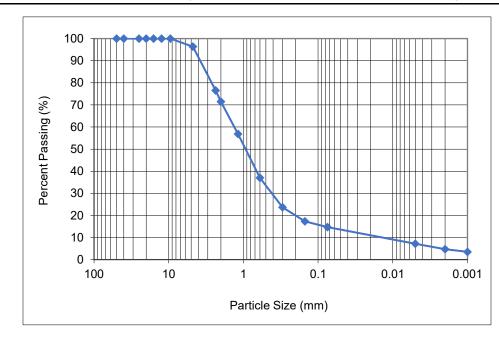
DATE TESTED: 2023.Jan.20

SAMPLED BY:

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Donald Eliazar TESTED BY:



Gravel		Sand		Silt	Silt Clay C		Silt Clay Colloi	Colloids
Glavei	Coarse	Medium	Fine		Clay	Collolus		
3.6	24.9	34.5	22.3	10.0	4.7	3.5		

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	96.4		
2.36	76.5		
2.00	71.5		
1.18	56.8		
0.600	37.0		
0.300	23.7		
0.150	17.3		
0.075	14.7		
0.005	7.2		
0.002	4.7		
0.001	3.5		

COMMENTS:

Material tested was identified as BH23-37, 2.7' (Alwood Cr).

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

PROJECT NO.

123316298

ATTN: Erik Hansen

2 REPORT NO.

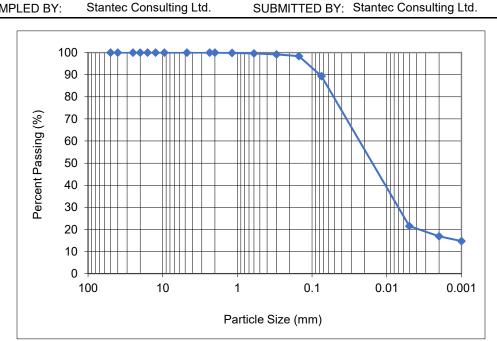
DATE SAMPLED: 2023.Jan.17 Stantec Consulting Ltd. SAMPLED BY:

DATE RECEIVED 2023.Jan.17

DATE TESTED: 2023.Jan.23

TESTED BY:

Donald Eliazar



Gravel		Sand		Silt	Silt Clay		Colloids	
Glavei	Coarse	Medium	Fine		Clay	Colloids		
0.0	0.0	0.4	10.2	72.5	16.9	14.7		

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	99.2
0.150	98.4
0.075	89.4
0.005	21.5
0.002	16.9
0.001	14.7

COMMENTS:

Material tested was identified as BH23-39, 2.7' (Gaynor PI).

REPORT DATE 2023.Jan.30 REVIEWED BY

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 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

3 REPORT NO.

DATE SAMPLED: 2023.Jan.17

DATE RECEIVED 2023.Jan.17

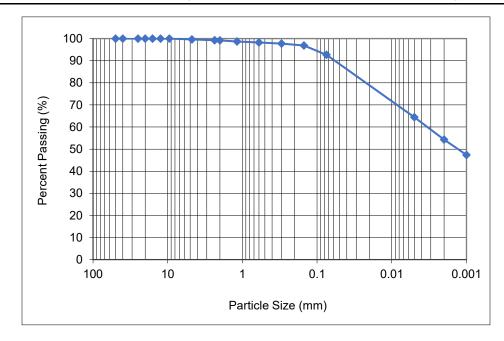
DATE TESTED: 2023.Jan.20

SAMPLED BY:

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Donald Eliazar TESTED BY:



Gravel		Sand		Silt	Silt Clay		Colloids
Glavei	Coarse	Medium	Fine		Clay	Colloids	
0.4	0.4	1.0	5.6	38.3	54.3	47.4	

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	99.6
2.36	99.3
2.00	99.2
1.18	98.7
0.600	98.3
0.300	97.7
0.150	96.9
0.075	92.7
0.005	64.5
0.002	54.3
0.001	47.4

COMMENTS:

Material tested was identified as BH23-40, 2.6' (Groverdale Ave).

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

PROJECT NO.

123316298

ATTN: Erik Hansen REPORT NO.

DATE SAMPLED: 2023.Jan.17

DATE RECEIVED 2023.Jan.17

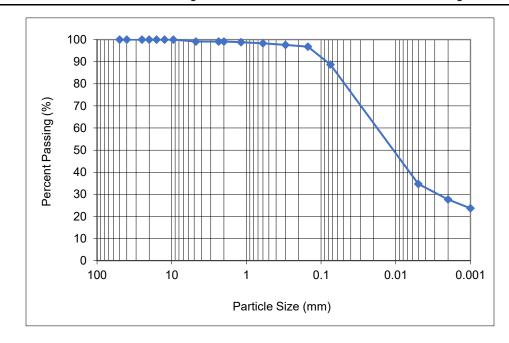
DATE TESTED: 2023.Jan.20

SAMPLED BY:

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Donald Eliazar TESTED BY:



Gravel		Sand		Silt	Silt Clay		Colloids
Graver	Coarse	Medium	Fine		Clay	Colloids	
0.9	0.0	0.8	9.6	61.0	27.7	23.7	

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	99.1
2.36	99.1
2.00	99.1
1.18	98.8
0.600	98.3
0.300	97.6
0.150	96.8
0.075	88.7
0.005	34.7
0.002	27.7
0.001	23.7

COMMENTS:

Material tested was identified as BH23-42, 2.8' (Garden Grove Dr).

REPORT DATE 2023.Jan.30 REVIEWED BY

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 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. 5

DATE SAMPLED: 2023.Jan.17

DATE RECEIVED 2023.Jan.17

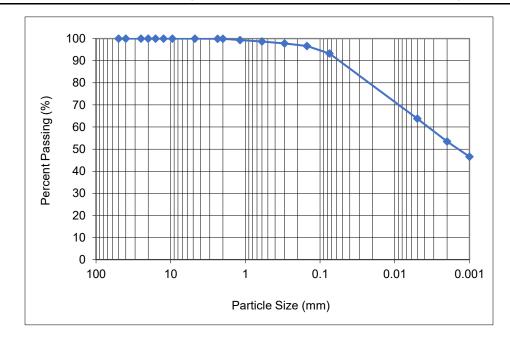
DATE TESTED: 2023.Jan.20

SAMPLED BY: St

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Donald Eliazar



Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	SIIL	Ciay	Colloids
0.0	0.1 1.2 5.4		5.4	39.9	53.4	46.6

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	99.9
2.00	99.9
1.18	99.3
0.600	98.7
0.300	97.8
0.150	96.7
0.075	93.3
0.005	63.8
0.002	53.4
0.001	46.6

COMMENTS:

Material tested was identified as BH23-44, 2.6' (Channing St).

REPORT DATE 2023.Jan.30

REVIEWED BY

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 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. 6

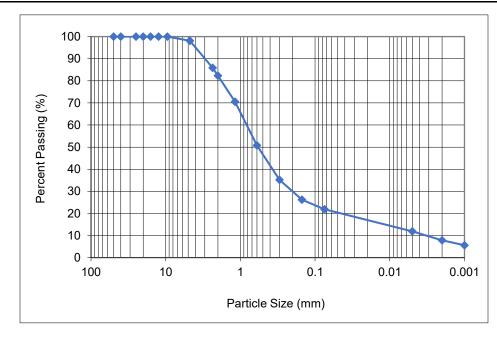
DATE SAMPLED: 2023.Jan.17 DATE F
SAMPLED BY: Stantec Consulting Ltd. SUBMI

DATE RECEIVED 2023.Jan.17

TESTED BY: Donald Eliazar

DATE TESTED: 2023.Jan.20

SUBMITTED BY: Stantec Consulting Ltd.



Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	SIIL	Clay	Collolus
1.9	1.9 15.7 3		28.9	14.1	7.8	5.6

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	98.1
2.36	85.8
2.00	82.4
1.18	70.5
0.600	50.7
0.300	35.2
0.150	26.2
0.075	21.9
0.005	11.9
0.002	7.8
0.001	5.6

COMMENTS:

Material tested was identified as BH23-46, 2.6' (Benbow Rd).

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

TESTED BY:

Donald Eliazar

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

SAMPLED BY:

PROJECT NO.

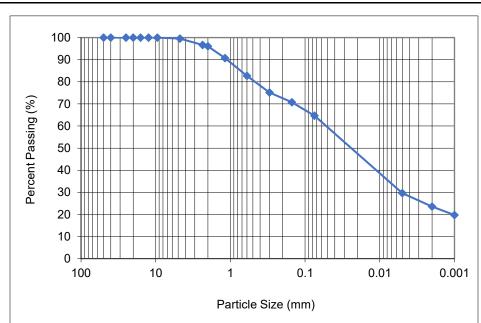
123316298

ATTN: Erik Hansen

REPORT NO. 7

DATE SAMPLED: 2023.Jan.17 DATE RECEIVED 2023.Jan.17 DATE TESTED: 2023.Jan.20

Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd.



Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	5111	Clay	Collolus
0.5	5 3.5 1		18.0	41.0	23.6	19.7

SIEVE SIZE	% PASSING
(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	99.5
2.36	96.7
2.00	96.1
1.18	90.7
0.600	82.7
0.300	75.1
0.150	70.7
0.075	64.6
0.005	29.6
0.002	23.6
0.001	19.7

COMMENTS:

Material tested was identified as BH23-48, 2.7' (Charter Dr).

REPORT DATE 2023.Jan.30

REVIEWED BY

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.



Table 1 - Compressive Strength Test Data

Test	Core	Diameter	Length	L/D Ratio	Correction Factor	Peak Load	Ctropath (MDa)	
No. Identification	(mm)	(mm)		ractor	(kN)	Measured	Corrected	
1	BH-23-32	146	160	1.10	0.894	718.57	39.4	35.2
2	BH-23-34	146	168	1.15	0.906	1141.00	62.6	56.7

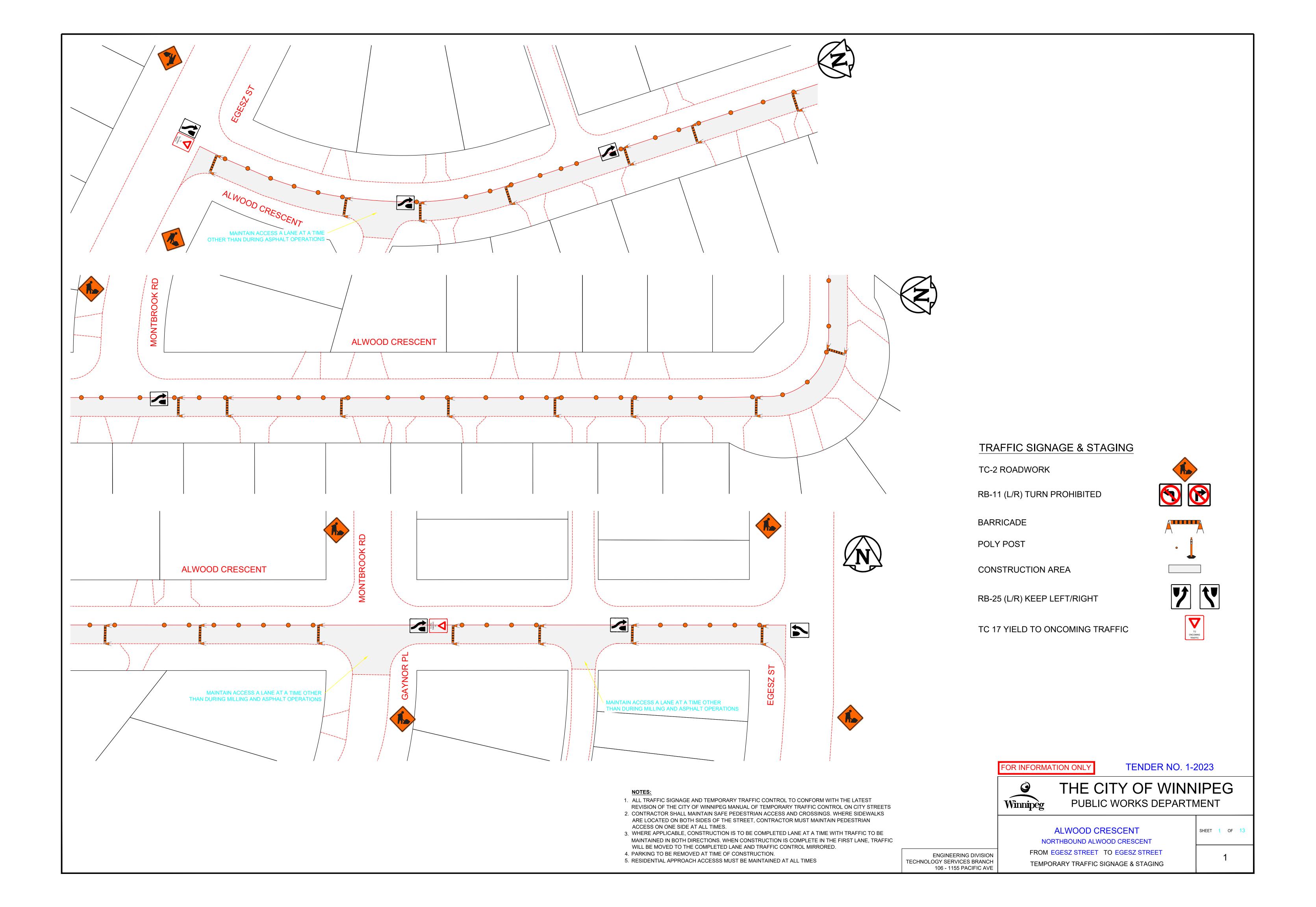
The City of Winnipeg
Appendix "B"
Tender No. 1-2023

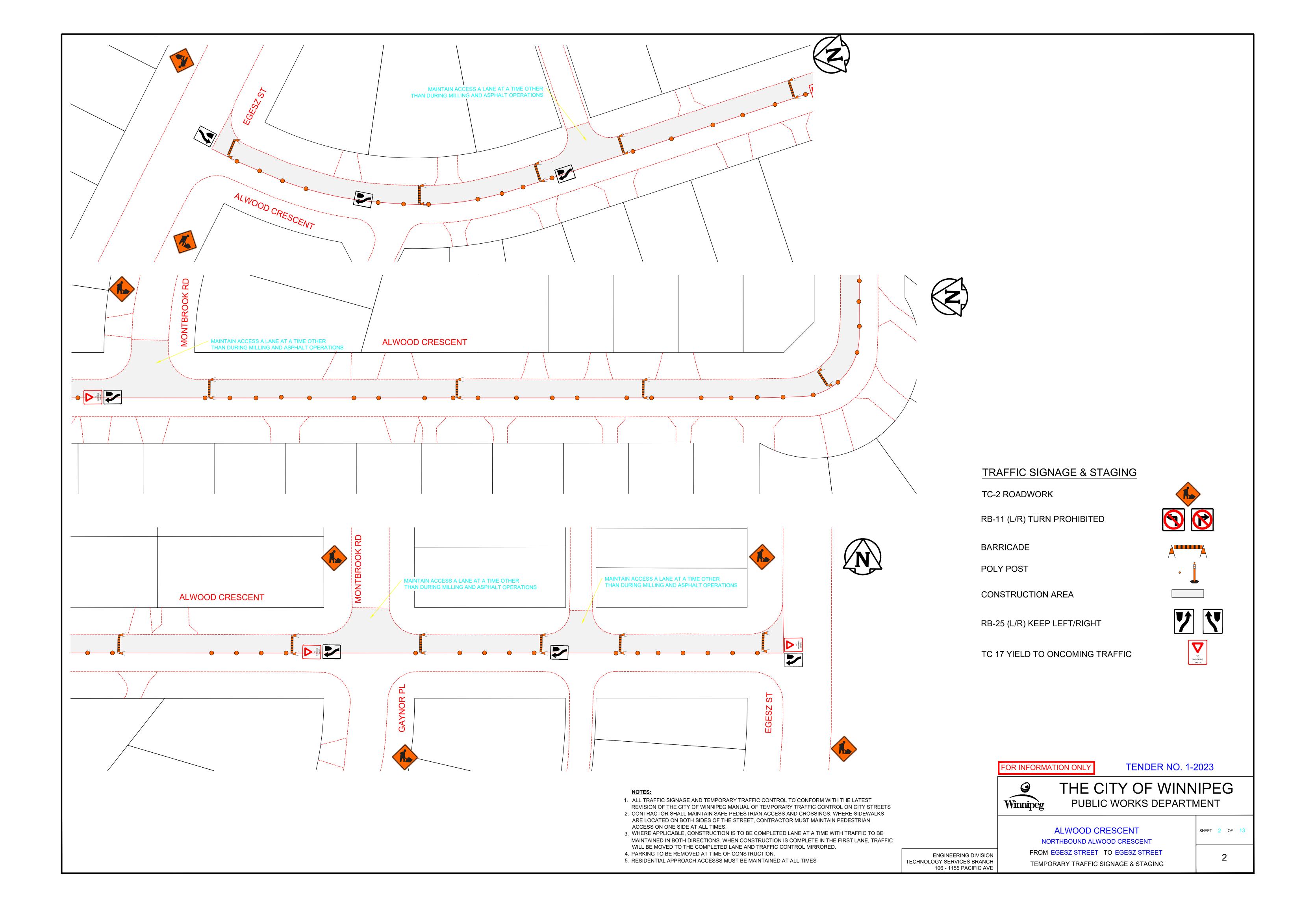
Template Version: eC2022 12 31 - Const Road Works

