APPENDIX 'A' - GEOTECHNICAL REPORT

GEOTECHNICAL REPORTS FOR:

Brock Street from Mathers Avenue to Taylor Avenue – Asphalt Pavement Reconstruction
Edderton Avenue from Beaumont Street to Derek Street – Asphalt Pavement Reconstruction
Rosemount Avenue from Beaumont Street to Derek Street – Asphalt Pavement Reconstruction

PAVEMENT CORES FOR:

Brock Street from Mathers Avenue to Taylor Avenue – Asphalt Pavement Reconstruction
Queenston Bay – West Leg from Mathers Avenue to Brock Street – Concrete Pavement Rehabilitation

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

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

February 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 1)

Stantec Consulting Ltd. (Stantec) was retained to undertake a factual geotechnical investigation for the 2024 Local Street Renewals Program (Contract 1) in Winnipeg, Manitoba. Use of this report is subject to the Statement of General Conditions provided in **Appendix A**.

The subsurface coring and drilling sampling program was conducted from December 1, 2023, to January 24, 2024. Pavement coring was performed by our geotechnical field personnel, and drilling services were provided by Paddock Drilling under the supervision of our personnel. The borehole locations are shown on the attached Borehole Location Plan provided in **Appendix B**. When subsurface drilling was required, the pavement cores were sampled with a 150 mm bit and boreholes were drilled with 125 mm solid stem augers. Geotechnical drilling boreholes were terminated at a depth of 2.0 m below the pavement, which resulted in borehole depths ranging from 2.05 m to 2.40 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 1)

EXISTING PAVEMENT THICKNESS

The existing pavement thickness is provided in the following table:

Street	Core ID	Asphalt Thickness (mm)	Concrete Thickness (mm)	Total Pavement Thickness (mm)
Brock Street	1	0	200	200
Brock Street	2	0	200	200
Brock Street	3	0	200	200
Brock Street	4	0	200	200
Queenston Bay	5	0	170	170
Queenston Bay	6	0	180	180
Queenston Bay	7	0	180	180
Edderton Ave	8	40	0	40
Edderton Ave	9	40	0	40
Edderton Ave	10	50	0	50
Edderton Ave	11	50	0	50
Rosemount Ave	12	100	0	100
Rosemount Ave	13	50	0	50
Rosemount Ave	14	50	0	50
Rosemount Ave	15	50	0	50

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**.

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

Reference: **2024 Local Street Renewals Program (Contract 1)**

Regards,

STANTEC CONSULTING LTD.

Guillaume Beauce P.Eng.
Geotechnical Engineer, Materials Testing Services
Phone: 204-928-7618
Mobile: 204-898-8290
guillaume.beauce@stantec.com

Jason Thompson C.E.T.
Manager, Materials Testing Services
Phone: 204-928-4004
Mobile: 204-981-8445
jason.thompson@stantec.com

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.

