The City of Winnipeg

Appendix 'A'
Tender No. 1-2024

Template Version: eC2023 07 27 - Const Road Works

APPENDIX 'A' - GEOTECHNICAL REPORT

GEOTECHNICAL REPORTS FOR:

St. Johns Avenue/Anderson Avenue Alley from Main Street to Fowler Street – Asphalt Pavement Reconstruction

Charles Street from Church Avenue to Machray Avenue – Asphalt Pavement Reconstruction Church Avenue from Charles Street to Main Street – Asphalt Pavement Reconstruction Luxton Avenue from St. Cross Street to End – Asphalt Pavement Reconstruction Machray Avenue from Aikins Street to Main Street – Asphalt Pavement Reconstruction

PAVEMENT CORES FOR:

Cochrane Street from End to Lansdowne Avenue – Concrete Pavement Rehabilitation Lansdowne Avenue from Main Street to St. Cross Street – Concrete Pavement Rehabilitation McAdam Avenue from End to Scotia Street – Concrete Pavement Rehabilitation

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

February 26, 2024

Project/File: 123316853

Richard Weibel City of Winnipeg 106, 1155 Pacific Avenue Winnipeg, MB R3E 3P1

Good day Richard,

Reference: 2024 Local Street Renewals Program (Contract 2)

Stantec Consulting Ltd. (Stantec) was retained to undertake a factual geotechnical investigation for the 2024 Local Street Renewals Program (Contract 1) in Winnipeg, Manitoba. 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 December 1, 2023, to January 24, 2024. Pavement coring was performed by our geotechnical field personnel, and drilling services were provided by Paddock Drilling under the supervision of our personnel. The borehole locations are shown on the attached Borehole Location Plan provided in **Appendix B**. When subsurface drilling was required, the pavement cores were sampled with a 150 mm bit and boreholes were drilled with 125 mm solid stem augers. Geotechnical drilling boreholes were terminated at depths of 2.0 m below the pavement, with the exception of boreholes BH-21, BH-22, and BH-23, which were terminated at a depth of 1.5 m due to limitations by underground utilities. Soil samples were obtained directly from the auger flights at depths of 0.6 m, 0.9 m, 1.2 m, 1.6 m, and 2.0 m from the bottom of the existing pavement. Upon completion of drilling, the testholes were examined for evidence of sloughing and groundwater seepage. The borehole records are provided in **Appendix C**. The soil classification used in the borehole records is as per ASTM D2487 – *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)*. Core photographs are provided in **Appendix D**.

Reference: 2024 Local Street Renewals Program (Contract 2)

EXISTING PAVEMENT THICKNESS

The existing pavement thickness is provided in the following table:

Table 1 – Existing Pavement Thickness

Street	Core ID	Asphalt Thickness (mm)	Concrete Thickness (mm)	Total Pavement Thickness (mm)
Machray Ave	BH-16	80	0	80
Machray Ave	BH-17	120	0	120
Machray Ave	BH-18	90	0	90
Machray Ave	BH-19	80	0	80
Charles St	BH-20	20	180	200
Charles St	BH-21	20	180	200
Charles St	BH-22	15	180	195
Church Ave	BH-23	90	0	90
Church Ave	BH-24	30	0	30
Lansdowne Ave	BH-25	0	175	175
Lansdowne Ave	BH-26	0	200	200
Lansdowne Ave	BH-27	0	160	160
Lansdowne Ave	BH-28	0	150	150
Cochrane St	BH-29	0	140	140
Cochrane St	BH-30	0	180	180
Cochrane St	BH-31	0	160	160
McAdam Ave	BH-32	0	180	180
McAdam Ave	BH-33	0	165	165
McAdam Ave	BH-34	0	165	165
McAdam Ave	BH-35	0	160	160
Luxton Ave	BH-36	100	125	225
Luxton Ave	BH-37	75	150	225
Luxton Ave	BH-38	50	150	200
Luxton Ave	BH-39	25	*see note below	*see note below
Luxton Ave	BH-40	25	150	175
Backlane	BH-41	70	100	170
Backlane	BH-42	35	0	35
Backlane	BH-43	160	0	160

^{*} Note – The pavement at borehole BH-39 consisted of 25 mm of asphalt, underlain by 50 mm of granular fill, underlain by 125 mm of concrete.

February 26, 2024 Richard Weibel Page 3 of 3

Reference: 2024 Local Street Renewals Program (Contract 2)

LABORATORY TESTING

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
- ASTM D698 Laboratory Compaction Characteristics of Soil Using Standard Effort
- ASTM D1883 California Bearing Ratio (CBR) of Laboratory-Compacted Soils
- CSA A23.2-14C Obtaining and testing drilled cores for compressive strength testing

The CBR tests were performed at 95% maximum dry density under soaked conditions. Prior to testing the concrete core samples for compressive strength, the cores were conditioned in water at room temperature for 48 hours. The moisture content results are shown on the borehole records, and the laboratory test reports are provided in **Appendix E**.

CLOSURE

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

Regards,

STANTEC CONSULTING LTD.

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Geotechnical Engineer, Materials Testing Services

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Jason Thompson C.E.T.

Manager, Materials Testing Services

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Attachment: Appendix A – Statement of General Conditions

Appendix B – Borehole Location Plan Appendix C – Borehole Records Appendix D – Core Photographs Appendix E – Laboratory Test Reports

- Atterberg Limits Test Reports
- Particle-Size Analysis Reports
- Standard Proctor Test Reports
- CBR Test Reports
- Concrete Core Compressive Strength Test Results

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.

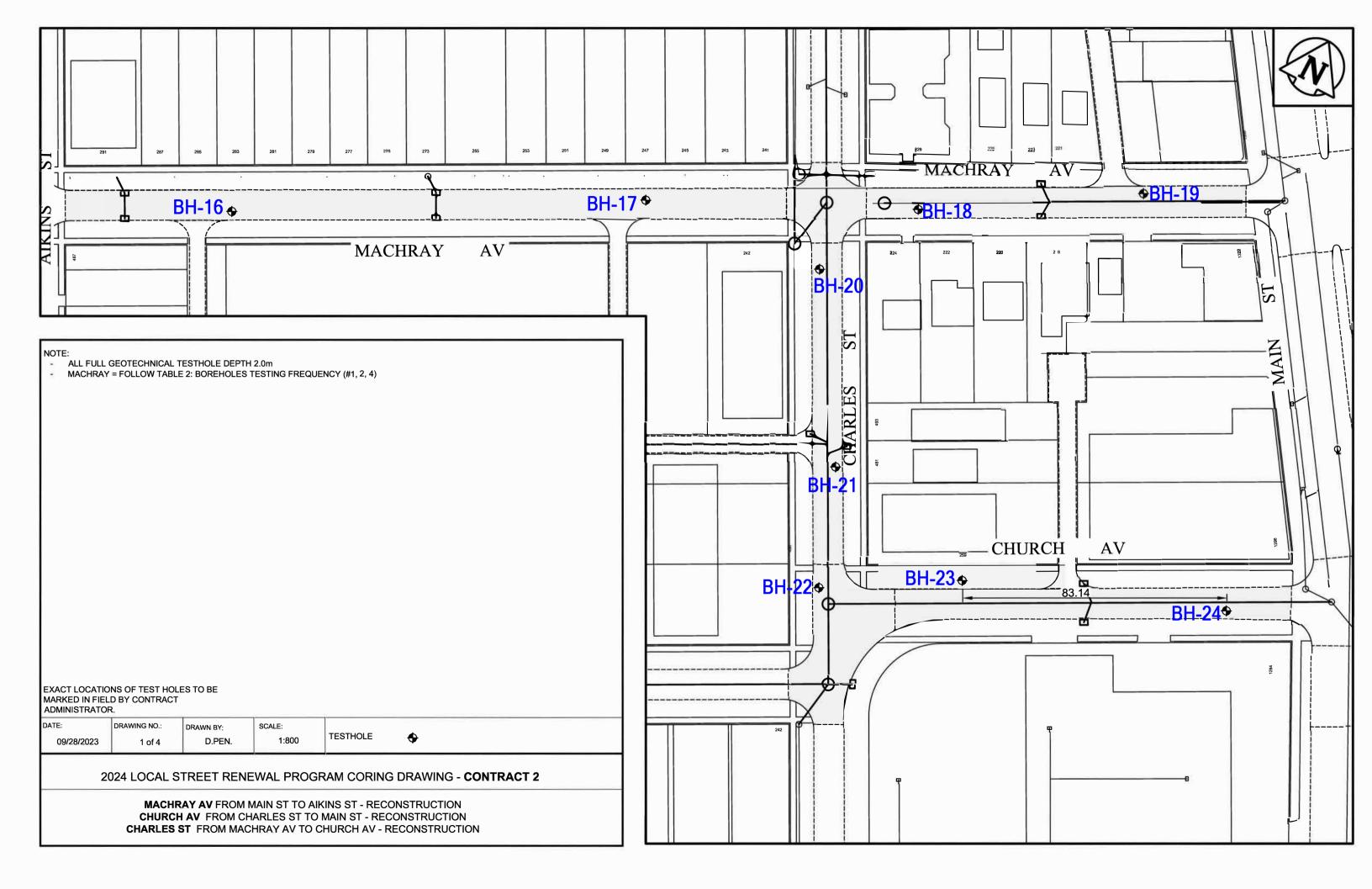
VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments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

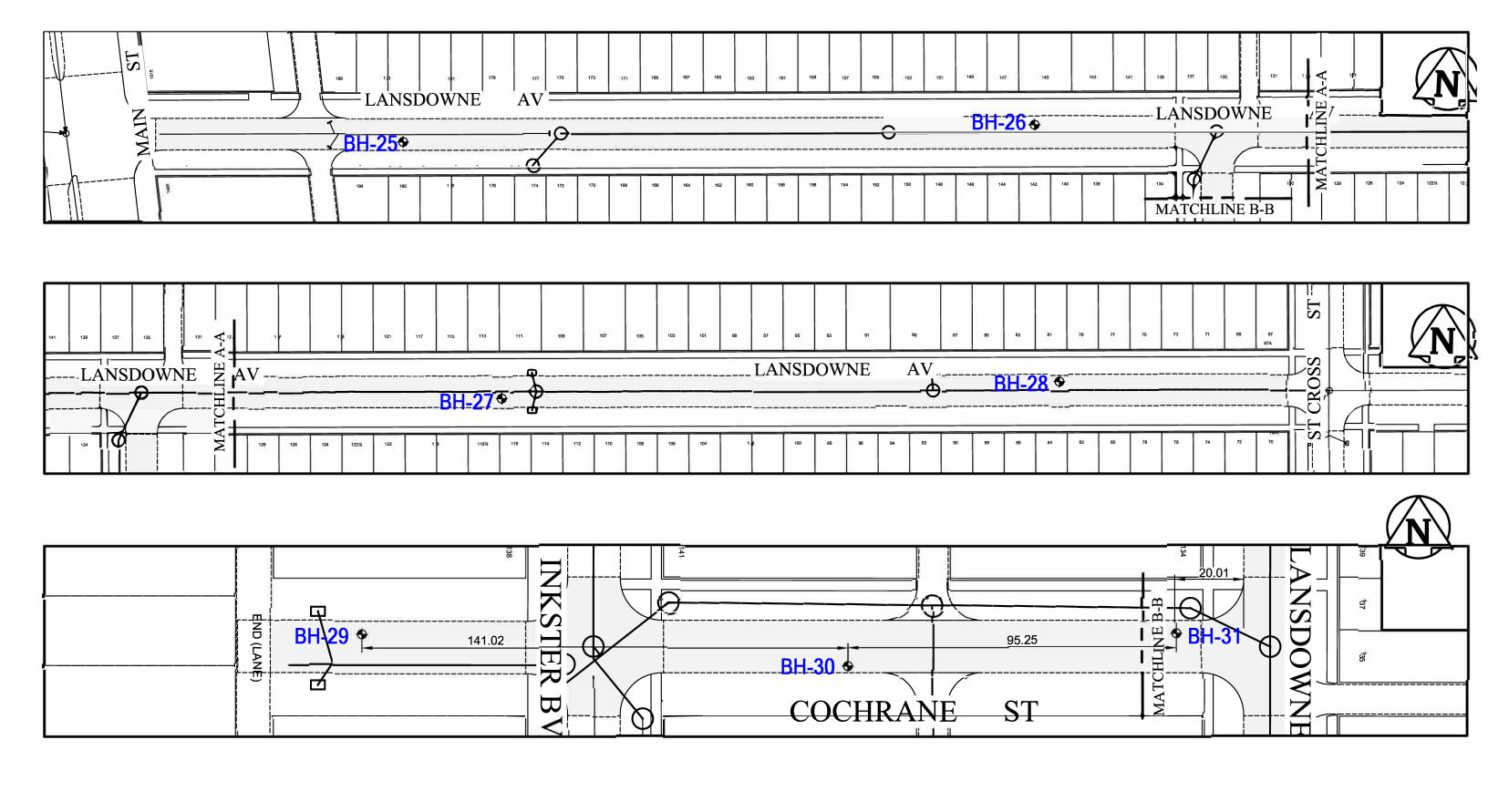
PLANNING, DESIGN, OR CONSTRUCTION: Development or design plans and specifications should be reviewed by Stantec, sufficiently ahead of initiating the next project stage (property acquisition, tender, construction, etc.), to confirm that this report completely addresses the elaborated project specifics 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.