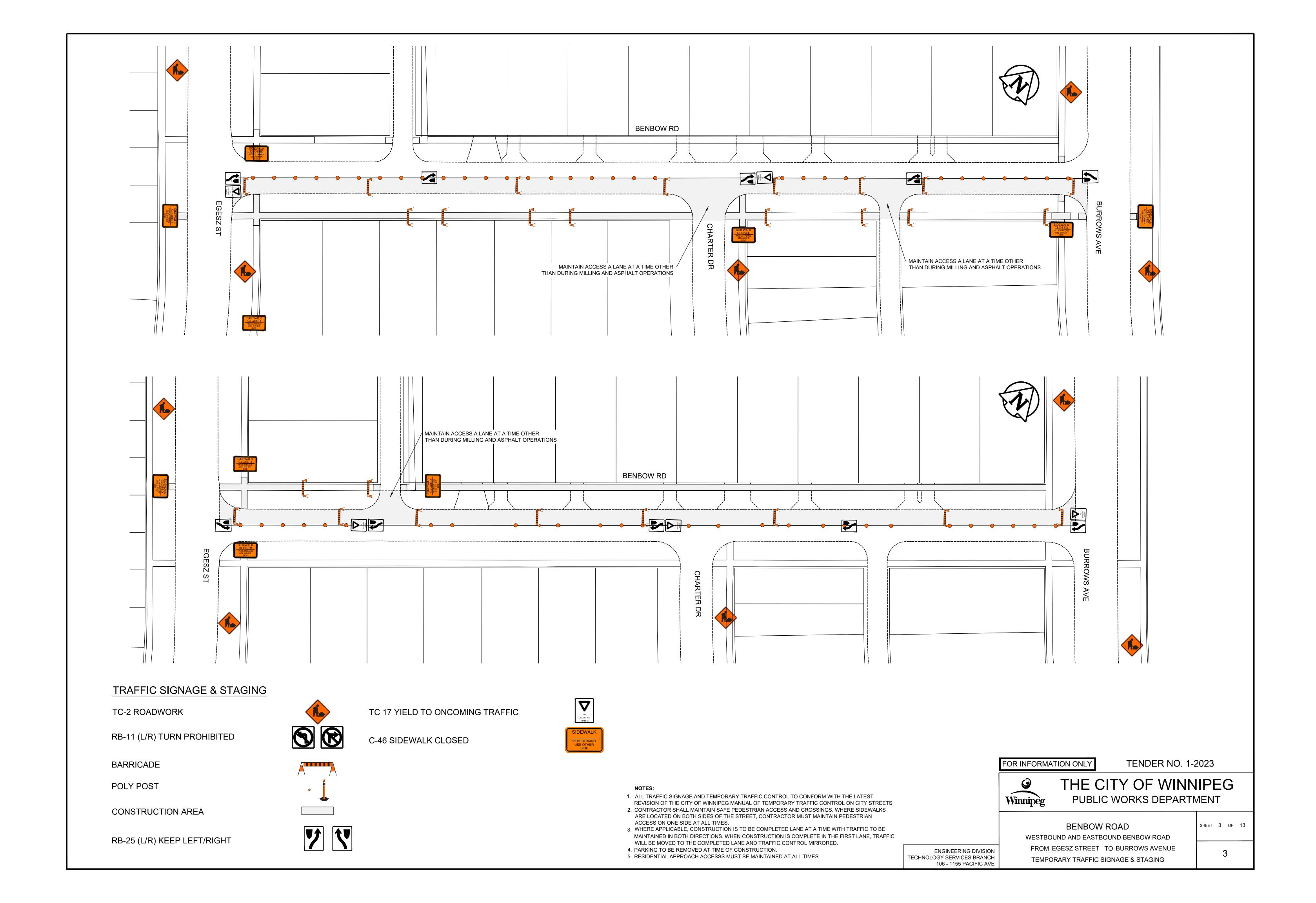
APPENDIX 'B' - TEMPORARY TRAFFIC CONTROL SIGNAGE DRAWINGS

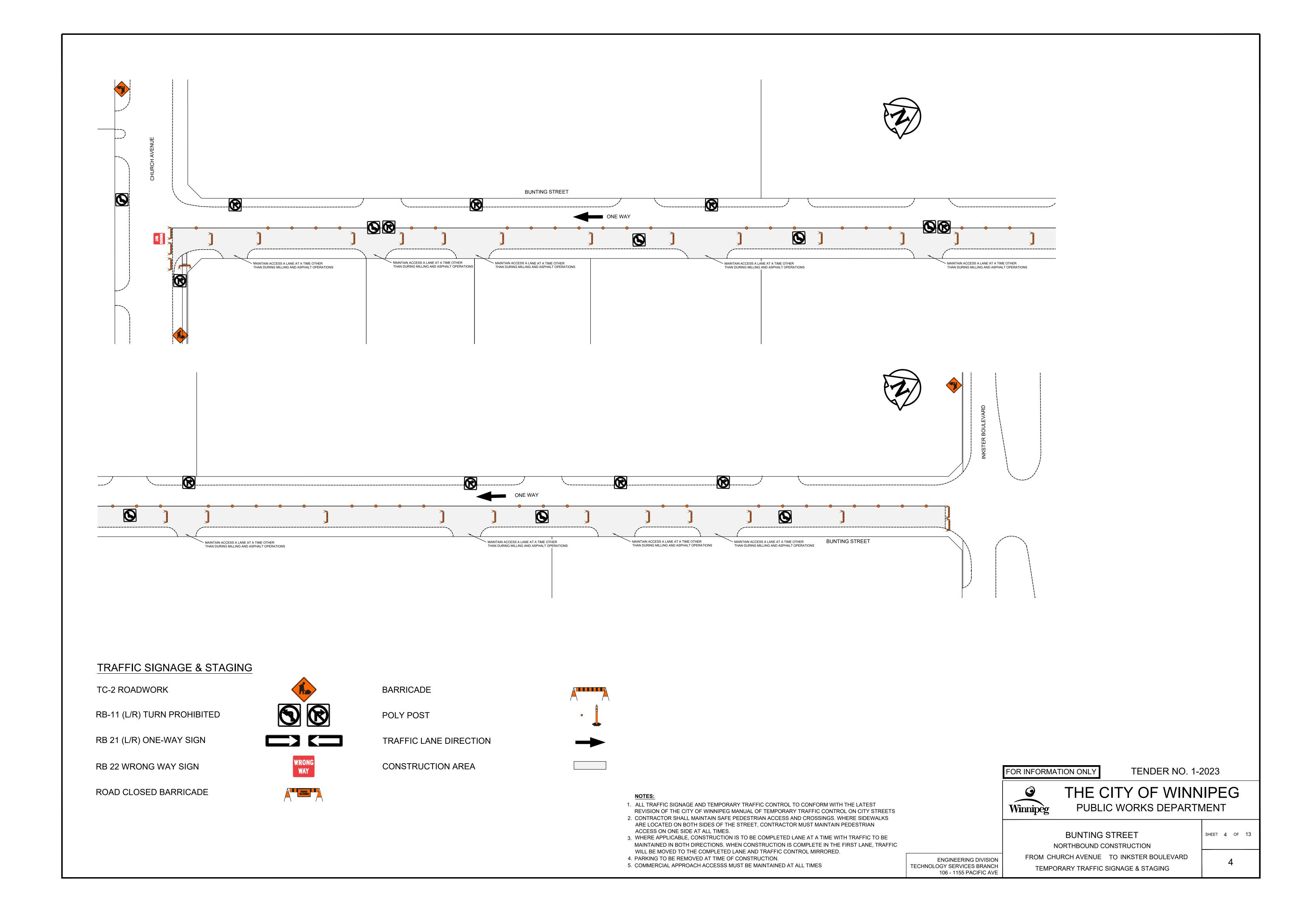
TEMPORARY TRAFFIC CONTROL SIGNAGE DRAWINGS FOR:

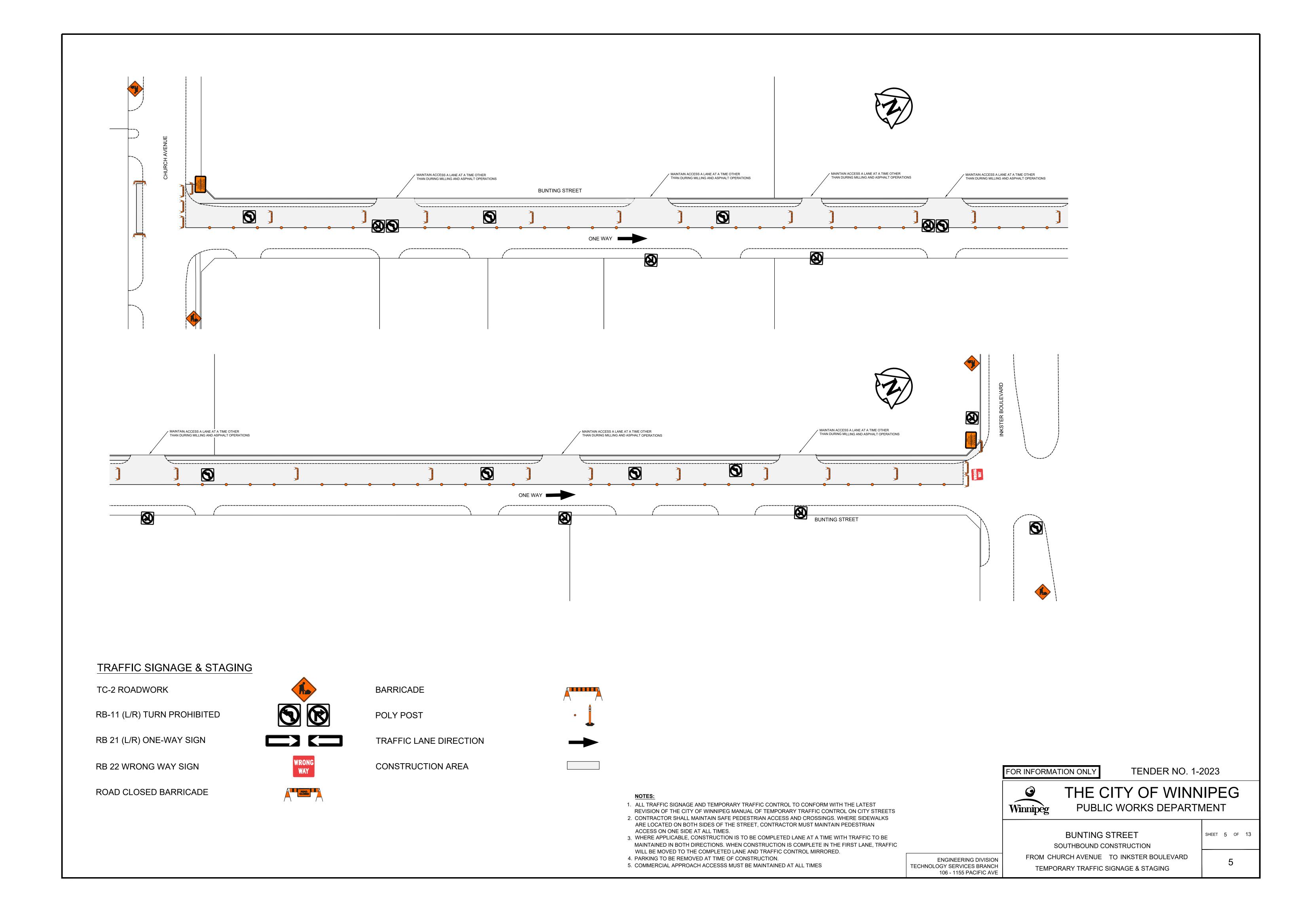
Alwood Crescent from Egesz Street to Egesz Street – Asphalt Pavement Rehabilitation Benbow Road from Egesz Street to Burrows Avenue – Asphalt Pavement Resurfacing Bunting Street from Church Avenue to Inkster Boulevard – Concrete Pavement Rehabilitation Channing Street from Burrows Avenue to Wendon Bay – Asphalt Pavement Resurfacing Charter Drive from Egesz Street to Benbow Road – Asphalt Pavement Resurfacing Garden Grove Drive from Groverdale Avenue to Fairgrove Bay – Asphalt Pavement Rehabilitation Groverdale Avenue from Garden Grove Drive to Burdick Place – Asphalt Pavement Resurfacing Park Lane Avenue from Approximately 367m South of Selkirk Avenue to Selkirk Avenue – Construction of New Concrete Sidewalk

