Template Version: eC2023 07 27 - Const Road Works

APPENDIX 'A' - GEOTECHNICAL REPORT

GEOTECHNICAL REPORT FOR:

- I. Weatherdon Avenue from Stafford Street to Arbuthnot Street
- II. Overton Street from Blenheim Avenue to Harrowby Avenue
- III. Dunraven Avenue from St. Mary's Road to Overton Street
- IV. Blenheim Avenue from St. Anne's Road to Des Meurons Street

PAVEMENT CORES FOR:

I. Sadler Avenue from St. Anne's Road to East End

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 21, 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 4)

Stantec Consulting Ltd. (Stantec) was retained to undertake a factual geotechnical investigation for the 2024 Local Street Renewals Program (Contract 4) 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, which resulted in borehole depths ranging from 2.1 m to 2.2 m below the surface. 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 4)

EXISTING PAVEMENT THICKNESS

The existing pavement thickness is provided in the following table:

Table 1 - Existing Pavement Thickness

Street	Street Core ID Asphalt Thickness (mm)		Concrete Thickness (mm)	Total Pavement Thickness (mm)					
Dunraven Ave	63	0	165	165					
Dunraven Ave	64	0	140	140					
Dunraven Ave	65	0	150	150					
Overton St	Overton St 66 0		150	150					
Overton St	67	0	140	140					
Overton St	68	0	150	150					
Blenheim Ave	69	95	160	255					
Blenheim Ave	70	55	150	205					
Blenheim Ave	71	45	155	200					
Blenheim Ave	72	30	170	200					
Weatherdon Ave	73	60	165	225					
Weatherdon Ave	74	140	85	225					
Weatherdon Ave	75	70	180	250					
Weatherdon Ave	76	120	0	120					
Weatherdon Ave	77	140	0	140					

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**.

February 21, 2024 Richard Weibel Page 3 of 3

Reference: 2024 Local Street Renewals Program (Contract 4)

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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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.

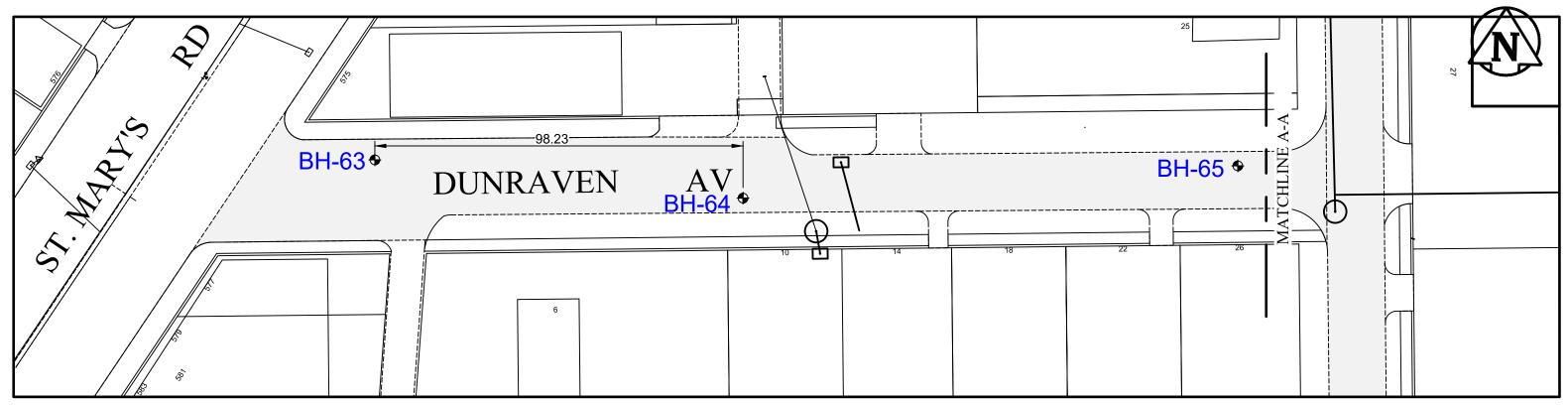
VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments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



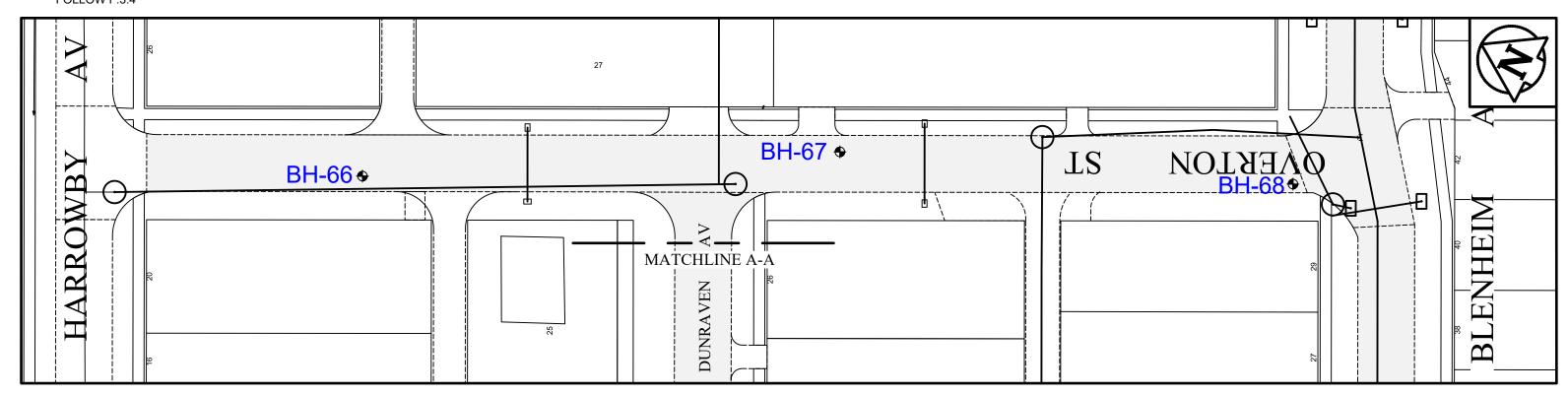
APPENDIX B

Borehole Location Plan

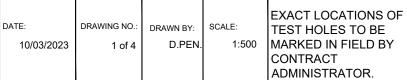


NOTE:

- ALL FULL DEPTH GEOTECHNICAL CORES (2.0m). FOLLOW F.3.4

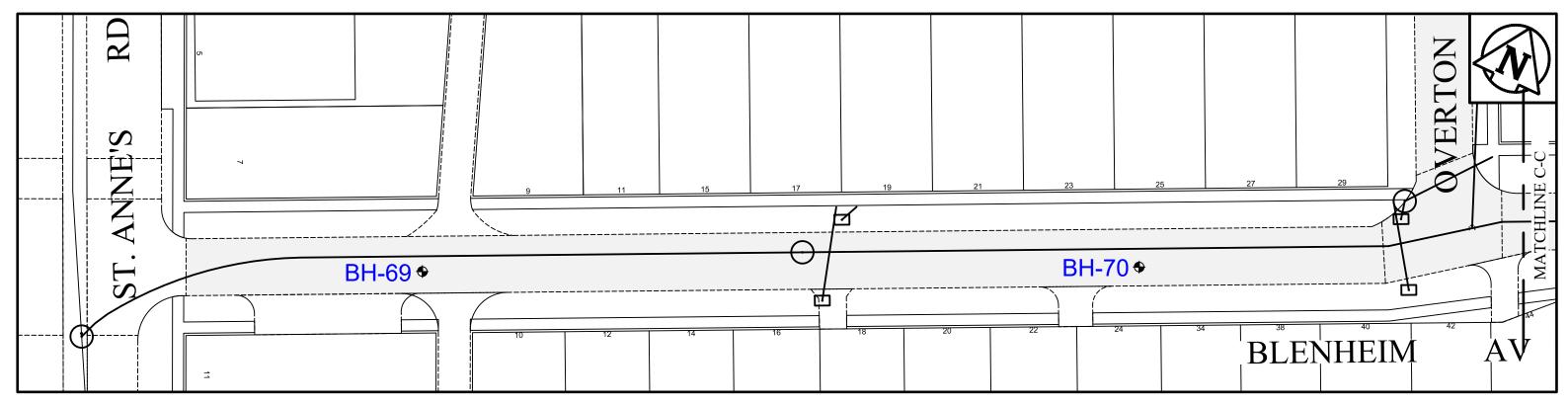


TESTHOLE ◆



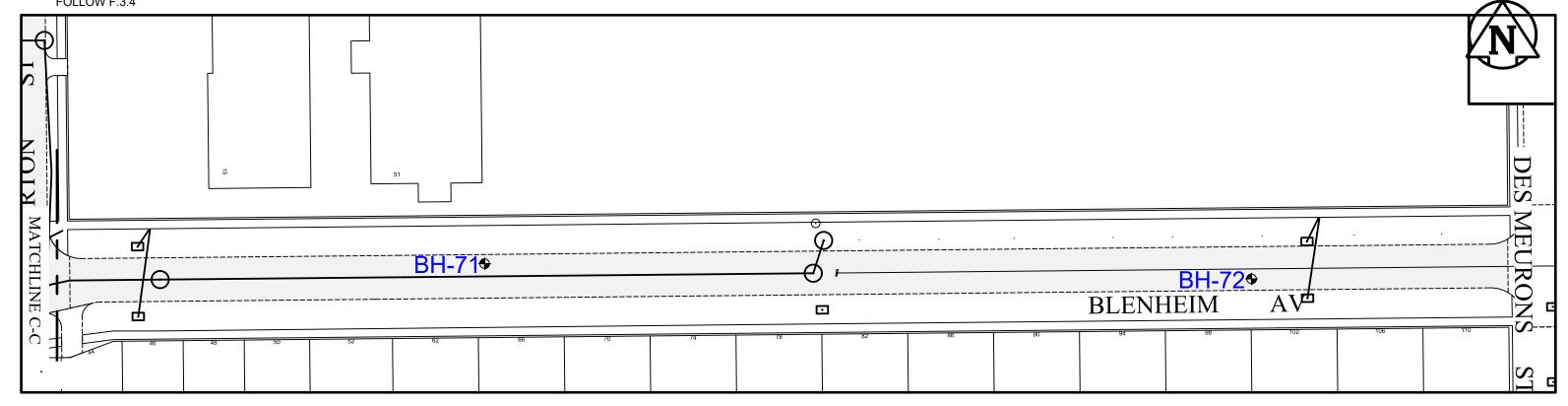
2024 LOCAL STREET RENEWAL PROGRAM CORING DRAWING - CONTRACT 4

DUNRAVEN AV FROM ST.MARY'S TO OVERTON ST - RECONSTRUCTION **OVERTON ST** FROM HARROWBY AV TO BLENHEIM AV - RECONSTRUCTION