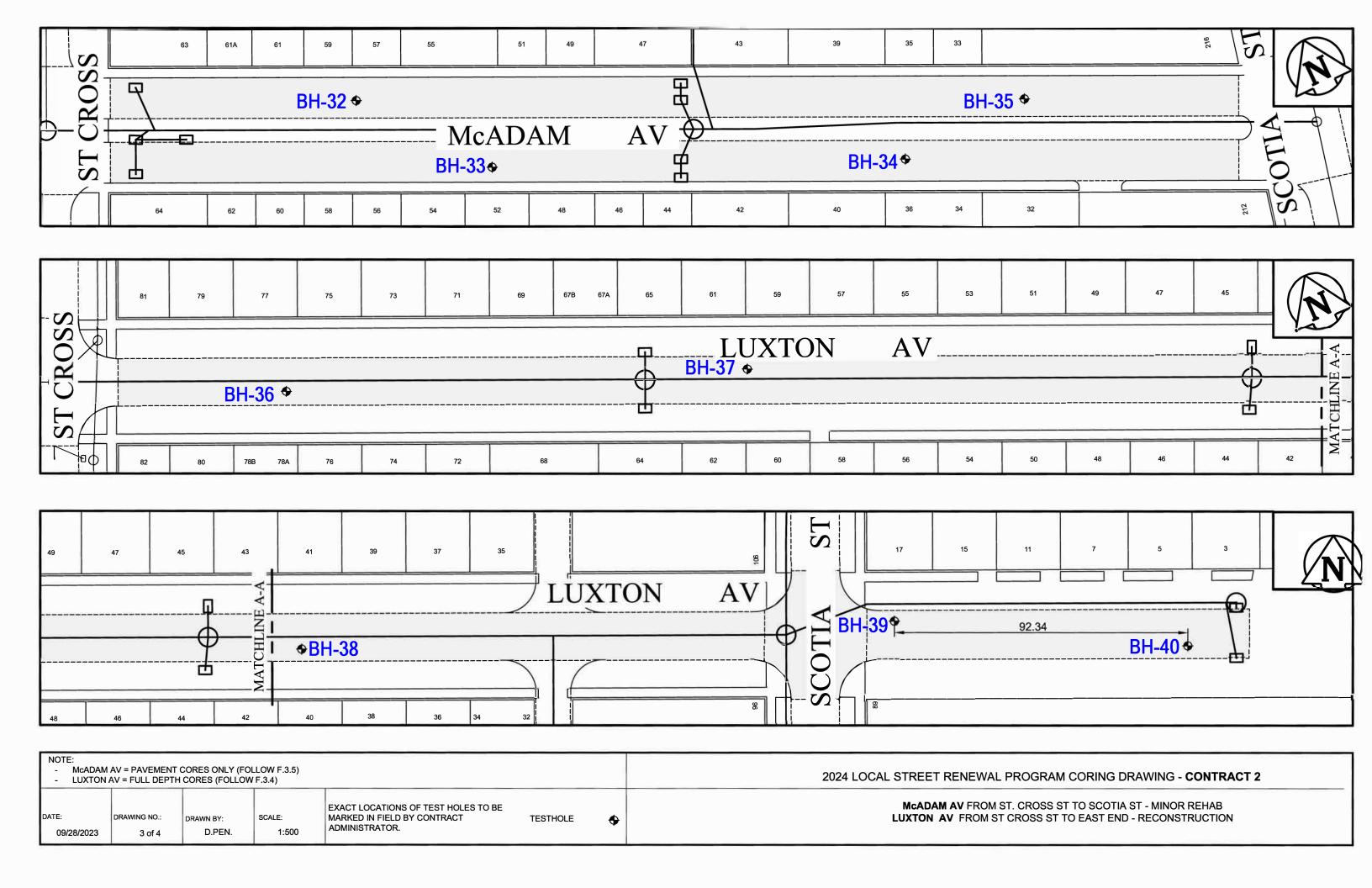
APPENDIX B

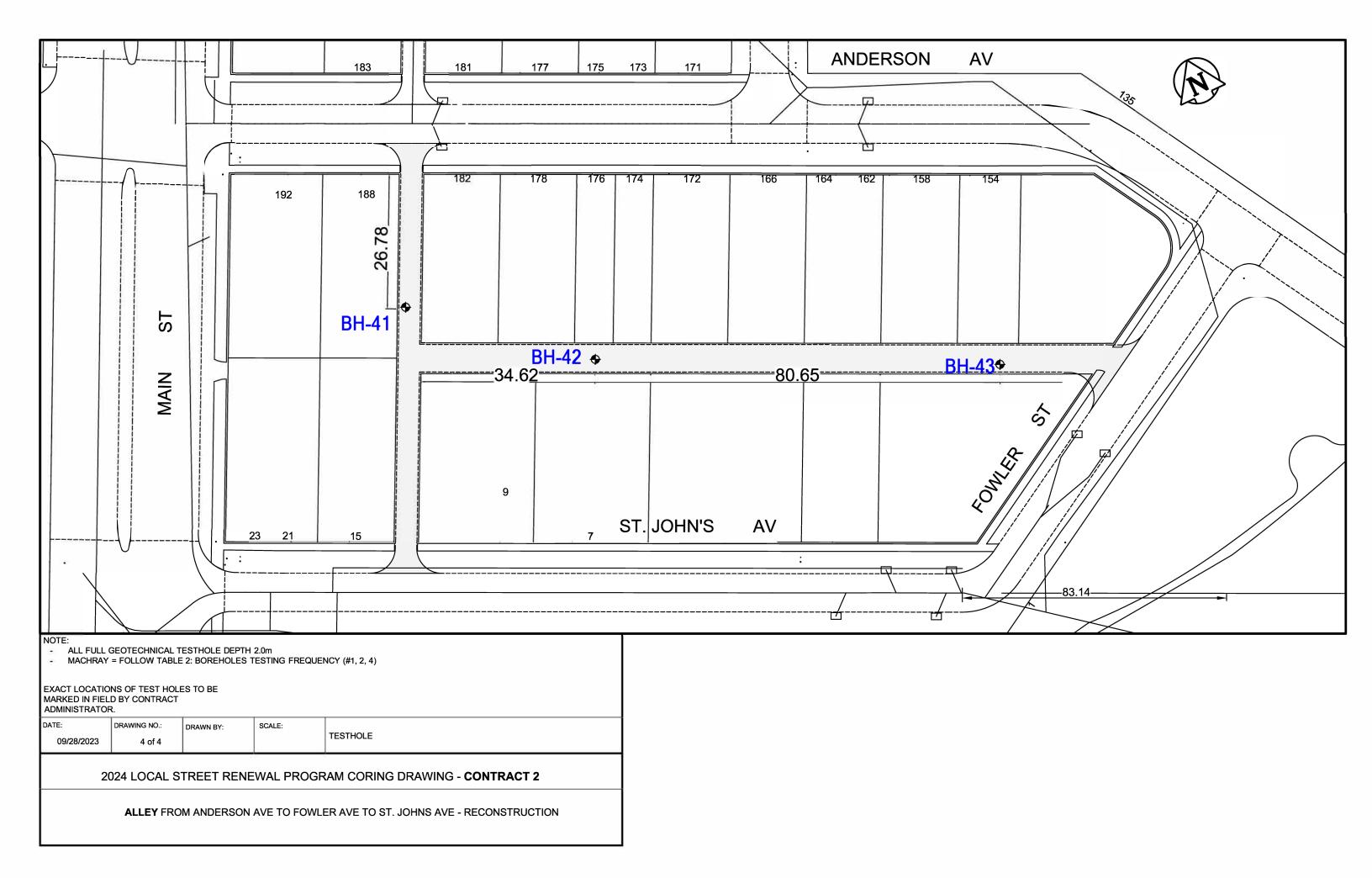
Borehole Location Plan





	VNE - 4 PAVEMEN ⁻ F.3.5 REHABILITAT		MIN 2 MID SLAB FOR LANSDOWNE	& COCHRANE ST			2024 LOCAL STREET RENEWAL PROGRAM CORING DRAWING - CONTRACT 2
DATE: 09/28/2023	DRAWING NO.: 2 of 4	DRAWN BY:		EXACT LOCATIONS OF TEST HOLES TO BE MARKED IN FIELD BY CONTRACT ADMINISTRATOR.	TESTHOLE	•	LANSDOWNE AV FROM MAIN ST TO ST CROSS ST - MINOR REHAB COCHRANE ST FROM LANSDOWNE AV TO SOUTH END - MAJOR REHAB





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.



















Bedrock





Boulders Cobbles Gravel

Clay

Concrete

Metamorphic Bedrock

Sedimentary Bedrock

SAMPLE TYPE

SS	Split spoon sample (obtained by performing the Standard Penetration Test)
ST	Shelby tube or thin wall tube
DΡ	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 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
,	Falling head permeability test using casing
	Falling head permeability test using well point or piezometer



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- - - - 2 - - -		Borehole surface backfilled as per Ci	gs and be	entonit	e chip	s.	ompetor of di	illiii y.								
-		Borehole surface backfilled as per Ci	gs and be	entonit	e chip	s.										
-		Borehole surface backfilled as per Ci	gs and be	entonit	e chip	s.										
2		• Borehole surface backfilled as per Ci	gs and be	entonit	e chip Street	es. t Cuts M	Drilling Con	ntractor:	: Padd		illing Ltd	d.			ogged B	

	IENIT	Stantec City of Winnipeg						OLE RECO	RD	PROJECT NO.: _12	BH-2
		CT: 2024 Local Street Renev							_	BH ELEVATION:	
		ON: Charles Street							_	DATUM: N/A	
		ORED: January 24 2024							Water Level: N/A		
					SAME	PLES			UNDRAINED SHEAR STRENGTH	I, Cu (kPa)	
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	/ERY (mm) TCR %	N-VALUE or RQD %	OTHER TESTS / REMARKS	▲ LABORATORY TEST ★ POCKET PENETROMETER 50 kPa 100 kPa WATER CONTENT & ATTERBER	◆ FIELD VANE TEST □ POCKET SHEAR VANE 150 kPa 200 kPa	BACKFILL
	"				₹	RECO	Į p		■ SPT (N-value) BLOWS/0.3m Water Content (%) and	1 0 1	
0 -		ASPHALT								50 60 70 80 	
-		Stiff black fat CLAY (CH)									
-				X as					1 - 0		
1 -	-	- grey and firm below 0.9 m		X as				Sieve/Hydro at 0.8 m G S M C 0% 2% 37% 61%	<i></i>		
-		Soft tan lean CLAY (CL)							<i>J</i>		
-				AS					8		
-		End of Borehole Borehole terminated at a depth of 1.5 No groundwater seepage or soil slou Borehole backfilled with auger cuttin	ıdhina wa	s obsentonit	erved e chip Stree	durinç s. t Cuts	g or up Manu	oon completion of dr	illing.		- -
- 2 - -		Borehole backfilled with auger cuttin Borehole surface backfilled as per C	ity Or VVIII								-
- 2 - - - -		Borehole surface backfilled as per C	ity or will								-
		Borehole surface backfilled as per C	iy di vviii								-
-		Borehole surface backfilled as per C	iy di vviii								- - - - - - - - - - - -
		Borehole surface backfilled as per C	iy Oi vviii								-
2		Borehole surface backfilled as per C	iy Öi vviii								
		Borehole surface backfilled as per C	ity Or vviii						venter. Dedded Different		
3		Borehole surface backfilled as per C SYMBOL ASPHALT	gr			loce	I ICRE	Drilling Conf		Logged Reviewe	

PR	ENT:	Stantec City of Winnipeg CT: 2024 Local Street Renewa	als					OLE RECOI	- -					В	H ELE	EVATI	ON: _	BH 1233168 N/A
		ON: Church Avenue ORED: January 10 2024							– W <i>A</i>	TER	LEVE	L:	N/A		ATUN	1: <u> </u>	I/A	
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (mm) Fig. or TCR %	N-VALUE or RQD %	OTHER TESTS / REMARKS	UND LA * PO	RAINEI ABORA DCKET 50 TER CC	O SHE TORY PENE kPa H ONTEN Balue) B	AR ST TEST TROM 10 IT & AT LOWS	RENGT	FH, Cu (◆ FI □ PC 1: ERG LIN	ELD V/DCKET 50 kPa	W _P	EST R VANE 200 kPa W W ₁	ACKFIL
0		ASPHALT Stiff black fat CLAY (CH)		X as					1	0 2	0	30	40	50	60	70	80	
1 -		Soft tan lean CLAY (CL)		X AS				Sieve/Hydro at 0.7 m G S M C 0% 4% 40% 56%			0							
- - - - 2 -		Firm brown fat CLAY (CH)		AS AS									ď					
3 -		End of Borehole Borehole terminated at a depth of 2.40 No groundwater seepage or soil sloug Borehole backfilled with auger cuttings Borehole surface backfilled as per City	hing wa	entonit	e chip	s. `		•	illing.									
-								Drilling Cont			ddock						Logge	

PR	IENT:	City of Winnipeg CT: 2024 Local Street Renew	rals					OLE RECOI	- -								BH	l EL	_EV	ATIO	N:	BH 23316 N/A	85
		ON: Church Avenue ORED: January 10 2024							_ 	ΔΤ	FR I	I F\/	/⊏I ·	1	J/Δ		DA	ATU	M: .	N/A	٠		
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	ТҮРЕ	NUMBER	RECOVERY (mm) The part of TCR %	N-VALUE or RQD %	OTHER TESTS / REMARKS	UNI	ABC POC	DRAT KET 50	O SH TOR PEN kPa H	Y TE	STR ST COME 100	ETER D kPa	GTH,	⊐ PC	ELD V OCKE	VANI ET SI Pa			BACKFILL	
						REC			XS	SPT	(N-va	alue)	V		ntent (%		low Cou		-		20		
-		ASPHALT Stiff black fat CLAY (CH)								10			30		40	50	J	60		0 8	80		
-		Soft tan lean CLAY (CL)		AS AS				Sieve/Hydro at 0.6 m G S M C 0% 3% 30% 68%				3		0									
1 -				X AS								<i>y</i>		<i>,</i>									
-		Firm brown fat CLAY (CH)		X AS									\										**************************************
2 -				AS										80									
-		End of Borehole Borehole terminated at a depth of 2.4 No groundwater seepage or soil slou Borehole backfilled with auger cutting Borehole surface backfilled as per Ci	ghing wa	entonit	e chip	S.			illing.														
3 -																							
-																							
4]								Drilling Cont	racto	r.	Por	dda	ck 「) Prillir	ng I s	t-d				Τ,	ogga		ات
							NCRE	Dilling Con	ı acto	۱.	r a(uuU	UK L	71 (IIII)	ıy L	ıu.				ᆛᅩ		ed By:	

PR	OJEC	City of Winnipeg CT: 2024 Local Street Renewa ON: Luxton Avenue	als						_												N/A
DA	TE B	ORED: January 10 2024							_ v	/ATEI	R LE	/EL:	_N	/A							
DЕРТН (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (mm) TO SO OT TO SO	N-VALUE or RQD %	OTHER TESTS / REMARKS	▲ I	DRAIN ABOF POCKE	RATOF ET PE 50 kPa 	RY TE NETR I ENT 8	ST OME 100 ATT WS/0	TER kPa H	€RG	FIEL POC 150	D VAN KET S kPa	SHEA 2		Pa W _L	BACKFILL
0 -		ASPHALT		Т					:::	10	20	30	4	0	50	<u>6</u>		70 : :	80 ::	<u> </u>	
ł		CONCRETE																			
-		Stiff black fat CLAY (CH)	[D]																		
		our black fat offi (oil)																			
_				AS																	\ggg
-								Sieve/Hydro at 0.8 m G S M C 0% 1% 35% 63%					1						∵! :		\bowtie
1 –								0% 1% 35% 63%	1111				1					1::			XXX
-		- brown below 1.1 m		AS									,								\bowtie
-																					\ggg
-				X as																	
-				A AS								:: ,									\ggg
- - - 2 -		Soft tan lean CLAY (CL) - sandy		X AS						Ø.					: :						
]				AS																	
-												:0									
3 -		End of Borehole Borehole terminated at a depth of 2.40 No groundwater seepage or soil sloug Borehole backfilled with auger cuttings Borehole surface backfilled as per City	hing wa	entonit	e chip	S.			rilling.												
4								Drilling Con			Paddo										By: G

PF	IENT:	Stantec City of Winnipeg T:2024 Local Street Renew	vals					OLE RECOI	- -		PROJECT BH ELEVAT	TON:	N/A
		ON: Luxton Avenue									DATUM:	N/A	
DA	(IEB	ORED: <u>January 10 2024</u>				DI 50			_	R LEVEL: N/A NED SHEAR STRENGTH	I. Cu (kPa)		$\overline{}$
DЕРТН (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	(E	N-VALUE or RQD %	OTHER TESTS / REMARKS	▲ LABOR ★ POCK	RATORY TEST ET PENETROMETER 50 kPa 100 kPa CONTENT & ATTERBER N-value) BLOWS/0.3m	◆ FIELD VANE T □ POCKET SHE 150 kPa RG LIMITS WP		BACKFILL
0 -		ACDUALT				<u> </u>			10	20 30 40 5	Blow Count 60 70	80	
-		ASPHALT CONCRETE											
-		Stiff black fat CLAY (CH)											
-		Suil black fat CLAY (Ch)		V 46									
-				AS				Sieve/Hydro at 0.8 m		: : : : : : : : : : : : : : : : : : :			>>>>
1 -								Sieve/Hydro at 0.8 m G S M C 0% 1% 47% 51%					
' -				AS									>>>>
_													\ggg
-													XXX
-				X AS									\ggg
-		- brown and firm below 1.5 m											
- - 2 -				X AS						0			
_													
-				X as						6			
-													\ggg
3 -		End of Borehole • Borehole terminated at a depth of 2.4 • No groundwater seepage or soil slot. • Borehole backfilled with auger cuttin. • Borehole surface backfilled as per C	ighing wa	entonit	e chip	S.			illing.				
4 -								Drilling Cont	ractor: I	Paddock Drilling Ltd.			D
4 -								Drilling Con	iacioi.	raddock Dilling Ltd.		Logged	Бу. С

PR	IENT:	City of Winnipeg 2024 Local Street Renew	vals					OLE RECOI	<u> </u>								Bŀ	ΗE	LEV	ATIO	N:	BH 23316 N/A	85
		ON: Luxton Avenue ORED: January 10 2024							- \	, A TI	ED I	. \	/EI -		N/A		D/	ATL	JM:	N/ <i>I</i>	4		
		-	PLOT		SAMI				UNI	DRA .ABC	INEC ORAT KET	O SH TOR PEN	IEAF Y TE	STF ST ROME	RENG	STH,		ELD	VAN ET S	E TES	VANE		Ī
DЕРТН (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA	TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %	OTHER TESTS / REMARKS			R CO		ENT	& AT	0.3m	BER	G LIN				0 kPa ├── / W _L ├── ¶	BACKFILL	
0 -		ASPHALT								10	<u>2</u>	0	30 ::		40			60	:::	70	80 :::		
-		CONCRETE																					
-		Stiff black fat CLAY (CH)																					
-																							XX
-				X as				Sieve/Hydro at 0.8 m] 		F									\times
1 –		- brown and firm below 0.85 m		X as				Sieve/Hydro at 0.8 m G S M C 0% 1% 56% 43%															$\stackrel{\times}{\times}$
-);									$\stackrel{\times}{\times}$
-				X AS										9									$\stackrel{\times}{\times}$
-				X as																			$\stackrel{\times}{\times}$
2 -																							$\stackrel{\langle}{\otimes}$
-				AS									6										XXX
-																							
		End of Borehole Borehole terminated at a depth of 2.4 No groundwater seepage or soil slou Borehole backfilled with auger cutting Borehole surface backfilled as per Ci	ighing wa	entonit	e chip	S.			illing.														
3 -																							
-																							
-																							
₄								Drilling Cont	tractr	r:	Pad	ddo	ck Г	Orillir	ng L	td.				1	.oaaer	By: C	_l GF
								19 00110			. ~				<u> </u>						- 3300		