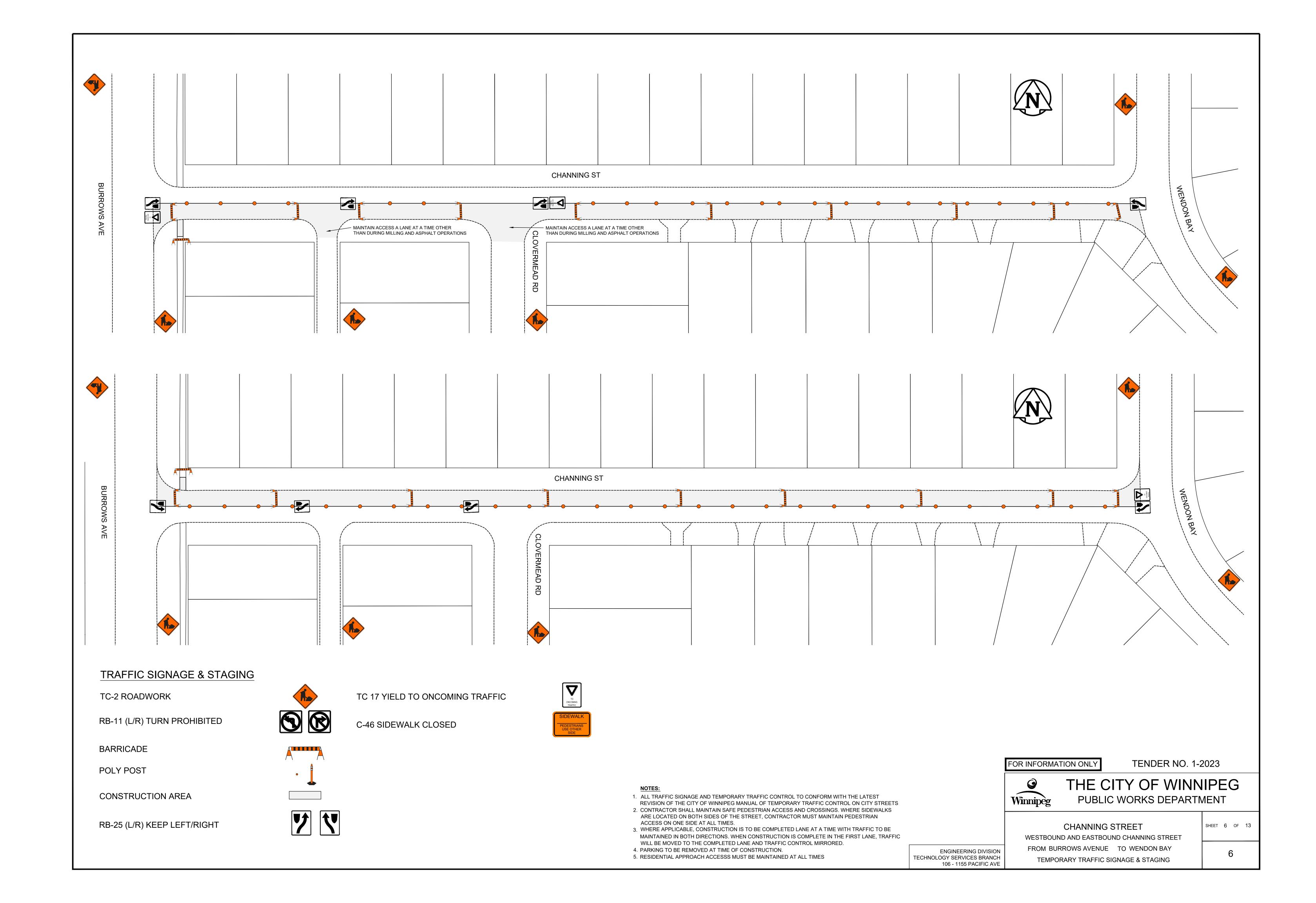


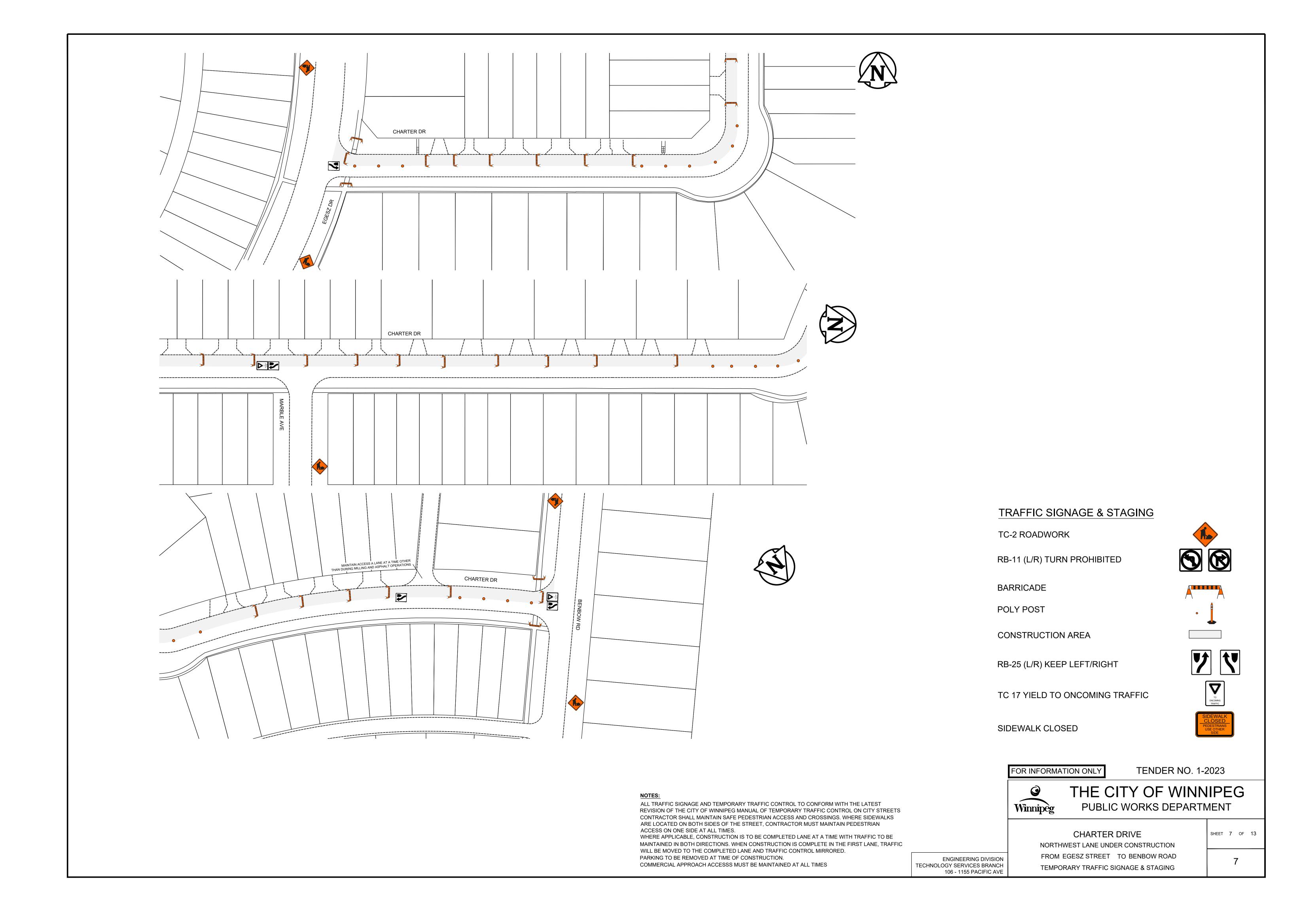


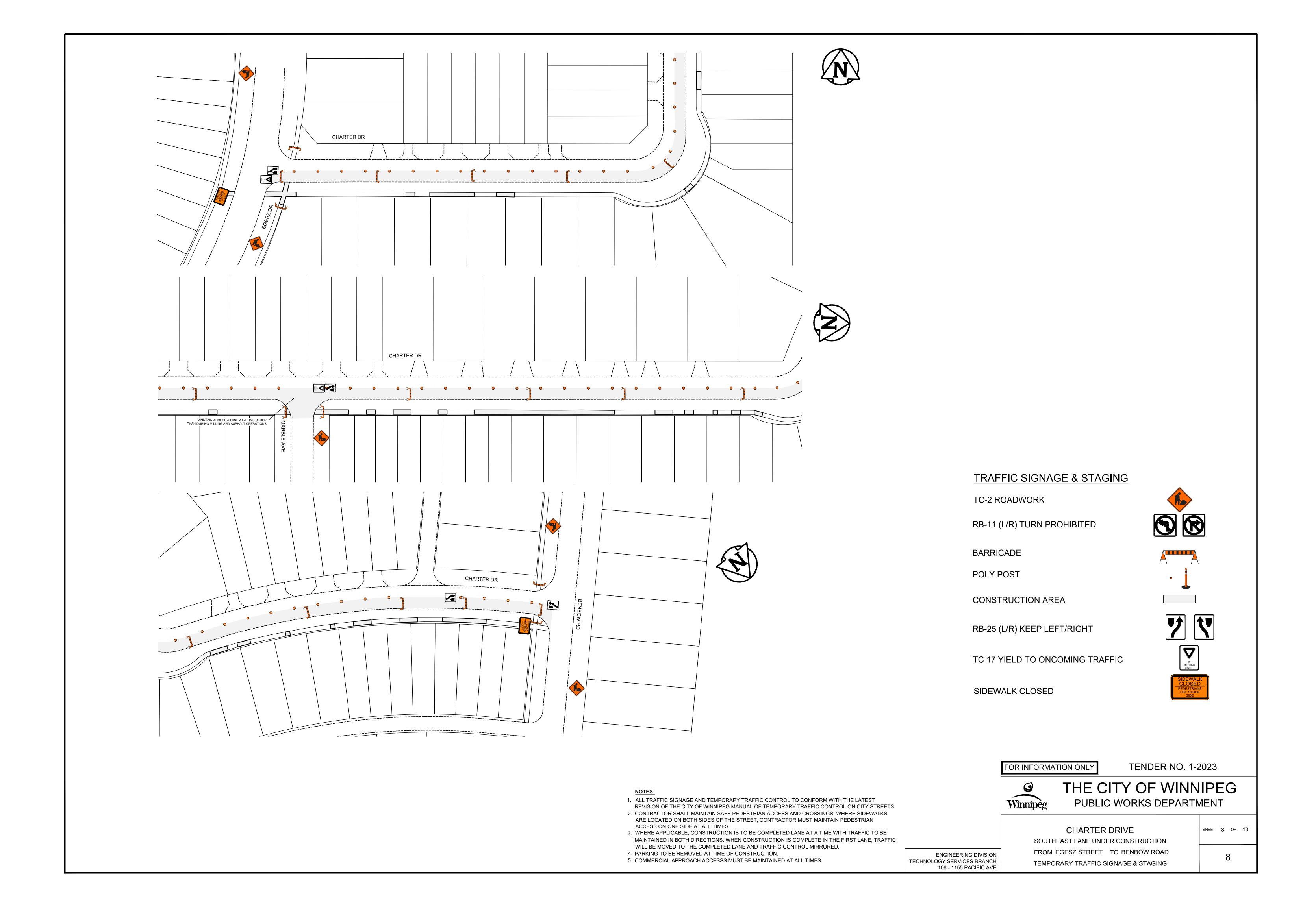


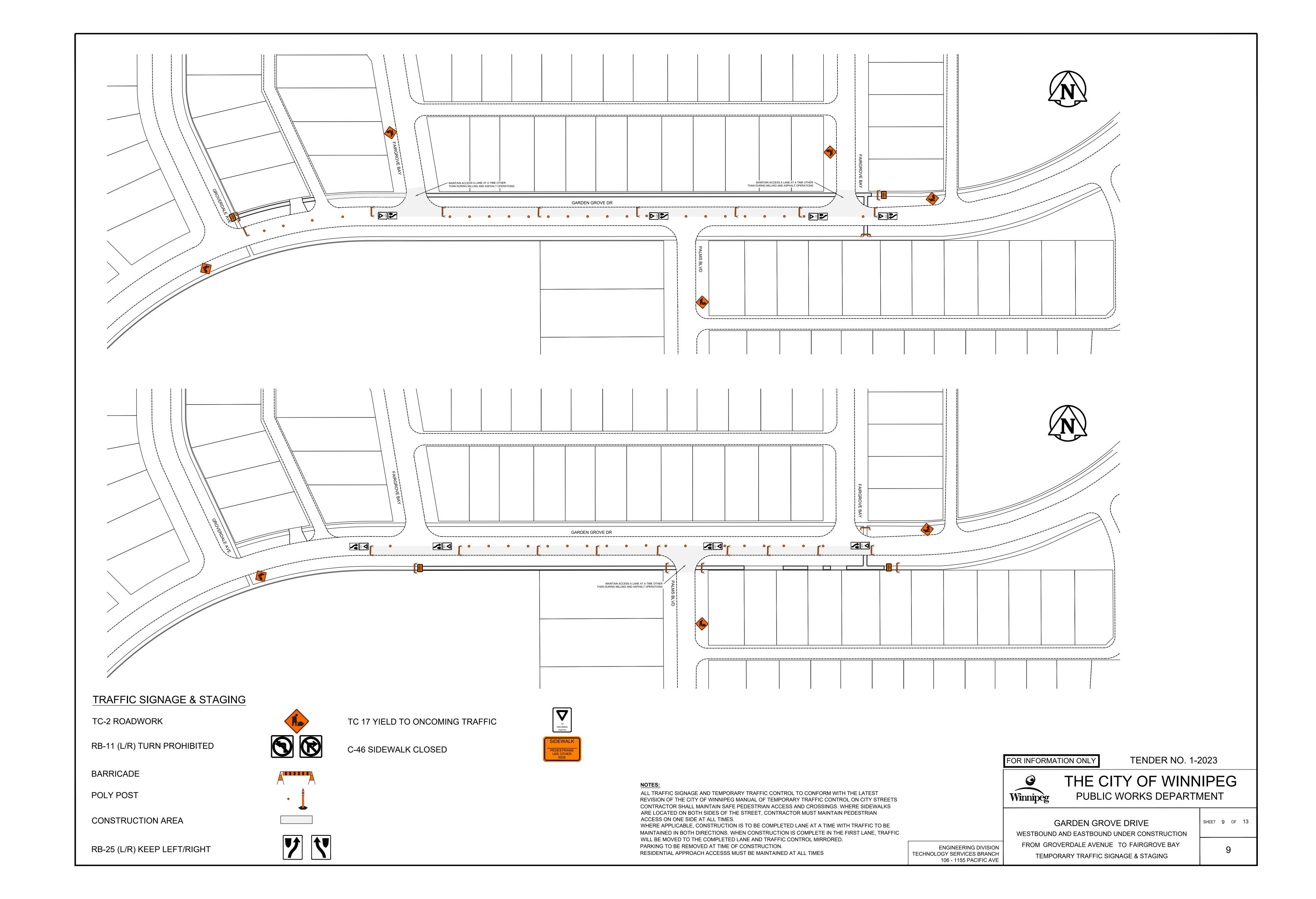


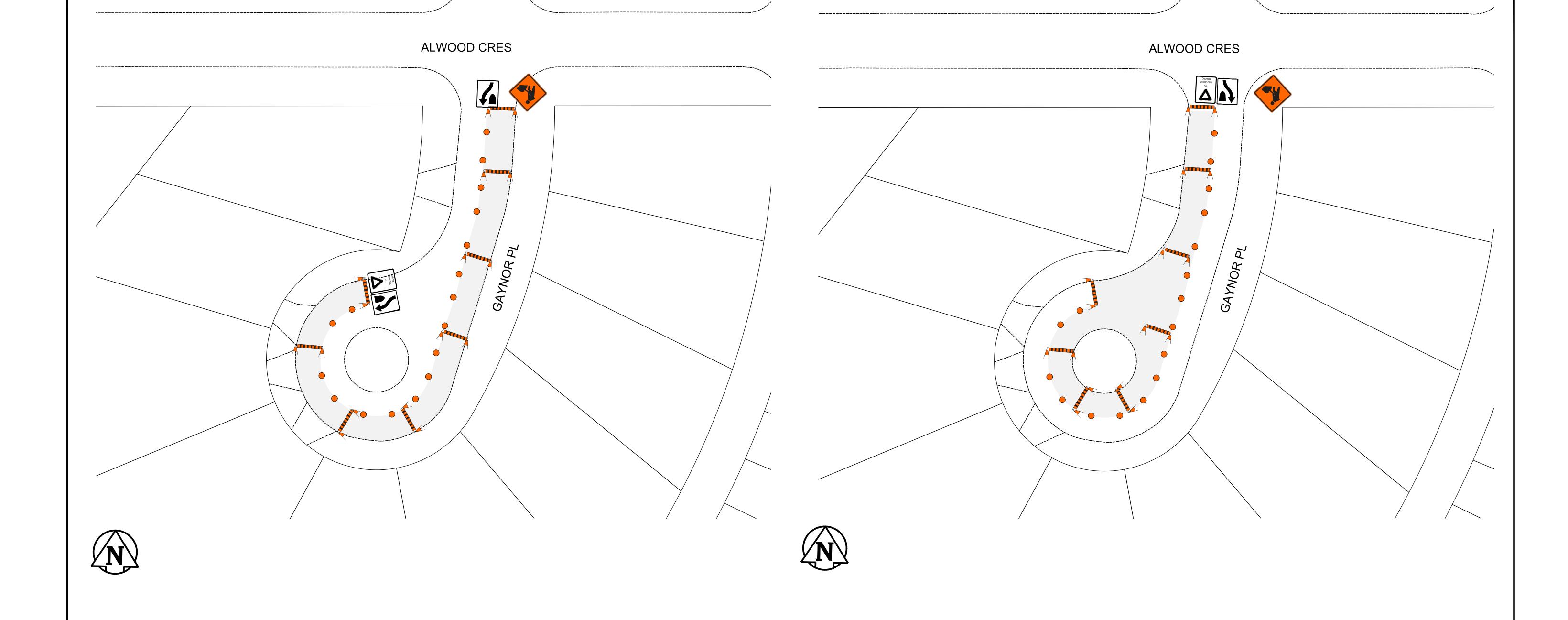












TRAFFIC SIGNAGE & STAGING

TC-2 ROADWORK

RB-11 (L/R) TURN PROHIBITED

BARRICADE

POLY POST

CONSTRUCTION AREA

RB-25 (L/R) KEEP LEFT/RIGHT

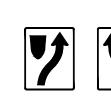


TC 17 YIELD TO ONCOMING TRAFFIC









1. ALL TRAFFIC SIGNAGE AND TEMPORARY TRAFFIC CONTROL TO CONFORM WITH THE LATEST REVISION OF THE CITY OF WINNIPEG MANUAL OF TEMPORARY TRAFFIC CONTROL ON CITY STREETS 2. CONTRACTOR SHALL MAINTAIN SAFE PEDESTRIAN ACCESS AND CROSSINGS. WHERE SIDEWALKS

ARE LOCATED ON BOTH SIDES OF THE STREET, CONTRACTOR MUST MAINTAIN PEDESTRIAN ACCESS ON ONE SIDE AT ALL TIMES. 3. WHERE APPLICABLE, CONSTRUCTION IS TO BE COMPLETED LANE AT A TIME WITH TRAFFIC TO BE

MAINTAINED IN BOTH DIRECTIONS. WHEN CONSTRUCTION IS COMPLETE IN THE FIRST LANE, TRAFFIC WILL BE MOVED TO THE COMPLETED LANE AND TRAFFIC CONTROL MIRRORED. 4. PARKING TO BE REMOVED AT TIME OF CONSTRUCTION.