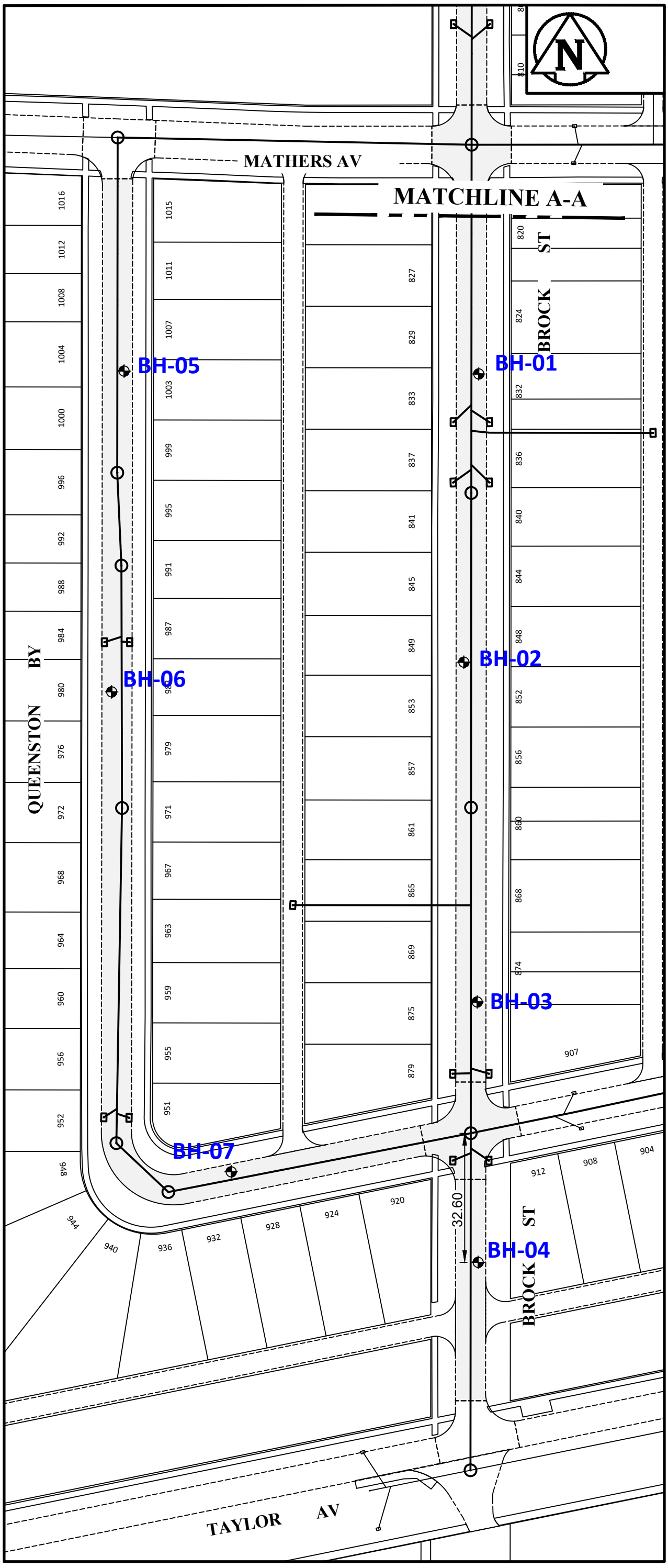
INTERPRETATION OF SITE CONDITIONS: Soil, rock, or other material descriptions, and statements regarding their condition, made in this report are based on site conditions encountered by Stantec at the time of the work and at the specific testing and/or sampling locations. Classifications and statements 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:

- BROCK ST = FULL DEPTH GEOTECHNICAL CORES. FOLLOW (J) LABRATORY TEST PROGRAMS FOR ALL CORES.
- QUEENSTON = DRILL PAVEMENT CORE ONLY EACH TEST HOLE LOCATION

TESTHOLE ⊕

EXACT LOCATIONS OF TEST HOLES TO BE MARKED IN FIELD BY CONTRACT ADMINISTRATOR.	DATE: 09/28/2023	DRAWING NO. 1 of 2	2024 LOCAL STREET RENEWAL PROGRAM CORING DRAWING - **CONTRACT 1** **BROCK ST** FROM GRANT AV TO TAYLOR AV - RECONSTRUCTION **QUEENSTON BY** FROM MATHERS AV TO BROCK ST - MINOR REHAB
	DRAWN BY: D.PEN.	SCALE: N.T.S.	