DAT	ELEVATION (m)	ON: Winnipeg, Manitoba ORED: January 10 2024 SOIL DESCRIPTION (MUSCS) ASPHALT FILL: granular CONCRETE Stiff black fat CLAY (CH)	STRATA PLOT	ТУРЕ		PLES							VEL	: <u> </u>	N/A		DΑ	ı UM.	: <u> </u>	u A		
DEРТН (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS) ASPHALT FILL: granular CONCRETE	STRATA PLOT	TYPE									VEL	·	<u>WA</u>							
		(MUSCS) ASPHALT FILL: granular CONCRETE	STRATA PLOT	TYPE	IMBER	(mm)%									RENG	TH, C	•	•				
		FILL: granular CONCRETE		_		TCR	N-VALUE or RQD %	OTHER TESTS / REMARKS	+	PO	50	PE) kPa	NETI	ROME 100	ETER 0 kPa +		150	CKET :) kPa 			Pa	BACKFILL
0 -		FILL: granular CONCRETE	/ 💥		₹	RECOVERY (mm) or TCR %	żō				T (N-v) BLC)WS/(0.3m	and Blov	ow Count		-		1	 I
		FILL: granular CONCRETE	/,\$xxx						+::	1(0	20	30		40	50		60 : : :	70	80		
-		CONCRETE							::	: : :		:								:: :	:::	
-	;	Stiff black fat CLAY (CH)							: :	: : :		:								:: :	:::	
-			_ ///						1::	:::		:									:::	
- 1																						
-				AS			Si G	eve/Hydro at 0.8 m S M C 6 0% 61% 31%				IĢ-					-1					
1 -	•	- brown and firm below 0.9 m		AS								0										
-																						
-				AS): : : :									
 -		Soft tan lean CLAY (CL)		AS								:0):::):::									
2 -		- sandy																				
				AS								.c)									
		End of Borehole Borehole terminated at a depth of 2.4 No groundwater seepage or soil sloue Borehole backfilled with auger cutting Borehole surface backfilled as per Cit	ghing wa s and be	entonit	e chip	S.			rillin	g.												
3 -																						
1																						
4																						
-								Drilling Con	itrac	tor:	Pa	addo	ock I	Orillir	ng Ltd	d.				Log	ged	By: G
BACKE	-	SYMBOL ASPHALT	. GR	OLIT	·	CONC	RET	Drilling Meth	hod	: 1	125 n	nm	SSA	`								ed By:

	ROJE	Stantec :City of Winnipeg CT:2024 Local Street Renev	vals				REH	OLE RECO	- - -								ВН	l El	LEV	ΆΤΙ	ON	:	BH- 233168 N/A
		ON: Luxton Avenue							_ \			-\	٠.		, <u>a</u>		DA	ΛTU	JM:		I/A		
	(IEB	ORED: <u>January 15 2024</u>			CAMI	DI EC			UND	RAIN						ГΗ,	Cu (l	(Pa))				
DЕРТН (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	ТҮРЕ	NUMBER	RECOVERY (mm)	N-VALUE or RQD %	OTHER TESTS / REMARKS	★ PC	ABOR OCKE	ATO ET PE 50 kF 	RY TEN	TESTRO	T ME1 100 ATTI S/0.	FER kPa	ERC	FIE PC	ELD OCKE 0 KF	VAN ET S	HEA :	200 F		BACKFILL
0 -		A COLLAL T				-			11	0	20	:	30 	r Cont		50	ow Cour	60 -	?	70	. : 80) : : : :	
-		ASPHALT CONCRETE														\vdots							
-		Stiff black fat CLAY (CH)																					××××
-		Soft tan sandy lean CLAY (CL)		X as				Sieve/Hydro at 0.8 m G S M C 2% 40% 37% 21%			1	7											
- 1 - -				X AS							6	<u>/: : :</u>											
, , ,				X AS							0												
- - -				AS							<i> </i>												
2 -				X as																			
-		End of Borehole Borehole terminated at a depth of 2. No groundwater seepage or soil slou Borehole backfilled with auger cuttin Borehole surface backfilled as per C	ighing wa	entonit	e chip	S.			illing.														
- - - 3 -																							
3 -								Drilling Cont	tractor	F	•²add	lock	: Dri	lling		<u></u>					Lo	gged	By: R

PF	IENT ROJE(Stantec : City of Winnipeg CT: 2024 Local Street Renew: ON: Backlane (Anderson Av						OLE RECOI	- -										ВН	EL	EV/	ATIC	ON:		BH 233168 N/A	353
		ORED: January 16 2024	/e/St. 5	JOHH	5 AV	<u>e, </u>			— _v	۷A	TE	RL	ΕV	ÆL		N	/ A		DA	IU	IVI: _	IN	A			_
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	ТҮРЕ	NUMBER	RECOVERY (mm) F	N-VALUE or RQD %	OTHER TESTS / REMARKS	UI	NDF LA	RAIN BOF	NED RAT	SH OR'	IEAF Y TE	R ST EST ROM	TRE - MET		ΓH, (Cu (ki FIEI PO0 150	LD \	VANE ET SH a	HEAF	R VAI	Pa	BACKFILL	
	П		STE	F	NON	RECOVE or T	o R			SP	T (N	1-val	ue)	BLC	OW S	S/0.3	3m ent (%) a		ow Count	t		-	w ·	w _L -1	m m	
0 -		ASPHALT	*						1::	_1(J ::	_20) :::	. St	U	-40		: 5U		30 : :	7	U :::	80			İ
		CONCRETE Stiff black fat CLAY (CH)	·.D.																							
-		Sun black lat GEAT (GIT)																							***	- X
-		Soft tan lean CLAY (CL)		As				Sieve/Hydro at 0.8 m				::- :1:	3	: : : : : : : :												*
1 -				X AS				Sieve/Hydro at 0.8 m G S M C 0% 2% 85% 13%	5				\		D: :											××××××××××××××××××××××××××××××××××××××
_																										*
_		Firm brown fat CLAY (CH)		X as																						{
-				A AS										d												× ×
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3 -		End of Borehole Borehole terminated at a depth of 2.70 Ro groundwater seepage or soil sloug Borehole backfilled with auger cutting Borehole surface backfilled as per Cit	ghing wa s and be	entonit	e chip	s. `		•	drilling	j.																
-																										-
4 –		1						Drilling Cont	ntract	or:	_	Pad	ldo	ck [Dril	ling	g Ltc	d					Log	ged	By: R	В
ACI	KFILL	. SYMBOL M ASPHALT	GR	OUT	\dot{D}	CON	ICRE					mı	m S	SSA	١										ed By:	C
<i>),</i> (O		NITE DRILL CUTTINGS	SAI		000		UGH	Completion				_								_						

WATER CONTENT & ATTERBERG LIMITS WP W L M SPT (N-value) BLOWS/0.3m Water Content (%) and Blow Court. 10 20 30 40 50 60 70 80 ASPHALT Firm black fat CLAY (CH) Sieve/Hydro at 0.6 m G S M C O% 2% 36% 62%			ON: Backlane (Anderson Avored: January 16 2024	0.04.						_	WA	TEF	R LE	EVE	EL:	N	/A				vi		_		
AS Servet	Œ				SAMI	PLES										ENGT					F TE!	ST			
AS Servet DEPIH (m)	EVATION (핏	BER	RY (mm)	LUE	OTHER TESTS / REMARKS			CKE	T PI	ENE		OME			PO	CKE	T Sł	HEAR	R VAN	- 1	CKFILL	
AS Soft tan lean CLAY (CL) Soft tan lean	1			STR	Τ	N	RECOVE or TC	N-VA or RG			■ SPT (N-value) BLOWS/0.3m Water Content (%) and								nd Blow Count					V _L	BA
- brown below 0.76 m AS Soft tan lean CLAY (CL) - sandy AS Find of Borehole - Borehole terminated at a depth of 2.700 m No groundwater seepage or soll sloughing was observed during or upon completion of drilling Porehole backfilled with auger cutings and bentonite chips.	0 -			_///						1	10	U ::::	20		30 : :	<u>. 4</u>	0	50		50		0	80		• .• •
- brown below 0.76 m Soft tan lean CLAY (CL) - sandy AS End of Borehole Borehole terminated at a depth of 2.700 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Soft tan lean CLAY (CL) - Soft tan lean CLAY (CL)			Firm black fat CLAY (CH)		V 40																				
Soft tan lean CLAY (CL) - sandy AS AS AS End of Borehole Borehole terminated at a depth of 2.700 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Borehole backflield with auger cuttings and bentonite chips.	-								Sieve/Hydro at 0.6 m G S M C 0% 2% 36% 62%					3	8	7									
End of Borehole Borehole terminated at a depth of 2.700 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Borehole backfilled with auger cuttings and bentonite chips.	1 - - -				As																				
End of Borehole Borehole terminated at a depth of 2.700 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Borehole backfilled with auger cuttings and bentonite chips.																									
 Borehole terminated at a depth of 2.700 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Borehole backfilled with auger cuttings and bentonite chips. 														•	: :										
	- - - -		Borehole terminated at a depth of 2.7 No groundwater seepage or soil slow Borehole backfilled with auger cutting	ghing wa s and be	entonit	e chip	s.		•	rillin	ng.														

PF	LIENT ROJE(Stantec : City of Winnipeg CT: 2024 Local Street Renewa						OLE RECOR	_ _ _						В	ΗE	LEV	ATIO	N:	BH 23316 N/A	88
		ON: Backlane (Anderson Av	e/St. 、	John	s Av	e)			_						D	ΑTL	JM:	_N/A	4		
D	ATE B	ORED: <u>January 16 2024</u>		I					_	TER					1.0	(I-D-				<u> </u>	_
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (mm) TO SE OT TORY	N-VALUE or RQD %	OTHER TESTS / REMARKS	★ PC	BORA CKET	TOR' PEN kPa ONTE	TESTETRO	T METE 100 k 	ER (Pa (RBEI	◆ FI □ P0 1 RG LII	ELD OCK 50 kl	VAN ET S Pa	200	T VANE 0 kPa 	BACKFILL	
0 -		ASPHALT				<u> </u>			1::::	O ?	20	30	40		Blow Co	60 -	7	0	80		
- - -		Firm black fat CLAY (CH) with sand																			
				AS																	85 \
-								Sieve/Hydro at 0.8 m G S M C 1% 21% 41% 37%								! :					$\langle \rangle$
1 -		Soft tan lean CLAY (CL) - sandy		X as				3.70													
-				X AS									6	P							
- - 2 -				AS									b :								\sim
۷ -				X as								/									
- - -		End of Borehole Borehole terminated at a depth of 2.20 No groundwater seepage or soil sloug Borehole backfilled with auger cutting Borehole surface backfilled as per City	hing was	entonit	e chip	S.			rilling.												
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-																					ļ
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4 -		SYMBOL ASPHALT			· ·	1	NCRE	Drilling Cont		Pa 125 n		k Dri	illing	Ltd.						By: F	

APPENDIX D

Core Photographs

Stantec



Figure 1 – Core No. 16 (Machray Ave)



Figure 2 – Core No. 17 (Machray Ave)



Figure 3 – Core No. 18 (Machray Ave)



Figure 4 – Core No. 19 (Machray Ave)





Figure 5 – Core No. 20 (Charles St)



Figure 7 – Core No. 22 (Charles St)



Figure 6 – Core No. 21 (Charles St)

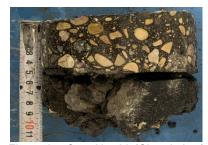


Figure 8 – Core No. 23 (Church Ave)





Figure 9 - Core No. 24 (Church Ave)



Figure 11 – Core No. 26 (Lansdowne Ave)



Figure 10 – Core No. 25 (Lansdowne Ave)



Figure 12 – Core No. 27 (Lansdowne Ave)





Figure 13 – Core No. 28 (Lansdowne Ave)



Figure 15 – Core No. 30 (Cochrane St)



Figure 14 – Core No. 29 (Cochrane St)



Figure 16 – Core No. 31 (Cochrane St)





Figure 17 – Core No. 32 (McAdam Ave)



Figure 19 – Core No. 34 (McAdam Ave)



Figure 18 – Core No. 33 (McAdam Ave)



Figure 20 – Core No. 35 (McAdam Ave)





Figure 21 – Core No. 36 (Luxton Ave)



Figure 23 - Core No. 38 (Luxton Ave)



Figure 22 – Core No. 37 (Luxton Ave)



Figure 24 – Core No. 39 (Luxton Ave)





Figure 25 – Core No. 40 (Luxton Ave)



Figure 27 – Core No. 42 (Alley)



Figure 26 – Core No. 41 (Alley)



Figure 28 – Core No. 43 (Alley)

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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3E 3P1

PROJECT NO. 123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.10

TRIAL

BLOWS

MC (%)

DATE RECEIVED: 2024.Jan.10

DATE TESTED: 2024.Jan.22

SAMPLED BY:

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Carson Cockwell

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-16, 680 mm

2956 STANTEC SAMPLE NO.

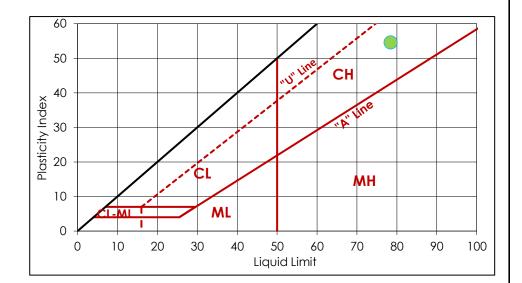
1

LIQUID LIMIT		
1	2	
23	24	
70	70	

PLASTIC LIMIT **TRIAL** 2 MC (%)

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

24 55 30.60



COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3E 3P1

PROJECT NO.

123316853

ATTN

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.15 SAMPLED BY:

TRIAL

BLOWS

MC (%)

Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.15

DATE TESTED: 2024.Jan.25

SUBMITTED BY: Stantec Consulting Ltd.

Carson Cockwell TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-17, 720 mm STANTEC SAMPLE NO. 2975

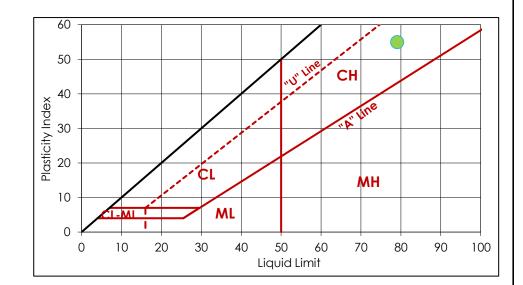
LIQUID LIMIT 2 24 22

80

	PLASTIC LIMIT			
TRIAL	1	2		
MC (%)	24	24		

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

24 55 38.60



COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3E 3P1

PROJECT NO.

123316853

ATTN

SAMPLED BY:

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.15

Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.15

DATE TESTED: 2024.Jan.25

SUBMITTED BY: Stantec Consulting Ltd.

TRIAL

MC (%)

TESTED BY:

Carson Cockwell

MATERIAL IDENTIFICATION

CLIENT FIELD ID

BH-18, 690 mm

2976 STANTEC SAMPLE NO.

2

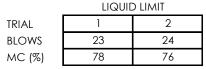
3

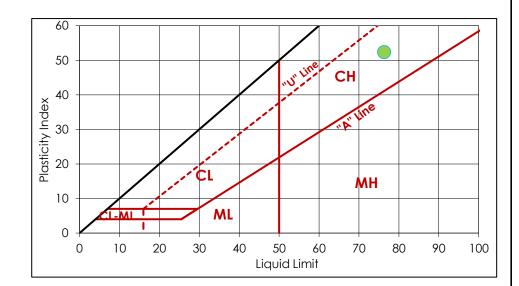
PLASTIC LIMIT

LIQUID LIMIT, LL PLASTIC LIMIT, PL

PLASTICITY INDEX, PI AS REC'D MC (%)

24 52 36.80





COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1 PROJECT NO.