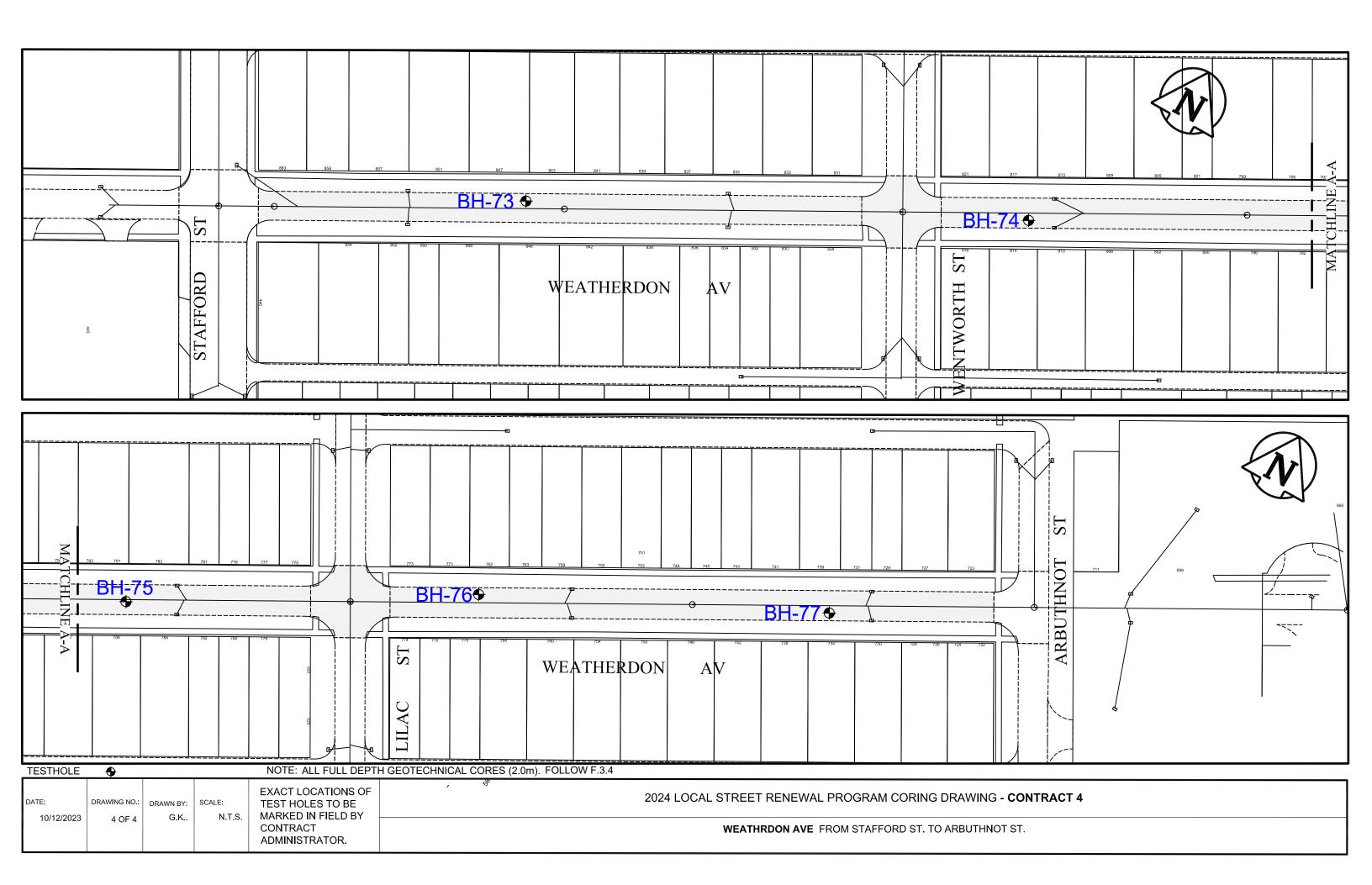
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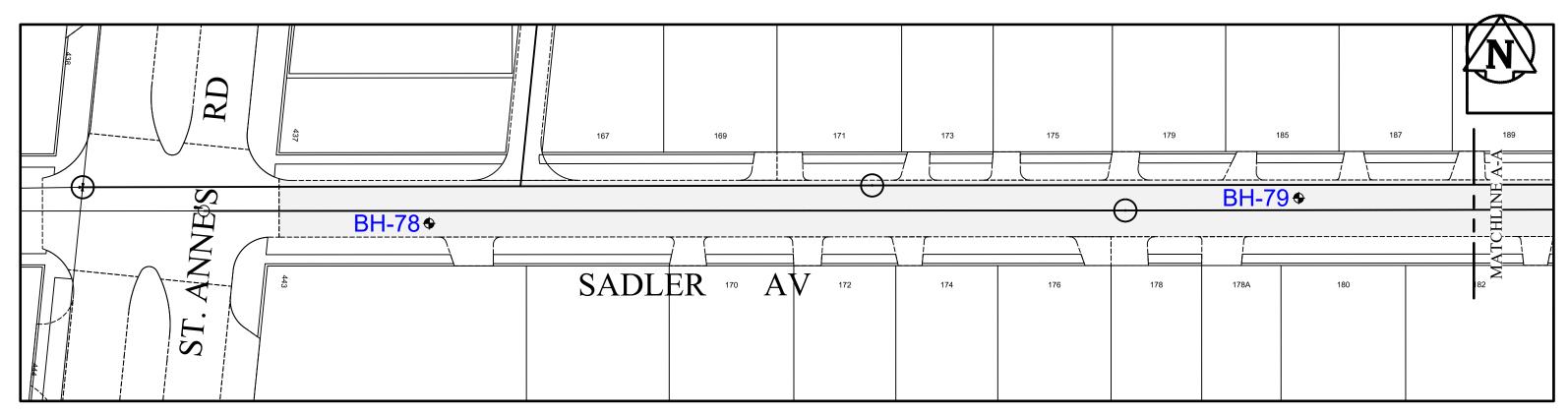
- ALL FULL DEPTH GEOTECHNICAL CORES (2.0m). FOLLOW F.3.4



TESTHOLE ◆

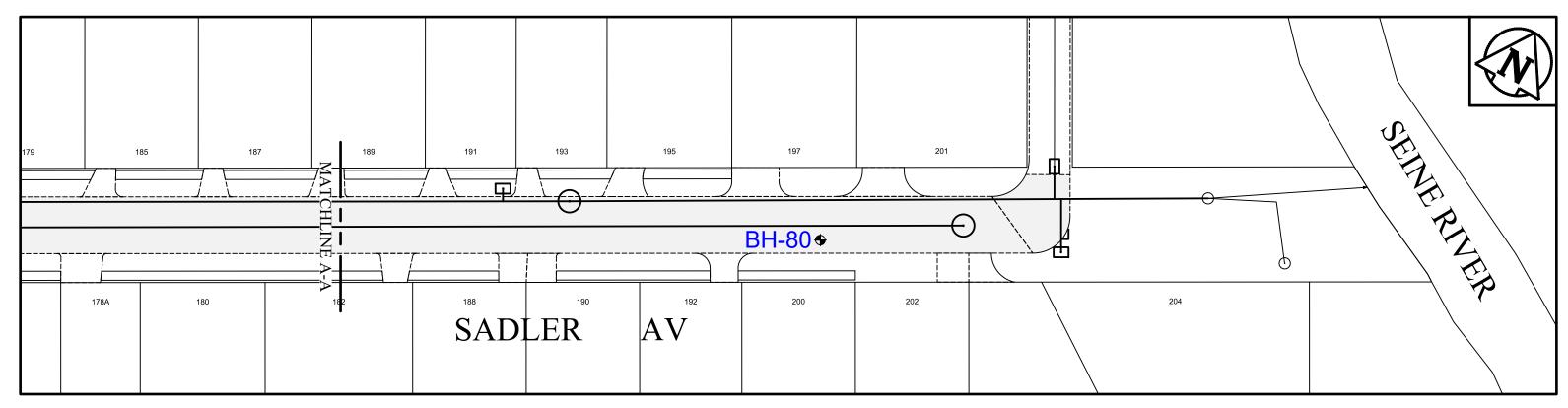
DATE: 10/03/2023	DRAWING NO.:	DRAWN BY:	EXACT LOCATIONS OF TEST HOLES TO BE MARKED IN FIELD BY	2024 LOCAL STREET RENEWAL PROGRAM CORING DRAWING - CONTRACT 4
10/03/2023	2 of 4	D.PEN.	CONTRACT ADMINISTRATOR.	BLENHEIM AV FROM ST.ANNES RD TO DES MEURONS ST - RECONSTRUCTION





NOTE:

- DRILL PAVEMENT CORE ONLY EACH TEST HOLE LOCATION. FOLLOW F.3.5



TESTHOLE ◆

ΓE:	DRAWING NO.:	DRAWN BY:	SCALE:	EXACT LOCATIONS OF TEST HOLES TO BE
10/05/2023	3 of 4	D.PEN.	1:500	MARKED IN FIELD BY
				CONTRACT ADMINISTRATOR

2024 LOCAL STREET RENEWAL PROGRAM CORING DRAWING - CONTRACT 4

SADLER AV FROM ST.ANNES RD TO EAST 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	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
, o	Falling head permeability test using casing
	Falling head permeability test using well point or piezometer



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PF	IENT ROJEC	City of Winnipeg CT: 2024 Local Street Renew	als						\ D - -								BH	l EL	.EV	OITA	N:	23316 N/A	85
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DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER		N-VALUE or RQD %	OTHER TESTS / REMARKS	▲ l ★ F	ABO	ORAT CKET 50 R CO	FOR PEN kPa H	Y TE: IETR ENT & BLO	ST OME 100 & AT	ETER) kPa	R a BER	◆ FIE □ PC 15	ELD V OCKE 50 kP	VAN ET SI Pa	HEAR \ 200	/ANE kPa 	BACKFILL	
0 -	Servet-hydro at 0.9 m Serv																						
CLIENT: City of Winnipeg PROJECT: 2024 Local Street Renewals LOCATION: Blenheim Avenue DATE BORED: January 09 2024 SAMPLES SOIL DESCRIPTION (MUSCs) SOIL DESCRIPTION (MUSCs) SOIL DESCRIPTION (MUSCs) ASPHALT CONCRETE Firm black fat CLAY (CH) Soft tan lean CLAY (CL) - sarrdy Firm brown fat CLAY (CH) Firm brown fat CLAY (CH) PROJECT NO.: 123316 BH ELEVATION: N/A DATUM: N/A WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, CU (KPa) A LASCRATION: TEST A PIELD VANE TEST PROJECT PREVENTEMETER OPPOCKET SHEAR VANE SOIL DESCRIPTION (MUSCs) TAS AS AS AS AS AS AS AS AS A																							
CLIENT: City of Winnipeg PROJECT: 2024 Local Street Renewals LOCATION: Blenheim Avenue DATE BORED: January 09 2024 SAMPLES SOIL DESCRIPTION (MUSCS) SOIL DESCRIPTION (MUSCS) SOIL DESCRIPTION (MUSCS) SOIL DESCRIPTION (MUSCS) ASPHALT CONCRETE Firm black fat CLAY (CH) Solf tan lean CLAY (CL) Sandy Solf tan lean CLAY (CL) Sandy Solf tan lean CLAY (CL) Sandy Firm brown fat CLAY (CH) PROJECT NO: 12331 BH ELEVATION: N DATUM: N/A WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (IPP) A LABGRATORY TEST PROJECT PROTECTION CU (IPP) A LABGRATORY TEST PROJECT SHEAR VANE SOLF SHEAR VANE S																							
-		Firm black fat CLAY (CH)																					XXXX
CLIENT: City of Winnipeg PROJECT NO: 123 PROJECT NO: DATUM: NA DATE BORED: January 09 2024 WATER LEVEL: NA UDCRAFROS SERAR STRENGTH; QUICKN SOIL DESCRIPTION (MUSCS) SOIL DESCRIPTION (MUSCS) SOIL DESCRIPTION (MUSCS) THE TESTS REMARKS THE Diack flat CLAY (CH) ASPHALT CONGRETE Firm black flat CLAY (CH) Soft tan lean CLAY (CH) Soft tan lean CLAY (CH) Firm brown flat CLAY (CH) Soft tan lean CLAY (CH) Firm brown flat CLAY (CH) Soft tan lean CLAY (CH) Firm brown flat CLAY (CH) Soft tan lean CLAY (CH) Soft		****																					
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1 –			City of Winnipeg 2024 Local Street Renewals Blenheim Avenue 30: January 09 2024 WATER LEVEL: NA WATER L		X																		
-		City of Winnipeg 2024 Local Street Renewals 3 BH ELEVATION: 1233 BH ELEVATION: 10 ATUM: NIA WATER LEVEL: NIA UNDRAWNED SHEAR STRENGTH, Cu (NPa) A LABORATORY TEST FIELD VANE TEST Could Plan 100 NPa		X																			
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-		City of Winnipeg T: 2024 Local Street Renewals DRED: Blanheim Avenue SOIL DESCRIPTION (MUSCs) SOIL DESCRIPTION (MUSCs) SOIL DESCRIPTION (MUSCs) ASPHALT CONCRETE Firm black fat CLAY (CH) Soft tan lean CLAY (CL) - sandy Soft tan lean CLAY (CL) - sandy Firm brown fat CLAY (CH) PROJECT NO: 1233 BH ELEVATION: _NA WATER LEVEL: N/A UNDRANCE SHEAR STRENSTH, Cu (kPa) ALABORATORY TEST		X																			
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PROJECT: 2024 Local Street Renewals DATE BORED: January 09 2024 WATER LEVEL: N/A WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (IP ³) A LABORATORY TEST PARTENDENT PROPOSED SHEAR VANE 50 IP ³ 100 IR ³ 150 IP ³ 200 IP ³ WATER CONTENT & ATTERBERG LIMITS VP W W W STEPL VANE 50 IP ³ 100 IR ³ 150 IR ³ 200 IP ³ WATER CONTENT & ATTERBERG LIMITS VP W W W STEPL VANE 50 IP ³ 100 IR ³ 150 IR ³ 200 IP ³ WATER CONTENT & ATTERBERG LIMITS VP W W W STEPL VANE 50 IP ³ 100 IR ³ 150 IR ³ 200 IP ³ WATER CONTENT & ATTERBERG LIMITS VP W W W STEPL VANE 50 IP ³ 100 IR ³ 150 IR ³ 200 IP ³ WATER CONTENT & ATTERBERG LIMITS VP W W W STEPL VANE 50 IP ³ 150 IR ³ 150		X																					
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PF	IENT:	Stantec City of Winnipeg CT: 2024 Local Street Renew ON: Blenheim Avenue	als						- -					ВН	ELE\	/ATIO	N:	2331685 N/A
		ORED: January 16 2024							– WA	ATER	LEVEL	.: N	I/A	DA	I UIVI.		`	
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		 Borehole backfilled with auger cutting 	ghing wa s and be	entonit	e chip	s.	PROJECT NO: 1233 BH ELEVATION:											
3 -		Borehole surface backfilled as per Cit	y of Win	nipeg	Stree	t Cuts	: Manu	ai.										
					PROJECT NO.: 12 BH ELEVATION: DATUM: N/A WATER LEVEL: N/A WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (kPa) A LABORATORY TEST PROCKET SHEAR VANE SO (kPa) 100 kPa 150 kPa 200 kPa WATER CONTENT & ATTERBERG LIMITS POCKET SHEAR VANE SO (kPa) 100 kPa 150 kPa 200 kPa WATER CONTENT & ATTERBERG LIMITS WATER CONTENT & ATTERBERG LIMI													
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PR	IENT:	City of Winnipeg 2024 Local Street Renewa	als					OLE RECO	- - -							BH	ELE	EVA	MOIT	1:	N/A
		ON: Blenheim Avenue ORED: January 16 2024								ΔТΕ	=D I	E\/E	:I ·	NI//		DA	ATUN	Л: <u> </u>	N/A	<u> </u>	
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (mm) FI or TCR %	N-VALUE or RQD %	OTHER TESTS / REMARKS	PROJECT NO.:	BACKFILL											
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-		Firm black fat CLAY (CH)																			
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2 - - -				X AS												0::::					
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	/FII I	SYMBOL ASPHALT	GR	OLIT	<u> </u>	CON	ICRE	TE Drilling Meth	hod.	12	 5 mr	n SS	SA								ed By:

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0 -		ASDHAI T		PROJECT NO: 1233168 BH ELEVATION: N/A DATUM: N/A WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (kPa) A LABORATORY TEST POCKET FENETROMETER D POCKET SHEAR VANE 50 kPa 100 kPa 150 kPa 200 kPa WATER CONTENT & ATTERBERG LIMITS Wp W WL X SPT (N-value) BLOWS/0.3m Water CONTENT & ATTERBERG LIMITS Wp W WL X SPT (N-value) BLOWS/0.3m Note Content (s) small time content 10 20 30 40 50 60 70 80 A AS 1																		
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ł		Firm black fat CLAY (CH)	PROJECT NO.: 1233168 BH ELEVATION: N/A DATUM: N/A WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (kPa) A LABORATORY TEST * FIELD VANE TEST * POCKET PENETROMETER DO KPa 150 KPa 200																			
-		City of Winnipag PROJECT NO. 2024 Local Street Renewals BH ELEVATION. DATUM: NA WATER LEVEL: NIA WATER LEVEL: NIA WATER LEVEL: NIA WATER CONTENT & ATTERBERG LIMITS (I) (Ps) WATER CONTENT &																				
1 -		Soft tan lean CLAY (CL)						0% 2% 23% 13%			PROJECT NO.:1233' BH ELEVATION:N DATUM:N/A FER LEVEL:N/A AINED SHEAR STRENGTH, Cu (kPa) SORATORY TEST	\otimes										
- - -		- sandy	Renewals PROJECT NO: 123 BH ELEVATION: DATUM: N/A																			
- - - 2 -		Firm brown fat CLAY (CH)	AT (CH) As a lated at a depth of 2.200 m. seepage or soil sloogings was observed during or upon completion of drilling. AT (CH) AS CONCRETE BY CONCRETE Drilling Method: 125 ma SSA PROJECT NO: 123. BH LELYATION: DATUM: N/A WATER LEVEI: N/A WATER LEVEI: N/A WATER LEVEI: N/A WATER CONTENTS A THERBERG LIMITS V. W. W. V.																			
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3 -		No groundwater seepage or soil sloug Borehole backfilled with auger cutting	hing wa	entonit	e chip	S.	BH ELEVATION: DATUM: N/A WATER LEVEL: N/A UNDRAINED SHEAR STRENGTH, Cu (I/Pa) A LABORATORY TEST															
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PF	IENT ROJEC	Stantec :City of Winnipeg CT:2024 Local Street Renew	als					OLE RECOI	KU - -					Bl	H ELE	VATION	1 :	BH- 233168: N/A
		ON: Weatherdon Avenue							_ \	TED	· -		. 1/4		ATUM:	N/A	١	
DEPTH (m)	ELEVATION (m)	ORED: January 09 2024 SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (mm)	N-VALUE or RQD %	OTHER TESTS / REMARKS	UND ▲ L ⁴ ★ PO	BORAT DCKET 50	O SHE FORY PENE kPa	AR STI TEST TROM 10 T & AT	RENGT ETER 00 kPa	ΓH, Cu (◆ FII	ELD VAI DCKET S 50 kPa HITS			BACKFILL
		ASPHALT CONCRETE Soft tan lean CLAY (CL) - some sand		AS				Sieve/Hydro at 0.8 m G S M C 0% 10% 74% 16%		0 2 	0		40	50		70 8	60	
- 2		Firm brown fat CLAY (CH)		AS AS							3							
3 -		End of Borehole Borehole terminated at a depth of 2.4t No 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.			rilling.									
4 _	KFILL	SYMBOL ASPHALT	∭GR	OUT		CON SLOI	ICRE	Drilling Cont		: Pa			ing Ltd	<u>d.</u>				By: Gl

	IENT	Stantec City of Winnipeg CT: 2024 Local Street Renew	als						עט - -		PROJECT BH ELEVA ⁻		
LC	CATI	ON: Weatherdon Avenue							_		DATUM: _	N/A	
DA	ATE B	ORED: January 09 2024							_ WATER	RLEVEL: N/A			
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-		AUTIALI											-
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-	ł	- brown below 2.1 m											XXX
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-		End of Borehole • Borehole terminated at a depth of 2.4 • No groundwater seepage or soil slouge	ahina wa	s obse	erved	during	or up	oon completion of dr	illing.	:::::::::::::::::::::::::::::::::::::::	:+:;;;!;;;;!;	;;; ;;; [*****
-		Borehole backfilled with auger cutting Borehole surface backfilled as per Cit	s and be	entonit	e chip	S.			-				İ
			- "	, 3	SAMPLES AS Sievel Hydro at 10.8 m Sieve			Ī					
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$D \cap C$						SLOU						1	

PF	IENT:	Stantec City of Winnipeg CT:2024 Local Street Renew	vals					OLE RECOI	- -						В	H EL	EVAT	NO.: _	N/A	85
		ON: Weatherdon Avenue ORED: January 09 2024							_ \	ATER		\		1/ A	D	ATUI	M:	N/A		_
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	(m	N-VALUE or RQD %	OTHER TESTS / REMARKS	UNI	DRAINE ABOR POCKE 5	ED S ATO T PE 0 kP	SHEAF RY TE ENETF 'a	R STREST ROME 100	ENGT TER kPa	□ P(ELD V OCKE 50 kPa		EST AR VANE 200 kPa W WL	ACKFIL	
						REC			XS	SPT (N-	value		Nater Con	itent (%) ai	nd Blow Co	unt 60	70	8 0		
0 -		ASPHALT CONCRETE Stiff block fot CLAY(CH)								10	20	30) 4	10	50	60	70	00		
		Stiff black fat CLAY (CH) - brown below 0.6 m																		
1 -				AS				Sieve/Hydro at 0.9 m G S M C 0% 3% 37% 60%				6	/							
				AS									\	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \						*******
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₹ΔCI	KFILL	SYMBOL ASPHALT NITE DRILL CUTTINGS	GR SA		$\cdot_{\!\scriptscriptstyle D}$	CON SLOI	CRE	TE Drilling Meth	nod:	125 ו	mm	SSA						Revie	wed By:	,

CLIENT: City of Winnipeg PROJECT: 2024 Local Street Renewals									_ PROJEC								CT NO.: _12			
LC	CATI	ON: Weatherdon Avenue							_					D	ATUM	1: N /	Α			
DA	ATE B	ORED: <u>January 09 2024</u>							_				N/A							
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (mm) TO SO OT TOR NO.	N-VALUE or RQD %	OTHER TESTS / REMARKS	▲ L ★ F	ABORA FOCKE 50	ATORY T PENI 0 kPa 	TEST ETRON 1 NT & A BLOWS	METER 00 kPa	◆ FI □ Pi 1 ERG LII	IELD V/OCKET 50 kPa			BACKFILL		
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- - -		Stiff black fat CLAY (CH)																		
- - -		Soft tan lean CLAY (CL)		AS				Sieve/Hydro at 0.7 m G S M C 0% 6% 66% 28%		•	/	/								
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-		Firm brown fat CLAY (CH)		AS									٥							
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- - -		End of Borehole Borehole terminated at a depth of 2.4 No groundwater seepage or soil sloug Borehole backfilled with auger cutting Borehole surface pa	ghing wa	s obsentonit	erved e chip	during s.	g or up	oon completion of dr	illing.											
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BAC:	\land \vdash ILL	SYMBOL ASPHALT NITE DRILL CUTTINGS	GR	OU I	:iz	CON SLO	10KE	IE Dilling Mett	ισα.	1201	11111 3	-UM					CAICME	ou by.		

Stantec CLIENT: City of Winnipeg PROJECT: 2024 Local Street Renewals LOCATION: Weatherdon Avenue									KU - -	PROJEC							.EV	ATIO	BH-7 23316853 N/A		
		ORED: January 09 2024							_ _ w	ATE	RL	EVE	L: _	N/A	4	יט	110	IVI	14/7	`	
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	RECOVERY (mm) FI or TCR %	N-VALUE or RQD %	OTHER TESTS / REMARKS	▲ L ★ F	ABO	RATO 50 k 50 k CON N-valu	ORY TENET	TEST TROM 1 T & A	METE 00 kF	ER Pa RBEF n (%) and	PC 15	ELD \ DCKE 50 kP	VANE ET SH a	200 V _P W	VANE) kPa 	BACKFILL
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-		Stiff black fat CLAY (CH)		As				Sieve/Hydro at 0.7 m G S M C 0% 2% 19% 80%					Ġ								
1 -				Ä AS										0							
- 2 - - -				X as																	
3 -		End of Borehole Borehole terminated at a depth of 2.40 No groundwater seepage or soil slougl Borehole backfilled with auger cuttings Borehole surface pa	ning wa	s obse	erved e chip	durinç	g or up	on completion of dr	rilling.												
4	(FII I	SYMBOL ASPHALT	∐GR	OUT		lco _N	ICRE	Drilling Con				dock n SS	Dril	ling	Ltd.					oggeo	I By: Gi

APPENDIX D

Core Photographs





Figure 1 – Core No. 63 (Dunraven Ave)





Figure 3 – Core No. 65 (Dunraven Ave)



Figure 4 – Core No. 66 (Overton St)





Figure 5 – Core No. 67 (Overton St)



Figure 6 – Core No. 68 (Overton St)



Figure 7 – Core No. 69 (Blenheim Ave)



Figure 8 – Core No. 70 (Blenheim Ave)





Figure 9 – Core No. 71 (Blenheim Ave)



Figure 11 – Core No. 73 (Weatherdon Ave)



Figure 10 – Core No. 72 (Blenheim Ave)



Figure 12 – Core No. 74 (Weatherdon Ave)





Figure 13 – Core No. 75 (Weatherdon Ave)



Figure 15 – Core No. 77 (Weatherdon Ave)



Figure 14 – Core No. 76 (Weatherdon Ave)



Figure 16 - Core No. 78 (Sadler Ave)





Figure 17 – Core No. 79 (Sadler Ave)



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

PROJECT NO.

123316853

ATTN

R3E 3P1

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.09

DATE RECEIVED: 2024.Jan.09

MC (%)

DATE TESTED: 2024.Jan.19

SAMPLED BY:

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Carson Cockwell TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID

BH-63, 765 mm

2946 STANTEC SAMPLE NO.

2

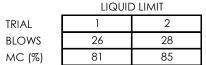
1

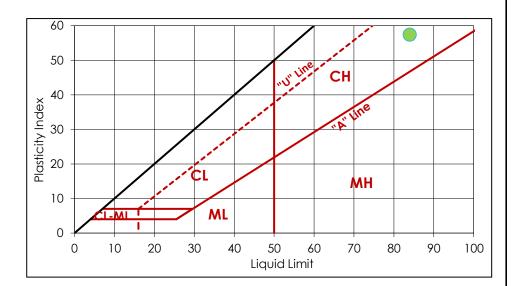
PLASTIC LIMIT **TRIAL**

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

AS REC'D MC (%)

27 57 38.40





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.16

DATE RECEIVED: 2024.Jan.16

DATE TESTED: 2024.Jan.31

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-64, 740 mm

STANTEC SAMPLE NO. 2989

LIQUID LIMIT

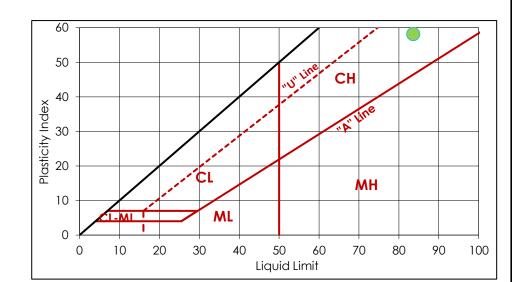
TRIAL BLOWS MC (%)

LIQUID LIMIT				
1	2			
26	25			
88	79			



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

84	1
25	1
58]
37.40	1



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

ATTN

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.09

SAMPLED BY:

Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.09

DATE TESTED: 2024.Jan.19

TRIAL

MC (%)

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Carson Cockwell

MATERIAL IDENTIFICATION

CLIENT FIELD ID

BH-65, 750 mm

2947 STANTEC SAMPLE NO.

3

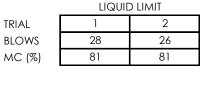
PLASTIC LIMIT

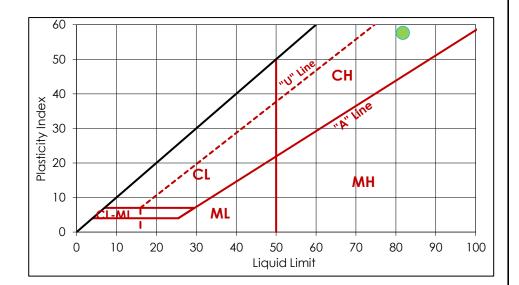
2

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

AS REC'D MC (%)

24 58 32.60





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:

TRIAL

BLOWS

MC (%)

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.16

LIQUID LIMIT

Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.16

DATE TESTED: 2024.Jan.30

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-66, 750 mm

22

78

2990 STANTEC SAMPLE NO.

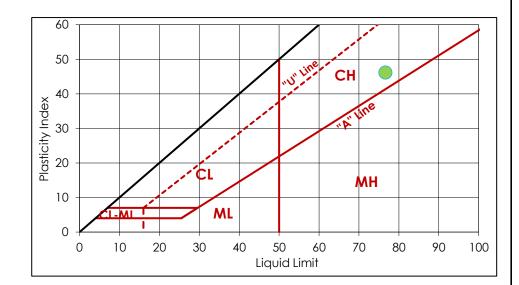
2

21

78

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

31 46 38.10



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**

DATE SAMPLED: 2024.Jan.09

DATE RECEIVED: 2024.Jan.09

DATE TESTED: 2024.Jan.19

SAMPLED BY:

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

REPORT NO.