ROSEMOUNT AV

1337 1333 1329 1325 1323 1321 1319 1315 1309 1307 1305

1338 1334 1330 1328 1322 1320 1314 1310 1308 1306 1302

1339 1335 1329 1325 1321 1317 1313 1309 1307 1305 1303 1301

1338 1336 1332 1328 1320 1318 1314 1310 1306 1302

EDDERTON AV

BEAUMONT ST

DANIEL ST

1237 1233 1229 1225 1221 1217 1213 1209 1205 1203

1238 1234 1230 1226 1222 1218 1212 1208 1204 1202

1235 1233 1229 1225 1221 1217 1213 1209 1207 1205 1203

1236 1232 1228 1224 1220 1216 1214 1210 1206 1202A 1202

DEREK ST

BH-12

BH-13

BH-14

BH-15

BH-08

BH-09

BH-10

BH-11

N

NOTE:
- GEOTECHNICAL TESTHOLES 2.0m DEPTH. FOLLOW F.3.4

TESTHOLE

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

DATE:	DRAWING NO.:
10/06/2023	2 of 2
DRAWN BY:	SCALE:
D.PEN.	1:1000

2024 LOCAL STREET RENEWAL PROGRAM CORING DRAWING - **CONTRACT 1**

ROSEMOUNT AV FROM BEAUMONT ST TO DEREK ST - RECONSTRUCTION

EDDERTON AV FROM BEAUMONT ST TO DEREK ST - RECONSTRUCTION

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

STRATA PLOT

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

Boulders Cobbles Gravel | Sand | Silt | Clay | Organics | Asphalt | Concrete | Fill | Igneous Bedrock | Meta-morphic Bedrock | Sedi-mentary Bedrock

SAMPLE TYPE

SS	Split spoon sample (obtained by performing the Standard Penetration Test)
ST	Shelby tube or thin wall tube
DP	Direct-Push sample (small diameter tube 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

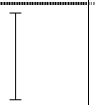
Numbers in this column are the field results of the Standard Penetration Test: the number of blows of a 140 pound (63.5 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (300 mm) into the soil. In accordance with ASTM D1586, the N-Value equals 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
H	Hydrometer analysis
k	Laboratory permeability
γ	Unit weight
G_s	Specific gravity of soil particles
CD	Consolidated drained triaxial
CU	Consolidated undrained triaxial with pore pressure measurements
UU	Unconsolidated undrained triaxial
DS	Direct Shear
C	Consolidation
Q_u	Unconfined compression
I_p	Point Load Index (I_p on Borehole Record equals $I_p(50)$ in which the index is corrected to a reference diameter of 50 mm)

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

BOREHOLE RECORD

BH-01

CLIENT: **City of Winnipeg** PROJECT NO.: **123316853**

PROJECT: **2024 Local Street Renewals** BH ELEVATION: **N/A**

LOCATION: **Brock Street** DATUM: **N/A**

DATE BORED: **January 15 2024** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**CONCRETE**						
		Firm brown fat **CLAY (CH)**		AS				
1				AS				Sieve/Hydro at 1.0 m G 0% S 3% M 33% C 64%
				AS				
2				AS				
				AS				
3		**End of Borehole** • Borehole terminated at a depth of 2.400 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled with auger cuttings and bentonite chips. • Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.						
4								

UNDRAINED SHEAR STRENGTH, Cu (kPa)

▲ LABORATORY TEST ◆ FIELD VANE TEST

★ POCKET PENETROMETER □ POCKET SHEAR VANE

50 kPa 100 kPa 150 kPa 200 kPa

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

✖ SPT (N-value) BLOWS/0.3m

Water Content (%) and Blow Count

10 20 30 40 50 60 70 80

BACKFILL

ELEVATION (m)

BACKFILL SYMBOL: ASPHALT, GROUT, CONCRETE, BENTONITE, DRILL CUTTINGS, SAND, SLOUGH

Drilling Contractor: Paddock Drilling Ltd. Logged By: RB

Drilling Method: 125 mm SSA Reviewed By: GB

Completion Depth: 2.4 m Page 1 of 1

BOREHOLE RECORD

BH-02

CLIENT: **City of Winnipeg**
PROJECT: **2024 Local Street Renewals**
LOCATION: **Brock Street**
DATE BORED: **January 15 2024**