5. RESIDENTIAL APPROACH ACCESSS MUST BE MAINTAINED AT ALL TIMES

FOR INFORMATION ONLY

TENDER NO. 1-2023



THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT

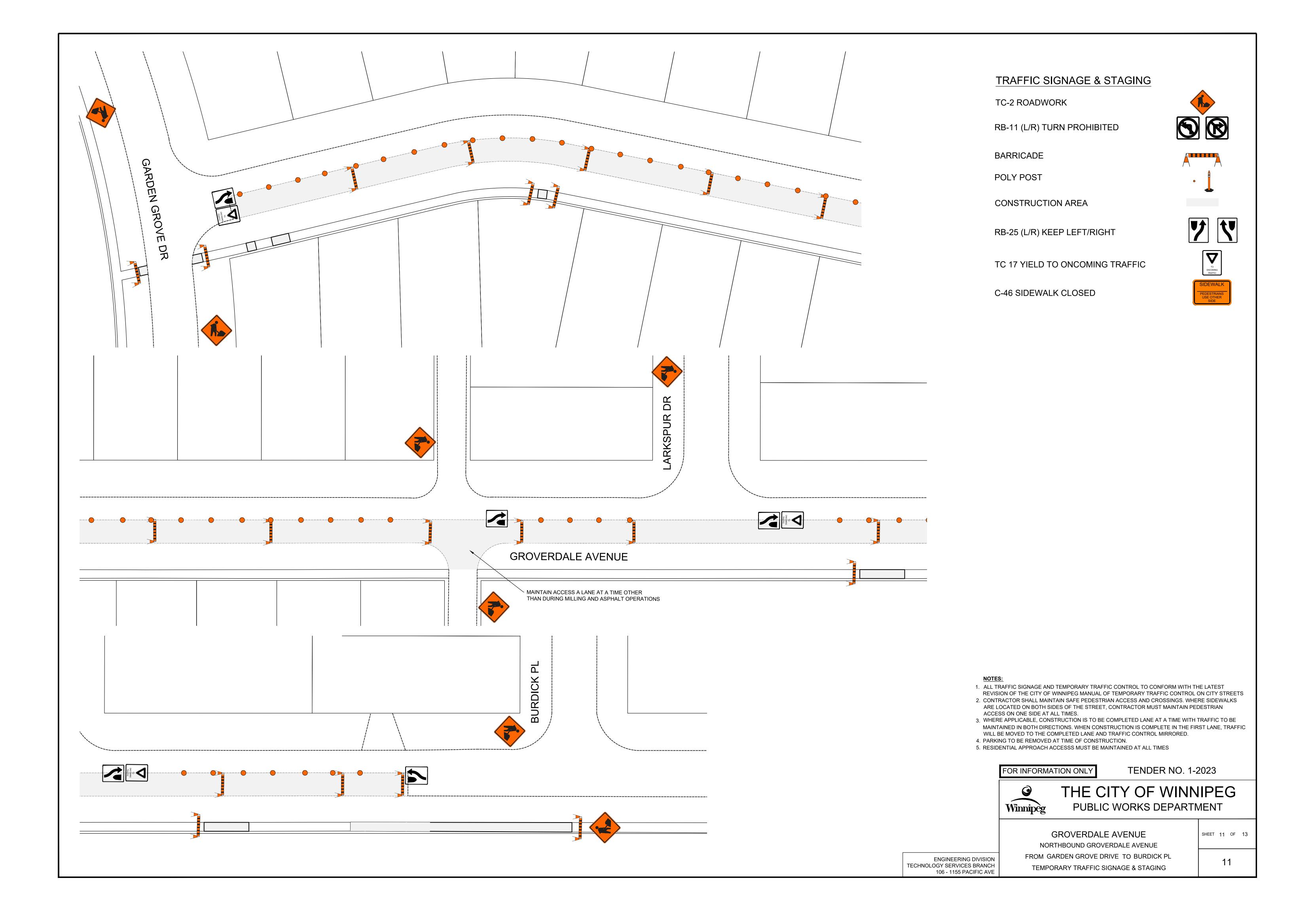
GAYNOR PLACE NORTHBOUND AND SOUTHBOUND GAYNOR PLACE FROM ALWOOD CRES TO END

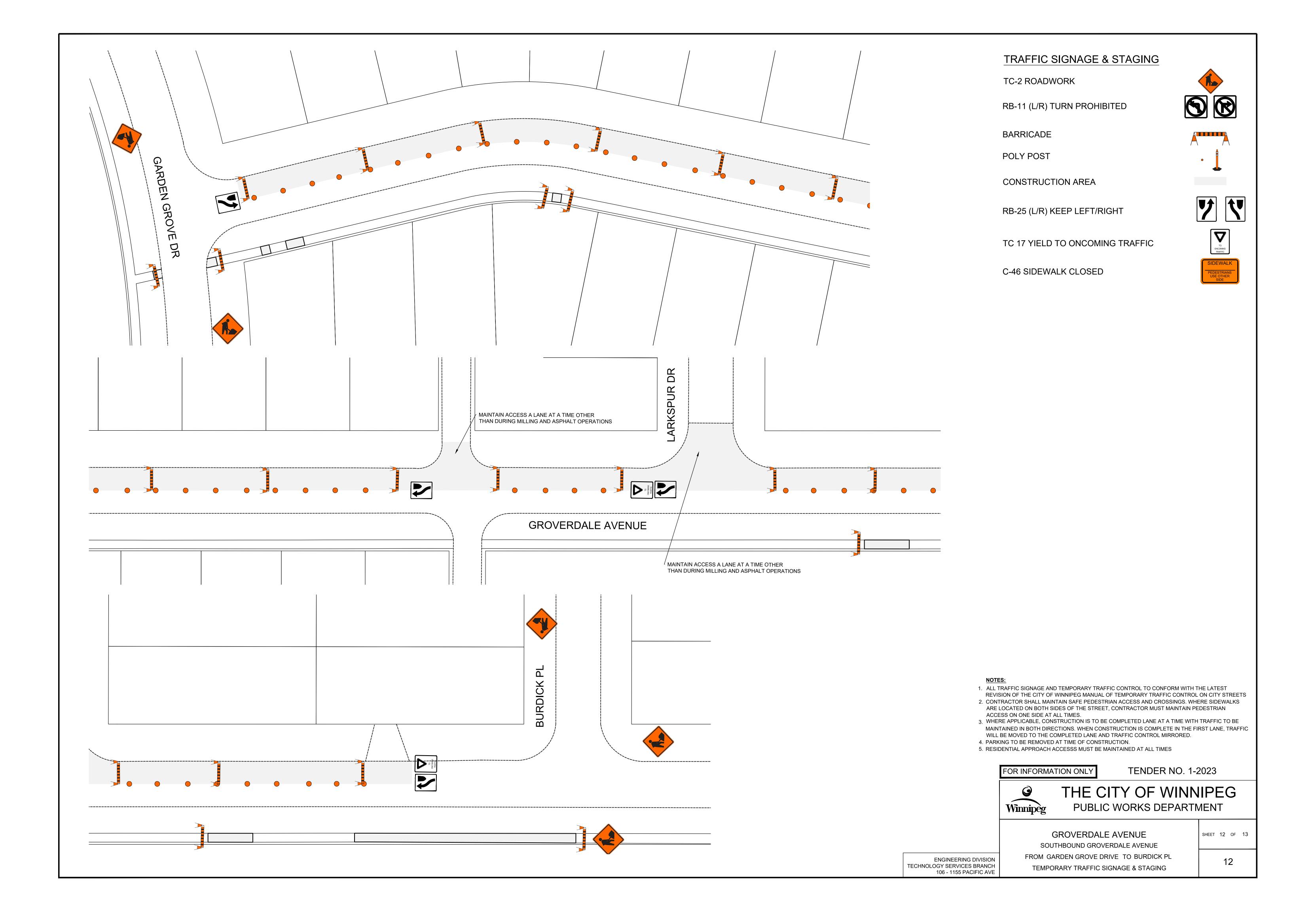
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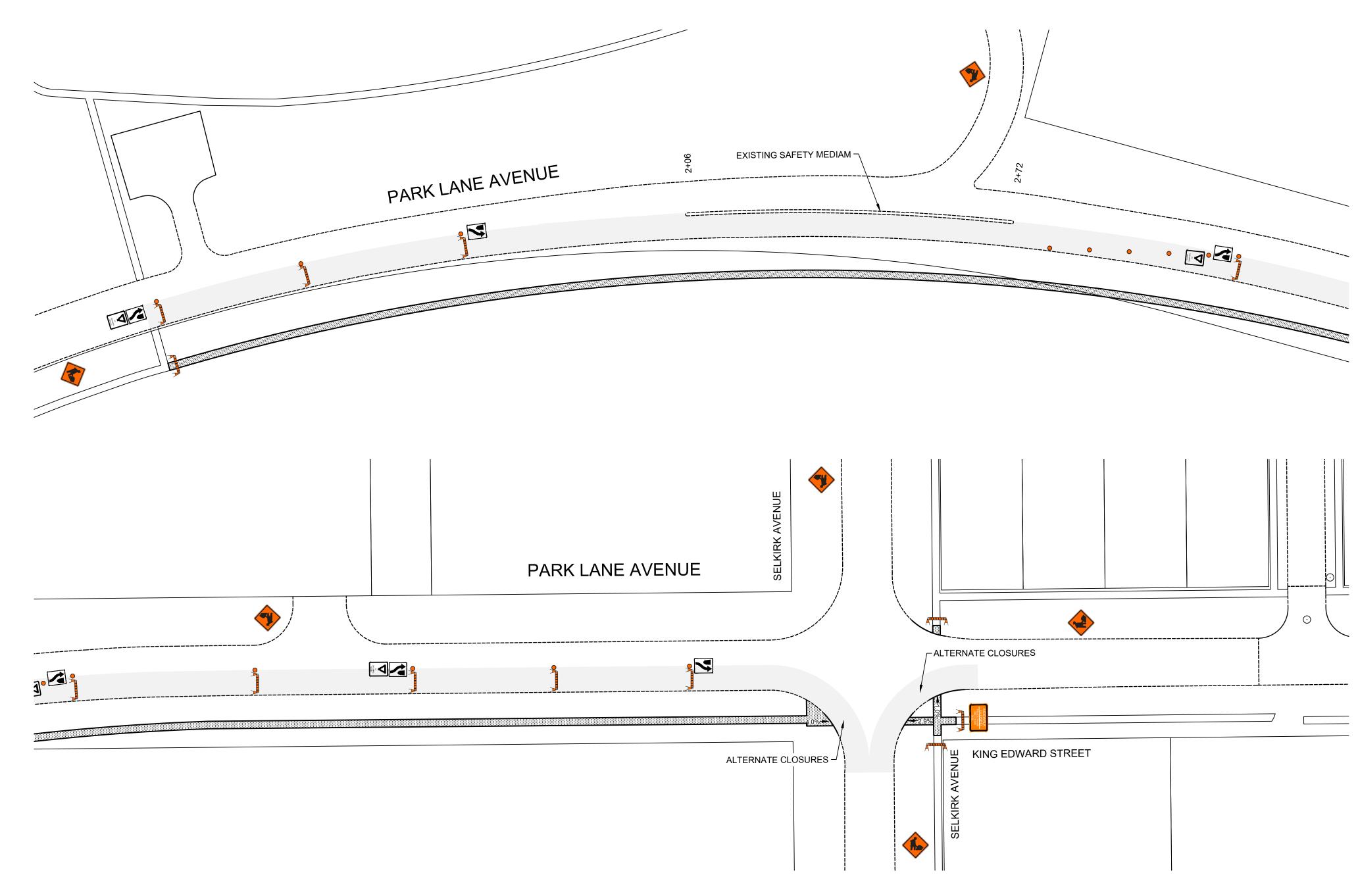
SHEET 10 OF 13

ENGINEERING DIVISION TECHNOLOGY SERVICES BRANCH 106 - 1155 PACIFIC AVE

TEMPORARY TRAFFIC SIGNAGE & STAGING







TRAFFIC SIGNAGE & STAGING

TC-2 ROADWORK

RB-11 (L/R) TURN PROHIBITED

BARRICADE

POLY POST

CONSTRUCTION AREA

RB-25 (L/R) KEEP LEFT/RIGHT

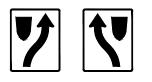
TC 17 YIELD TO ONCOMING TRAFFIC

C-46 SIDEWALK CLOSED













1. ALL TRAFFIC SIGNAGE AND TEMPORARY TRAFFIC CONTROL TO CONFORM WITH THE LATEST REVISION OF THE CITY OF WINNIPEG MANUAL OF TEMPORARY TRAFFIC CONTROL ON CITY STREETS 2. CONTRACTOR SHALL MAINTAIN SAFE PEDESTRIAN ACCESS AND CROSSINGS. WHERE SIDEWALKS ARE LOCATED ON BOTH SIDES OF THE STREET, CONTRACTOR MUST MAINTAIN PEDESTRIAN

3. WHERE APPLICABLE, CONSTRUCTION IS TO BE COMPLETED LANE AT A TIME WITH TRAFFIC TO BE MAINTAINED IN BOTH DIRECTIONS. WHEN CONSTRUCTION IS COMPLETE IN THE FIRST LANE, TRAFFIC WILL BE MOVED TO THE COMPLETED LANE AND TRAFFIC CONTROL MIRRORED.

4. PARKING TO BE REMOVED AT TIME OF CONSTRUCTION.

ACCESS ON ONE SIDE AT ALL TIMES.

5. RESIDENTIAL APPROACH ACCESSS MUST BE MAINTAINED AT ALL TIMES

FOR INFORMATION ONLY

TENDER NO. 1-2023



THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT

PARK LANE AVENUE SHEET 13 OF 13 NORTHBOUND PARK LANE AVENUE FROM PARK LANE EXISTING SIDEWALK TO SELKIRK AVENUE 13 TEMPORARY TRAFFIC SIGNAGE & STAGING

ENGINEERING DIVISION TECHNOLOGY SERVICES BRANCH 106 - 1155 PACIFIC AVE



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 – Alwood Crescent and Various Locations

Stantec Consulting Ltd. (Stantec) was retained to undertake a factual geotechnical investigation for the 2023 Local Street Renewals Program (Alwood Crescent 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 16, 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 – Alwood Crescent 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.

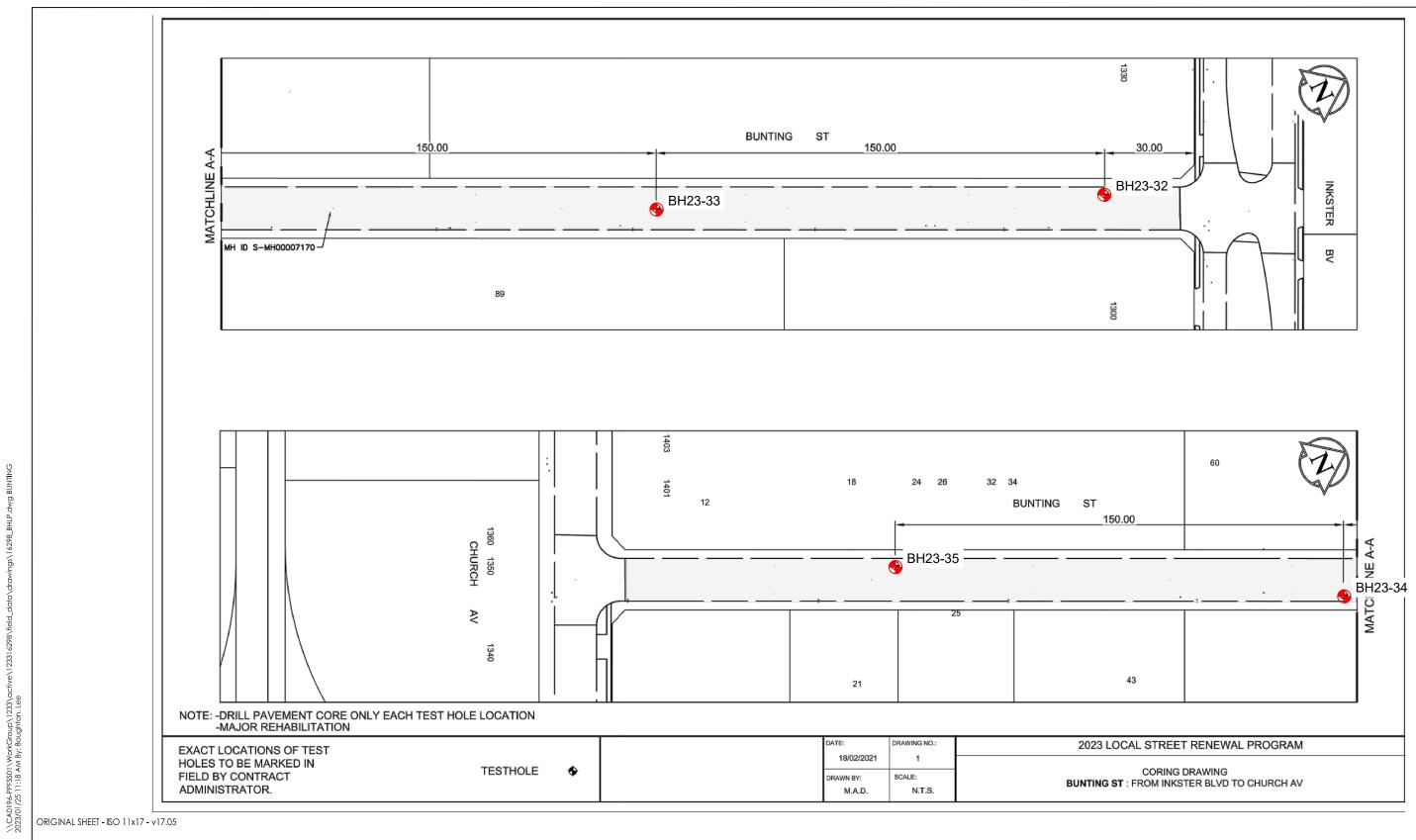
VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments 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



Scale

APPROXIMATE BOREHOLE LOCATION

Legend

CITY OF WINNIPEG

2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

2023-01-24 123316298

Figure No.