Carson Cockwell TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-67, 740 mm

2948 STANTEC SAMPLE NO.

LIQUID LIMIT

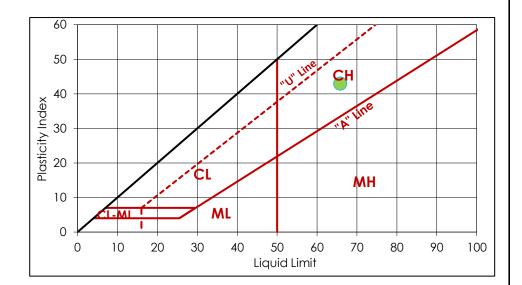
TRIAL **BLOWS** MC (%)

1	2	
20	20	
68	67	



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

ATTN

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.09

DATE RECEIVED: 2024.Jan.09

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-68, 750 mm

2949 STANTEC SAMPLE NO.

HOURD HAIT

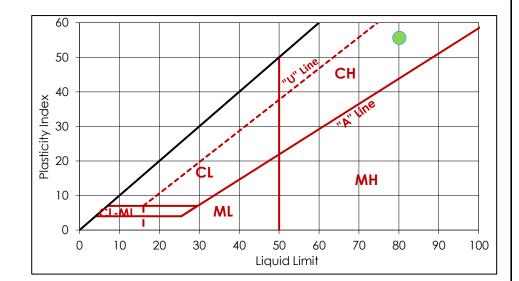
TRIAL **BLOWS** MC (%)

LIQUID LIMIT				
1	2			
24	26			
80	80			

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

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

25 56 36.90



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.09 SAMPLED BY:

DATE RECEIVED: 2024.Jan.09

TRIAL

MC (%)

DATE TESTED: 2024.Jan.22

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Carson Cockwell

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-69, 855 mm

2950 STANTEC SAMPLE NO.

2

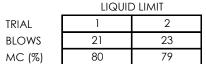
7

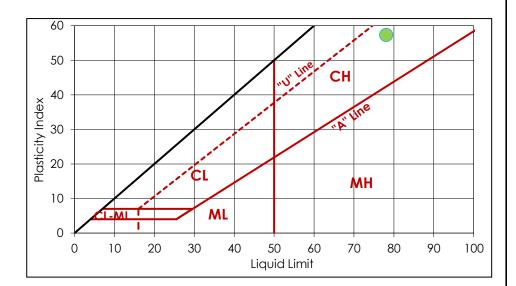
PLASTIC LIMIT

LIQUID LIMIT, LL PLASTIC LIMIT, PL

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

21 57 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

REPORT NO.

DATE SAMPLED: 2024.Jan.16 SAMPLED BY:

Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.16

MC (%)

DATE TESTED: 2024.Jan.30

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-70, 805 mm

2991 STANTEC SAMPLE NO.

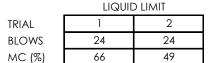
2

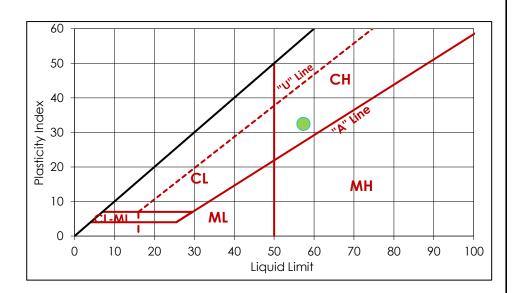
PLASTIC LIMIT **TRIAL**

LIQUID LIMIT, LL PLASTIC LIMIT, PL

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

25 32 32.10





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.16

LIQUID LIMIT

67

DATE RECEIVED: 2024.Jan.16

TRIAL

MC (%)

DATE TESTED: 2024.Jan.30

SAMPLED BY:

TRIAL

BLOWS

MC (%)

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Madison Murphy TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID

BH-71, 800 mm

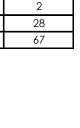
2992 STANTEC SAMPLE NO.

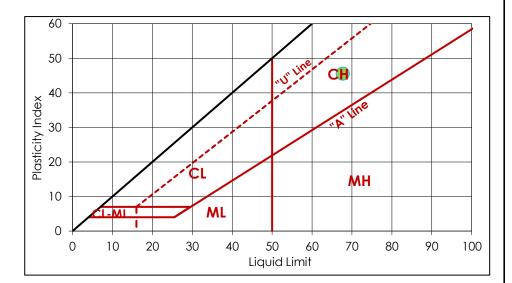
PLASTIC LIMIT 2

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

AS REC'D MC (%)

22 46 32.20





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

10

ATTN

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.16 SAMPLED BY:

TRIAL

BLOWS

MC (%)

Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.16

DATE TESTED: 2024.Jan.30

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Madison Murphy

MATERIAL IDENTIFICATION

CLIENT FIELD ID

BH-72, 800 mm

2

25

76

LIQUID LIMIT

25

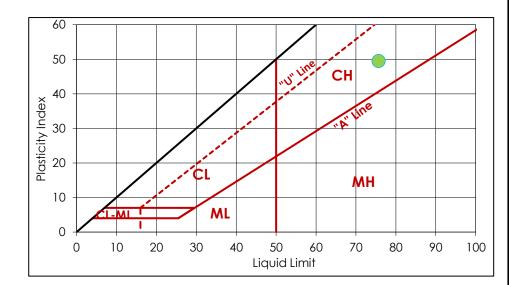
76

2993 STANTEC SAMPLE NO.

TRIAL MC (%)

PLASTIC LIMIT 2 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

11

ATTN

Richard Weibel

REPORT NO.

MC (%)

DATE SAMPLED: 2024.Jan.09

DATE RECEIVED: 2024.Jan.09

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-73, 825 mm

2951 STANTEC SAMPLE NO.

2

16

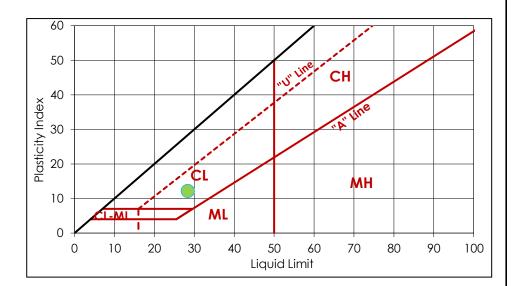
PLASTIC LIMIT **TRIAL**

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

AS REC'D MC (%)

16 12 20.30





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

12

ATTN

R3E 3P1

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.09

DATE RECEIVED: 2024.Jan.09

TRIAL

MC (%)

DATE TESTED: 2024.Jan.22

SAMPLED BY:

Stantec Consulting Ltd.

BH-74, 825 mm

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Carson Cockwell

MATERIAL IDENTIFICATION

CLIENT FIELD ID

2952 STANTEC SAMPLE NO.

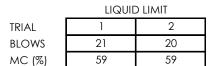
2

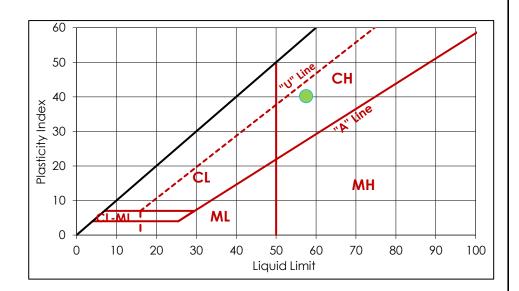
PLASTIC LIMIT

LIQUID LIMIT, LL PLASTIC LIMIT, PL

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

17 40 28.70





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

R3E 3P1

PROJECT NO. 123316853

ATTN Richard Weibel

REPORT NO. 13

DATE SAMPLED: 2024.Jan.09

DATE RECEIVED: 2024.Jan.09

DATE TESTED: 2024.Jan.22

SAMPLED BY: Stanted

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Carson Cockwell

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-75, 850 mm

STANTEC SAMPLE NO. 2953

LIQUID LIMIT

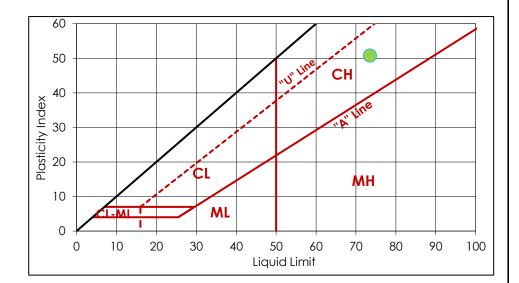
TRIAL BLOWS MC (%)

LIQUID LIMIT				
1	2			
26	26			
73	73			



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

	_
74	l
23	l
51	l
36.80	I



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

ATTN

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.09 SAMPLED BY:

DATE RECEIVED: 2024.Jan.09

DATE TESTED: 2024.Jan.22

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Carson Cockwell TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-76, 720 mm STANTEC SAMPLE NO.

2954

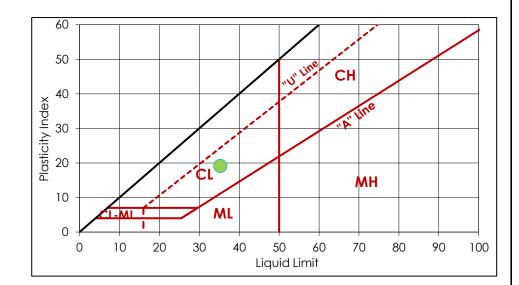
14

LIQUID LIMIT TRIAL

TRIAL	1	2
BLOWS	29	28
MC (%)	35	34

PLASTIC LIMIT **TRIAL** 2 MC (%) 16 LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI AS REC'D MC (%)

16 19 30.10



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. 15

DATE SAMPLED: 2024.Jan.09

DATE RECEIVED: 2024.Jan.09

DATE TESTED: 2024.Jan.19

SAMPLED BY:

TRIAL

BLOWS

MC (%)

Stantec Consulting Ltd.

LIQUID LIMIT

SUBMITTED BY: Stantec Consulting Ltd.

Carson Cockwell TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-77, 740 mm

29

73

2955 STANTEC SAMPLE NO.

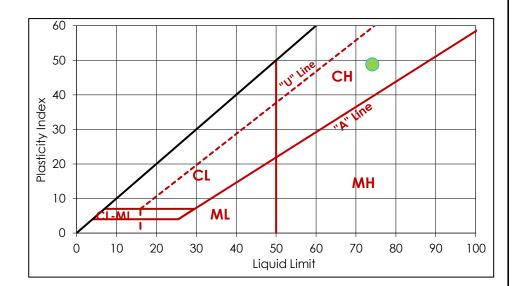
2

27

73

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

25 49 33.10



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

R3E 3P1 PROJECT NO.

Richard Weibel **ATTN** REPORT NO. 1

DATE SAMPLED: 2024.Jan.09 DATE RECEIVED: 2024. Jan. 09 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-63, 765 mm STANTEC SAMPLE NO. 2946

123316853

	100	***	◇			
	90			+		
	80					
8	70				+	
sing	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	
99.8	
99.8	
99.7	
99.2	
51.4	
46.3	
42.1	

Gravel	Sand		Silt	Clay	Colloids	
Glavei	Coarse	Medium	Fine	2111	Cluy	Colloids
0.0	0.0	0.2	0.6	52.9	46.3	42.1

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

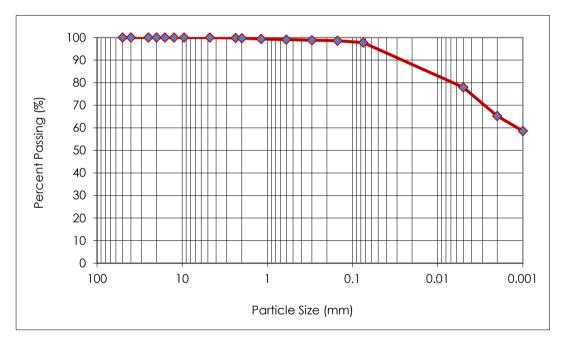
PROJECT NO. 123316853

Richard Weibel **ATTN** REPORT NO.