PROJECT NO.: **123316853**
BH ELEVATION: **N/A**
DATUM: **N/A**
WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**CONCRETE**						
		Firm brown fat **CLAY (CH)**						
		Soft tan lean **CLAY (CL)**						
		Firm brown fat **CLAY (CH)**		AS				Sieve/Hydro at 1.0 m G 0% S 2% M 50% C 48%
1				AS				
				AS				
2				AS				
				AS				
3		**End of Borehole** • Borehole terminated at a depth of 2.400 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled with auger cuttings and bentonite chips. • Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.						
4								

UNDRAINED SHEAR STRENGTH, Cu (kPa)
▲ LABORATORY TEST ◆ FIELD VANE TEST
★ POCKET PENETROMETER □ POCKET SHEAR VANE
50 kPa 100 kPa 150 kPa 200 kPa

WATER CONTENT & ATTERBERG LIMITS W_P W W_L
✖ SPT (N-value) BLOWS/0.3m
Water Content (%) and Blow Count
10 20 30 40 50 60 70 80

BACKFILL

ELEVATION (m)

BACKFILL SYMBOL: ASPHALT, GROUT, CONCRETE, BENTONITE, DRILL CUTTINGS, SAND, SLOUGH

Drilling Contractor: Paddock Drilling Ltd.
Drilling Method: 125 mm SSA
Completion Depth: 2.4 m

Logged By: RB
Reviewed By: GB
Page 1 of 1

Stantec

BOREHOLE RECORD

BH-03

CLIENT: **City of Winnipeg** PROJECT NO.: **123316853**

PROJECT: **2024 Local Street Renewals** BH ELEVATION: **N/A**

LOCATION: **Brock Street** DATUM: **N/A**

DATE BORED: **January 15 2024** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**CONCRETE**						
		Firm brown fat **CLAY (CH)**		AS				
1								Sieve/Hydro at 1.0 m G 0% S 0% M 21% C 78%
		Soft tan lean **CLAY (CL)**		AS				
		Firm brown fat **CLAY (CH)**		AS				
2				AS				
				AS				
3		**End of Borehole** • Borehole terminated at a depth of 2.400 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled with auger cuttings and bentonite chips. • Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.						
4								

UNDRAINED SHEAR STRENGTH, Cu (kPa)

▲ LABORATORY TEST ◆ FIELD VANE TEST

★ POCKET PENETROMETER □ POCKET SHEAR VANE

50 kPa 100 kPa 150 kPa 200 kPa

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

✖ SPT (N-value) BLOWS/0.3m

Water Content (%) and Blow Count

10 20 30 40 50 60 70 80

BACKFILL

ELEVATION (m)

BACKFILL SYMBOL: ASPHALT, GROUT, CONCRETE, BENTONITE, DRILL CUTTINGS, SAND, SLOUGH

Drilling Contractor: Paddock Drilling Ltd. Logged By: RB

Drilling Method: 125 mm SSA Reviewed By: GB

Completion Depth: 2.4 m Page 1 of 1

Stantec

BOREHOLE RECORD

BH-04

CLIENT: **City of Winnipeg** PROJECT NO.: **123316853**

PROJECT: **2024 Local Street Renewals** BH ELEVATION: **N/A**

LOCATION: **Brock Street** DATUM: **N/A**

DATE BORED: **January 08 2024** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**CONCRETE**						
		Firm brown fat **CLAY (CH)**		AS				
1				AS				Sieve/Hydro at 1.0 m G S M C 0% 2% 21% 78%
				AS				
2				AS				
				AS				
3		**End of Borehole** • Borehole terminated at a depth of 2.400 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled with auger cuttings and bentonite chips. • Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.						
4								

UNDRAINED SHEAR STRENGTH, Cu (kPa)

▲ LABORATORY TEST ◆ FIELD VANE TEST

★ POCKET PENETROMETER □ POCKET SHEAR VANE

50 kPa 100 kPa 150 kPa 200 kPa

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

✖ SPT (N-value) BLOWS/0.3m

Water Content (%) and Blow Count

10 20 30 40 50 60 70 80

BACKFILL

ELEVATION (m)