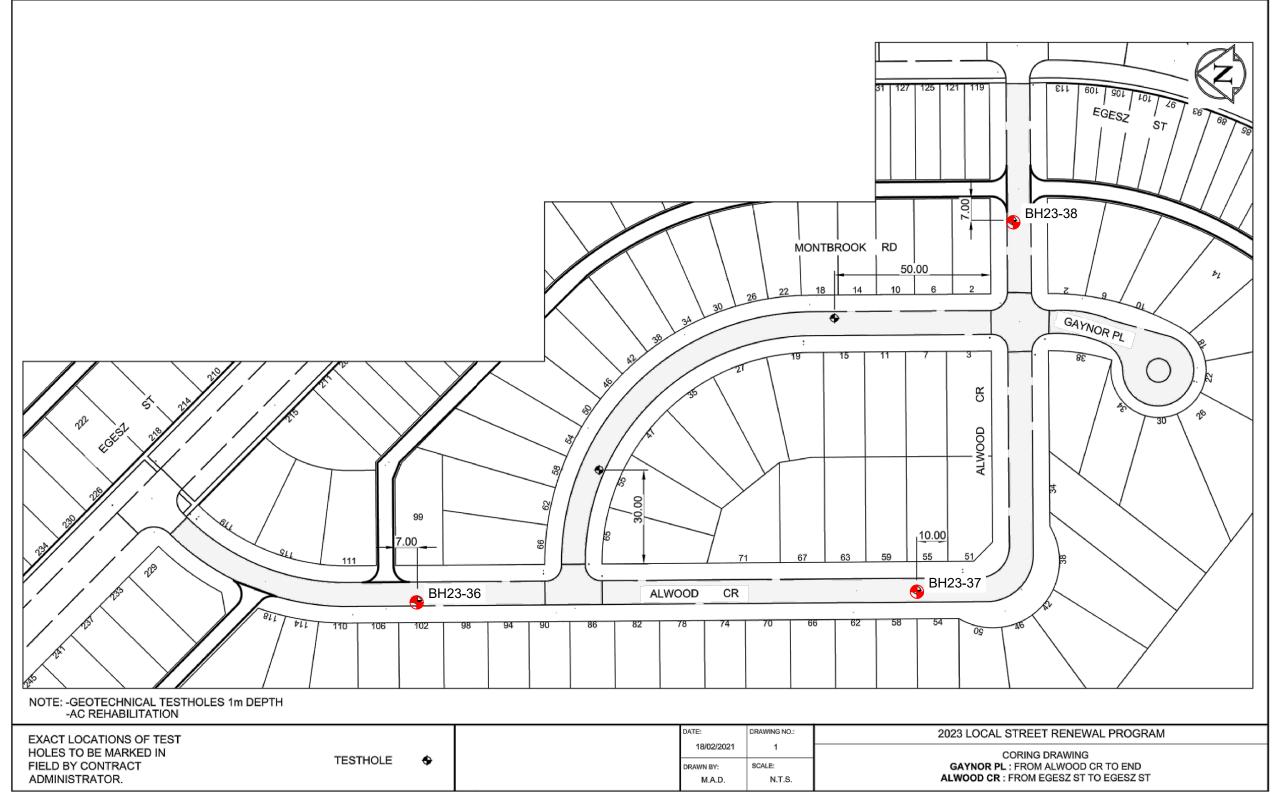
BOREHOLE LOCATION PLAN

Stantec

Stantec Consulting Ltd. Suite 500, 311 Portage Avenue

Winnipeg MB Canada R3B 2B9 Tel. 204.489.5900 Fax. 204.453.9012

www.stantec.com



Client/Project

CITY OF WINNIPEG

2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

2023-01-25 123316298

Figure No.

ALWOOD

Stantec

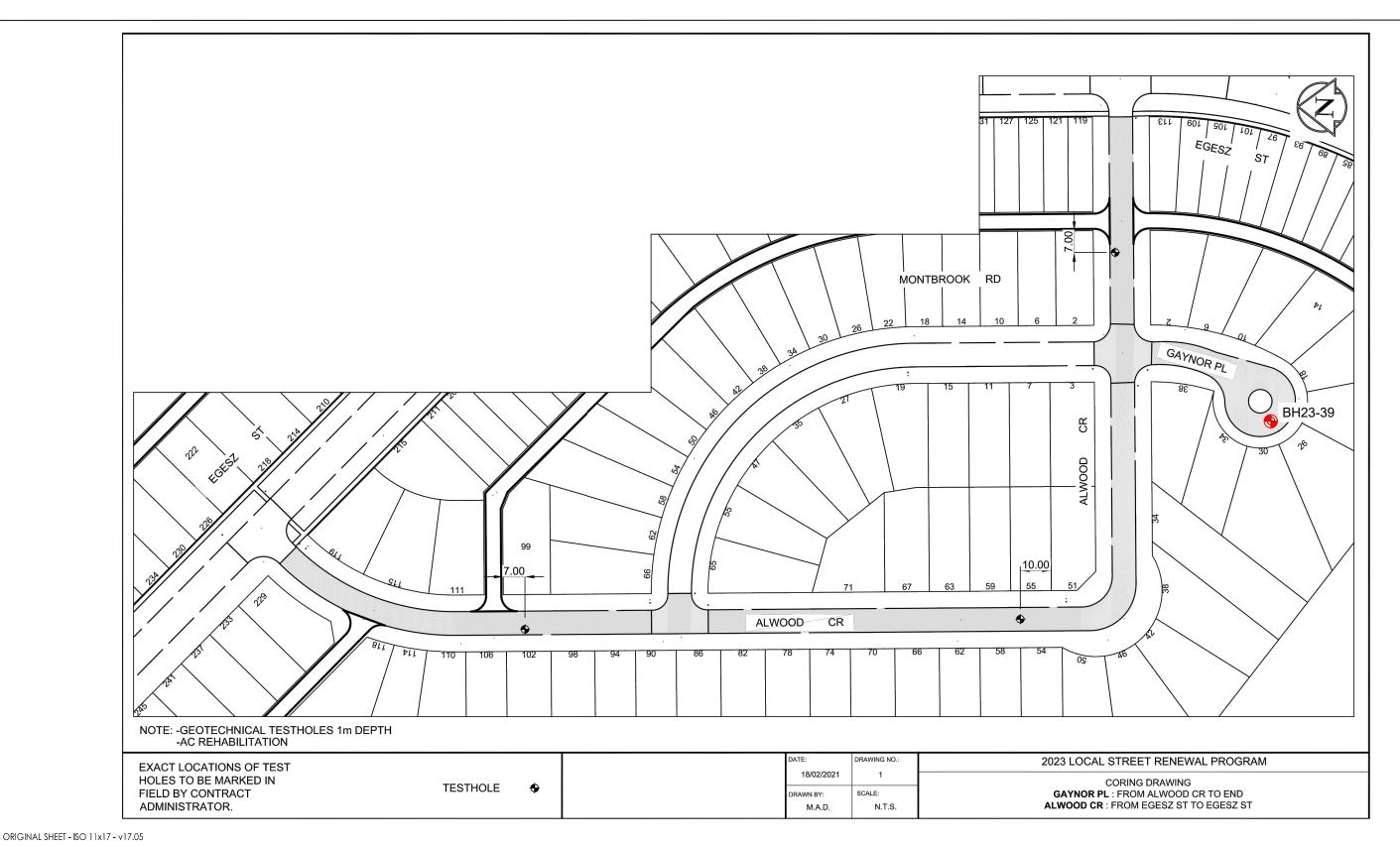
Stantec Consulting Ltd.
Suite 500, 311 Portage Avenue
Winnipeg MB Canada R3B 2B9
Tel. 204.489.5900 Fax. 204.453.9012
www.stantec.com

APPROXIMATE BOREHOLE LOCATION

Legend

Scale

BOREHOLE LOCATION PLAN



Stantec

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

APPROXIMATE BOREHOLE LOCATION

Scale

Client/Project

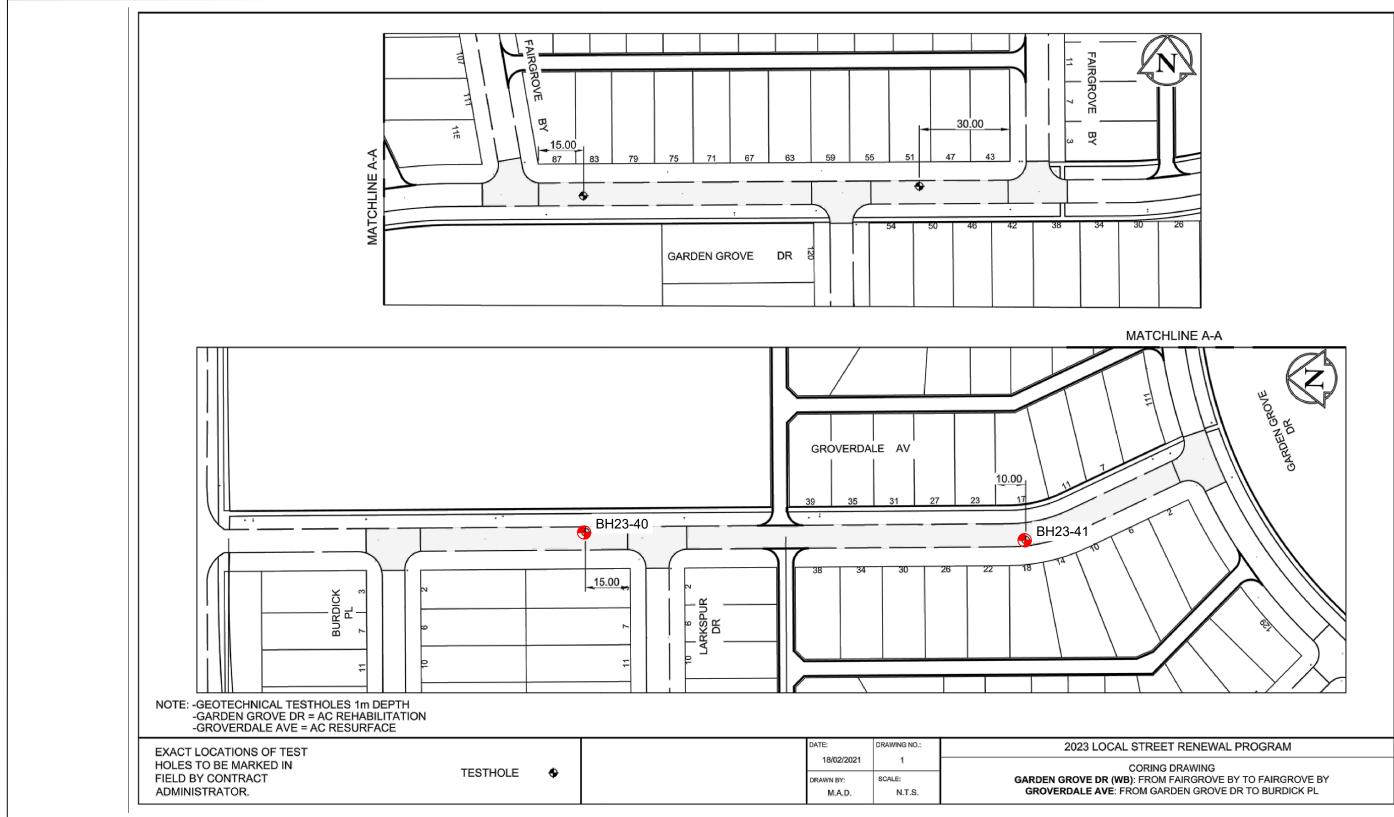
CITY OF WINNIPEG

2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

2023-01-24 123316298

Figure No.

GAYNOR



2023-01-25 123316298



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Winnipeg MB Canada R3B 2B9
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Legend

APPROXIMATE BOREHOLE LOCATION

Scale

Client/Project

CITY OF WINNIPEG

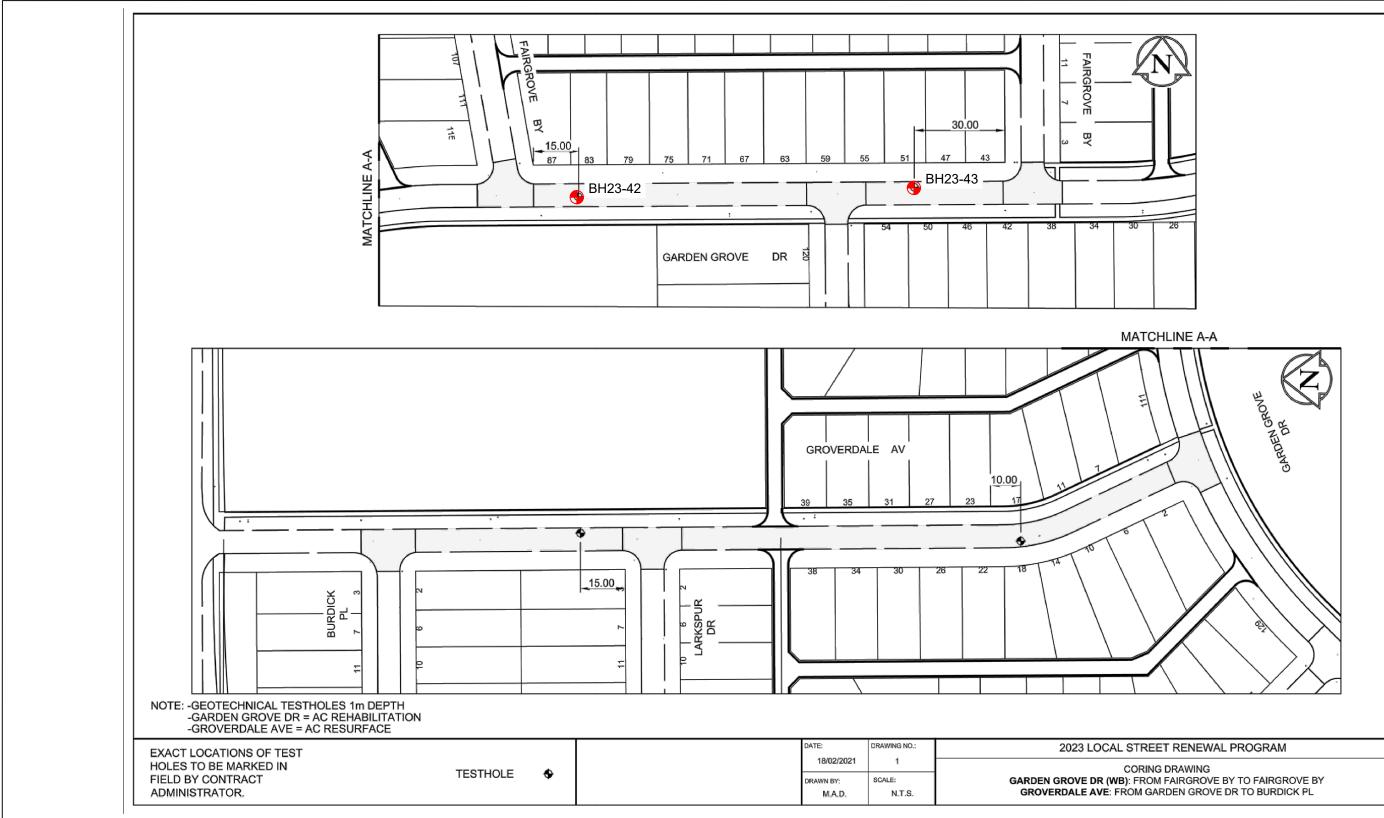
2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

Figure No.