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

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-64, 740 mm STANTEC SAMPLE NO. 2989



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	99.8	
2.00	99.7	
1.18	99.4	
0.600	99.1	
0.300	98.8	
0.150	98.6	
0.075	97.8	
0.005	77.9	
0.002	65.2	
0.001	58.6	

Gravel	Sand			C:II+	Clay	Colloids
Glavei	Coarse	Medium	Fine	Silt	Cluy	Colloids
0.0	0.3	0.8	1.1	32.6	65.2	58.6

COMMENTS

No comments.

Guillaume Beauce, P.Eng. REPORT DATE 2024.Jan.22 **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

R3E 3P1

PROJECT NO.

123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.09

SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2024. Jan. 09 SUBMITTED BY: Stantec Consulting Ltd. DATE TESTED: 2024.Jan.15

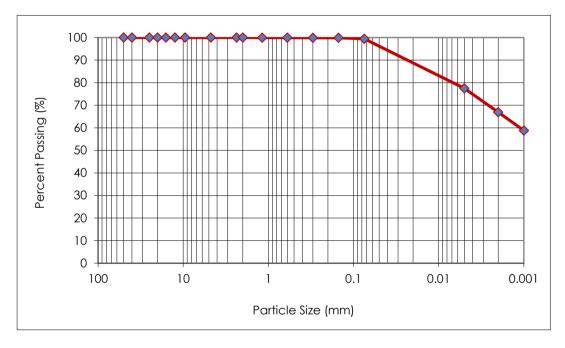
TESTED BY:

Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-65, 750 mm STANTEC SAMPLE NO. 2947

3



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	99.9
0.300	99.9
0.150	99.9
0.075	99.5
0.005	77.5
0.002	67.0
0.001	58.8

Gravel	Sand			Silt	Clay	Colloids
Glavei	Coarse	Medium	Fine	SIII	Cluy	Colloids
0.0	0.0	0.1	0.4	32.5	67.0	58.8

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

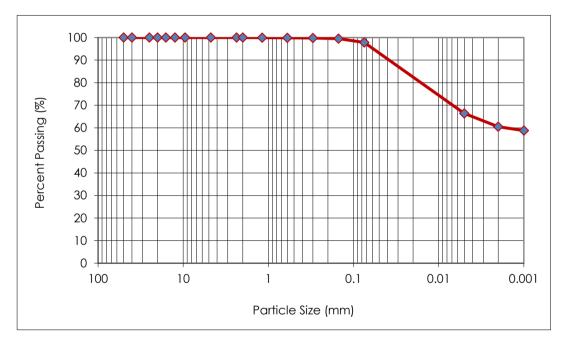
PROJECT NO. 123316853

Richard Weibel **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-66, 750 mm STANTEC SAMPLE NO. 2990



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	99.9
0.300	99.8
0.150	99.5
0.075	97.8
0.005	66.4
0.002	60.5
0.001	58.8

Gravel	Sand			Silt	Clay	Colloids
Glavei	Coarse	Medium	Fine	SIII	Cluy	Colloids
0.0	0.0	0.1	2.1	37.3	60.5	58.8

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

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Winnipeg, Manitoba R3E 3P1

PROJECT NO.

123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.09

DATE RECEIVED: 2024. Jan. 09

DATE TESTED: 2024.Jan.15

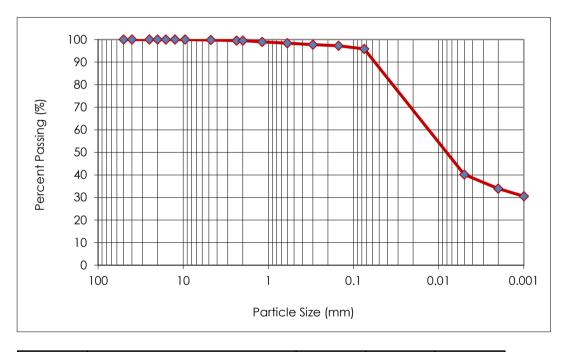
SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-67, 740 mm STANTEC SAMPLE NO. 2948



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	99.8
2.36	99.5
2.00	99.5
1.18	99.0
0.600	98.4
0.300	97.8
0.150	97.3
0.075	95.9
0.005	40.2
0.002	33.9
0.001	30.6

Gravel	Sand			Silt	Clay	Colloids
Glavei	Coarse	Medium	Fine	3111	Cluy	Colloids
0.2	0.3	1.5	2.1	62.0	33.9	30.6

COMMENTS

No comments.

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

Geotechnical Engineer - Materials Testing Services

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

REVIEWED BY



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.09

DATE RECEIVED: 2024. Jan. 09

DATE TESTED: 2024.Jan.15

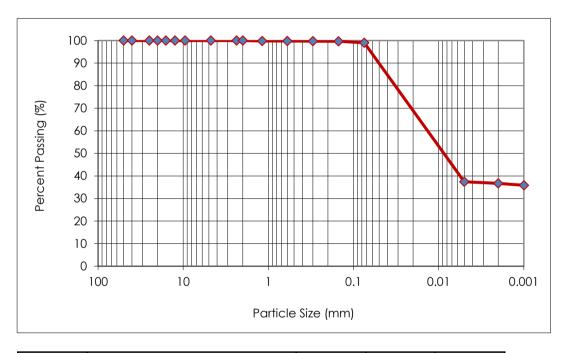
SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-68, 750 mm STANTEC SAMPLE NO. 2949



Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	100.0
1.18	99.8
0.600	99.8
0.300	99.8
0.150	99.7
0.075	99.1
0.005	37.4
0.002	36.7
0.001	35.9

Gravel	Sand			Silt	Clay	Colloids
Giavei	Coarse	Medium	Fine	SIII	Cluy	Colloids
0.0	0.0	0.2	0.7	62.4	36.7	35.9

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

R3E 3P1

PROJECT NO. 123316853

7

ATTN Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.09

DATE RECEIVED: 2024.Jan.09

DATE TESTED: 2024.Jan.15

SAMPLED BY: Stantec Consulting Ltd.

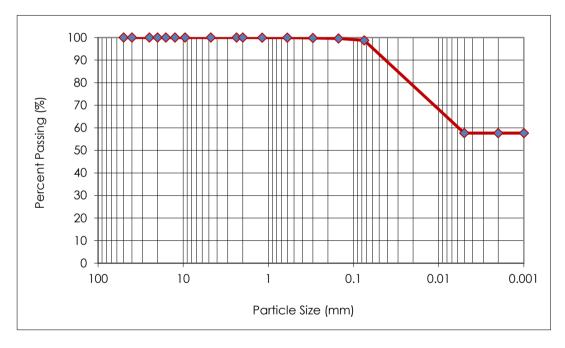
SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-69, 855 mm

STANTEC SAMPLE NO. 2950



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	99.9
0.300	99.8
0.150	99.6
0.075	98.8
0.005	57.7
0.002	57.7
0.001	57.7

Gravel	Sand			Silt	Clay	Colloids
Glavei	Coarse	Medium	Fine	SIII	Cluy	Colloids
0.0	0.0	0.1	1.1	41.1	57.7	57.7

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

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-70, 805 mm STANTEC SAMPLE NO. 2991

	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 Siz			

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	99.8
2.36	98.9
2.00	98.5
1.18	97.4
0.600	96.2
0.300	94.9
0.150	93.8
0.075	92.5
0.005	69.6
0.002	60.6
0.001	58.7

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	3111	Cidy	Colloids
0.2	1.3	3.0	3.0	31.9	60.6	58.7

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

R3E 3P1

PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 9

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-71, 800 mm

STANTEC SAMPLE NO. 2992

	100	***	◇				
	90	 					
	80						
(%)	70						
ing	60						
Percent Passing (%)	50						
en†	40						
erce	30						
₾.	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
99.9
99.8
99.7
99.6
99.3
98.9
97.7
62.3
54.8
53.1

Gravel	Sand			C:II+	Clay	Colloids
	Coarse	Medium	Fine	Silt	Cidy	Colloids
0.0	0.2	0.4	1.7	42.9	54.8	53.1

COMMENTS

No comments.

REPORT DATE 2024.Jan.22

Definie

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**

10 REPORT NO.

DATE SAMPLED: 2024.Jan.16

DATE RECEIVED: 2024. Jan. 16

DATE TESTED: 2024.Jan.19

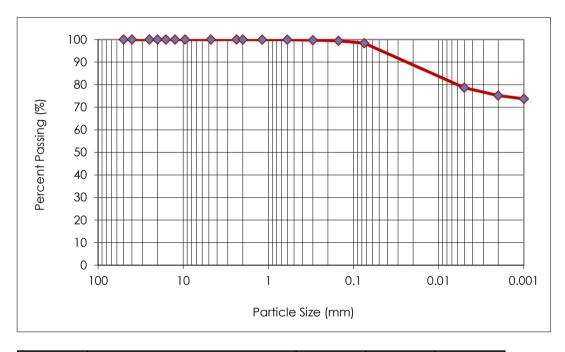
SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-72, 800 mm STANTEC SAMPLE NO. 2993



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	99.9		
0.300	99.7		
0.150	99.5		
0.075	98.4		
0.005	78.7		
0.002	75.2		
0.001	73.7		

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	3111	Cluy	Colloids
0.0	0.0	0.2	1.4	23.2	75.2	73.7

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

R3E 3P1 PROJECT NO.

Richard Weibel **ATTN** REPORT NO. 11

DATE SAMPLED: 2024.Jan.09 DATE RECEIVED: 2024. Jan. 09 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-73, 825 mm STANTEC SAMPLE NO. 2951

123316853

	100	****	∞ — >>					
	90							
	80			+				
(%)	70							
sing	60				$\overline{}$			
Percent Passing (%)	50				+			
ent	40							
erc	30				+			
	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	99.7
2.36	99.1
2.00	99.0
1.18	98.6
0.600	98.2
0.300	97.9
0.150	97.4
0.075	89.5
0.005	21.0
0.002	16.0
0.001	13.2

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	3111	Cidy	Colloids
0.3	0.7	1.0	8.5	73.5	16.0	13.2

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.

Richard Weibel 12 **ATTN** REPORT NO.

DATE SAMPLED: 2024.Jan.09 DATE RECEIVED: 2024. Jan. 09 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-74, 825 mm STANTEC SAMPLE NO. 2952

123316853

	100	***	◇				
	90					\perp	
	80 08						
(%)	70						
sing	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	99.9
2.00	99.9
1.18	99.8
0.600	99.7
0.300	99.4
0.150	98.8
0.075	94.1
0.005	49.6
0.002	41.4
0.001	37.2

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine	3111	Cidy	Colloids
0.0	0.1	0.4	5.4	52.7	41.4	37.2

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

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PROJECT

2024 Local Street Renewals Program

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Winnipeg, Manitoba

R3E 3P1

PROJECT NO.