BACKFILL SYMBOL: ASPHALT, GROUT, CONCRETE, BENTONITE, DRILL CUTTINGS, SAND, SLOUGH

Drilling Contractor: Paddock Drilling Ltd. Logged By: GP

Drilling Method: 125 mm SSA Reviewed By: GB

Completion Depth: 2.4 m Page 1 of 1

Stantec

BOREHOLE RECORD

BH-08

CLIENT: **City of Winnipeg** PROJECT NO.: **123316853**

PROJECT: **2024 Local Street Renewals** BH ELEVATION: **N/A**

LOCATION: **Edderton Avenue** DATUM: **N/A**

DATE BORED: **January 17 2024** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**ASPHALT**						
		Firm black fat **CLAY (CH)**						
		- brown below 5.5 m		AS				Sieve/Hydro at 0.6 m G 0% S 7% M 40% C 53%
1				AS				
				AS				
				AS				
2				AS				
3		**End of Borehole** • Borehole terminated at a depth of 2.700 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled with auger cuttings and bentonite chips. • Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.						
4								

UNDRAINED SHEAR STRENGTH, Cu (kPa)

▲ LABORATORY TEST ◆ FIELD VANE TEST

★ POCKET PENETROMETER □ POCKET SHEAR VANE

50 kPa 100 kPa 150 kPa 200 kPa

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

✖ SPT (N-value) BLOWS/0.3m

Water Content (%) and Blow Count

10 20 30 40 50 60 70 80

BACKFILL

ELEVATION (m)

BACKFILL SYMBOL: ASPHALT, GROUT, CONCRETE, BENTONITE, DRILL CUTTINGS, SAND, SLOUGH

Drilling Contractor: Paddock Drilling Ltd.	Logged By: RB
Drilling Method: 125 mm SSA	Reviewed By: GB
Completion Depth: 2.7 m	Page 1 of 1

Printed Feb 8 2024 17:14:22 SOIL 123316853-2024_LOCAL_STREET_RENEWALS.GPJ NEW TEMPLATE TEST PROJECT.GPJ 2/8/24

Stantec

BOREHOLE RECORD

BH-09

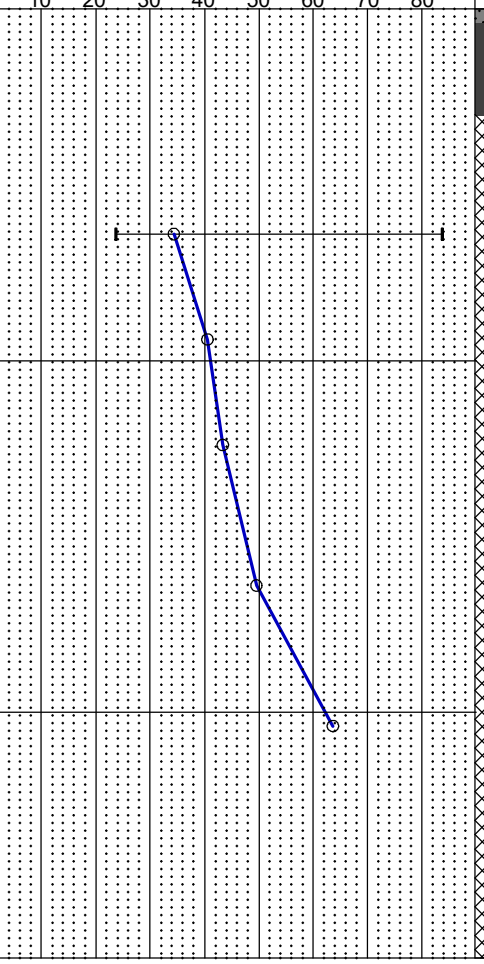
CLIENT: **City of Winnipeg**
PROJECT: **2024 Local Street Renewals**
LOCATION: **Edderton Avenue**
DATE BORED: **January 17 2024**