ATTN Richard Weibel REPORT NO. 4

DATE SAMPLED: 2024.Jan.10 DATE RECEIVED: 2024.Jan.10 DATE TESTED: 2024.Jan.22 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Carson Cockwell

MATERIAL IDENTIFICATION

TRIAL

BLOWS

MC (%)

CLIENT FIELD ID BH-19, 680 mm

23

LIQUID LIMIT

2

23

STANTEC SAMPLE NO. 2957

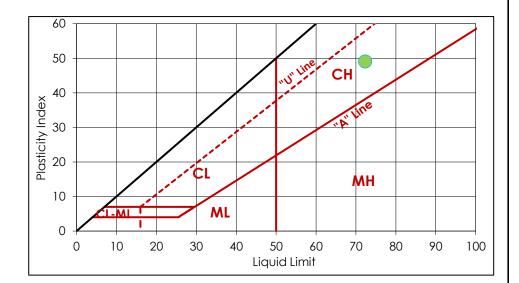
123316853

 PLASTIC LIMIT

 TRIAL
 1
 2

 MC (%)
 23
 23

LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI AS REC'D MC (%) 72 23 49 29.40



COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipea, Manitoba

R3F 3P1 PROJECT NO.

Richard Weibel **ATTN** REPORT NO.

DATE SAMPLED: 2024.Jan.29 DATE RECEIVED: 2024. Jan. 29 DATE TESTED: 2024.Feb.05 Graeme Patrick SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-20, 800 mm

4025 STANTEC SAMPLE NO.

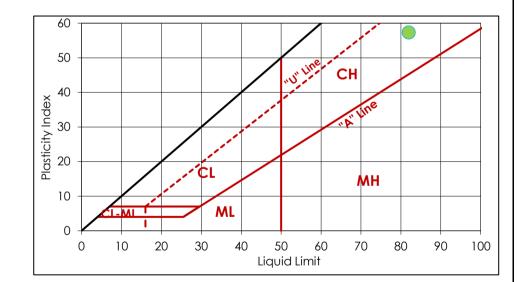
123316853

LIQUID LIMIT TRIAL 2 **BLOWS** 27 27 81 MC (%)

PLASTIC LIMIT TRIAL MC (%)

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

25 57 30.50



COMMENTS No comments.

REPORT DATE 2024.Feb.06 **REVIEWED BY**

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3F 3P1

PROJECT NO. 123316853

ATTN Richard Weibel

REPORT NO. 6

DATE SAMPLED: 2024.Jan.29

DATE RECEIVED: 2024. Jan. 29

DATE TESTED: 2024.Feb.05

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Graeme Patrick

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-22, 795 mm

STANTEC SAMPLE NO. 4026

LIQUID LIMIT

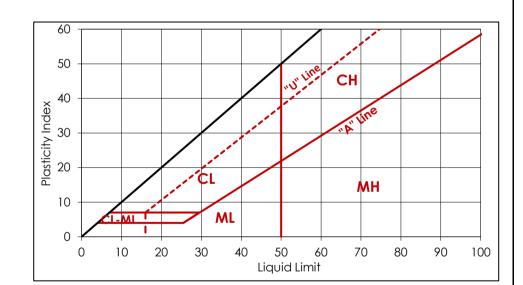
TRIAL BLOWS MC (%)

1	2
24	25
93	92



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





COMMENTS
No comments.

REPORT DATE 2024.Feb.06

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

PROJECT NO.

123316853

ATTN

R3E 3P1

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.10

. 2024.Juli.10

DATE RECEIVED: 2024.Jan.10

TRIAL

MC (%)

DATE TESTED: 2024.Jan.22

SAMPLED BY:

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Carson Cockwell

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-23, 690 mm

STANTEC SAMPLE NO. 2958

7

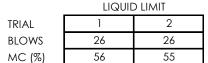
PLASTIC LIMIT

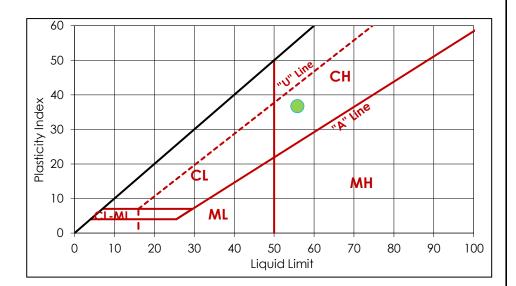
PLASTIC LIMIT

LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI

AS REC'D MC (%)

19 37 37.20





COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

PROJECT NO. 123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.10

DATE RECEIVED: 2024.Jan.10

DATE TESTED: 2024.Jan.22

Stantec Consulting Ltd. SAMPLED BY:

SUBMITTED BY: Stantec Consulting Ltd.

Carson Cockwell TESTED BY:

MATERIAL IDENTIFICATION

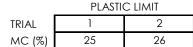
CLIENT FIELD ID BH-24, 630 mm

2959 STANTEC SAMPLE NO.

LIQUID LIMIT

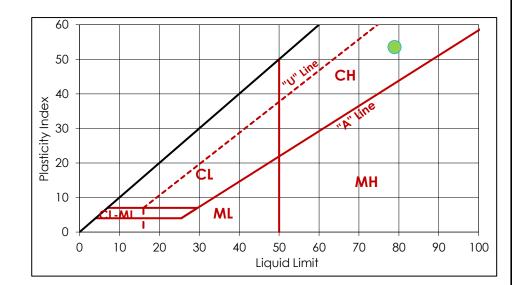
TRIAL **BLOWS** MC (%)

LIGOID LIMIT			
1	2		
28	26		
78	78		



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





COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

PROJECT NO. 123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.10

DATE RECEIVED: 2024.Jan.10

DATE TESTED: 2024.Jan.22

Stantec Consulting Ltd. SAMPLED BY:

SUBMITTED BY: Stantec Consulting Ltd.

Carson Cockwell TESTED BY:

MATERIAL IDENTIFICATION

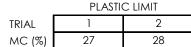
CLIENT FIELD ID BH-36, 825 mm

2961 STANTEC SAMPLE NO.

LIQUID LIMIT

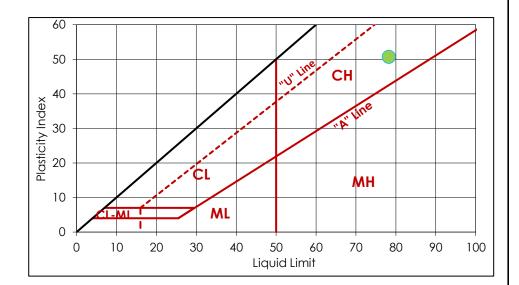
TRIAL **BLOWS** MC (%)

=: == =:::::		
1	2	
27	27	
77	78	



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





COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

PROJECT NO.

123316853

10

ATTN

R3E 3P1

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.10

DATE RECEIVED: 2024.Jan.10

TRIAL

MC (%)

DATE TESTED: 2024.Jan.22

SAMPLED BY:

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Carson Cockwell

MATERIAL IDENTIFICATION

CLIENT FIELD ID

BH-37, 825 mm

2961 STANTEC SAMPLE NO.

2

PLASTIC LIMIT

LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI

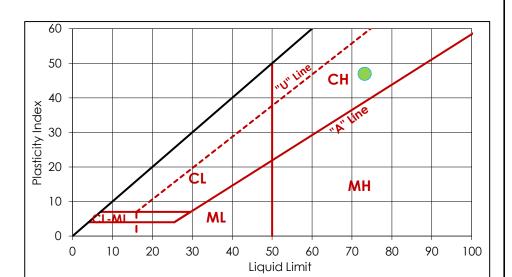
AS REC'D MC (%)

26 47 25.00

TRIAL **BLOWS** MC (%)

1	2
21	22
75	74

LIQUID LIMIT



COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

PROJECT NO.

123316853

Richard Weibel **ATTN**

REPORT NO. 11

DATE SAMPLED: 2024.Jan.10 SAMPLED BY:

TRIAL

BLOWS

MC (%)

Stantec Consulting Ltd.

2

22

LIQUID LIMIT

DATE RECEIVED: 2024.Jan.10 SUBMITTED BY: Stantec Consulting Ltd. DATE TESTED: 2024.Jan.22

Carson Cockwell TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-38, 800 mm

20

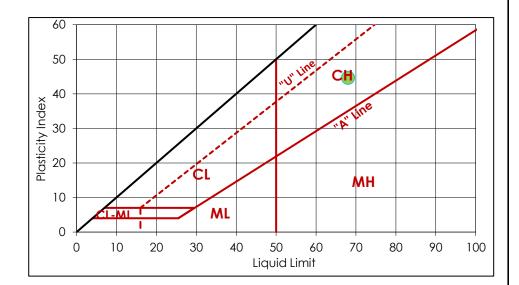
69

2962 STANTEC SAMPLE NO.

PLASTIC LIMIT **TRIAL** 2 MC (%)

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

23 45 33.50



COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3E 3P1

PROJECT NO.

123316853

ATTN

Richard Weibel

12 REPORT NO.

DATE SAMPLED: 2024.Jan.10

DATE RECEIVED: 2024.Jan.10

DATE TESTED: 2024.Jan.22

SAMPLED BY:

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Carson Cockwell

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-39, 800 mm

2963 STANTEC SAMPLE NO.

LIQUID LIMIT

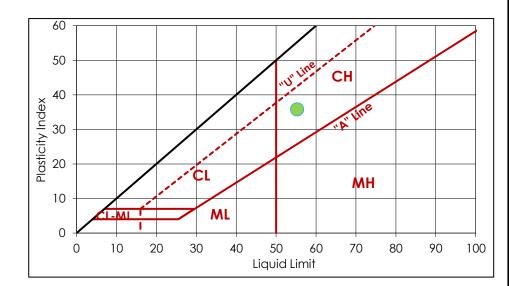
TRIAL **BLOWS** MC (%)

1	2
20	20
57	57



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

55	
20	
36	1
21.50	1



COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1 PROJECT NO.

Richard Weibel **ATTN** REPORT NO. 13

DATE SAMPLED: 2024.Jan.15 DATE RECEIVED: 2024.Jan.15 DATE TESTED: 2024.Jan.25 Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. Carson Cockwell SAMPLED BY: TESTED BY:

MATERIAL IDENTIFICATION

TRIAL

BLOWS

MC (%)

CLIENT FIELD ID BH-40, 775 mm

28

46

LIQUID LIMIT

2

29

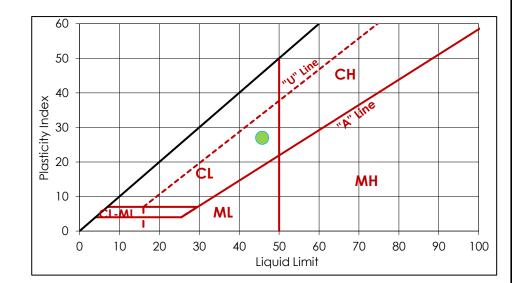
2977 STANTEC SAMPLE NO.

123316853

PLASTIC LIMIT **TRIAL** 2 MC (%)

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





COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

PROJECT NO.

123316853

14

ATTN

SAMPLED BY:

TRIAL

BLOWS

MC (%)

R3E 3P1

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.16

Stantec Consulting Ltd.

2

26

LIQUID LIMIT

25

DATE RECEIVED: 2024.Jan.16

DATE TESTED: 2024.Jan.30

SUBMITTED BY: Stantec Consulting Ltd.

Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

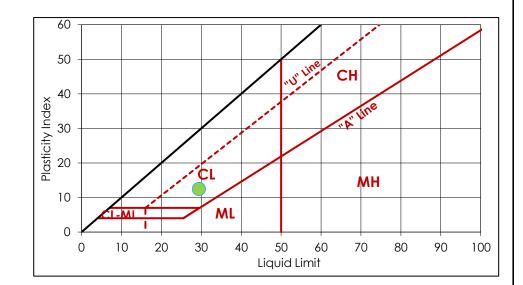
CLIENT FIELD ID BH-41, 770 mm

2986 STANTEC SAMPLE NO.

PLASTIC LIMIT **TRIAL** 2 MC (%)

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

17 12 21.80



COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue Winnipeg, Manitoba

PROJECT NO. 123316853

R3E 3P1

ATTN

SAMPLED BY:

TRIAL

BLOWS

MC (%)

Richard Weibel

REPORT NO. 15

DATE SAMPLED: 2024.Jan.16

Stantec Consulting Ltd.

LIQUID LIMIT

DATE RECEIVED: 2024.Jan.16

DATE TESTED: 2024.Jan.30

SUBMITTED BY: Stantec Consulting Ltd.

Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-42, 635 mm

22

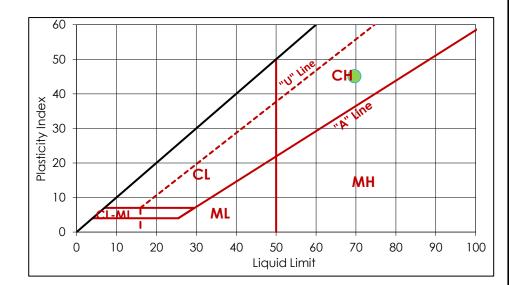
2987 STANTEC SAMPLE NO.

2

22

TRIAL MC (%) PLASTIC LIMIT 2 LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI AS REC'D MC (%)

25 45 38.70



COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

PROJECT NO.

123316853

16

ATTN

R3E 3P1

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.16

DATE RECEIVED: 2024.Jan.16

DATE TESTED: 2024.Jan.30

SAMPLED BY:

TRIAL

BLOWS

MC (%)

Stantec Consulting Ltd.

2

24

LIQUID LIMIT

24

58

SUBMITTED BY: Stantec Consulting Ltd.

Larry Presado TESTED BY:

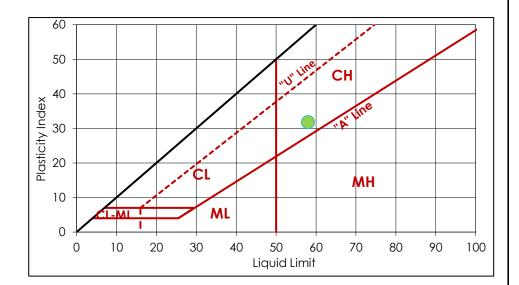
MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-43, 760 mm

2988 STANTEC SAMPLE NO.

TRIAL MC (%) PLASTIC LIMIT 2 LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI AS REC'D MC (%)

26 32 40.40



COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

PROJECT NO.

123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.10

R3F 3P1

DATE RECEIVED: 2024. Jan. 10

DATE TESTED: 2024.Jan.15

SAMPLED BY: Stantec Consulting Ltd.

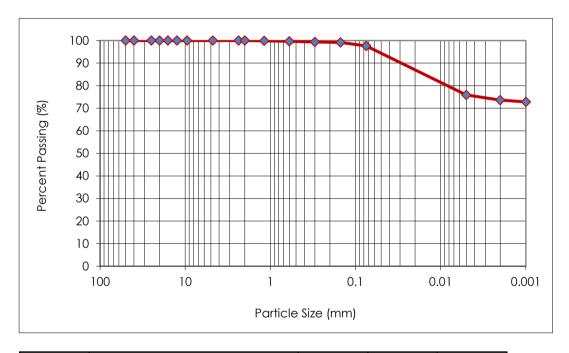
SUBMITTED BY: Stantec Consulting Ltd.

Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-16, 680 mm STANTEC SAMPLE NO. 2956

1



Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	100.0
1.18	99.9
0.600	99.7
0.300	99.4
0.150	99.2
0.075	97.6
0.005	75.9
0.002	73.6
0.001	72.8

Gravel Sand		Silt	Clay	Colloids		
Glavei	Coarse	Medium	Fine	3111	Cluy	Colloids
0.0	0.0	0.5	1.9	24.0	73.6	72.8

COMMENTS

No comments.

REPORT DATE 2024.Jan.18 **REVIEWED BY**

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

123316853 PROJECT NO.

Richard Weibel **ATTN** REPORT NO.

DATE SAMPLED: 2024.Jan.15 DATE RECEIVED: 2024. Jan. 15 DATE TESTED: 2024.Jan.23 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-17, 720 mm STANTEC SAMPLE NO. 2975

	100	***	↔ • • • • • • • • • • • • • • • • • • •	*		
	90					
	80					
(%)	70					
ing.	60					
Percent Passing (%)	50					
ent	40					
erc	30					
ш	20					
	10					
	100	10	1	0.1	0.01	0.001
Particle Size (mm)						

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	100.0
0.600	100.0
0.300	99.8
0.150	99.6
0.075	98.9
0.005	75.5
0.002	67.0
0.001	60.9

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	3111	Cidy	Colloids
0.0	0.0	0.1	1.0	31.9	67.0	60.9

COMMENTS

No comments.