123316853

Richard Weibel **ATTN**

13 REPORT NO.

DATE SAMPLED: 2024.Jan.09

DATE RECEIVED: 2024. Jan. 09

DATE TESTED: 2024.Jan.15

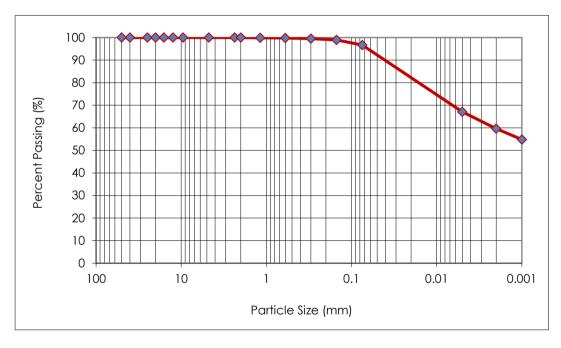
SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-75, 850 mm STANTEC SAMPLE NO. 2953



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	99.5
0.150	99.0
0.075	96.7
0.005	67.1
0.002	59.6
0.001	54.8

Gravel		Sand		Silt	Silt Clay C		Colloids
Glavei	Coarse	Medium	Fine		Clay	Colloids	
0.0	0.0	0.4	2.9	37.1	59.6	54.8	

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

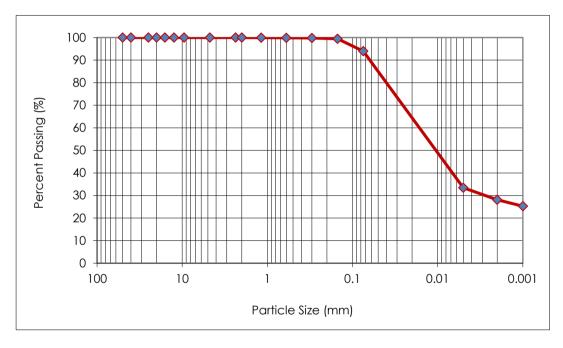
PROJECT NO. 123316853

Richard Weibel **ATTN** REPORT NO. 14

DATE SAMPLED: 2024.Jan.09 DATE RECEIVED: 2024. Jan. 09 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-76, 720 mm STANTEC SAMPLE NO. 2954



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	99.9
0.300	99.8
0.150	99.5
0.075	94.0
0.005	33.5
0.002	28.1
0.001	25.3

Gravel		Sand		Silt	Silt Clay C		Colloids
Glavei	Coarse	Medium	Fine		Cluy	Colloids	
0.0	0.0	0.1	5.9	65.9	28.1	25.3	

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**

15 REPORT NO.

DATE SAMPLED: 2024.Jan.09

DATE RECEIVED: 2024. Jan. 09

DATE TESTED: 2024.Jan.15

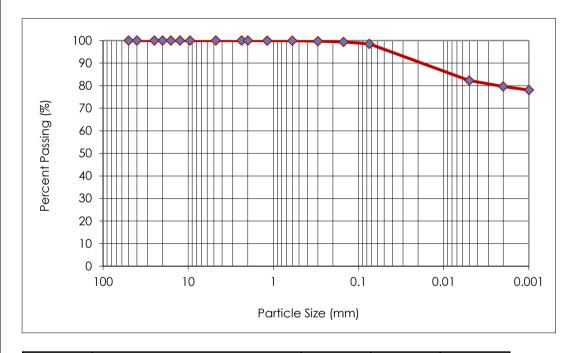
SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-77, 740 mm STANTEC SAMPLE NO. 2955



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	99.7
0.150	99.4
0.075	98.5
0.005	82.3
0.002	79.6
0.001	78.1
3.301	, 5,1

Gravel		Sand		Silt	Silt Clay		Colloids
Giavei	Coarse	Medium	Fine		Cidy		
0.0	0.0	0.2	1.3	18.9	79.6	78.1	

COMMENTS

No comments.

REPORT DATE

2024.Jan.18

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services





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. 123316853-4 - Contract 4

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.09 2024.Jan.09 DATE TESTED 2024.Jan.12

INSITU MOISTURE 28.9 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Madison Murphy

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE

Clay **DESCRIPTION**

SUPPLIER Existing Materials

SOURCE Dunraven Ave - BH-63, 0.77 m

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION**

OVERSIZE CORRECTION METHOD RETAINED 4.75mm SCREEN

D698

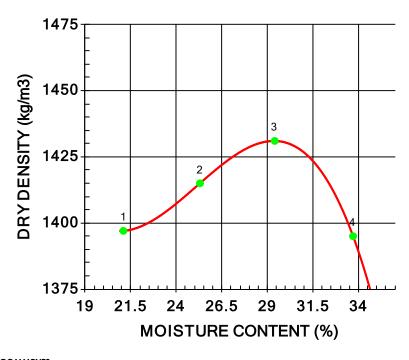
A: 101.6mm Mold,

Passing 4.75mm

Automatic

Moist None

N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1692	1397	21.1
2	1773	1415	25.3
3	1852	1431	29.4
4	1865	1395	33.7

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1430	29.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2946.

Page 1 of 1

2024.Jan.15

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. 123316853-4 - Contract 4

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.16 2024.Jan.16 DATE TESTED 2024.Jan.30

INSITU MOISTURE 31.7 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Subgrade

SIZE Clay

DESCRIPTION

SUPPLIER Existing Materials **SOURCE** Dunraven Ave - BH-64, 0.74 m

COMPACTION PROCEDURE

RETAINED 4.75mm SCREEN

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD

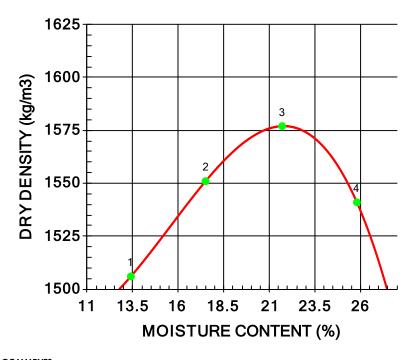
D698

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	1506	13.4
2	1822	1551	17.5
3	1919	1577	21.7
4	1939	1541	25.8

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1580	22.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2989.

Page 1 of 1

2024.Jan.31

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. 123316853-4 - Contract 4

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.09 2024.Jan.09 DATE TESTED 2024.Jan.15

INSITU MOISTURE 34.8 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Clay **DESCRIPTION**

SUPPLIER Existing Materials

SOURCE Dunraven Ave - BH-65, 0.75 m

COMPACTION PROCEDURE

RETAINED 4.75mm SCREEN

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD

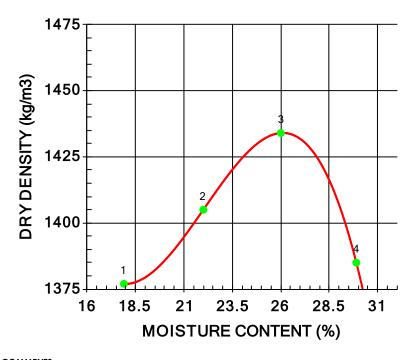
A: 101.6mm Mold,

Passing 4.75mm

Manual Moist None

D698

N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1623	1377	17.9
2	1714	1405	22.0
3	1807	1434	26.0
4	1799	1385	29.9

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1430	26.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2947.

Page 1 of 1

2024.Jan.16

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

PROJECT 2024 Local Street Renewals Program

ATTN: Richard Weibel

PROJECT NO. 123316853-4 - Contract 4

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.30 2024.Jan.16 2024.Jan.16 DATE TESTED

INSITU MOISTURE 38.4 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Pervez Safdar

MATERIAL IDENTIFICATION

Subgrade MAJOR COMPONENT

SIZE Clay **DESCRIPTION**

SUPPLIER Existing Materials **SOURCE** Overton St - BH-66. 0.75 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 1575 RY DENSITY (kg/m3) 1550 1525 1500 1475 16.5 19 21.5 24 29 14 26.5 **MOISTURE CONTENT (%)**

TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1719	1488	15.5
2	1837	1530	20.1
3	1943	1567	24.0
4	1960	1529	28.2

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1570	24.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2990.

Page 1 of 1 2024.Jan.31

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. 123316853-4 - Contract 4

PROCTOR NO. 5 DATE SAMPLED 2024.Jan.09 DATE RECEIVED 2024.Jan.09 DATE TESTED 2024.Jan.15

INSITU MOISTURE 24,9 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Clay

DESCRIPTION

SUPPLIER Existing Materials

SOURCE Overton St - BH-67, 0.74 m

D698

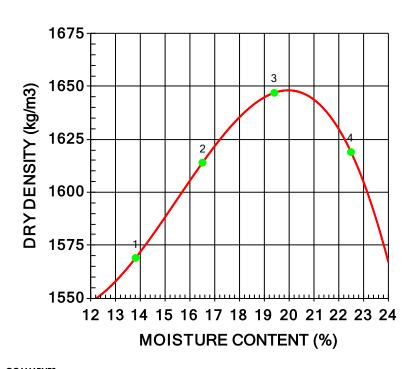
COMPACTION PROCEDURE A: 101.6mm Mold,

Passing 4.75mm

RAMMER TYPE Automatic

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	1785	1569	13.8
2	1880	1614	16.5
3	1967	1647	19.4
4	1983	1619	22.5

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1650	20.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2948.

Page 1 of 1 2024. Jan. 16 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. 123316853-4 - Contract 4

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.09 2024.Jan.09 DATE TESTED 2024.Jan.15

RETAINED 4.75mm SCREEN

INSITU MOISTURE 32.1 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Clay

DESCRIPTION SUPPLIER Existing Materials

SOURCE Overton St - BH-68, 0.75 m

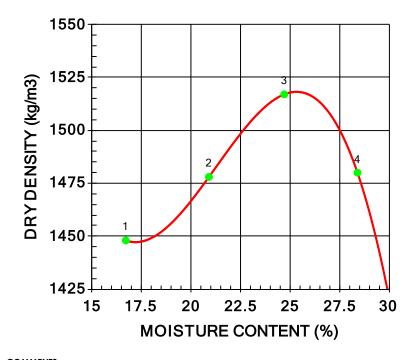
D698

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	1690	1448	16.7
2	1787	1478	20.9
3	1892	1517	24.7
4	1900	1480	28.4

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1520	25.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2949.

Page 1 of 1 REVIEWED BY: 2024.Jan.16 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. 123316853-4 - Contract 4

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.16 2024.Jan.09 2024.Jan.09 DATE TESTED

INSITU MOISTURE 24.2 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Clay

DESCRIPTION

SUPPLIER Existing Materials **SOURCE** Blenheim Ave - BH-69, 0.86 m

COMPACTION PROCEDURE

RETAINED 4.75mm SCREEN

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD

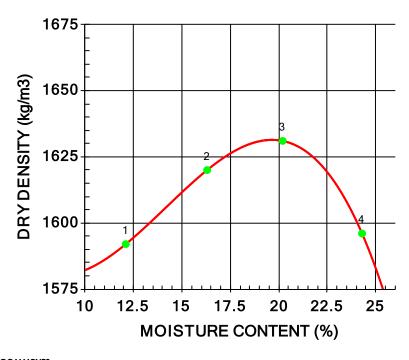
A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

D698

None N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1785	1592	12.1
2	1884	1620	16.3
3	1961	1631	20.2
4	1984	1596	24.3

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1630	19.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2950.

Page 1 of 1

2024.Jan.18

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. 123316853-4 - Contract 4

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.31 2024.Jan.16 2024.Jan.16 DATE TESTED

INSITU MOISTURE 29.5 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Subgrade

SIZE Clay **DESCRIPTION**

SUPPLIER Existing Materials **SOURCE** Blenheim Ave - BH-70, 0.81 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 %

1450 1425 RY DENSITY (kg/m3) 3 1400 1375 1350

21.5

MOISTURE CONTENT (%)

24

WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1547	1332	16.1
1658	1376	20.5
1755	1412	24.3
1786	1389	28.6
	(kg/m³) 1547 1658 1755	(kg/m³) (kg/m³) 1547 1332 1658 1376 1755 1412

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1420	25.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2991.

1325

14

16.5

19

Page 1 of 1 REVIEWED BY: 2024.Feb.01 Stantec Consulting Ltd.

26.5

29





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. 123316853-4 - Contract 4

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.16 2024.Jan.16 DATE TESTED 2024.Jan.31

INSITU MOISTURE 29.3 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY

Pervez Safdar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Subgrade

SIZE Clay

DESCRIPTION

SUPPLIER Existing Materials

SOURCE Blenheim Ave - BH-71, 0.80 m COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD

RETAINED 4.75mm SCREEN

D698

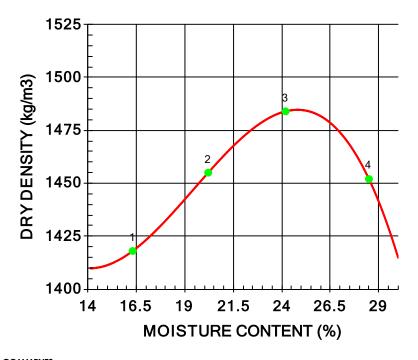
A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None

N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1649	1418	16.3
2	1749	1455	20.2
3	1843	1484	24.2
4	1866	1452	28.5

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1480	25.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2993.

Page 1 of 1

2024.Feb.01

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. 123316853-4 - Contract 4

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.16 2024.Jan.16 DATE TESTED 2024.Jan.31 10

INSITU MOISTURE 38.3 % COMPACTION STANDARD

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Subgrade

SIZE Clay

DESCRIPTION SUPPLIER Existing Materials

SOURCE Blemheim Ave - BH-72, 0.80 m

COMPACTION PROCEDURE

RETAINED 4.75mm SCREEN

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD Standard Proctor, ASTM

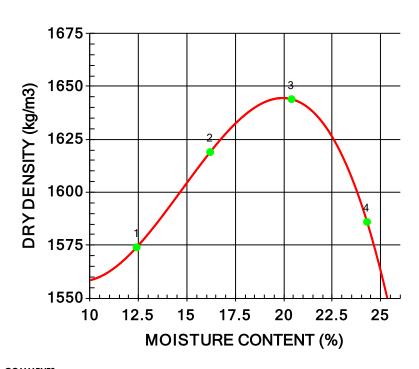
D698

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	1769	1574	12.4
2	1881	1619	16.2
3	1979	1644	20.4
4	1971	1586	24.3

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1640	20.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2992.

Page 1 of 1 2024.Feb.01 Stantec Consulting Ltd.