<u>GROVERDA</u>LE

BOREHOLE LOCATION PLAN

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2023-01-24 123316298



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Legend

APPROXIMATE BOREHOLE LOCATION

Scale

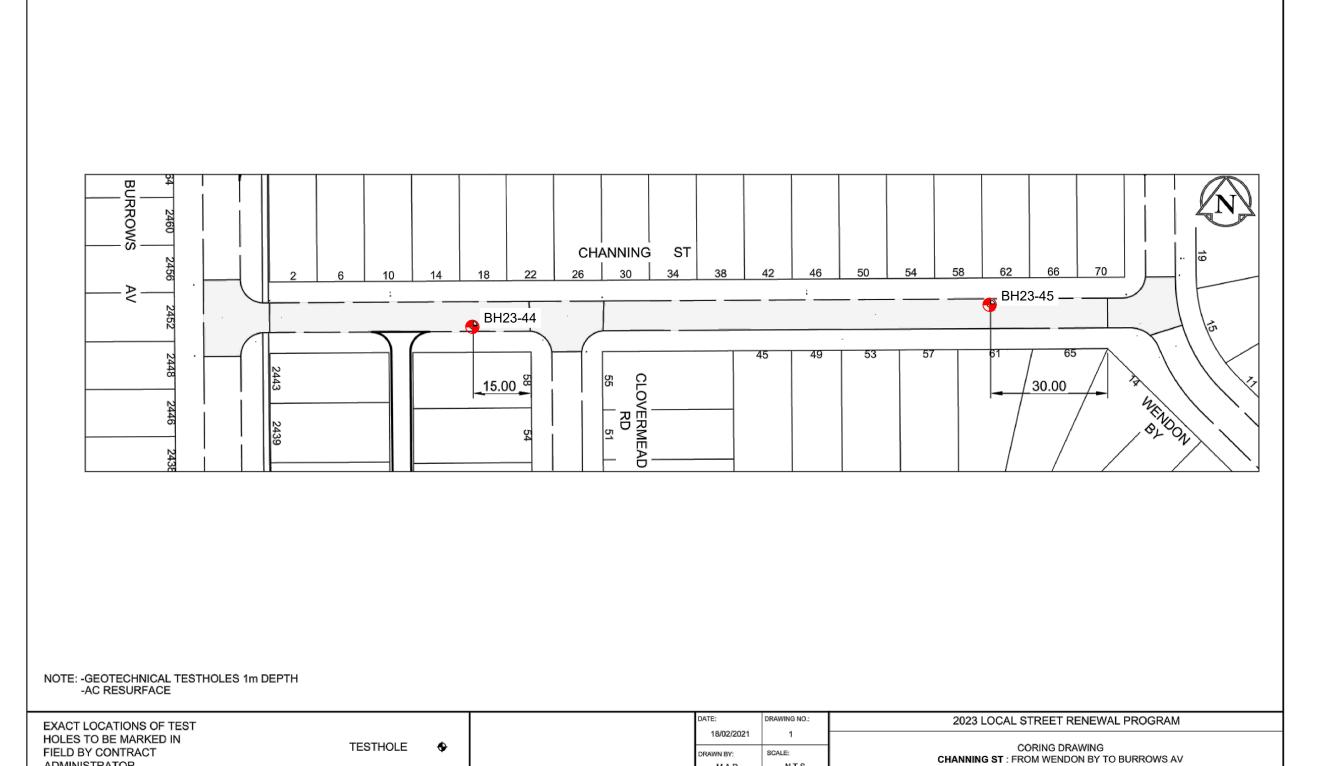
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Figure No.

GARDEN GROVE



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ADMINISTRATOR.

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APPROXIMATE BOREHOLE LOCATION

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CITY OF WINNIPEG

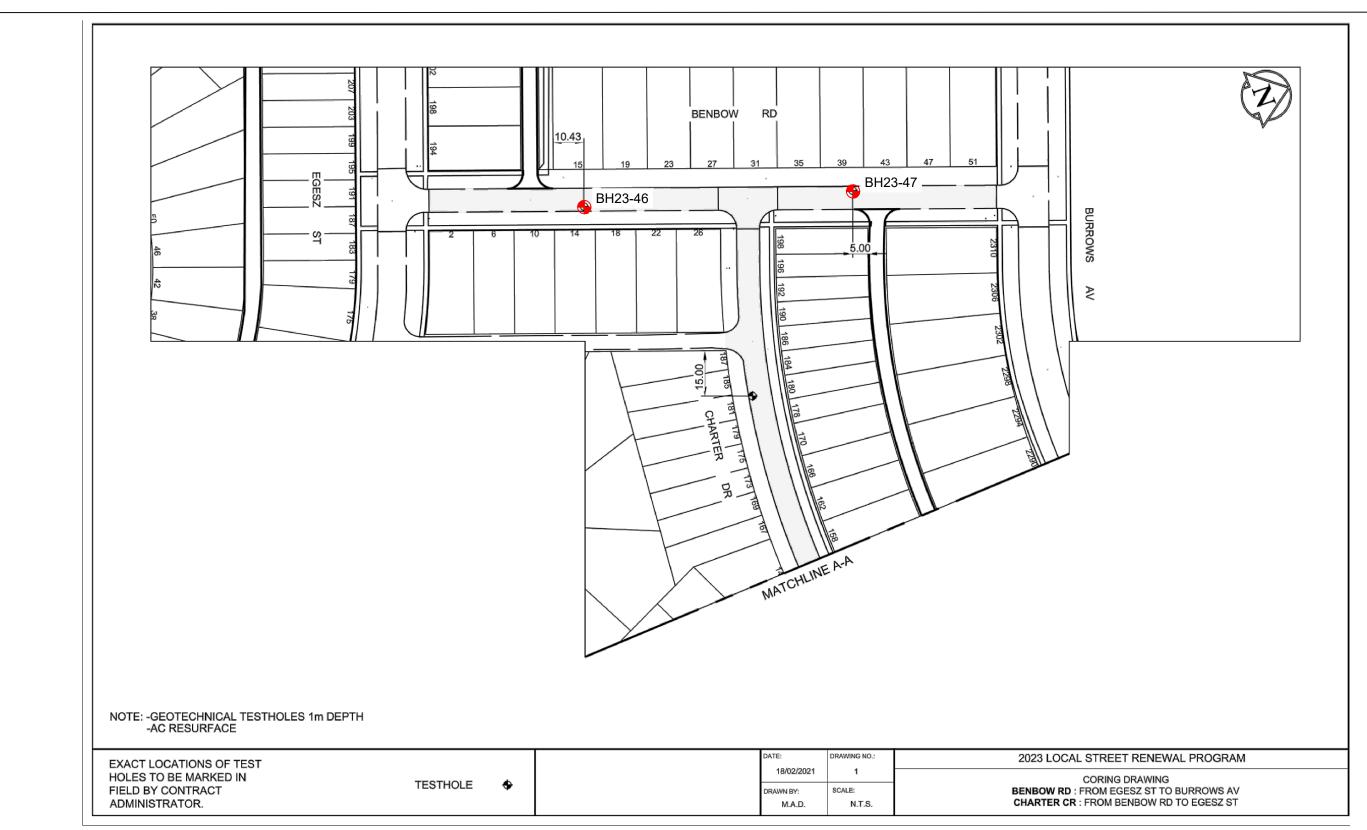
2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

Figure No.

CHANNING

BOREHOLE LOCATION PLAN





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APPROXIMATE BOREHOLE LOCATION

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CITY OF WINNIPEG

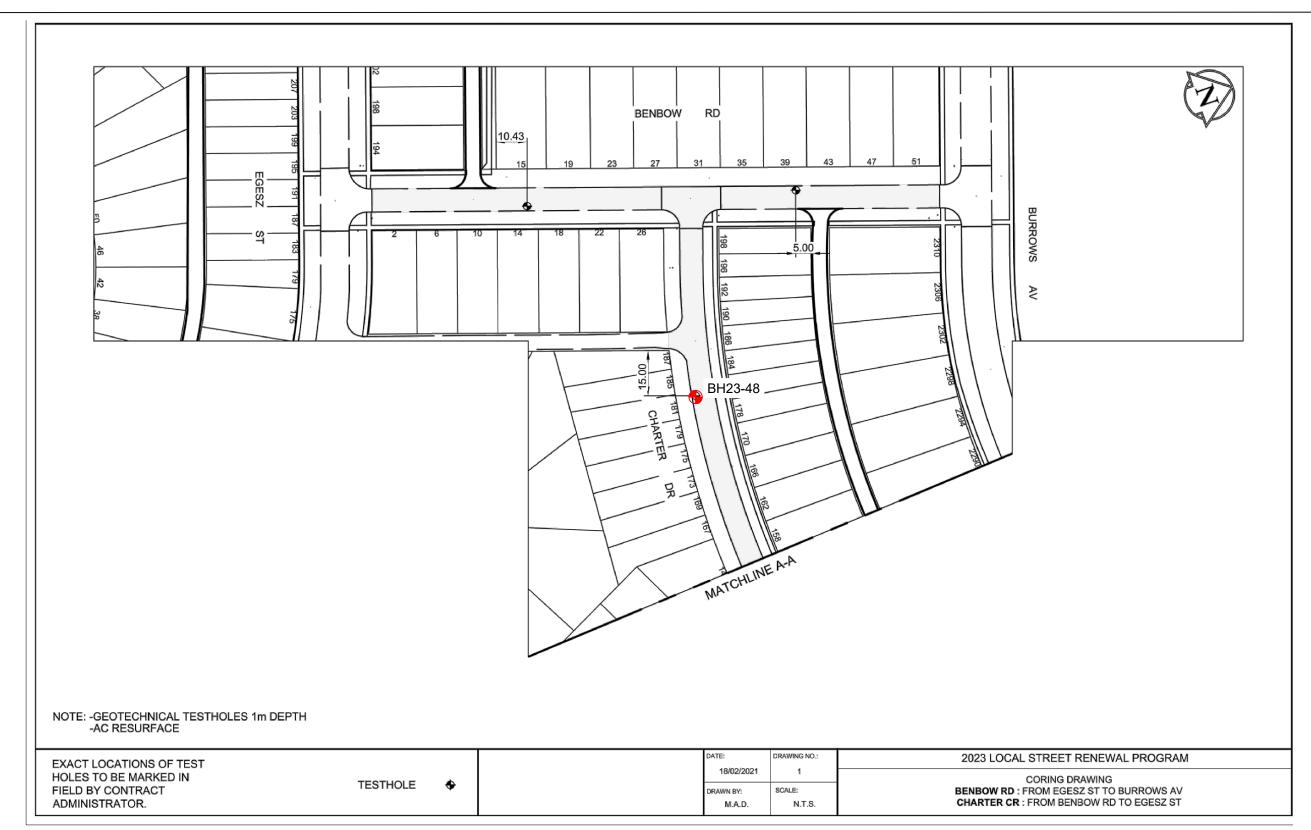
2023 LOCAL STREET RENEWALS PROGRAM

WINNIPEG, MB

Figure No.

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Legend

APPROXIMATE BOREHOLE LOCATION

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CITY OF WINNIPEG

2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

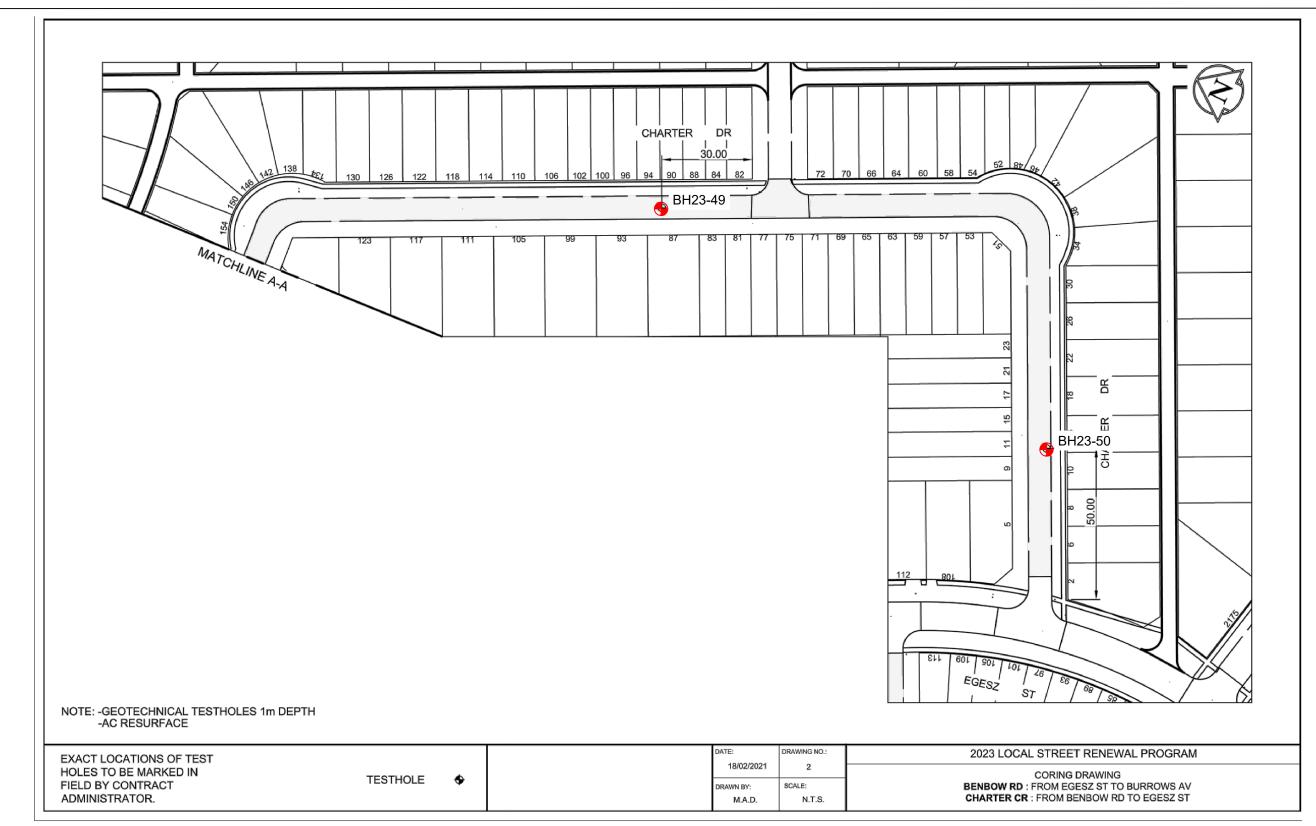
Figure No.

Client/Project

CHARTER (1OF 2)

BOREHOLE LOCATION PLAN





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APPROXIMATE BOREHOLE LOCATION

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2023 LOCAL STREET RENEWALS PROGRAM WINNIPEG, MB

Figure No.