REPORT DATE 2024.Jan.25

REVIEWED BY

Geotechnical Engineer - Materials Testing Services

Guillaume Beauce, P.Eng.



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1 PROJECT NO.

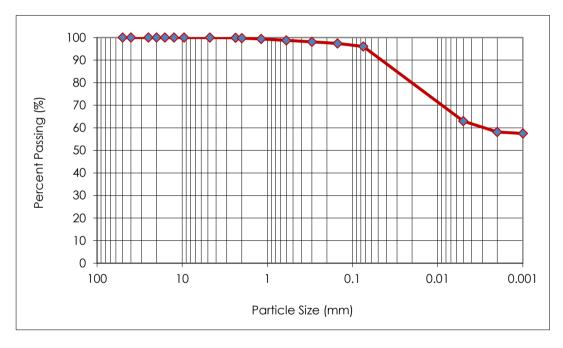
Richard Weibel 3 **ATTN** REPORT NO.

DATE SAMPLED: 2024.Jan.15 DATE RECEIVED: 2024. Jan. 15 DATE TESTED: 2024.Jan.23 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-18, 690 mm STANTEC SAMPLE NO. 2976

123316853



F	
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	99.7
1.18	99.4
0.600	98.8
0.300	98.1
0.150	97.4
0.075	96.0
0.005	63.0
0.002	58.1
0.001	57.5

Gravel	Sand			6:11+	Clay	Colloids
	Coarse	Medium	Fine	Silt	Cluy	Colloids
0.0	0.3	1.3	2.4	37.9	58.1	57.5

COMMENTS

No comments.

REPORT DATE 2024.Jan.25 **REVIEWED BY** Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 4

DATE SAMPLED: 2024.Jan.10 DATE RECEIVED: 2024.Jan.10 DATE TESTED: 2024.Jan.15 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-19, 680 mm

STANTEC SAMPLE NO. 2957

	100					
	90					
	80					
8	70					
ing	60					H
Percent Passing (%)	50					
in H	40					
SICE	30					
Pe	111111111					
	20					
	10					
	100	10	1	0.1	0.01	0.001
			Particle Siz	e (mm)		

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	99.7
0.600	99.5
0.300	99.4
0.150	99.2
0.075	98.7
0.005	75.3
0.002	68.0
0.001	66.5

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	SIII	Cidy	Colloids
0.0	0.1	0.5	0.7	30.7	68.0	66.5

COMMENTS

No comments.

REPORT DATE 2024. Jan. 18 REVIEWED BY Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3F 3P1

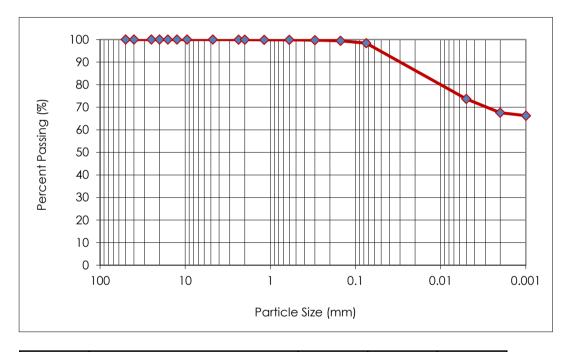
PROJECT NO. 123316853

Richard Weibel **ATTN** REPORT NO.

DATE SAMPLED: 2024.Jan.29 DATE RECEIVED: 2024. Jan. 29 DATE TESTED: 2024.Feb.02 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-20, 800 mm STANTEC SAMPLE NO. 4025



% Passing
100.0
100.0
100.0
100.0
100.0
100.0
100.0
100.0
100.0
99.9
99.9
99.9
99.7
99.4
98.4
73.7
67.6
66.3

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	SIII	Cidy	Colloids
0.0	0.1	0.1	1.4	30.8	67.6	66.3

COMMENTS

No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY

Geotechnical Engineer - Materials Testing Services

Guillaume Beauce, P.Eng.



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3F 3P1

PROJECT NO.

123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.29

DATE RECEIVED: 2024. Jan. 29

DATE TESTED: 2024.Feb.02

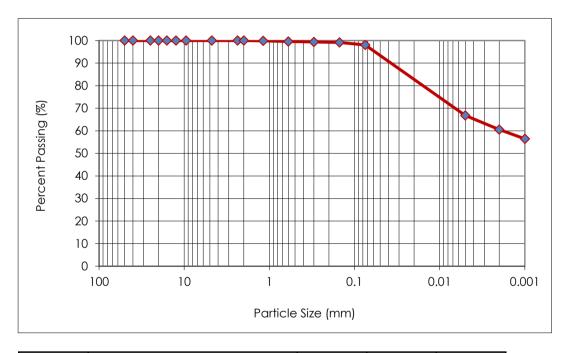
SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-22, 795 mm STANTEC SAMPLE NO. 4026



% Passing	
100.0	
100.0	
100.0	
100.0	
100.0	
100.0	
100.0	
100.0	
100.0	
100.0	
99.9	
99.6	
99.4	
99.1	
98.0	
66.8	
60.6	
56.5	

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	SIII	Cidy	Colloids
0.0	0.0	0.5	1.5	37.4	60.6	56.5

COMMENTS

No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY

Geotechnical Engineer - Materials Testing Services

Guillaume Beauce, P.Eng.



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

PROJECT NO.

123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.10

DATE RECEIVED: 2024. Jan. 10

DATE TESTED: 2024.Jan.15

R3F 3P1

SAMPLED BY: Stantec Consulting Ltd.

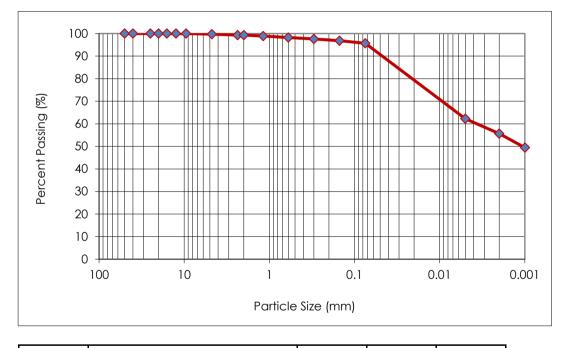
SUBMITTED BY: Stantec Consulting Ltd.

Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-23, 690 mm STANTEC SAMPLE NO. 2958

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	99.7
2.36	99.3
2.00	99.3
1.18	98.9
0.600	98.2
0.300	97.6
0.150	96.9
0.075	95.7
0.005	62.2
0.002	55.6
0.001	49.5

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	3111	Cidy	Colloids
0.3	0.4	1.4	2.2	40.1	55.6	49.5

COMMENTS

No comments.

REPORT DATE 2024.Jan.18

REVIEWED BY

Geotechnical Engineer - Materials Testing Services

Guillaume Beauce, P.Eng.



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3F 3P1

PROJECT NO.

123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.10

DATE RECEIVED: 2024. Jan. 10

DATE TESTED: 2024.Jan.15

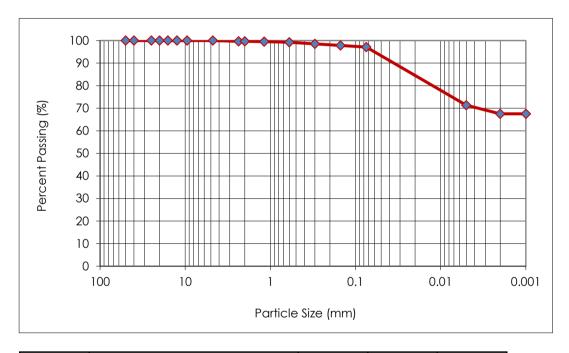
SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-24, 630 mm STANTEC SAMPLE NO. 2959



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	99.7
2.00	99.7
1.18	99.5
0.600	99.2
0.300	98.6
0.150	97.8
0.075	97.1
0.005	71.4
0.002	67.5
0.001	67.5

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	SIII	Cidy	Colloids
0.0	0.3	0.9	1.7	29.6	67.5	67.5

COMMENTS

No comments.

REPORT DATE 2024.Jan.18

Guillaume Beauce, P.Eng. **REVIEWED BY**

Geotechnical Engineer - Materials Testing Services



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3F 3P1

PROJECT NO.

123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.10

DATE RECEIVED: 2024. Jan. 10

DATE TESTED: 2024.Jan.15

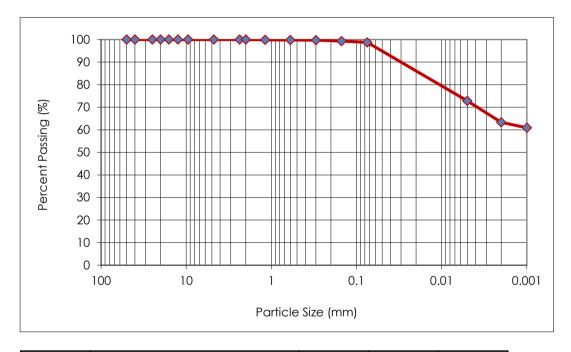
SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-36, 825 mm STANTEC SAMPLE NO. 2960



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	99.9		
0.600	99.8		
0.300	99.7		
0.150	99.3		
0.075	98.7		
0.005	72.8		
0.002	63.3		
0.001	60.9		

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	SIII	Clay	Colloids
0.0	0.0	0.3	1.0	35.4	63.3	60.9

COMMENTS

No comments.

REPORT DATE 2024.Jan.18 **REVIEWED BY**

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3E 3P1

PROJECT NO.

123316853

Richard Weibel **ATTN**

10 REPORT NO.

DATE SAMPLED: 2024.Jan.10

DATE RECEIVED: 2024. Jan. 10

DATE TESTED: 2024.Jan.15

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-37, 825 mm STANTEC SAMPLE NO. 2961

	100	****	-	\ 		
	90					
	80					
(%)	70					
ing ing	60					
Percent Passing (%)	50					
ent	40					
erc	30					
<u>п</u>	20					
	10					
	0					
	100	10	1	0.1	0.01	0.001
			Particle Si	ze (mm)		

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	99.9
0.600	99.9
0.300	99.8
0.150	99.4
0.075	98.8
0.005	61.5
0.002	51.4
0.001	45.7

Craval		Sand		Silt	Clay Colloid	
Gravel	Coarse	Medium	Fine		Clay	Colloids
0.0	0.0	0.1	1.1	47.4	51.4	45.7

COMMENTS

No comments.

REVIEWED BY

Geotechnical Engineer - Materials Testing Services

REPORT DATE 2024.Jan.18 Guillaume Beauce, P.Eng.



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

PROJECT NO. 123316853

Richard Weibel **ATTN**

REPORT NO. 11

DATE SAMPLED: 2024.Jan.10

DATE RECEIVED: 2024. Jan. 10

DATE TESTED: 2024.Jan.15

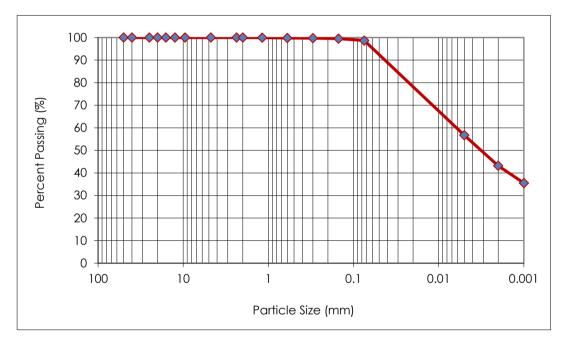
SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-38, 800 mm STANTEC SAMPLE NO. 2962



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	99.9
0.600	99.8
0.300	99.7
0.150	99.5
0.075	98.7
0.005	56.7
0.002	43.1
0.001	35.5
1.18 0.600 0.300 0.150 0.075 0.005 0.002	99.9 99.8 99.7 99.5 98.7 56.7 43.1

Cravol		Sand		Silt	Clay Colloids	
Gravel	Coarse	Medium	Fine	3111	Cidy	Colloids
0.0	0.0	0.2	1.1	55.6	43.1	35.5

COMMENTS

No comments.

REPORT DATE 2024.Jan.18

REVIEWED BY

Geotechnical Engineer - Materials Testing Services

Guillaume Beauce, P.Eng.



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

123316853 PROJECT NO.

12

Richard Weibel **ATTN** REPORT NO.

DATE SAMPLED: 2024.Jan.10 DATE RECEIVED: 2024. Jan. 10 DATE TESTED: 2024.Jan.15 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-39, 800 mm STANTEC SAMPLE NO. 2963

	100	****	◇				
	90						
	80			+			
(%)	70						
in g	60						
Percent Passing (%)	50						
ent	40						
erc	30						
ш	20						
	10						
	0						
	100	10	1	0.1	0.01	0.001	
Particle Size (mm)							

% Passing
100.0
100.0
100.0
100.0
100.0
100.0
100.0
100.0
100.0
100.0
99.9
99.9
99.7
97.7
92.5
37.2
31.4
27.4

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	3111	Cidy	Colloids
0.0	0.0	0.2	7.3	61.1	31.4	27.4

COMMENTS

No comments.

REPORT DATE 2024.Jan.18 **REVIEWED BY** Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1 PROJECT NO.

ATTN Richard Weibel REPORT NO. 13

DATE SAMPLED: 2024.Jan.15

DATE RECEIVED: 2024.Jan.15

DATE TESTED: 2024.Jan.23

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

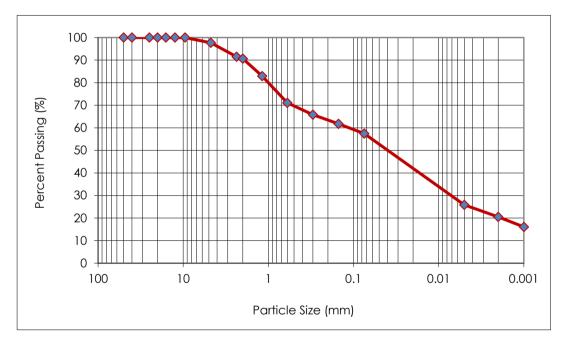
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-40, 775 mm

STANTEC SAMPLE NO. 2977

123316853



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	97.7	
2.36	91.5	
2.00	90.6	
1.18	82.9	
0.600	71.1	
0.300	65.8	
0.150	61.8	
0.075	57.4	
0.005	25.8	
0.002	20.6	
0.001	16.1	

Gravel		Sand		Silt	Clay	Colloids
Glavel	Coarse	Medium	Fine		Cidy	Colloids
2.3	7.1	22.6	10.6	36.8	20.6	16.1

COMMENTS

No comments.

REPORT DATE

2024.Jan.25 REVIEWED BY Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3F 3P1

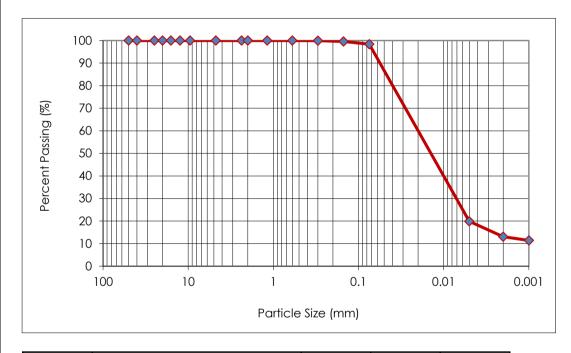
PROJECT NO. 123316853

Richard Weibel 14 **ATTN** REPORT NO.

DATE SAMPLED: 2024.Jan.16 DATE RECEIVED: 2024. Jan. 16 DATE TESTED: 2024.Jan.19 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-41, 770 mm STANTEC SAMPLE NO. 2986



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	100.0
0.600	100.0
0.300	100.0
0.150	99.6
0.075	98.4
0.005	19.9
0.002	13.1
0.001	11.4

Gravel Cod		Sand		Silt	Clay	Colloids
	Coarse	Medium	Fine	SIII	Cluy	Colloids
0.0	0.0	0.0	1.6	85.3	13.1	11.4

COMMENTS

No comments.