PROJECT NO.: **123316853**
BH ELEVATION: **N/A**
DATUM: **N/A**
WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: RECOVERY (mm) or TCR %	SAMPLES: N-VALUE or RQD %	OTHER TESTS / REMARKS	BACKFILL	ELEVATION (m)
0		**ASPHALT**								
		Firm brown fat **CLAY (CH)**		AS				Sieve/Hydro at 0.6 m G 0% S 2% M 28% C 69%		
1				AS						
				AS						
				AS						
2				AS						
3		**End of Borehole** • Borehole terminated at a depth of 2.700 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled with auger cuttings and bentonite chips. • Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.								
4										

UNDRAINED SHEAR STRENGTH, Cu (kPa)
▲ LABORATORY TEST ◆ FIELD VANE TEST
★ POCKET PENETROMETER □ POCKET SHEAR VANE
50 kPa 100 kPa 150 kPa 200 kPa

WATER CONTENT & ATTERBERG LIMITS W_P W W_L
✖ SPT (N-value) BLOWS/0.3m
Water Content (%) and Blow Count
10 20 30 40 50 60 70 80



BACKFILL SYMBOL: ASPHALT, GROUT, CONCRETE, BENTONITE, DRILL CUTTINGS, SAND, SLOUGH

Drilling Contractor: Paddock Drilling Ltd.
Drilling Method: 125 mm SSA
Completion Depth: 2.7 m

Logged By: RB
Reviewed By: GB
Page 1 of 1

Stantec

BOREHOLE RECORD

BH-10

CLIENT: **City of Winnipeg** PROJECT NO.: **123316853**

PROJECT: **2024 Local Street Renewals** BH ELEVATION: **N/A**

LOCATION: **Edderton Avenue** DATUM: **N/A**

DATE BORED: **January 08 2024** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**ASPHALT**						
		FILL: crushed limestone, 19 mm maximum aggregate size						
		Stiff black fat **CLAY (CH)**		AS				
				AS				Sieve/Hydro at 0.7 m G S M C 0% 2% 31% 67%
1				AS				
		Soft tan lean **CLAY (CL)**		AS				
		Firm brown fat **CLAY (CH)** - trace silt						
				AS				
2				AS				
3		**End of Borehole** • Borehole terminated at a depth of 2.400 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled with auger cuttings and bentonite chips. • Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.						
4								

UNDRAINED SHEAR STRENGTH, Cu (kPa)

▲ LABORATORY TEST ◆ FIELD VANE TEST

★ POCKET PENETROMETER □ POCKET SHEAR VANE

50 kPa 100 kPa 150 kPa 200 kPa

WATER CONTENT & ATTERBERG LIMITS W_P W W_L

✖ SPT (N-value) BLOWS/0.3m

Water Content (%) and Blow Count

10 20 30 40 50 60 70 80

BACKFILL

ELEVATION (m)