PROCTOR TEST REPORT

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

CLIENT City of Winnipeg

PROJECT 2024 Local Street Renewals Program

ATTN: Richard Weibel

PROJECT NO. 123316853-4 - Contract 4

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.16 2024.Jan.09 2024.Jan.09 DATE TESTED

INSITU MOISTURE 31.1 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Clay **DESCRIPTION**

SUPPLIER Existing Materials

SOURCE Weatherdon Ave - BH-73, 0.83 m

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD

RETAINED 4.75mm SCREEN

D698

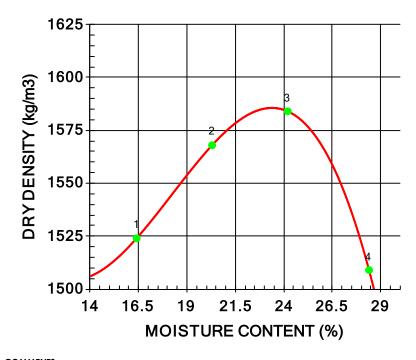
A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None

N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1774	1524	16.4
2	1886	1568	20.3
3	1967	1584	24.2
4	1937	1509	28.4

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1590	23.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2951.

Page 1 of 1

2024.Jan.18

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 NO. 123316853-4 - Contract 4

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.16 2024.Jan.09 2024.Jan.09 DATE TESTED 12

COMPACTION PROCEDURE

RETAINED 4.75mm SCREEN

INSITU MOISTURE 27.2 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

RAMMER TYPE SIZE Clay **DESCRIPTION PREPARATION** SUPPLIER OVERSIZE CORRECTION METHOD

Existing Materials **SOURCE** Weatherdon Ave - BH-74, 0.83 m

PROJECT 2024 Local Street Renewals Program

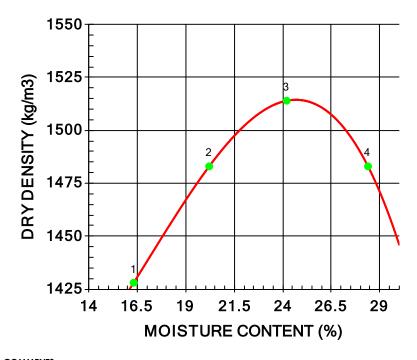
D698

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	1661	1428	16.3
2	1782	1483	20.2
3	1880	1514	24.2
4	1904	1483	28.4

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1510	24.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2952.

Page 1 of 1 REVIEWED BY: 2024.Jan.18 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 NO. 123316853-4 - Contract 4

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.16 2024.Jan.09 2024.Jan.09 DATE TESTED 13

INSITU MOISTURE 35.5 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE

Clay **DESCRIPTION**

SUPPLIER Existing Materials

SOURCE Weatherdon Ave - BH-75, 0.85 m

OVERSIZE CORRECTION METHOD

PROJECT 2024 Local Street Renewals Program

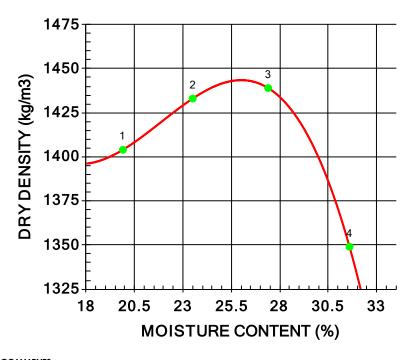
D698

COMPACTION PROCEDURE A: 101.6mm Mold,

Passing 4.75mm

RAMMER TYPE Manual **PREPARATION** Moist

None RETAINED 4.75mm SCREEN N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)	
1	1683	1404	19.9	
2	1770	1433	23.5	
3	1833	1439	27.4	
4	1775	1349	31.6	

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1440	26.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2953.

Page 1 of 1 REVIEWED BY: 2024.Jan.18 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. 123316853-4 - Contract 4

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.09 2024.Jan.09 DATE TESTED 2024.Jan.17

INSITU MOISTURE 30.1 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE

Clay **DESCRIPTION**

SUPPLIER Existing Materials SOURCE Weatherdon Ave - BH-76, 0.72 m

COMPACTION PROCEDURE

RAMMER TYPE

PREPARATION OVERSIZE CORRECTION METHOD RETAINED 4.75mm SCREEN

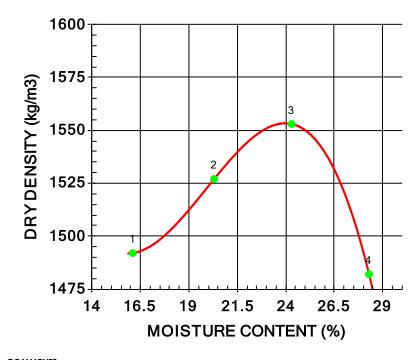
A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

D698

None N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)	
1	1732	1492	16.1	
2	1837	1527	20.3	
3	1930	1553	24.3	
4	1902	1482	28.3	

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1550	24.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2954.

Page 1 of 1 REVIEWED BY: 2024.Jan.18 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. 123316853-4 - Contract 4

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.09 DATE TESTED 2024.Jan.17 15 2024.Jan.09

INSITU MOISTURE 37.4 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE

Clay **DESCRIPTION**

SUPPLIER Existing Materials

SOURCE Watherdon Ave - BH-77, 0.74 m

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD

RETAINED 4.75mm SCREEN

D698

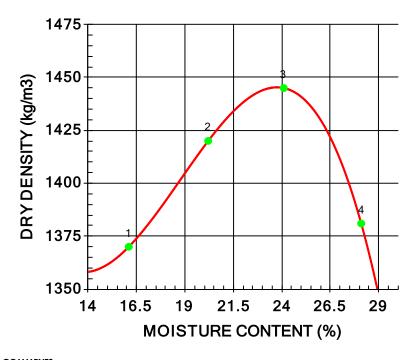
A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None

N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)	
1	1591	1370	16.1	
2	1707	1420	20.2	
3	1793	1445	24.1	
4	1769	1381	28.1	

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1440	23.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2955.

Page 1 of 1

2024.Jan.18

Stantec Consulting Ltd.



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 4

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.16
SAMPLED BY: Graeme Patrick SUBMITTED BY: Graeme Patrick TESTED BY: Madison Murphy

MATERIAL IDENTIFICATION

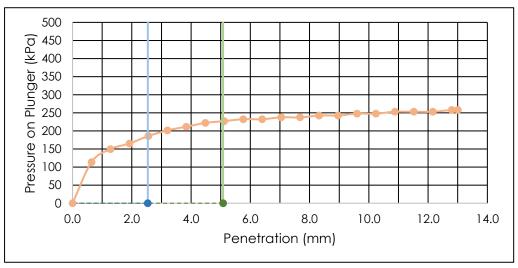
MATERIAL USESubgradeSUPPLIERExisting MaterialMAX. NOMINAL SIZE4.75 mmSOURCEExisting MaterialMATERIAL TYPEClaySAMPLE LOCATIONBH-63, 0.765 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2946

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1430 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE29.5 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1360 kg/m 3 SWELL OF SAMPLE 0.02 % AS-COMPACTED MOISTURE 29.4 % POST-TEST MOISTURE 33.8 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 2.7

CBR VALUE AT 5.08 mm PENETRATION 2.3

COMMENTS

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

REPORT DATE 2024.Jan.22

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, Public Works Department

PROJECT

2024 Local Street Renewals

Program - Contract 4

104 - 1155 Pacific Avenue Winnipea, Manitoba

PROJECT NO.

123316853

2

R3E 2P1

FROJECT NO.

123310033

ATTN

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.16 DATE RECEIVED: 2024.Jan.16 DATE TESTED: 2024.Feb.06 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION Subgrade **SUPPLIER** Existing Material MATERIAL USE 4.75 mm Existing Material MAX. NOMINAL SIZE **SOURCE** BH-64, 0.740 m MATERIAL TYPE Silty Clay SAMPLE LOCATION SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2989 IMMERSION PERIOD 96 ± 2 hr TARGET MAX. DRY DENSITY 1580 kg/m³ Soaked TARGET OPTIMUM MOISTURE 22.0 % CONDITION OF SAMPLE 4.54 kg SURCHARGE MASS 1500 kg/m^3 +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY **SWELL OF SAMPLE** 3.77 % AS-COMPACTED MOISTURE 22.1 % POST-TEST MOISTURE 31.5 % AS-COMPACTED % COMPACTION 95 % 500 **CBR VALUE AT 2.54 mm** 0 450 **PENETRATION** ¥ 400 2.3 Plunger 350 300 CBR VALUE AT 5.08 mm **PENETRATION** 250 O 2.0 200 Pressure 150 100

COMMENTS

50 0 0.0

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.12

REVIEWED BY Jason Thompson, C.E.T.

14.0

Principal - Manager of Materials Testing Services

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10.0

12.0



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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 4

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 3

DATE SAMPLED: 2024.Jan.09 DATE TESTED: 2024.Jan.17
SAMPLED BY: Graeme Patrick SUBMITTED BY: Graeme Patrick TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

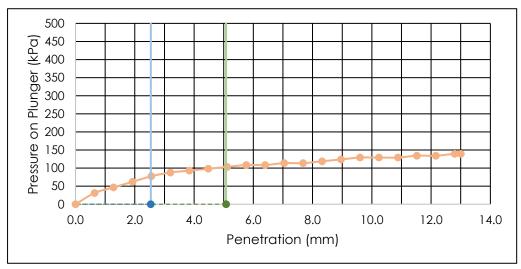
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Clay SAMPLE LOCATION BH-65, 0.750 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2947

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1430 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE26.0 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1358 kg/m 3 SWELL OF SAMPLE 0.07 % AS-COMPACTED MOISTURE 26.0 % POST-TEST MOISTURE 48.6 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 1.1

CBR VALUE AT 5.08 mm PENETRATION 1.0

COMMENTS

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

REPORT DATE 2024.Jan.22

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, Public Works Department

PROJECT

2024 Local Street Renewals

Program - Contract 4

Winnipeg, MB

R3F 2P1

PROJECT NO.

123316853

ATTN

Richard Weibel

104 - 1155 Pacific Avenue

REPORT NO.

DATE SAMPLED: 2024.Jan.16 DATE RECEIVED: 2024.Jan.16 DATE TESTED: 2024.Feb.06 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION Subgrade **SUPPLIER** Existing Material MATERIAL USE 4.75 mm Existing Material MAX. NOMINAL SIZE **SOURCE** BH-66, 0.750 m MATERIAL TYPE Clay and silt SAMPLE LOCATION SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2990 IMMERSION PERIOD 96 ± 2 hr TARGET MAX. DRY DENSITY 1570 kg/m³ Soaked TARGET OPTIMUM MOISTURE 24.5 % CONDITION OF SAMPLE 4.54 kg SURCHARGE MASS 1491 kg/m^3 +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY **SWELL OF SAMPLE** 4.32 % AS-COMPACTED MOISTURE 24.6 % POST-TEST MOISTURE 33.6 % AS-COMPACTED % COMPACTION 95 % 500 **CBR VALUE AT 2.54 mm** 0 450 **PENETRATION** ¥ 400 2.7 Plunger 350 300 CBR VALUE AT 5.08 mm **PENETRATION** 250 O 2.3 200 Pressure 150 100

COMMENTS

50 0.0

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.12

REVIEWED BY Jason Thompson, C.E.T.

14.0

Principal - Manager of Materials Testing Services

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10.0

12.0



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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 4

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 5

DATE SAMPLED: 2024.Jan.09 DATE TESTED: 2024.Jan.17
SAMPLED BY: Graeme Patrick SUBMITTED BY: Graeme Patrick TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

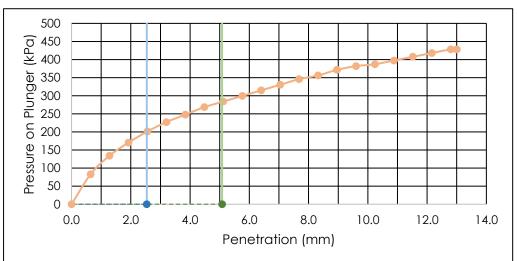
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Clay SAMPLE LOCATION BH-67, 0.740 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2948

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1650 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE20.0 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1570 kg/m 3 SWELL OF SAMPLE 0.03 % AS-COMPACTED MOISTURE 20.0 % POST-TEST MOISTURE 31.1 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 2.9

CBR VALUE AT 5.08 mm PENETRATION 2.8

COMMENTS

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

REPORT DATE 2024.Jan.22

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 4

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 6

DATE SAMPLED: 2024.Jan.09 DATE RECEIVED: 2024.Jan.09 DATE TESTED: 2024.Jan.20 SAMPLED BY: Graeme Patrick TESTED BY: Madison Murphy

MATERIAL IDENTIFICATION

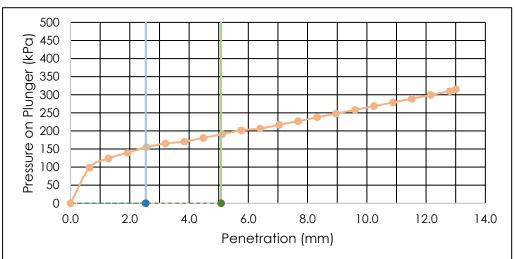
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Clay SAMPLE LOCATION BH-68, 0.750 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2949

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1520 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE25.5 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1446 kg/m 3 SWELL OF SAMPLE 0.03 % AS-COMPACTED MOISTURE 25.4 % POST-TEST MOISTURE 33.7 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 2.2

CBR VALUE AT 5.08 mm PENETRATION 1.9

COMMENTS

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

REPORT DATE 2024.Jan.25

REVIEWED BY Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services



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 4

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 7

DATE SAMPLED: 2024.Jan.09 DATE RECEIVED: 2024.Jan.09 DATE TESTED: 2024.Jan.20 SAMPLED BY: Graeme Patrick TESTED BY: Madison Murphy

MATERIAL IDENTIFICATION

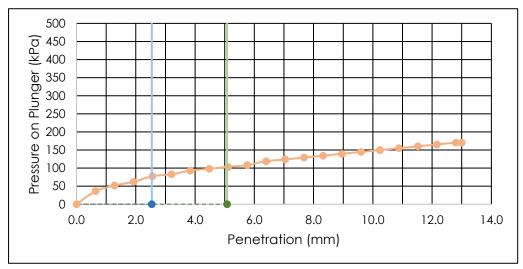
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Clay SAMPLE LOCATION BH-69, 0.855 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2950

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1630 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE19.0 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1552 kg/m 3 SWELL OF SAMPLE 0.05 % AS-COMPACTED MOISTURE 19.2 % POST-TEST MOISTURE 33.2 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 1.1

CBR VALUE AT 5.08 mm PENETRATION 1.0

COMMENTS

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

REPORT DATE 2024.Jan.25

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, Public Works Department

PROJECT

2024 Local Street Renewals

104 - 1155 Pacific Avenue

Program - Contract 4

Winnipeg, MB

PROJECT NO.