REPORT DATE 2024.Jan.22

Guillaume Beauce, P.Eng. **REVIEWED BY**

Geotechnical Engineer - Materials Testing Services



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3F 3P1

PROJECT NO. 123316853

Richard Weibel **ATTN**

15 REPORT NO.

DATE SAMPLED: 2024.Jan.16

DATE RECEIVED: 2024. Jan. 16

DATE TESTED: 2024.Jan.19

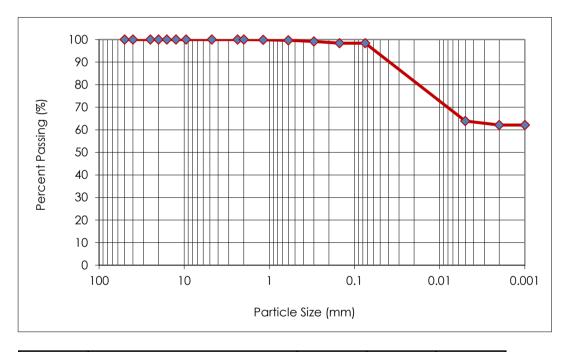
SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-42, 635 mm STANTEC SAMPLE NO. 2987



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	99.9
0.600	99.7
0.300	99.2
0.150	98.4
0.075	98.4
0.005	63.9
0.002	62.1
0.001	62.1

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	SIII	Cluy	Colloids
0.0	0.0	0.6	1.0	36.3	62.1	62.1

COMMENTS

No comments.

REPORT DATE 2024.Jan.22

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



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

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3F 3P1 PROJECT NO.

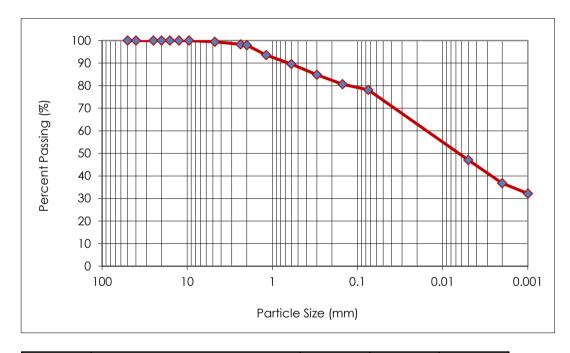
Richard Weibel **ATTN** REPORT NO. 16

DATE SAMPLED: 2024.Jan.16 DATE RECEIVED: 2024. Jan. 16 DATE TESTED: 2024.Jan.19 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-43, 760 mm STANTEC SAMPLE NO. 2988

123316853



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	99.4		
2.36	98.3		
2.00	98.0		
1.18	93.6		
0.600	89.6		
0.300	84.8		
0.150	80.7		
0.075	78.2		
0.005	47.1		
0.002	36.8		
0.001	32.2		

Gravel	Cravel Sand Silt	Silt	Clay	Colloids		
Gravei	Coarse	Medium	Fine	SIII	Cluy	Colloids
0.6	1.4	11.2	8.6	41.4	36.8	32.2

COMMENTS

No comments.

REPORT DATE 2024.Jan.22

Guillaume Beauce, P.Eng. **REVIEWED BY**

Geotechnical Engineer - Materials Testing Services





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1 CLIENT City of Winnipeg C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-2 - Contract 2

PROCTOR NO. 1 DATE SAMPLED 2024.Jan.10 DATE RECEIVED 2024.Jan.10 DATE TESTED 2024.Jan.17

INSITU MOISTURE 27.4 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Fat CLAY (CH)
DESCRIPTION

SUPPLIER Existing Materials
SOURCE Machray Ave - BH-16, 0.68 m

COMI ACTION STANDARD

COMPACTION PROCEDURE

RAMMER TYPE

PREPARATION
OVERSIZE CORRECTION METHOD
RETAINED 4.75mm SCREEN

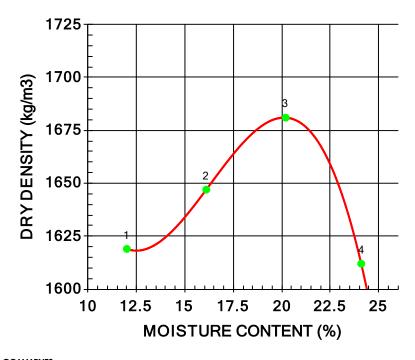
Standard Proctor, AS D698

A: 101.6mm Mold,

Passing 4.75mm Manual

Moist None

N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1813	1619	12.0
2	1912	1647	16.1
3	2021	1681	20.2
4	2001	1612	24.1

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1680	20.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2956.

Page 1 of 1 2024.Jan.18 Stantec Consulting Ltd.

REVIEWED BY:





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-2 - Contract 2

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.24 2024.Jan.15 2024.Jan.15 DATE TESTED

RAMMER TYPE

INSITU MOISTURE 33.5 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Fat CLAY (CH) **DESCRIPTION**

SUPPLIER Existing Materials **SOURCE** Machray Ave - BH-17, 0.72 m

PREPARATION OVERSIZE CORRECTION METHOD

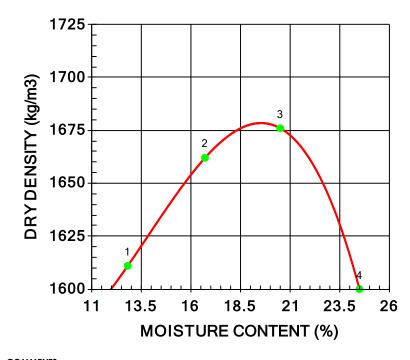
D698

COMPACTION PROCEDURE A: 101.6mm Mold,

Passing 4.75mm

Manual Moist None

RETAINED 4.75mm SCREEN N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1817	1611	12.8
2	1939	1662	16.7
3	2019	1676	20.5
4	1992	1600	24.5

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1680	19.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2975.

Page 1 of 1 REVIEWED BY: 2024.Jan.25 Stantec Consulting Ltd.





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-2 - Contract 2

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.15 2024.Jan.15 DATE TESTED 2024.Jan.25

INSITU MOISTURE 32.1 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Subgrade

SIZE

DESCRIPTION Fat CLAY (CH)

SUPPLIER Existing Material SOURCE Machray Ave, BH-18, 0.69 m

COMPACTION PROCEDURE

RAMMER TYPE

PREPARATION OVERSIZE CORRECTION METHOD

RETAINED 4.75mm SCREEN

D698

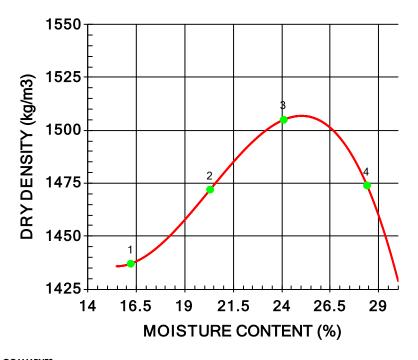
A: 101.6mm Mold,

Passing 4.75mm

Manual

Dry

None N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1670	1437	16.2
2	1771	1472	20.3
3	1868	1505	24.1
4	1893	1474	28.4

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1510	25.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample no. 2976.

Page 1 of 1

2024.Jan.26

Stantec Consulting Ltd.

REVIEWED BY:





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel PROJECT 2024 Local Street Renewals Program

PROJECT NO.

MATERIAL IDENTIFICATION

TESTED BY

123316853-2 - Contract 2

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.18 2024.Jan.10 2024.Jan.10 DATE TESTED

INSITU MOISTURE 25.2 % COMPACTION STANDARD

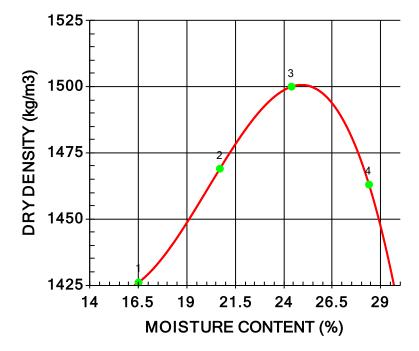
> D698 Donald Eliazar

COMPACTION PROCEDURE

A: 101.6mm Mold, MAJOR COMPONENT Backfill Passing 4.75mm

RAMMER TYPE SIZE Fat CLAY (CH) Manual **DESCRIPTION PREPARATION** Moist SUPPLIER OVERSIZE CORRECTION METHOD Existing Materials None

SOURCE Machray Ave - BH-19, 0.68 m RETAINED 4.75mm SCREEN N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1661	1426	16.5
2	1773	1469	20.7
3	1866	1500	24.4
4	1878	1463	28.4

Standard Proctor, ASTM

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1500	25.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2957.

Page 1 of 1 REVIEWED BY: 2024.Jan.19 Stantec Consulting Ltd.





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1 CLIENT City of Winnipeg C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-2 - Contract 2

PROCTOR NO. 5 DATE SAMPLED 2024, Jan. 29 DATE RECEIVED 2024, Jan. 29 DATE TESTED 2024, Feb. 07

COMPACTION PROCEDURE

INSITU MOISTURE 31.5 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Madison Murphy

MATERIAL IDENTIFICATION

MAJOR COMPONENT Subgrade

SIZE Fat CLAY (CH)
DESCRIPTION

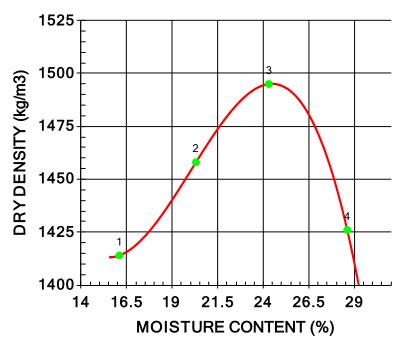
SUPPLIER Existing Materials
SOURCE Charles Street - BH-20, 0.8(

AY (CH) RAMMER TYPE

PREPARATION

Existing Materials OVERSIZE CORRECTION METHOD

Charles Street - BH-20, 0.80 m RETAINED 4.75mm SCREEN



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1642	1414	16.1
2	1754	1458	20.3
3	1858	1495	24.3
4	1834	1426	28.6

D698

Manual

Moist

None

N/A %

A: 101.6mm Mold,

Passing 4.75mm

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1500	24.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 4025.

Page 1 of 1 2024.Feb.08 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-2 - Contract 2

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Feb.08 2024.Feb.09 DATE TESTED 2024.Feb.09

INSITU MOISTURE 33.2 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Subgrade

SIZE Fat CLAY (CH)

DESCRIPTION SUPPLIER

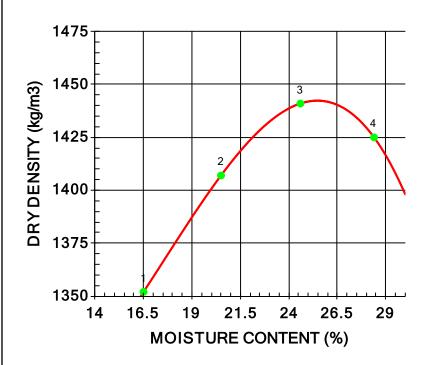
Existing Materials SOURCE Charles Street - BH 22, 0.79 m

D698

COMPACTION PROCEDURE A: 101.6mm Mold,

Passing 4.75mm

RAMMER TYPE Manual **PREPARATION** Moist OVERSIZE CORRECTION METHOD None RETAINED 4.75mm SCREEN N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1575	1352	16.5
2	1696	1407	20.5
3	1796	1441	24.6
4	1830	1425	28.4

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1440	25.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 4026.

Page 1 of 1 REVIEWED BY: 2024.Feb.09 Stantec Consulting Ltd. Jason Thompson, C.E.T.





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel PROJECT 2024 Local Street Renewals Program

PROJECT NO.

123316853-2 - Contract 2

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.10 2024.Jan.10 DATE TESTED 2024.Jan.18

INSITU MOISTURE 28.0 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Fat CLAY (CH) **DESCRIPTION**

SUPPLIER Existing Materails

SOURCE Church Ave - BH-23, 0.69 m

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD RETAINED 4.75mm SCREEN

D698

A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None N/A %

1600 DRY DENSITY (kg/m3) 1575 3 2 1550 1525 1500 16.5 19 21.5 14 24 26.5 **MOISTURE CONTENT (%)**

TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1775	1526	16.3
2	1876	1558	20.4
3	1950	1565	24.6
4	1930	1501	28.6

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1570	23.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2958.

Page 1 of 1

2024.Jan.19

Stantec Consulting Ltd.

REVIEWED BY:





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-2 - Contract 2

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.10 2024.Jan.10 DATE TESTED 2024.Jan.18

INSITU MOISTURE 34.6 % COMPACTION STANDARD

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Fat CLAY (CH)

DESCRIPTION SUPPLIER Existing Materials

SOURCE Church Ave - BH-24, 0.63 m

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD

RETAINED 4.75mm SCREEN

Standard Proctor, ASTM

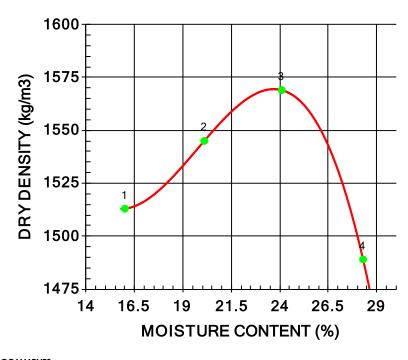
D698

A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1755	1513	16.0
2	1856	1545	20.1
3	1947	1569	24.1
4	1911	1489	28.3

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1570	23.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2959.

Page 1 of 1

2024.Jan.19

Stantec Consulting Ltd.

REVIEWED BY:





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-2 - Contract 2

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.18 2024.Jan.10 2024.Jan.10 DATE TESTED

INSITU MOISTURE 29.3 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Fat CLAY (CH) **DESCRIPTION**

SUPPLIER Existing Materials

SOURCE Luxton Ave - BH-36, 0.83 m

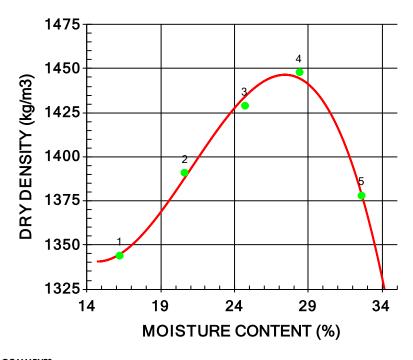
D698

COMPACTION PROCEDURE A: 101.6mm Mold,

Passing 4.75mm

RAMMER TYPE Manual **PREPARATION** Moist OVERSIZE CORRECTION METHOD None

RETAINED 4.75mm SCREEN N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1562	1344	16.2
2	1678	1391	20.6
3	1782	1429	24.7
4	1859	1448	28.4
5	1827	1378	32.6

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1450	27.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2960.

Page 1 of 1 REVIEWED BY: 2024.Jan.19 Stantec Consulting Ltd.





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-2 - Contract 2

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.18 2024.Jan.10 2024.Jan.10 DATE TESTED 10

INSITU MOISTURE 28.8 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Fat CLAY (CH)

DESCRIPTION SUPPLIER

Existing Materials SOURCE Luxton Ave - BH-37 , 0.83 m

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD RETAINED 4.75mm SCREEN

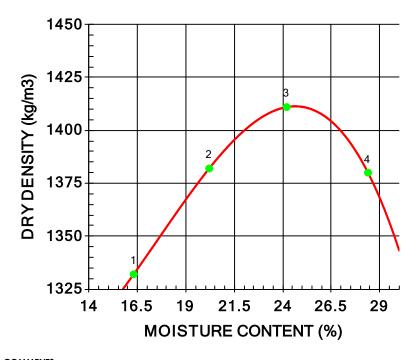
D698

A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1549	1332	16.3
2	1661	1382	20.2
3	1753	1411	24.2
4	1772	1380	28.4

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1410	24.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2961.

Page 1 of 1

2024.Jan.22

Stantec Consulting Ltd.

REVIEWED BY:





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1 CLIENT City of Winnipeg C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-2 - Contract 2

PROCTOR NO. 11 DATE SAMPLED 2024.Jan.10 DATE RECEIVED 2024.Jan.10 DATE TESTED 2024.Jan.19

RETAINED 4.75mm SCREEN

INSITU MOISTURE 29.5 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Fat CLAY (CH)

DESCRIPTION

SUPPLIER Existing Materials

SOURCE Luxton Ave - BH-38, 0.80 m

OMPACTION STANDARD Standard Procti

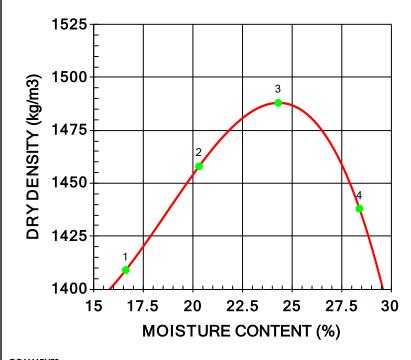
D698

N/A %

COMPACTION PROCEDURE A: 101.6mm Mold,

Passing 4.75mm

RAMMER TYPE Manual PREPARATION Moist OVERSIZE CORRECTION METHOD None



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1643	1409	16.6
2	1754	1458	20.3
3	1849	1488	24.3
4	1846	1438	28.4

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1490	24.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2962.