BACKFILL SYMBOL: ASPHALT, GROUT, CONCRETE, BENTONITE, DRILL CUTTINGS, SAND, SLOUGH

Drilling Contractor: Paddock Drilling Ltd. Logged By: GP

Drilling Method: 125 mm SSA Reviewed By: GB

Completion Depth: 2.4 m Page 1 of 1

BOREHOLE RECORD

BH-11

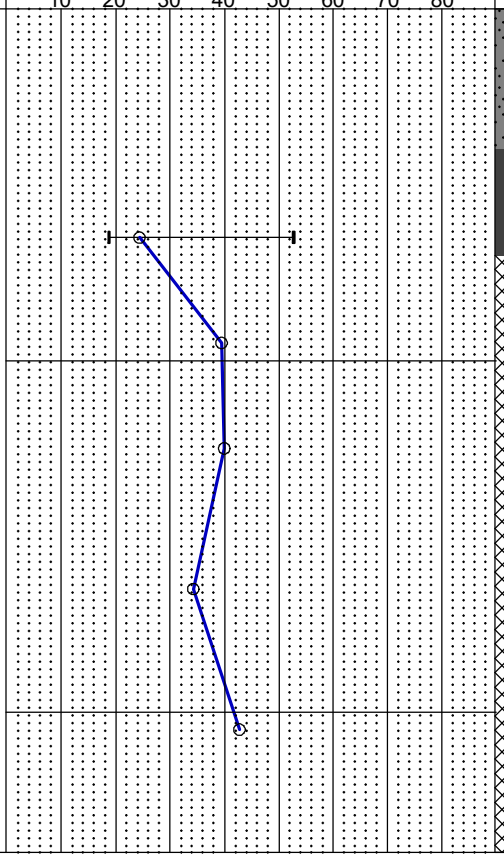
CLIENT: **City of Winnipeg**
PROJECT: **2024 Local Street Renewals**
LOCATION: **Edderton Avenue**
DATE BORED: **January 08 2024**

PROJECT NO.: **123316853**
BH ELEVATION: **N/A**
DATUM: **N/A**
WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**ASPHALT**						
		FILL: crushed limestone, 19 mm maximum aggregate size						
		Soft tan lean **CLAY (CL)** with sand		AS				Sieve/Hydro at 0.7 m G 4% S 23% M 24% C 49%
1				AS				
				AS				
		Firm brown fat **CLAY (CH)** - silty, sandy, trace gravel		AS				
2				AS				
3								
4								

UNDRAINED SHEAR STRENGTH, Cu (kPa)
▲ LABORATORY TEST ◆ FIELD VANE TEST
★ POCKET PENETROMETER □ POCKET SHEAR VANE
50 kPa 100 kPa 150 kPa 200 kPa

WATER CONTENT & ATTERBERG LIMITS W_P W W_L
✖ SPT (N-value) BLOWS/0.3m
Water Content (%) and Blow Count
10 20 30 40 50 60 70 80



BACKFILL

End of Borehole
- Borehole terminated at a depth of 2.400 m.
- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- Borehole backfilled with auger cuttings and bentonite chips.
- Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.

BACKFILL SYMBOL: ASPHALT, GROUT, CONCRETE, BENTONITE, DRILL CUTTINGS, SAND, SLOUGH

Drilling Contractor: Paddock Drilling Ltd.
Drilling Method: 125 mm SSA
Completion Depth: 2.4 m

Logged By: GP
Reviewed By: GB
Page 1 of 1

Printed Feb 8 2024 17:14:25 SOIL 123316853-2024_LOCAL_STREET_RENEWALS.GPJ NEW TEMPLATE TEST PROJECT.GPJ 2/8/24

Stantec

BOREHOLE RECORD

BH-12

CLIENT: **City of Winnipeg** PROJECT NO.: **123316853**

PROJECT: **2024 Local Street Renewals** BH ELEVATION: **N/A**

LOCATION: **Rosemount Avenue** DATUM: **N/A**

DATE BORED: **January 08 2024** WATER LEVEL: **N/A**

UNDRAINED SHEAR STRENGTH, Cu (kPa)
▲ LABORATORY TEST ◆ FIELD VANE TEST
★ POCKET PENETROMETER □ POCKET SHEAR VANE
50 kPa 100 kPa 150 kPa 200 kPa

WATER CONTENT & ATTERBERG LIMITS W_P W W_L
✖ SPT (N-value) BLOWS/0.3m
Water Content (%) and Blow Count
10 20 30 40 50 60 70 80

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS	BACKFILL	ELEVATION (m)
0		**ASPHALT**								
		FILL: crushed limestone, 19 mm maximum aggregate size								
		Firm brown fat **CLAY (CH)** - silty, trace sand		AS				Sieve/Hydro at 0.7 m G 0% S 3% M 38% C 59%		
1				AS						
				AS						
				AS						
2				AS						
		End of Borehole • Borehole terminated at a depth of 2.400 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled with auger cuttings and bentonite chips. • Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.								
3										
4										