CHARTER (2 OF 2)

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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	ear Strength	Approximate
Consistency	kips/sq.ft.	kPa	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
₽	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
Y	Falling head permeability test using well point or piezometer

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DEFIN (M)	ELEVATION (m)	SOIL DESCRIPTION	# BIT ELEVATION: N/A DATUS: MATERIAL CONTROL & MATE															
	ELEVA	(USCS)																
\downarrow																		
		ASPHALT: 100 mm																
t		Granular FILL																
-				V ~														
F		Brown, moist, fat CLAY (CH)	SAMPLES SAMP															
						MPLES COLUMN N/A												
1					BH ELEVATION: N/A DATUM: N/A													
				V				PROJECT NO.: 1233162 BH ELEVATION: N/A DATUM: N/A WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, CU (kPa) LABORATORY TEST A FIELD VANE TEST OF POCKET SHEAR VANE SPI (N-vaule) BLOWS/0.3m WATER CONTENT & ATTERBERG LIMITS PI (N-vaule) BLOWS/0.3m 10 20 30 40 50 50 00 70 80 OC.										
4				AS AS														
			BH ELEVATION: N/A DATUM: N/A WAIER LEVEL: N/A WAIER LEVEL: N/A WAIER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (N°D) LABORATORY TEST A FIED VAN TEST ON POCKET SFEAR VAN E IN ON POCKET SFEAR VAN															
						PROJECT NO.: 123316298 BH ELEVATION: N/A DATUM: N/A WATER LEVEL: N/A WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (kPa) LABORATORY TEST A FIELD VANE TEST POCKET PEN. * POCKET SHEAR VANE POCKET SHEAR VANE SO kPa 100 kPa 150 kPa 200 kPa WATER CONTENT & ATTERBERG LIMITS POCKET (N-value) BLOWS/0.3m Water Content (S) and Blow Count 10 20 30 40 50 60 70 80												
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+			DATUM:															
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		 Borehole stopped at a depth of 1.2 																
		m.			L_													
-							Drilling Co	ntract	or: M	aple L	.eaf C	rilling	Ltd.			Lo	ogge	d By: LB
		ymbol R asphalt	Serencies As Serencies Serence ved By:															
	101	IITE DRILL CUTTINGS																

PR	IENT: OJEC	Stantec City of Winnipeg T: 2023 Local Street Renew ON: Garden Grove Dr, Winni						OLE RE		_						ВН	ELEV	'ATIC	ON:	<u>12:</u> N	H23- 33162 N/A
		ORED: January 10, 2023								_ W.A	ATER I	EVE	L: <u>N</u>	/ A							
DEPTH (m)	-	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE		_	-VALUE RQD %	OTHER TE REMAR	STS / CS	LAB PO	ORAT CKET I	ORY PEN.) kPa 	TEST	▲ ★ 100	F P kPa	IELD VA OCKET 150	ANE T SHEA kPa	AR V	200 k	Pa	BACKFILL/ MONITOR WELL/ PIEZOMETER
			-		z	RECO	2 5			SPT	(N-val	Je) BL				d Blow Cou	at	•	•	•	
0 -		ASPHALT: 140 mm	SAMPLES SAMPLES UNDRAINED SHEAR STRENGTH, Cu (kPa) LABORATORY TEST A FIELD VANE TEST POCKET PEN. * POCKET SHEAR VANE DOWN NO NO NO NO NO NO NO NO NO NO NO NO NO																		
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-		Brown, moist, lean CLAY (CL)		X AS									 Ο:								
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_				V AC				Sieve/Hydro at 1).8 m												
								3 N 1% 10% 619	28%												
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-				AS								о В									
		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.																			
J								Drillin	a Cor	l:::::	or. w	anle	:: : : -	af Dr	illina	Itd.	Liii	: <u> </u>	100	age	 d By: Li
۵۵	(FILL :	symbol M asphalt	GR	OUT	·:_	100l	NCRE UGH							ات	19						ed By:

	IENT:	City of Winnipeg 2023 Local Street Renev	wals I	Prog		OLE RECO								:_12	H23- 33162' N/A
		ON: Garden Grove Dr, Winni		_			_								
DA	ATE BC	ORED: <u>January 10, 2023</u>					_ WA	TER L	EVEL:	N/A					
DEPIH (m)	ELEVATION (m)	SOIL DESCRIPTION	AS AS AS AS AS AS AS AS AS AS AS AS AS A		CKFILL/ ITOR WELL/ ZOMETER										
5	ELEV	(4005)													
o 🕇		ASPHALT: 135 mm													
-			REACH												
-		Granular FILL		X AS			:0:								
		Brown, moist, lean CLAY (CL)													
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		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.													
•							ntracto	or: M	aple L	eaf D	rilling	g Ltd.			
۸ (C)	KFILL S	symbol 📆 asphalt 📗	135 mm 10 20 30 40 50 60 70 80 131LL 131LL 13 AS 1 O . 14 AS 15 AS 16 O . 17 AS 18 AS 19 O . 18 AS 19 O . 19 AS 10 O . 10 AS 10 O . 10 AS 10 O . 11 AS 12 O . 13 AS 14 O . 15 AS 15 O . 16 O . 17 AS 18 O . 18 O	ed By:											

CLIE	NT:	1tec <u>City of Winnipeg</u> 2023 Local Street Rene	wals	Prog				OLE RECOF	_									BH2 12331 _N/A	1629
LOC	CATION: _	Channing St, Winnipeg,							_					D	ATU	M: _	N/A		
DATE	E BORED:	<u>January 10, 2023</u>																	_
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE		_	.VALUE RQD %	OTHER TESTS / REMARKS	PO	ORAT CKET F 50	ORY TE PEN. kPa	ST ★ 100	I I kPa	FIELD T POCK 1.5	VANI ET SH 50 kP	E TEST HEAR V	200 k	D D D D D D D D D D D D D D D D D D D	MONITOR WELL/ PIEZOMETER
					Z	S P	Żδ									•	•		`
\downarrow		September Sept																	
	ASPHA	SPHALT: 95 mm 10 20 30 40 50 60 0 80																	
-	Granu	lar FILL		V															
-	Brown	, moist, fat CLAY (CH)		AS AS							. O :								
-																			
			DATUM: NA WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH. CU. (IPPO) LASORATORY TEST A FIELD VANIE TEST POCKET FIRM. A FIELD VANIE TEST POCKET FIRM. A FIELD VANIE TEST POCKET FIRM. A FIELD VANIE TEST POCKET FIRM. A FIELD VANIE TEST POCKET FIRM. A FIELD VANIE TEST POCKET FIRM. A FIELD VANIE TEST POCKET FIRM. A FIELD VANIE TEST POCKET FIRM. A FIELD VANIE TEST POCKET FIRM. A FIELD VANIE TEST WATER CONTENT & ATTERBERG UMITS TO TO TO TO TO TO TO TO TO TO TO TO TO																
				V				Sieve/Hydro at 0.7 m											
				AS				G S M C 0% 7% 40% 53%			H : O :					: !			
				AS								0							
	• The s m. • No g	soil was frozen to a depth of 0.9 groundwater seepage or soil																	
	com	pletion of drilling.																	
L				Ц			I	Drilling Cor	ntract	or: M	aple I	_eaf D	rillinc	Ltd Ltd	:1:	:::1:	Loc	gaed By	 v: I R
	ill symbc	DL ASPHALT		OUT	[:·		√RF							,					

10		City of Winnipeg T: 2023 Local Street Renew ON: Channing St, Winnipeg,		Prog															LEVA	OITA	N:	N/A	
		ORED: <u>January 6, 2023 †</u>		nuar	y 11	, 20:	23			WA	TER	LE	VEI	_:_I	N/A			D/ (10					
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION	LOT		SAM	£		OTHER TESTS /			OR <i>A</i> CKET	TO PE	RY 1 N.		*		FIE	Cu (kPa	, NE TE SHEAI	IAV S		FILL/ R WELL/	METER
DEPTI	ELEVATI	(USCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (m	N-VALUE or RQD %	REMARKS			ER		NTE	OW:	& AT \$/0.3	m	ERG	150 k	w F		W _L	BACKFILL/ MONITOR WELL/	PIEZO/
0 +		ASPHALT: 80 mm	26.5							10)	20		30	lier Cor	40	50	low Count) 60	7	70	80		
ł		Granular FILL	77						:														
-				AS						Ċ													
=_		Brown, moist, fat CLAY (CH)																					
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1 -																							
				AS											О								
		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.																					_
		symbol M asphalt	GR			_	NCRETI	Drilling Cor Drilling Me							af [Drillin	g L	.td.				ged By: ewed By	

PR	IENT: OJEC	Stantec City of Winnipeg CT: 2023 Local Street Renewood ON: Benbow Rd, Winnipeg, MB		Prog				OLE RECOF	_						BH E	ELEVA	NOITA	: <u>123</u> : <u>N</u>	H23- 33162 N/A
DA	ATE BO	DRED: January 6, 2023 to	Ja	nuai			23		_	ATER L				TIL C	/I-D	\			
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	_	N-VALUE or RQD %	OTHER TESTS / REMARKS	PO WA	ORAINE ORATI CKET F 50 TER CO	ORY TEN. kPa ONTEN	1 1 1 & 7 WS/0	▲ ★ 00 kP¢	FIEL PO a BERG	LD VA CKET 150 LIMIT:	SHEAF kPa	200	kPa 	BACKFILL/ MONITOR WELL/ PIEZOMETER
0 -		ASPHALT: 80 mm	2						1	0 :	20	30	40	50			70 8	30	
-		Tan, moist, sandy SILT (ML)	3.7 2	X as															
-				V ^S						V									
-																			
-				X AS					0.										
-																			
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				X AS				Sieve/Hydro at 0.7 m G S M C 2% 76% 14% 8%	O	H									
-																			
1 -				X as					0										
-				X					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.																	
]								Drilling Cor	::::: ntract	or: M	:::: aple	l::: Leaf	Drilli	ii na L	td.		Lo) ::::: Dage o	By: LE
BACI	<fill :<="" td=""><td>Symbol Asphalt</td><td>GR</td><td>OUT</td><td></td><td>]C01</td><td>NCRE</td><td></td><td></td><td></td><td></td><td></td><td></td><td><u> </u></td><td></td><td></td><td></td><td></td><td>ed By:</td></fill>	Symbol Asphalt	GR	OUT]C01	NCRE							<u> </u>					ed By:

	IENT:	Stantec City of Winnipeg 2023 Local Street Renew	<u>vals</u>	<u>Prog</u>					_											. : <u>12</u>	331629	9
		ON: Benbow Rd, Winnipeg, M																				
DA	ATE BO	ORED: January 6, 2023 t	MATERIAL PROPERTY OF THE PROPE																			
(m)	(m) N		ĮŌ.		SAM				L	ABC	ORATO	ORY		•	F	FIELD	VAI	NE TE		• E •	IIL/ WELL/ ETER	
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	PROJECT NO.: 1233162 BH ELEVATION: N/A DATUM: N/A To January 11, 2023 WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (PPc) LABORATORY TEST A FIELD VANE IST POCKET SHEAR VANA WATER CONTENT & ATTERBERG UNITS M- W-	BACKF MONITOR PIEZOM																		
0 -		70	N.			~				10	2	0) ::::	70	80		ļ
		ASPHALT: 70 mm	3																			١
		Granular FILL	SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) WATER LEVEL: N/A SOIL DESCRIPTION (USCS) WATER CEVEL: N/A OTHER TESTS / REMARKS OTHER TESTS / REMARKS OTHER TESTS / REMARKS OTHER TESTS / REMARKS WATER CEVEL: N/A UNDRAINED SHEAR STRENGTH, CU kPa POCKET PEIN, * POCKET SHEAR VANE IS N/A WATER CENTERN * POCKET SHE																			
-		Brown, moist, silty CLAY (CL-ML)	SOIL DESCRIPTION (USCs) SOIL DESCRIPTION (USCs) ATTERMENT AND A SUPERATION (USCs) WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (RPa) LABORATORY TEST																			
			SOIL DESCRIPTION (USCS) WATER CEVELS: N/A WATER CEVELS: N/A WATER CEVELS WATER CEVELS WATER CEVELS WATER CEVELS SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) WATER CENTERS (USCS) SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) SOIL DESCRIPTION (USCS) WATER CEVELS SOIL DESCRIPTION (USCS)																			
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							## NOTHER TESTS / REMARKS OTHER TESTS / REMARKS OTHER TOTAL PROPERTY OF THE															
-				M																		ı
				Å AS							PROJECT NO.: 123314 BH ELEVATION: N/A DATUM: N/A ATER LEVEL: N/A PRAINED SHEAR STRENGTH, Cu (kPq) FOR ATORY TEST POCKET SHEAR VANE STRENGTH PEN. POCKET SHEAR VANE POCKET PEN. ATTERBERG LIMITS POCKET PEN. ATTERBERG LIMITS POCKET PEN. POCKET PEN. POCKET PEN. POCKET PEN. POCKET SHEAR VANE POCKET PEN. POCKET PEN. POCKET PEN. POCKET SHEAR VANE POCKET PEN. POCKET PE		ı									
_																	PROJECT NO.: 123 BH ELEVATION: _N DATUM: _N/A Cu (kPa) IELD VANE TEST OCKET SHEAR VANE		ı			
			PROJECT NO.: _123316298 BH ELEVATION: _N/A DATUM: _N/A SAMPLES SAMPLES OTHER TESTS / REMARKS																			
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						MATER LEVEL; N/A WATER LEVEL; N/A UNDRAINED SHEAR STRENGTH, Cu (RPa) LABORATORY TEST A FIELD VANE TEST POCKET PEN. *POCKET SHEAR VANE WATER CONTENT & ATTERBERG LIMITS *POCKET SHEAR VANE SPT (N-value) BLOWS/0.3m Wother Content PER and silve Clears 10 20 30 40 50 60 70 80 Q Q Q Q Q Q Q Q Q Q Q Q Q																
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		The soil was frozen to a depth of 0.9 m.																				۱
_		No groundwater seepage or soil sloughing was observed upon																				ļ
		completion of drilling. • Borehole stopped at a depth of 1.2																				۱
		m.																				۱
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٩C	<fill :<="" td=""><td>symbol Asphalt</td><td>GR</td><td>OUT</td><td>·~</td><td>CON</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></td><td></td><td>ved By:</td><td>_</td></fill>	symbol Asphalt	GR	OUT	·~	CON	NCRET								· · · · ·						ved By:	_
_	ENTO		SA		<u>∵∠</u>	SLOI	IGH	Completio											_	age		-

PR	IENT: OJEC	City of Winnipeg 2023 Local Street Renew		Prog				OLE RECOI	_								вн Е	LEVA	OITA). : <u>12</u> √: _	331629 N/A				
		ON: <u>Charter Dr, Winnipeg, M</u> DRED: <u>January 6, 2023</u> t		nuar	v 11	20	23		_	WA	TFR	ΙFV	/FΙ:	N/	Δ		DATU	JM:	_N	/A					
	(12.00				SAM				_							TH, C	iu (kPc	a)							
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	1	N-VALUE or RQD %	OTHER TESTS / REMARKS		LABORATORY TEST FIE						PO a ERG		SHEAI Pa	♦ NE □ 0 kPa + W _L	BACKFILL/ MONITOR WELL/ PIEZOMETER					
0 -		ASPHALT: 120 mm	24							10) :::	20		Water C BO	ontent (%	50	ow Count) 7	70 : : :	80					
-		Brown, moist, sandy lean CLAY (CL)																							
_		Brown, most, sandy lean CEAT (CE)		X AS););););													
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				AS AS								0													
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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.																							
					<u> </u>	1		Drilling Cor							Drillir	ng L	td.		Logged By: LB						
_			∷ GR ∵ SAI		<i>₽</i>	1001 _[NCRE UGH	TE Drilling Me						4					_	Reviewed By: (

PR LC	IENT: OJEC CATI	City of Winnipeg T:2023 Local Street Renew ON:Charter Dr, Winnipeg, M	В		ram				_ _ _								ВН	ELE	VA	101).:_ 12 √: _	3H23 233162 N/A				
DA	ATE BO	DRED:							_																	
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	1	N-VALUE or RQD %	OTHER TESTS / REMARKS	50 kPa 100 kPa					ELD VA OCKET 150	ELD VANE TEST OCKET SHEAR VANE 150 kPa 200 kPa				BACKFILL/ MONITOR WELL/ PIEZOMETER							
						REC			SPT (N-value) BLOWS/0.3m Water Content (%) and f																	
0 -		ASPHALT: 135 mm								10		20	3	0	40	5	60 <i>e</i>	60	70		80					
		Backfilling sand FILL		X AS							0:															
-				V																						
1		End of Borehole		AS						Ö																
-		The soil was frozen to a depth of 0.6 m. No groundwater seepage or soil sloughing was observed upon completion of drilling. Borehole stopped at 0.6 m at two seperate locations due to potential																								
-		seperate locations due to potentia underground utilities nearby.																								
1 -																										
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					-	٦.				tractor: Maple Leaf Drilling Ltd.												ed By: LI				
		SYMBOL ASPHALT NITE DRILL CUTTINGS [GR SAI	OUT	<i>.</i> ∠		NCRET UGH	E Drilling Me Completio		hod: 125 mm SSA										_	Reviewed By: Page 1 of 1					

	LIENT:	Stantec City of Winnipeg 2023 Local Street Renew	/als	Prog				OLE RECO	_											:_12	8 H23- 331629 N/A	9
		ION: Charter Dr, Winnipeg, M		ilog					_												N/A	
		ORED: <u>January 10, 2023</u>		anuc	ary 1	1, 20	023		W.	ATER	LE\	/EL:	N/A	١								
					SAM	PLES			UNI	DRAIN	ED :	SHEA	R STR	ENGT	H, C	u (kF	Pa)					Γ
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	TYPE	NUMBER	/ERY (mm) TCR %	N-VALUE or RQD %	OTHER TESTS / REMARKS	PC	BORAT OCKET 5 ATER C	PEN 0 kF	I. Pa	10	r 0 kPa	PO	150	kPa	AR \	√ANE	kPa 	BACKFILL/ MONITOR WELL/ PIEZOMETER	
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		Granular FILL	- ////																			l
		Brown, moist, sandy lean CLAY (CL)		X AS																		l
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		End of Borehole • The soil was frozen to a depth of 0.9																				١
		m. • No groundwater seepage or soil																				١
-		sloughing was observed upon completion of drilling.																				ŀ
		Borehole stopped at a depth of 1.2 m.																				١
_																						l
								Drilling Co	ntrac	or: N	1ap	ole L	eaf [Drillin	ıg Li	td.			Lo	ogge	d By: LB	3
_			GR		·D]CO1	NCRET	Drilling Me	thod:	125 ı	mn	n SS/	4						Re	eviev	ved By:	(
_	ENTO		SAI		$\overline{\otimes}$	SLOI	IGH	Completic	n Do	ath:	1 0	m									1 of 1	_

APPENDIX D

Core Photographs





Figure 1 – Core No. 32 (Bunting St)



Figure 3 – Core No. 34 (Bunting St)



Figure 2 – Core No. 33 (Bunting St)



Figure 4 – Core No. 35 (Bunting St)