Page 1 of 1 2024.Jan.22

Stantec Consulting Ltd.

REVIEWED BY:





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-2 - Contract 2

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.10 2024.Jan.10 DATE TESTED 2024.Jan.19 12

INSITU MOISTURE 23.8 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Fat CLAY (CH)

DESCRIPTION SUPPLIER Existing Materials

SOURCE Luxton Ave - BH-39, 0.80 m

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION**

OVERSIZE CORRECTION METHOD RETAINED 4.75mm SCREEN

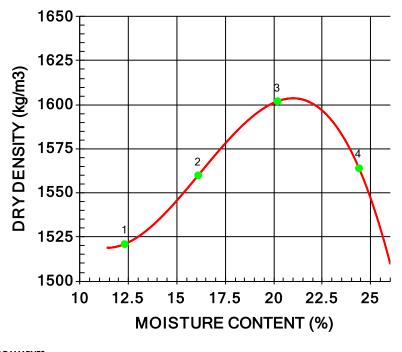
D698

A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1708	1521	12.3
2	1811	1560	16.1
3	1926	1602	20.2
4	1945	1564	24.4

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1600	21.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2963.

Page 1 of 1

2024.Jan.22

Stantec Consulting Ltd.

REVIEWED BY:





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-2 - Contract 2

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.15 2024.Jan.15 DATE TESTED 2024.Jan.25 13

INSITU MOISTURE 19.4 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Subgrade

SIZE

DESCRIPTION

Sandy lean CLAY (CL)

Existing Material SUPPLIER SOURCE Luxton Ave, BH-40, 0.775 m

COMPACTION PROCEDURE

RAMMER TYPE

PREPARATION OVERSIZE CORRECTION METHOD

RETAINED 4.75mm SCREEN

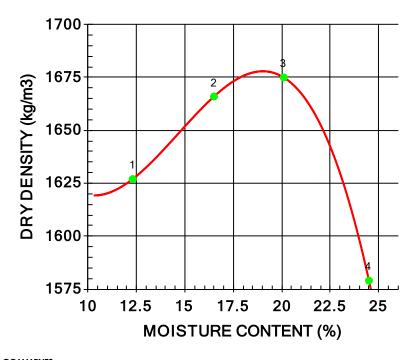
D698

A: 101.6mm Mold,

Passing 4.75mm

Automatic Dry

None N/A %



TRIAL NUMBER	WET DENSITY DRY DENSITY (kg/m³)		MOISTURE CONTENT (%)	
1	1827	1627	12.3	
2	1941	1666	16.5	
3	2012	1675	20.1	
4	1966	1579	24.5	

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1680	19.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample no. 2977.

Page 1 of 1 REVIEWED BY: 2024.Jan.26 Stantec Consulting Ltd.





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-2 - Contract 2

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.16 DATE TESTED 2024.Jan.29 2024.Jan.16

INSITU MOISTURE 35.6 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Subgrade

Lean CLAY (CL) SIZE **DESCRIPTION**

SUPPLIER Existing Materials

SOURCE Alley - BH-41, 0.77 m

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD

RETAINED 4.75mm SCREEN

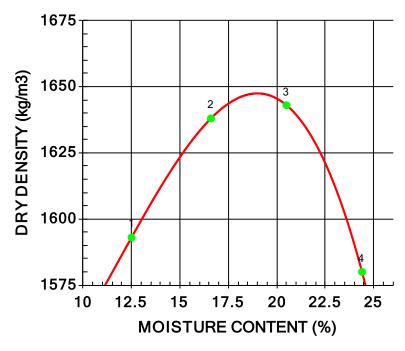
A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

D698

None N/A %



TRIAL NUMBER	WET DENSITY DRY DENSITY (kg/m³) (kg/m³)		MOISTURE CONTENT (%)
1	1792	1593	12.5
2	1910	1638	16.6
3	1980	1643	20.5
4	1965	1580	24.4

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1650	19.0
OVERSIZE CORRECTED		

Stantec Sample No. 2986. Material tested was sampled from above-mentioned location at the backlane of Anderson Ave & St. Johns Ave.

Page 1 of 1 2024.Jan.30

Stantec Consulting Ltd.

REVIEWED BY:





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1 CLIENT City of Winnipeg C.C.

ATTN: Richard Weibel PROJECT 2024 Local Street Renewals Program

PROJECT NO.

123316853-2 - Contract 2

PROCTOR NO. 15 DATE SAMPLED

DATE SAMPLED 2024.Jan.16

DATE RECEIVED

2024.Jan.16

DATE TESTED

2024.Jan.29

INSITU MOISTURE 27.7 %

TESTED BY Pervez Safdar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Subgrade

SIZE Fat CLAY (CH)

DESCRIPTION
SUPPLIER Existing Materials

SOURCE Alley - BH-42, 0.64

COMPACTION STANDARD

COMPACTION PROCEDURE

RAMMER TYPE
PREPARATION
OVERSIZE CORRECTION METHOD

RETAINED 4.75mm SCREEN

Standard Proctor, ASTM

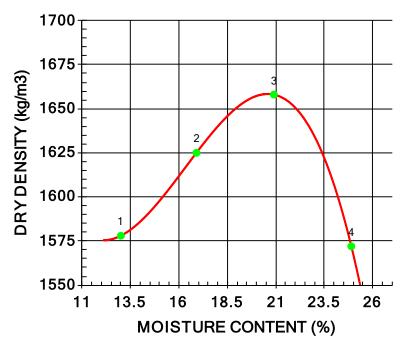
D698

A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None N/A %



WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1783	1578	13.0
1900	1625	16.9
2004	1658	20.9
1963	1572	24.9
	(kg/m³) 1783 1900 2004	(kg/m³) (kg/m³) 1783 1578 1900 1625 2004 1658

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1660	20.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2987. Material tested was sampled from the above-mentioned location at the backlane of Anderson Ave & St. Johns Ave.

Page 1 of 1

2024.Jan.30

Stantec Consulting Ltd.

REVIEWED BY:





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1 CLIENT City of Winnipeg C.C.

ATTN: Richard Weibel PROJECT 2024 Local Street Renewals Program

PROJECT NO.
PROCTOR NO.

123316853-2 - Contract 2

. .

DATE SAMPLED 2024.Jan.16

DATE RECEIVED

2024.Jan.16

DATE TESTED

2024.Jan.30

INSITU MOISTURE 37.8 %

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Subgrade

SIZE

Fat CLAY with sand (CH)

DESCRIPTION

SUPPLIER Existing Materials
SOURCE Alley - BH-43, 0.76 m

COMPACTION STANDARD

COMPACTION PROCEDURE

COMI MEHOITI ROCEBORE

RAMMER TYPE PREPARATION

OVERSIZE CORRECTION METHOD RETAINED 4.75mm SCREEN

Standard Proctor, ASTM

D698

A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None N/A %

1575 1575 1550 1525 14 16.5 19 21.5 24 26.5 29 MOISTURE CONTENT (%)

TRIAL NUMBER	WET DENSITY DRY DENSITY (kg/m³)		MOISTURE CONTENT (%)	
1	1774	1535	15.6	
2	1873	1560	20.1	
3	1943	1572	23.6	
4	1889	1477	27.9	

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1570	23.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2988. The material tested was sampled from the above-mentioned location at the backlane of Anderson Ave & St. Johns Ave.

Page 1 of 1

2024.Jan.31

Stantec Consulting Ltd.

REVIEWED BY:



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg PROJECT 2024 Local Street Renewals

Program - Contract 2

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 1

DATE SAMPLED: 2024.Jan.09 DATE TESTED: 2024.Jan.21 SAMPLED BY: Graeme Patrick SUBMITTED BY: Graeme Patrick TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

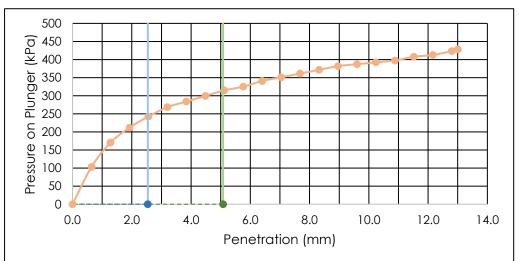
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Fat CLAY (CH) SAMPLE LOCATION BH-16, 0.680 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2956

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1680 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE20.0 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1597 kg/m³ SWELL OF SAMPLE 0.03 % AS-COMPACTED MOISTURE 19.9 % POST-TEST MOISTURE 29.9 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 3.5

CBR VALUE AT 5.08 mm PENETRATION 3.1

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Jan.26

REVIEWED BY Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg

104-1155 Pacific Ave.

Winnipeg, MB

R3E 2P1

ATTN

Richard Weibel

PROJECT

2024 Local Street Renewals

Program - Contract 2

123316853 PROJECT NO.

2 REPORT NO.

DATE SAMPLED: 2024.Jan.15 DATE TESTED: 2024.Feb.02 DATE RECEIVED: 2024.Jan.15 Stantec Consutling Ltd. SUBMITTED BY: Stantec Consutling Ltd. SAMPLED BY: TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION Subgrade **SUPPLIER** Existing Material MATERIAL USE 4.75 mm Existing Material MAX. NOMINAL SIZE **SOURCE** Fat CLAY (CH) BH-17, 0.720 m MATERIAL TYPE SAMPLE LOCATION SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2975 IMMERSION PERIOD 96 ± 2 hr TARGET MAX. DRY DENSITY 1680 kg/m³ Soaked TARGET OPTIMUM MOISTURE 19.5 % CONDITION OF SAMPLE 4.54 kg SURCHARGE MASS 1596 kg/m³ +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 19.5 % **SWELL OF SAMPLE** 2.58 % AS-COMPACTED MOISTURE POST-TEST MOISTURE 28.5 % AS-COMPACTED % COMPACTION 95 % 1000 **CBR VALUE AT 2.54 mm** (kPa) 900 **PENETRATION** 800 3.1 Plunger 700 CBR VALUE AT 5.08 mm 600 **PENETRATION** 500 O 2.8 400 Pressure

COMMENTS

2.0

4.0

6.0

Penetration (mm)

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

8.0

REPORT DATE 2024.Feb.07 REVIEWED BY Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services

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10.0

12.0

14.0



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ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg PROJECT 2024 Local Street Renewals

104-1155 Pacific Ave. Program - Contract 2

Winnipeg, MB

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 3

DATE SAMPLED: 2024.Jan.15 DATE RECEIVED: 2024.Jan.15 DATE TESTED: 2024.Feb.02 SAMPLED BY: Stantec Consutting Ltd. SUBMITTED BY: Stantec Consutting Ltd. TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION Subgrade **SUPPLIER** Existing Material MATERIAL USE 4.75 mm Existing Material MAX. NOMINAL SIZE **SOURCE** Fat CLAY (CH) BH-18, 0.690 m MATERIAL TYPE SAMPLE LOCATION SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2976 IMMERSION PERIOD 96 ± 2 hr TARGET MAX. DRY DENSITY 1510 kg/m³ Soaked TARGET OPTIMUM MOISTURE 25.0 % CONDITION OF SAMPLE 4.54 kg SURCHARGE MASS 1434 kg/m³ +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY **SWELL OF SAMPLE** 4.93 % AS-COMPACTED MOISTURE 25.1 % POST-TEST MOISTURE 41.8 % AS-COMPACTED % COMPACTION 95 % 1000 **CBR VALUE AT 2.54 mm** (kPa) 900 **PENETRATION** 800 1.7 Plunger 700 600 CBR VALUE AT 5.08 mm **PENETRATION** 500 Pressure on 1.4 400 300 200 100 0 0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 Penetration (mm)

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Feb.07

REVIEWED BY Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services

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Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg PROJECT 2024 Local Street Renewals

Program - Contract 2

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 4

DATE SAMPLED: 2024.Jan.09 DATE RECEIVED: 2024.Jan.09 DATE TESTED: 2024.Jan.29 SAMPLED BY: Graeme Patrick TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

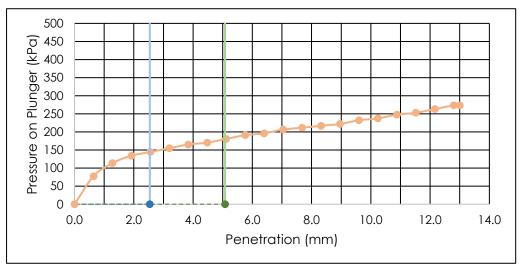
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Fat CLAY (CH) SAMPLE LOCATION BH-19, 0.680 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2957

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1500 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE25.0 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1427 kg/m 3 SWELL OF SAMPLE 0.03 % AS-COMPACTED MOISTURE 24.9 % POST-TEST MOISTURE 33.2 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 2.1

CBR VALUE AT 5.08 mm PENETRATION 1.8

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Feb.03

REVIEWED BY Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg PROJECT 2024 Local Street Renewals

104-1155 Pacific Ave. Program - Contract 2

Winnipeg, MB

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 5

DATE SAMPLED: 2024.Jan.17 DATE TESTED: 2024.Feb.19
SAMPLED BY: Stantec Consutting Ltd. SUBMITTED BY: Stantec Consutting Ltd. TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION Existing Material MATERIAL USE Subgrade **SUPPLIER** MAX. NOMINAL SIZE 4.75 mm Existing Material SOURCE MATERIAL TYPE Fat CLAY (CH) BH-20, 0.800 m SAMPLE LOCATION SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 4025 96 ± 2 hr IMMERSION PERIOD TARGET MAX. DRY DENSITY 1500 kg/m^3 Soaked 24.5 % CONDITION OF SAMPLE TARGET OPTIMUM MOISTURE SURCHARGE MASS 4.54 kg 1424 kg/m^3 +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 24.6 % **SWELL OF SAMPLE** 2.21 % AS-COMPACTED MOISTURE POST-TEST MOISTURE 35.2 % AS-COMPACTED % COMPACTION 95 % 700 **CBR VALUE AT 2.54 mm** Pressure on Plunger (kPa) **PENETRATION** 600 4.2 500 CBR VALUE AT 5.08 mm 400 **PENETRATION** 300 3.3 200 100 0 8.0 0.0 2.0 4.0 6.0 10.0 12.0 14.0 Penetration (mm)

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Feb.26

REVIEWED BY Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services

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ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg **PROJECT** 2024 Local Street Renewals 104-1155 Pacific Ave.

Program - Contract 2

Winnipeg, MB

R3E 2P1 PROJECT NO. 123316853

Richard Weibel ATTN REPORT NO.

DATE SAMPLED: 2024.Jan.17 DATE RECEIVED: 2024.Jan.17 DATE TESTED: 2024.Feb.19 Stantec Consutling Ltd. SUBMITTED BY: Stantec Consutling Ltd. Donald Eliazar SAMPLED BY: TESTED BY:

MATERIAL IDENTIFICATION Existing Material MATERIAL USE Subgrade **SUPPLIER** MAX. NOMINAL SIZE 4.75 mm Existing Material SOURCE MATERIAL TYPE Fat CLAY (CH) BH-22, 0.795 m SAMPLE LOCATION SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 4026 96 ± 2 hr IMMERSION PERIOD TARGET MAX. DRY DENSITY 1440 kg/m³ Soaked 25.5 % CONDITION OF SAMPLE TARGET OPTIMUM MOISTURE SURCHARGE MASS 4.54 kg 1369 kg/m^3 +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 25.4 % **SWELL OF SAMPLE** 3.82 % AS-COMPACTED MOISTURE POST-TEST MOISTURE 44.2 % AS-COMPACTED % COMPACTION 95 % 500 **CBR VALUE AT 2.54 mm** (kPa) 450 **PENETRATION** 400 1.9 Plunger 350 300 CBR VALUE AT 5.08 mm 250 **PENETRATION** 0 1.7 200 Pressure 150 100 50 0 8.0 2.0 4.0 6.0 10.0 12.0 14.0

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

Penetration (mm)

REPORT DATE 2024.Feb.26 **REVIEWED BY** Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services

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Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg **PROJECT** 2024 Local Street Renewals 104-1155 Pacific Ave.

Program - Contract 2

Winnipeg, MB

R3E 2P1 PROJECT NO. 123316853

7 **ATTN** Richard Weibel REPORT NO.