123316853

Richard Weibel ATTN

REPORT NO. 8

DATE SAMPLED: 2024.Jan.16

R3E 2P1

DATE RECEIVED: 2024.Jan.16

DATE TESTED: 2024.Feb.12

SAMPLED BY:

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Donald Eliazar

MATERIAL IDENTIFICATION

MATERIAL USE Subgrade MAX. NOMINAL SIZE 4.75 mm MATERIAL TYPE

Clay and silt

SUPPLIER SOURCE

Existing Material Existing Material

BH-70, 0.805 m

SPECIFICATION ID Not Applicable SAMPLE LOCATION

STANTEC SAMPLE NO.

2991

IMMERSION PERIOD

96 ± 2 hr

TARGET MAX. DRY DENSITY

1420 kg/m³

CONDITION OF SAMPLE

Soaked

TARGET OPTIMUM MOISTURE

25.5 %

SURCHARGE MASS

4.54 kg

0 %

AS-COMPACTED DRY DENSITY

 1347 kg/m^3

+19 mm OVERSIZE **SWELL OF SAMPLE**

3.43 %

AS-COMPACTED MOISTURE

25.6 %

95 %

POST-TEST MOISTURE

500

450

36.6 %

AS-COMPACTED % COMPACTION

CBR VALUE AT 2.54 mm PENETRATION

2.0

(kPa) 400 350 300

CBR VALUE AT 5.08 mm **PENETRATION** 1.8

Plunger 250 0 200 Pressure 150 100 50 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.20

Jason Thompson, C.E.T. **REVIEWED BY**

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, Public Works Department

PROJECT

2024 Local Street Renewals

Program - Contract 4

123316853

104 - 1155 Pacific Avenue Winnipeg, MB

R3E 2P1 PROJECT NO.

ATTN Richard Weibel REPORT NO. 9

DATE SAMPLED: 2024.Jan.16 DATE RECEIVED: 2024.Jan.16 DATE TESTED: 2024.Feb.12 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION Existing Material MATERIAL USE Subgrade **SUPPLIER** MAX. NOMINAL SIZE 4.75 mm Existing Material SOURCE MATERIAL TYPE Clay and silt BH-71, 0.800 m SAMPLE LOCATION SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2992 $96 \pm 2 \text{ hr}$ IMMERSION PERIOD TARGET MAX. DRY DENSITY 1640 kg/m³ Soaked 20.0 % CONDITION OF SAMPLE TARGET OPTIMUM MOISTURE SURCHARGE MASS 4.54 kg 1557 kg/m^3 +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 20.0 % **SWELL OF SAMPLE** 2.18 % AS-COMPACTED MOISTURE POST-TEST MOISTURE 29.9 % AS-COMPACTED % COMPACTION 95 % 500 **CBR VALUE AT 2.54 mm** (kPa) 450 PENETRATION 400 2.9 Plunger 350 300 CBR VALUE AT 5.08 mm 250 **PENETRATION** 0 2.6 200 Pressure 150 100 50 0 8.0 0.0 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.20

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, Public Works Department

PROJECT 2024 Local Street Renewals

104 - 1155 Pacific Avenue

Program - Contract 4

Winnipeg, MB

R3E 2P1

PROJECT NO. 123316853

Richard Weibel ATTN

10 REPORT NO.

DATE SAMPLED: 2024.Jan.16 DATE RECEIVED: 2024.Jan.16 DATE TESTED: 2024.Feb.12 Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting 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 Clay BH-72, 0.800 m SAMPLE LOCATION SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2993 96 ± 2 hr IMMERSION PERIOD TARGET MAX. DRY DENSITY 1480 kg/m³ Soaked 25.0 % CONDITION OF SAMPLE TARGET OPTIMUM MOISTURE SURCHARGE MASS 4.54 kg 1407 kg/m^3 +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 4.09 % 24.9 % **SWELL OF SAMPLE** AS-COMPACTED MOISTURE POST-TEST MOISTURE 38.6 % AS-COMPACTED % COMPACTION 95 % 500 **CBR VALUE AT 2.54 mm** (kPa) 450 **PENETRATION** 400 2.2 Plunger 350 300 CBR VALUE AT 5.08 mm 250 **PENETRATION** 0 1.8 200 Pressure 150 100

COMMENTS

50 0

0.0

2.0

4.0

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

8.0

6.0

Penetration (mm)

REPORT DATE 2024.Feb.20 **REVIEWED BY** Jason Thómpson, C.E.T.

14.0

Principal - Manager of Materials Testing Services

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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

Program - Contract 4

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 11

DATE SAMPLED: 2024.Jan.09 DATE RECEIVED: 2024.Jan.09 DATE TESTED: 2024.Jan.20 SAMPLED BY: Graeme Patrick TESTED BY: Madison Murphy

MATERIAL IDENTIFICATION

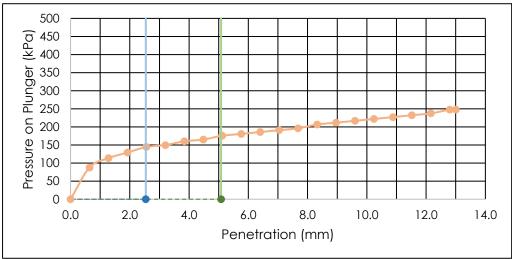
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Clay SAMPLE LOCATION BH-73, 0.825 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2951

IMMERSION PERIOD96 ± 2 hrTARGET MAX. DRY DENSITY1590 kg/m³CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE23.5 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1509 kg/m 3 SWELL OF SAMPLE 0.03 % AS-COMPACTED MOISTURE 23.6 % POST-TEST MOISTURE 31.9 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 2.1

CBR VALUE AT 5.08 mm PENETRATION 1.7

COMMENTS

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

REPORT DATE 2024.Jan.25

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 4

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 12

DATE SAMPLED: 2024.Jan.09 DATE RECEIVED: 2024.Jan.09 DATE TESTED: 2024.Jan.20 SAMPLED BY: Graeme Patrick TESTED BY: Madison Murphy

MATERIAL IDENTIFICATION

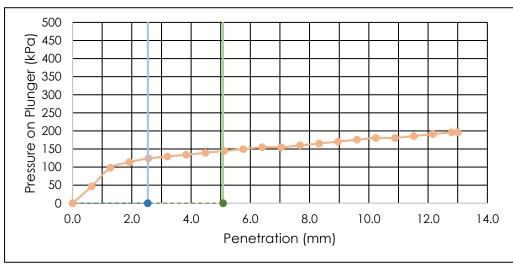
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Clay SAMPLE LOCATION BH-74, 0.825 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2952

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1510 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE24.5 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1436 kg/m 3 SWELL OF SAMPLE 0.03 % AS-COMPACTED MOISTURE 24.4 % POST-TEST MOISTURE 34.3 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 1.8

CBR VALUE AT 5.08 mm PENETRATION 1.4

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 PROJECT 2024 Local Street Renewals

Program - Contract 4

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 13

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

MATERIAL IDENTIFICATION

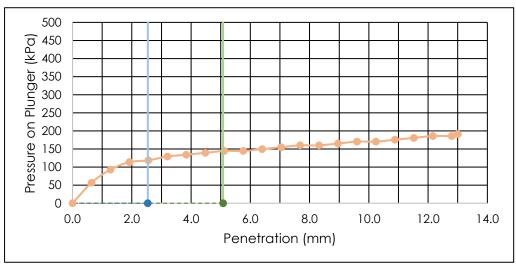
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Clay SAMPLE LOCATION BH-75, 0.850 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2953

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1440 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE26.0 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1369 kg/m 3 SWELL OF SAMPLE 0.05 % AS-COMPACTED MOISTURE 25.9 % POST-TEST MOISTURE 43.1 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 1.7

CBR VALUE AT 5.08 mm PENETRATION 1.4

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 **PROJECT** 2024 Local Street Renewals 104-1155 Pacific Ave.

Program - Contract 4

Existing Material

Existing Material

BH-76, 0.720 m

2954

Winnipeg, MB

R3E 2P1 PROJECT NO. 123316853

Richard Weibel **ATTN** REPORT NO. 14

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

MATERIAL IDENTIFICATION MATERIAL USE MAX. NOMINAL SIZE

MATERIAL TYPE

SPECIFICATION ID

IMMERSION PERIOD

SURCHARGE MASS

CONDITION OF SAMPLE

Subgrade 4.75 mm Clay

Not Applicable

96 ± 2 hr Soaked

4.54 kg

+19 mm OVERSIZE **SWELL OF SAMPLE** POST-TEST MOISTURE

0 % 0.02 % 28.7 % **SUPPLIER**

SOURCE SAMPLE LOCATION

STANTEC SAMPLE NO.

TARGET MAX. DRY DENSITY TARGET OPTIMUM MOISTURE

AS-COMPACTED DRY DENSITY AS-COMPACTED MOISTURE AS-COMPACTED % COMPACTION

> **CBR VALUE AT 2.54 mm PENETRATION** 4.5

1550 kg/m³

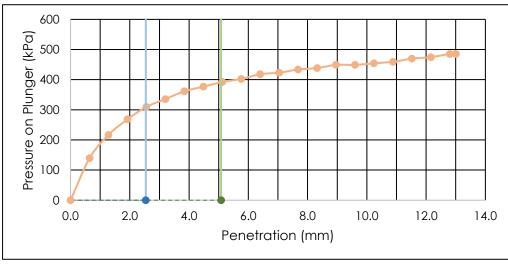
 1472 kg/m^3

24.0 %

24.1 %

95 %

CBR VALUE AT 5.08 mm **PENETRATION** 3.9



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

Jason Thompson, C.E.T. **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 4

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 15

DATE SAMPLED: 2024.Jan.09 DATE TESTED: 2024.Jan.21
SAMPLED BY: Graeme Patrick SUBMITTED BY: Graeme Patrick TESTED BY: Madison Murphy

MATERIAL IDENTIFICATION

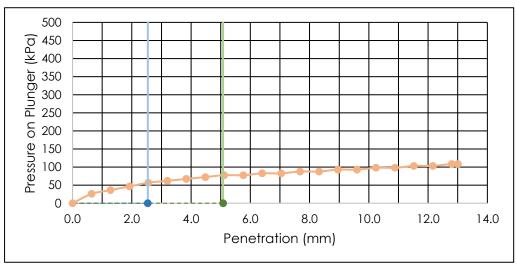
MATERIAL USESubgradeSUPPLIERExisting MaterialMAX. NOMINAL SIZE4.75 mmSOURCEExisting MaterialMATERIAL TYPEClaySAMPLE LOCATIONBH-77, 0.740 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2955

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1440 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE23.5 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1367 kg/m 3 SWELL OF SAMPLE 0.02 % AS-COMPACTED MOISTURE 23.6 % POST-TEST MOISTURE 46.9 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 0.8

CBR VALUE AT 5.08 mm PENETRATION 0.8

COMMENTS

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

REPORT DATE 2024.Jan.29

REVIEWED BY Jason Thompson, C.E.T.



Table 2 - Compressive Strength Test Data

Street	Core	Core Diameter (mm)	Length (mm)	L/D Ratio	Correction Factor	Peak Load (kN)	Compr Strengt	essive h (MPa)
	טו						Measured	Corrected
Sadler Ave	BH-78	76.77	141.54	1.844	0.9875	253.27	54.72	54.03
Sadler Ave	BH-80	76.54	168.75	2.205	1.0000	163.83	35.61	35.61

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				
Dunraven Avenue from St. Mary's Road to Overton Street	2.0			
Overton Street from Blenheim Avenue to Harrowby Avenue				
Blenheim Avenue from St. Anne's Road to Des Meurons Street				
Weatherdon Avenue from Stafford Street to Arbuthnot Street				

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