Figure 7 – Core No. 38 (Alwood Cr)



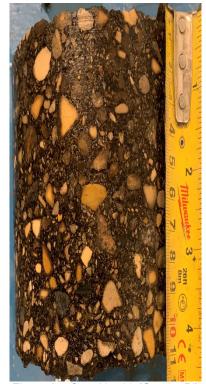


Figure 8 – Core No. 39 (Gaynor PI)





Figure 9 – Core 40 (Groverdale Ave)



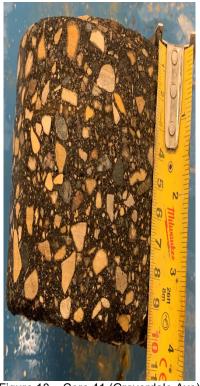


Figure 10 – Core 41 (Groverdale Ave)



Figure 12 – Core 43 (Garden Grove Dr)





Figure 13 – Core 44 (Channing St)



Figure 15 – Core 46 (Benbow Rd)





Figure 16 – Core 47 (Benbow Rd)







Figure 19 – Core 50 (Charter Dr)



Figure 18 – Core 49 (Charter Dr)

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: BH23-37, 2.7' (Alwood Cr)

LIQUID LIMIT

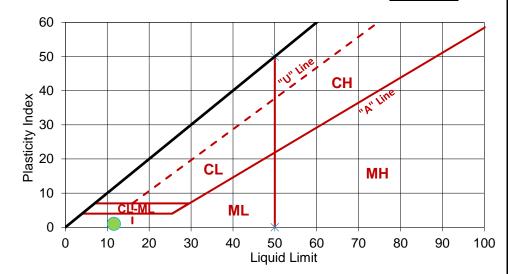
TRIAL BLOWS MC (%) Corr. MC (%)

LIQUID LIMIT					
1	2				
21	20				
12	12				
12	12				

	PLASTI	C LIMIT
TRIAL	1	2
MC (%)	11	11

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

12 11 1 3.8



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 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.25 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Donald Eliazar

SAMPLE ID: BH23-39, 2.7' (Gaynor PI)

____LIQUID LIMIT

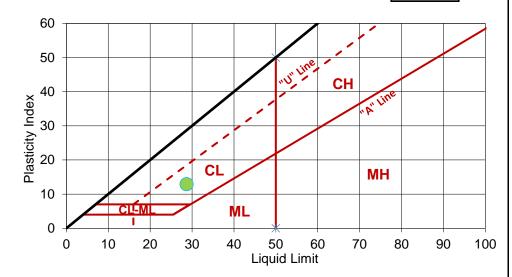
TRIAL BLOWS MC (%) Corr. MC (%)

LIQUID LIMIT				
1	2			
25	27			
29	29			
29	29			

	PLASTI	C LIMIT
TRIAL	1	2
MC (%)	16	16

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

29 16 13 16.6



COMMENTS:

REPORT DATE 2023.Jan.30

REVIEWED BY G

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 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. 3

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: BH23-40, 2.6' (Groverdale Ave)

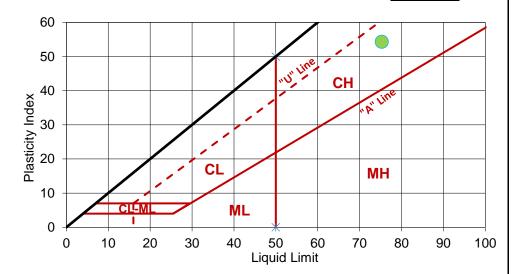
LIQUID LIMIT

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

EIQOID ZIIIIII					
1	2				
26	27				
75	75				
75	76				

	PLASTI	C LIMIT
TRIAL	1	2
MC (%)	21	21

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



COMMENTS:

REPORT DATE 2023.Jan.30

REVIEWED BY G

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 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. 4

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: BH23-42, 2.8' (Garden Grove Dr)

LIQUID LIMIT

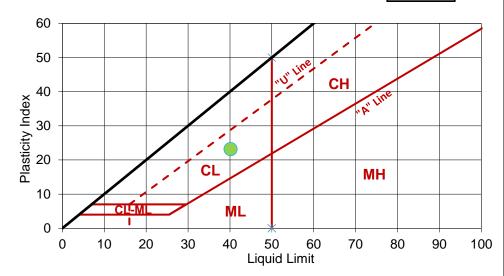
TRIAL
BLOWS
MC (%)
Corr. MC (%)

EIGOID LIMIT					
1	2				
25	26				
40	40				
40	40				

	PLASTI	C LIMIT
TRIAL	1	2
MC (%)	17	17

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

	40
	17
Pl	23
	24.5



COMMENTS:

REPORT DATE 2023.Jan.30

REVIEWED BY G

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 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. 5

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: BH23-44, 2.6' (Channing St)

LIQUID LIMIT

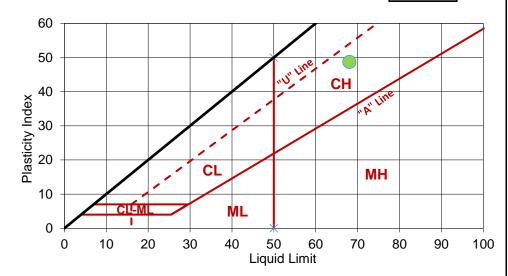
TRIAL
BLOWS
MC (%)
Corr. MC (%)

1	2				
26	27				
67	68				
68	68				

	PLASTIC LIMIT				
TRIAL	1	2			
MC (%)	19	19			

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

68 19 49 24.6



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. 6

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: BH23-46, 2.6' (Benbow Rd)

LIQUID LIMIT

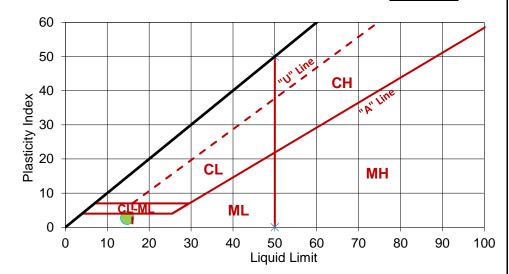
TRIAL BLOWS MC (%) Corr. MC (%)

LIQUID LIIVII I		
1	2	
29	29	
14	15	
15	15	

	PLASTIC LIMIT		
TRIAL	1	2	
MC (%)	12	12	

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

15 12 , PI 3 4.9



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 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. 7

DATE SAMPLED: 2023.Jan.17 DATE TESTED: 2023.Jan.27 DATE RECEIVED: 2023.Jan.17 SAMPLED BY:

Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. **TESTED BY:** Larry Presado

SAMPLE ID: BH23-48, 2.7' (Charter Dr)

LIQUID LIMIT

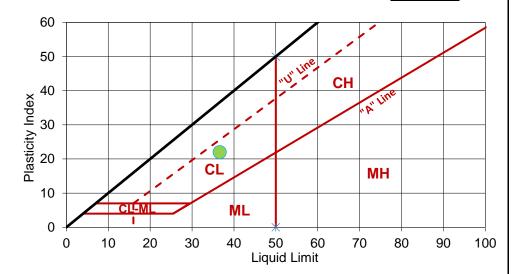
TRIAL BLOWS MC (%) Corr. MC (%)

1	2	
23	24	
37	37	
37	37	

	PLASTIC LIMIT		
TRIAL	1	2	
MC (%)	15	15	

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

37 15 22 18.8



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

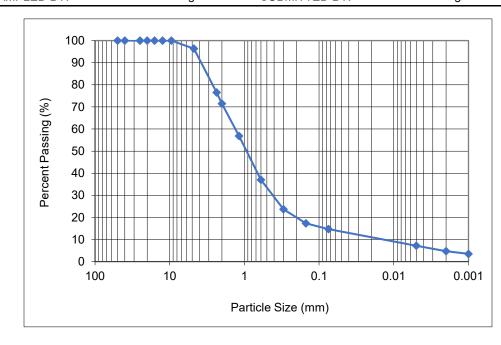
Winnipeg, Manitoba

R3E 3P1

123316298 PROJECT NO.

1 ATTN: Erik Hansen REPORT NO.

DATE SAMPLED: 2023.Jan.17 DATE RECEIVED 2023.Jan.17 DATE TESTED: 2023.Jan.20 Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. Donald Eliazar SAMPLED BY: TESTED BY:



Gravel		Sand		Silt	Clay	Colloids
Glavei	Coarse	Medium	Fine	5111	Clay	Colloids
3.6	24.9	34.5	22.3	10.0	4.7	3.5

ī
% PASSING
PASSING
100.0
100.0
100.0
100.0
100.0
100.0
100.0
96.4
76.5
71.5
56.8
37.0
23.7
17.3
14.7
7.2
4.7
3.5

COMMENTS:

Material tested was identified as BH23-37, 2.7' (Alwood Cr).

REPORT DATE 2023.Jan.30 REVIEWED BY

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 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

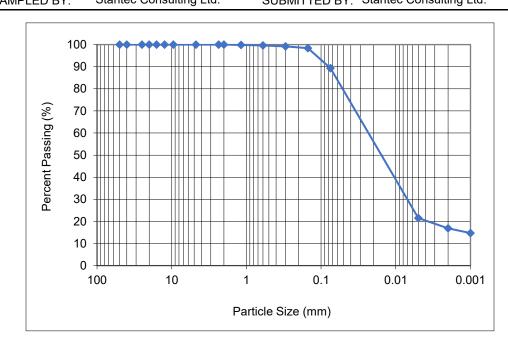
PROJECT NO.

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	
Graver	Coarse	Medium	Fine	SIIL	Clay	Colloids
0.0	0.0	0.4	10.2	72.5	16.9	14.7

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	99.2
0.150	98.4
0.075	89.4
0.005	21.5
0.002	16.9
0.001	14.7

COMMENTS:

Material tested was identified as BH23-39, 2.7' (Gaynor PI).

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

PROJECT NO.

123316298

ATTN: Erik Hansen

3 REPORT NO.

DATE SAMPLED: 2023.Jan.17

DATE RECEIVED 2023.Jan.17

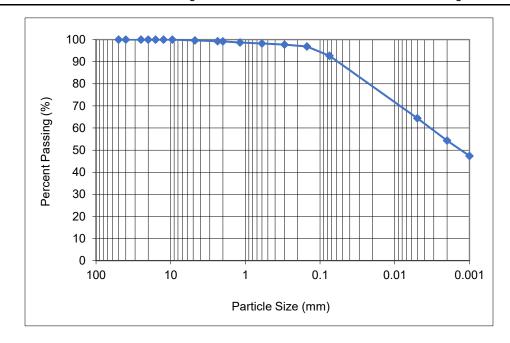
DATE TESTED: 2023.Jan.20

SAMPLED BY:

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Donald Eliazar TESTED BY:



Gravel	Sand		Silt Clay Co		Silt Clay Col	Qil t	Clay Collei	Colloids
Glavei	Coarse	Medium	Fine	SIIL	Clay	Colloids		
0.4	0.4	1.0	5.6	38.3	54.3	47.4		

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	99.6
2.36	99.3
2.00	99.2
1.18	98.7
0.600	98.3
0.300	97.7
0.150	96.9
0.075	92.7
0.005	64.5
0.002	54.3
0.001	47.4

COMMENTS:

Material tested was identified as BH23-40, 2.6' (Groverdale Ave).

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

PROJECT NO.

REPORT NO.

123316298

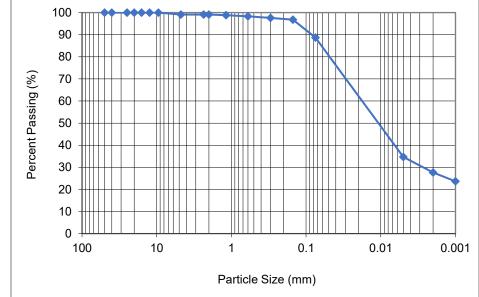
ATTN: Erik Hansen

DATE SAMPLED: 2023.Jan.17 DATE RECEIVED 2023.Jan.17

DATE TESTED: 2023.Jan.20

Donald Eliazar





Gravel	Sand		Silt Clay Co		Colloids	
Glavei	Coarse	Medium	Fine	SIIL	Clay	Colloids
0.9	0.0	0.8	9.6	61.0	27.7	23.7

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	99.1
2.36	99.1
2.00	99.1
1.18	98.8
0.600	98.3
0.300	97.6
0.150	96.8
0.075	88.7
0.005	34.7
0.002	27.7
0.001	23.7

COMMENTS:

Material tested was identified as BH23-42, 2.8' (Garden Grove Dr).

REPORT DATE 2023.Jan.30 REVIEWED BY

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 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

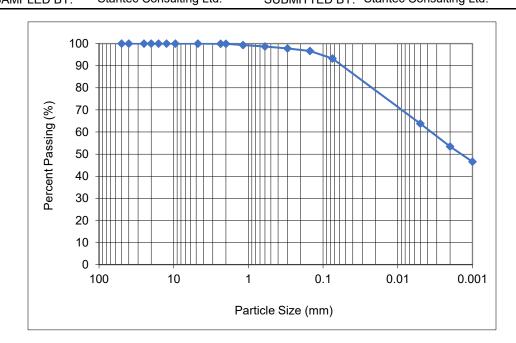
PROJECT NO.

123316298

ATTN: Erik Hansen

REPORT NO. 5

DATE SAMPLED: 2023.Jan.17 DATE RECEIVED 2023.Jan.17 DATE TESTED: 2023.Jan.20 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Donald Eliazar



Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	SIIL	Clay	Colloids
0.0	0.1	1.2	5.4	39.9	53.4	46.6

% PASSING
100.0
100.0
100.0
100.0
100.0
100.0
100.0
100.0
99.9
99.9
99.3
98.7
97.8
96.7
93.3
63.8
53.4
46.6

COMMENTS:

Material tested was identified as BH23-44, 2.6' (Channing St).

REPORT DATE 2023.Jan.30

REVIEWED BY

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 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. 6

DATE SAMPLED: 2023.Jan.17

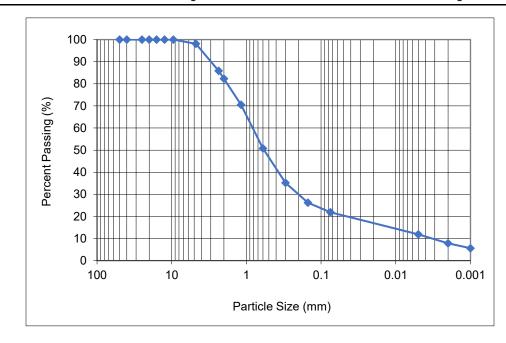
DATE RECEIVED 2023.Jan.17

DATE TESTED: 2023.Jan.20

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Donald Eliazar



Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	SIIL	Clay	Colloids
1.9	15.7	31.6	28.9	14.1	7.8	5.6

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	98.1
2.36	85.8
2.00	82.4
1.18	70.5
0.600	50.7
0.300	35.2
0.150	26.2
0.075	21.9
0.005	11.9
0.002	7.8
0.001	5.6

COMMENTS:

Material tested was identified as BH23-46, 2.6' (Benbow Rd).

REPORT DATE 2023.Jan.30

REVIEWED BY

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 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

123316298

104 - 1155 Pacific Avenue

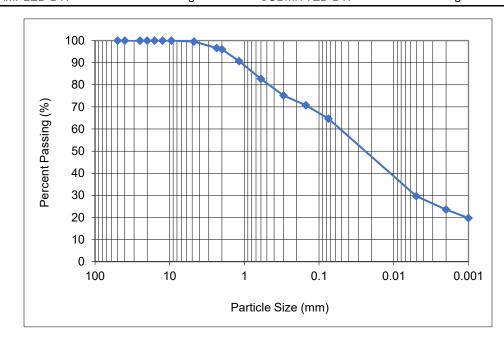
Winnipeg, Manitoba

R3E 3P1

PROJECT NO.

7 ATTN: Erik Hansen REPORT NO.

DATE SAMPLED: 2023.Jan.17 DATE RECEIVED 2023.Jan.17 DATE TESTED: 2023.Jan.20 Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. Donald Eliazar SAMPLED BY: TESTED BY:



Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	SIIL	Clay	Colloids
0.5	3.5	13.4	18.0	41.0	23.6	19.7

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	99.5
2.36	96.7
2.00	96.1
1.18	90.7
0.600	82.7
0.300	75.1
0.150	70.7
0.075	64.6
0.005	29.6
0.002	23.6
0.001	19.7

COMMENTS:

Material tested was identified as BH23-48, 2.7' (Charter Dr).

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 Factor	Peak Load	Compressive Strength (MPa)	
No.	identification	(mm)	(mm)		ractor	(kN)	Measured	Corrected
1	BH-23-32	146	160	1.10	0.894	718.57	39.4	35.2
2	BH-23-34	146	168	1.15	0.906	1141.00	62.6	56.7