DATE SAMPLED: 2024.Jan.09 DATE RECEIVED: 2024.Jan.09 DATE TESTED: 2024.Jan.29 Graeme Patrick SUBMITTED BY: Graeme Patrick Donald Eliazar **TESTED BY:** SAMPLED BY:

MATERIAL IDENTIFICATION

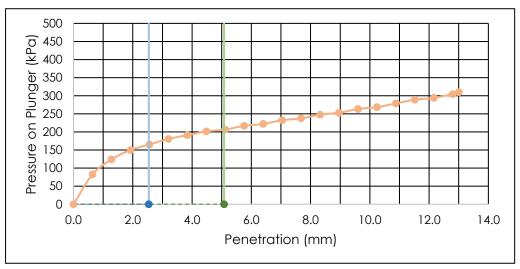
Existing Material MATERIAL USE Subgrade **SUPPLIER** 4.75 mm Existing Material MAX. NOMINAL SIZE **SOURCE** MATERIAL TYPE Fat CLAY (CH) BH-23, 0.690 m SAMPLE LOCATION

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2958

96 ± 2 hr **IMMERSION PERIOD** TARGET MAX. DRY DENSITY 1570 kg/m³ Soaked 23.0 % CONDITION OF SAMPLE TARGET OPTIMUM MOISTURE

SURCHARGE MASS 4.54 kg

 1491 kg/m^3 +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 23.0 % **SWELL OF SAMPLE** 0.04 % AS-COMPACTED MOISTURE POST-TEST MOISTURE 35.8 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 2.4

CBR VALUE AT 5.08 mm **PENETRATION** 2.1

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Feb.03 **REVIEWED BY** Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg **PROJECT** 2024 Local Street Renewals

Program - Contract 2

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

Richard Weibel **ATTN** REPORT NO. 8

DATE SAMPLED: 2024.Jan.09 DATE RECEIVED: 2024.Jan.09 DATE TESTED: 2024.Jan.29 Graeme Patrick SUBMITTED BY: Graeme Patrick Donald Eliazar **TESTED BY:** SAMPLED BY:

MATERIAL IDENTIFICATION

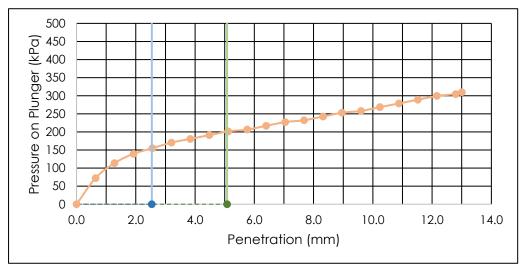
Existing Material MATERIAL USE Subgrade **SUPPLIER** 4.75 mm Existing Material MAX. NOMINAL SIZE **SOURCE** MATERIAL TYPE Fat CLAY (CH) BH-24, 0.630 m SAMPLE LOCATION

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2959

96 ± 2 hr **IMMERSION PERIOD** TARGET MAX. DRY DENSITY 1570 kg/m³ Soaked 23.5 % CONDITION OF SAMPLE TARGET OPTIMUM MOISTURE

SURCHARGE MASS 4.54 kg

 1491 kg/m^3 +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY **SWELL OF SAMPLE** 0.04 % AS-COMPACTED MOISTURE 23.6 % POST-TEST MOISTURE 36.2 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 2.2

CBR VALUE AT 5.08 mm **PENETRATION** 2.0

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Feb.03 **REVIEWED BY** Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg PROJECT 2024 Local Street Renewals

Program - Contract 2

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 9

DATE SAMPLED: 2024.Jan.09 DATE RECEIVED: 2024.Jan.09 DATE TESTED: 2024.Jan.29 SAMPLED BY: Graeme Patrick TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

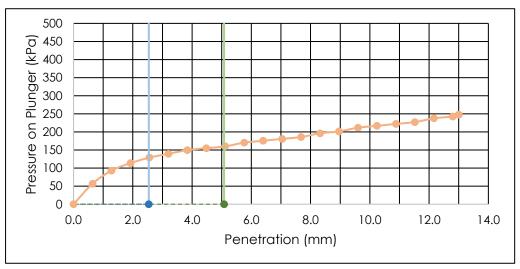
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Fat CLAY (CH) SAMPLE LOCATION BH-36, 0.825 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2960

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1450 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE27.5 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1377 kg/m 3 SWELL OF SAMPLE 0.04 % AS-COMPACTED MOISTURE 27.6 % POST-TEST MOISTURE 39.7 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 1.9

CBR VALUE AT 5.08 mm PENETRATION 1.6

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Feb.03

REVIEWED BY Jason Mompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg PROJECT 2024 Local Street Renewals

Program - Contract 2

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 10

DATE SAMPLED: 2024.Jan.10 DATE RECEIVED: 2024.Jan.10 DATE TESTED: 2024.Jan.25
SAMPLED BY: Graeme Patrick TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

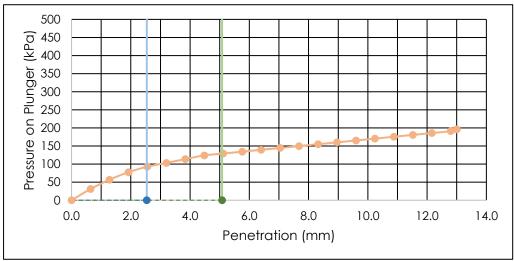
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Fat CLAY (CH) SAMPLE LOCATION BH-37, 0.825 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2961

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1410 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE24.5 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1339 kg/m 3 SWELL OF SAMPLE 0.07 % AS-COMPACTED MOISTURE 24.6 % POST-TEST MOISTURE 48.2 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 1.3

CBR VALUE AT 5.08 mm PENETRATION 1.3

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Jan.30

REVIEWED BY Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg PROJECT 2024 Local Street Renewals

Program - Contract 2

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 11

DATE SAMPLED: 2024.Jan.10 DATE RECEIVED: 2024.Jan.10 DATE TESTED: 2024.Jan.25
SAMPLED BY: Graeme Patrick TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Fat CLAY (CH) SAMPLE LOCATION BH-38, 0.800 m

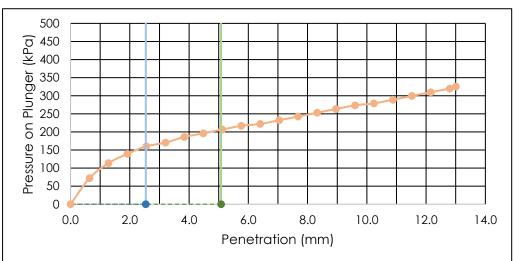
SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2962

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1490 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE24.5 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1414 kg/m³
SWELL OF SAMPLE 0.04 % AS-COMPACTED MOISTURE 24.6 %

POST-TEST MOISTURE 39.3 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 2.3

CBR VALUE AT 5.08 mm PENETRATION 2.1

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Jan.30

REVIEWED BY Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg PROJECT 2024 Local Street Renewals

Program - Contract 2

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 12

DATE SAMPLED: 2024.Jan.10 DATE RECEIVED: 2024.Jan.10 DATE TESTED: 2024.Jan.25
SAMPLED BY: Graeme Patrick TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

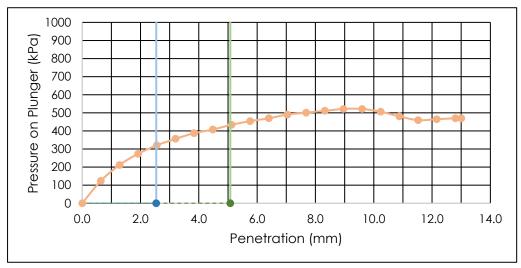
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Fat CLAY (CH) SAMPLE LOCATION BH-39, 0.775 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2963

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1600 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE21.0 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1522 kg/m 3 SWELL OF SAMPLE 0.02 % AS-COMPACTED MOISTURE 20.9 % POST-TEST MOISTURE 24.9 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 4.6

CBR VALUE AT 5.08 mm PENETRATION 4.3

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Jan.30

REVIEWED BY Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg **PROJECT** 2024 Local Street Renewals 104-1155 Pacific Ave.

Program - Contract 2

Winnipeg, MB

R3E 2P1 123316853 PROJECT NO.

Richard Weibel 13 **ATTN** REPORT NO.

DATE SAMPLED: 2024.Jan.15 DATE TESTED: 2024.Feb.02 DATE RECEIVED: 2024.Jan.15 Stantec Consutling Ltd. SUBMITTED BY: Stantec Consulling Ltd. SAMPLED BY: TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION Subgrade Existing Material MATERIAL USE **SUPPLIER** 4.75 mm Existing Material MAX. NOMINAL SIZE **SOURCE** Sandy lean CLAY (CL) BH-40, 0.775 mm MATERIAL TYPE SAMPLE LOCATION SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2977 IMMERSION PERIOD 96 ± 2 hr TARGET MAX. DRY DENSITY 1680 kg/m³ Soaked TARGET OPTIMUM MOISTURE 19.0 % CONDITION OF SAMPLE 4.54 kg SURCHARGE MASS 1597 kg/m³ +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 18.9 % **SWELL OF SAMPLE** 1.37 % AS-COMPACTED MOISTURE POST-TEST MOISTURE 23.2 % AS-COMPACTED % COMPACTION 95 % 1000 **CBR VALUE AT 2.54 mm** (kPa) 900 **PENETRATION** 800 6.4 Plunger 700 600 CBR VALUE AT 5.08 mm **PENETRATION** 500 Pressure on 5.7 400 300 200 100 0

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

8.0

REPORT DATE 2024.Feb.07

0.0

2.0

4.0

6.0

Penetration (mm)

REVIEWED BY Jason Thompson, C.E.T.

14.0

Principal - Manager of 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.

10.0

12.0



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg PROJECT 2024 Local Street Renewals 104-1155 Pacific Ave. Program - Contract 2

Winnipeg, MB

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 14

DATE SAMPLED: 2024.Jan.16

DATE RECEIVED: 2024.Jan.16

DATE TESTED: 2024.Feb.06

SAMPLED RY: Stanted Consulting Ltd. SURMITTED RY: Stanted Consulting Ltd. TESTED RY: Donald Eligazar

Stantec Consutling Ltd. SAMPLED BY: SUBMITTED BY: Stantec Consutling Ltd. TESTED BY: Donald Eliazar MATERIAL IDENTIFICATION Subgrade **SUPPLIER** Existing Material MATERIAL USE 4.75 mm Existing Material MAX. NOMINAL SIZE **SOURCE** Lean CLAY (CL) BH-41, 0.770 m MATERIAL TYPE SAMPLE LOCATION SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2986 IMMERSION PERIOD 96 ± 2 hr TARGET MAX. DRY DENSITY 1650 kg/m³ Soaked TARGET OPTIMUM MOISTURE 19.0 % CONDITION OF SAMPLE 4.54 kg SURCHARGE MASS 1569 kg/m³ +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 18.9 % **SWELL OF SAMPLE** 2.58 % AS-COMPACTED MOISTURE POST-TEST MOISTURE 27.4 % AS-COMPACTED % COMPACTION 95 % 1000 **CBR VALUE AT 2.54 mm** (kPa) 900 **PENETRATION** 800 3.1 Plunger 700 600 CBR VALUE AT 5.08 mm **PENETRATION** 500 O 2.9 400 Pressure 300 200 100 0 0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

Penetration (mm)

REPORT DATE 2024.Feb.12

REVIEWED BY Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services

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ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg **PROJECT** 2024 Local Street Renewals

104-1155 Pacific Ave. Program - Contract 2

Winnipeg, MB

R3E 2P1 123316853 PROJECT NO.

Richard Weibel 15 **ATTN** REPORT NO.

DATE SAMPLED: 2024.Jan.16 DATE TESTED: 2024.Feb.06 DATE RECEIVED: 2024.Jan.16 Stantec Consutling Ltd.

Donald Eliazar SAMPLED BY: SUBMITTED BY: Stantec Consutling Ltd. TESTED BY: MATERIAL IDENTIFICATION Subgrade **SUPPLIER** Existing Material MATERIAL USE 4.75 mm Existing Material MAX. NOMINAL SIZE **SOURCE** Fat CLAY (CH) BH-42, 0.635 m MATERIAL TYPE SAMPLE LOCATION SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2987 IMMERSION PERIOD 96 ± 2 hr TARGET MAX. DRY DENSITY 1660 kg/m³ Soaked TARGET OPTIMUM MOISTURE 20.5 % CONDITION OF SAMPLE 4.54 kg SURCHARGE MASS 1577 kg/m³ +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY **SWELL OF SAMPLE** 1.91 % AS-COMPACTED MOISTURE 20.4 % POST-TEST MOISTURE 25.5 % AS-COMPACTED % COMPACTION 95 % 1000 **CBR VALUE AT 2.54 mm** (kPa) 900 **PENETRATION** 800 4.3 Plunger 700 600 CBR VALUE AT 5.08 mm **PENETRATION** 500 O 3.9 400 Pressure 300 200 100 0 0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 Penetration (mm)

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Feb.12 REVIEWED BY Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services

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ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg **PROJECT** 2024 Local Street Renewals Program - Contract 2

104-1155 Pacific Ave. Winnipeg, MB

R3E 2P1 123316853 PROJECT NO.

Richard Weibel **ATTN** REPORT NO. 16

DATE SAMPLED: 2024.Jan.16 DATE TESTED: 2024.Feb.06 DATE RECEIVED: 2024.Jan.16

Stantec Consutling Ltd. SUBMITTED BY: Stantec Consulling Ltd. SAMPLED BY: TESTED BY: Donald Eliazar MATERIAL IDENTIFICATION Subgrade Existing Material MATERIAL USE **SUPPLIER** 4.75 mm Existing Material MAX. NOMINAL SIZE **SOURCE** Fat CLAY with sand (CH) BH-43, 0.760 m MATERIAL TYPE SAMPLE LOCATION SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2988 IMMERSION PERIOD 96 ± 2 hr TARGET MAX. DRY DENSITY 1570 kg/m³ Soaked TARGET OPTIMUM MOISTURE 23.0 % CONDITION OF SAMPLE 4.54 kg SURCHARGE MASS +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1491 kg/m³ **SWELL OF SAMPLE** 2.83 % AS-COMPACTED MOISTURE 23.0 % POST-TEST MOISTURE 26.6 % AS-COMPACTED % COMPACTION 95 % 1000 **CBR VALUE AT 2.54 mm** (kPa) 900 **PENETRATION** 800 4.3 Plunger 700 600 CBR VALUE AT 5.08 mm **PENETRATION** 500 O 3.9 400 Pressure 300 200 100 0 0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

Penetration (mm)

REPORT DATE 2024.Feb.12 **REVIEWED BY** Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services

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Table 1 - Compressive Strength Test Data

Street	Core	Diameter	Length	L/D Correction			Peak Load	•	ressive h (MPa)
	ID	(mm)	(mm)	Ratio	Factor	(kN)	Measured	Corrected	
Lansdowne Ave	BH-25	100.44	177.78	1.770	0.9816	533	67.27	66.03	
Lansdowne Ave	BH-27	100.46	135.91	1.353	0.9424	382.13	48.21	45.43	
Cochrane St	BH-29	100.45	154.45	1.538	0.9630	408.59	51.56	49.65	
Cochrane St	BH-30	100.40	184.09	1.834	0.9867	347.48	43.89	43.31	
Cochrane St	BH-31	76.50	164.99	2.157	1.0000	209.1	45.49	45.49	
McAdam Ave	BH-32	76.66	187.91	2.451	1.0000	297.17	64.38	64.38	
McAdam Ave	BH-33	76.44	161.43	2.112	1.0000	314.92	68.62	68.62	
McAdam Ave	BH-34	100.70	165.63	1.645	0.9716	423.85	53.22	51.71	
McAdam Ave	BH-35	76.54	165.02	2.156	1.0000	262.43	57.04	57.04	

TABLE - California Bearing Ratio (CBR) for Asphalt Pavement Reconstructions

Reference Standard Construction Specifications:

- (a) CW 3130, Clause 3.5 Supply and Installation of Geotextile Fabrics
- (b) CW 3135, Clause 3.3 Supply and Installation of Geogrid

Asphalt Pavement Reconstructions	CBR*
St. Johns Avenue/Anderson Avenue Alley from Main Street to Fowler Street	3.9
Charles Street from Church Avenue to Machray Avenue	2.7
Church Avenue from Charles Street to Main Street	2.3
Luxton Avenue from St. Cross Street to End	1.8
Machray Avenue from Aikins Street to Main Street	2.6

^{*} CBR for calculating overlap of Geotextile Fabric rolls and Geogrid rolls.