BACKFILL SYMBOL: ASPHALT, GROUT, CONCRETE, BENTONITE, DRILL CUTTINGS, SAND, SLOUGH

Drilling Contractor: Paddock Drilling Ltd. Logged By: GP

Drilling Method: 125 mm SSA Reviewed By: GB

Completion Depth: 2.4 m Page 1 of 1

Stantec

BOREHOLE RECORD

BH-13

CLIENT: **City of Winnipeg**
PROJECT: **2024 Local Street Renewals**
LOCATION: **Rosemount Avenue**
DATE BORED: **January 17 2024**

PROJECT NO.: **123316853**
BH ELEVATION: **N/A**
DATUM: **N/A**
WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**ASPHALT**						
		Firm brown fat **CLAY (CH)** - trace silt						
		Soft tan lean **CLAY (CL)** with sand		AS				Sieve/Hydro at 0.7 m G S M C 0% 13% 52% 35%
1				AS				
				AS				
		Firm brown fat **CLAY (CH)**		AS				
2				AS				
3		**End of Borehole** • Borehole terminated at a depth of 2.700 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled with auger cuttings and bentonite chips. • Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.						
4								

UNDRAINED SHEAR STRENGTH, Cu (kPa)
▲ LABORATORY TEST ◆ FIELD VANE TEST
★ POCKET PENETROMETER □ POCKET SHEAR VANE
50 kPa 100 kPa 150 kPa 200 kPa

WATER CONTENT & ATTERBERG LIMITS W_P W W_L
✖ SPT (N-value) BLOWS/0.3m
Water Content (%) and Blow Count
10 20 30 40 50 60 70 80

BACKFILL

BACKFILL SYMBOL: ASPHALT, GROUT, CONCRETE, BENTONITE, DRILL CUTTINGS, SAND, SLOUGH

Drilling Contractor: Paddock Drilling Ltd.	Logged By: RB
Drilling Method: 125 mm SSA	Reviewed By: GB
Completion Depth: 2.7 m	Page 1 of 1

Stantec

BOREHOLE RECORD

BH-14

CLIENT: **City of Winnipeg**
PROJECT: **2024 Local Street Renewals**
LOCATION: **Rosemount Avenue**
DATE BORED: **January 08 2024**

PROJECT NO.: **123316853**
BH ELEVATION: **N/A**
DATUM: **N/A**
WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**ASPHALT**						
		FILL: crushed limestone, 19 mm maximum aggregate size						
		Firm to stiff brown fat **CLAY (CH)** - trace silt		AS				Sieve/Hydro at 0.7 m G 0% S 3% M 36% C 61%
1				AS				
				AS				
				AS				
2				AS				
3								
4								

UNDRAINED SHEAR STRENGTH, Cu (kPa)
▲ LABORATORY TEST ◆ FIELD VANE TEST
★ POCKET PENETROMETER □ POCKET SHEAR VANE
50 kPa 100 kPa 150 kPa 200 kPa

WATER CONTENT & ATTERBERG LIMITS W_P W W_L
✖ SPT (N-value) BLOWS/0.3m
Water Content (%) and Blow Count
10 20 30 40 50 60 70 80

BACKFILL

End of Borehole
- Borehole terminated at a depth of 2.400 m.
- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- Borehole backfilled with auger cuttings and bentonite chips.
- Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.

BACKFILL SYMBOL: ASPHALT, GROUT, CONCRETE, BENTONITE, DRILL CUTTINGS, SAND, SLOUGH

Drilling Contractor: Paddock Drilling Ltd.
Drilling Method: 125 mm SSA
Completion Depth: 2.4 m

Logged By: GP
Reviewed By: GB
Page 1 of 1

Printed Feb 8 2024 17:14:28 SOIL 123316853-2024_LOCAL_STREET_RENEWALS.GPJ NEW TEMPLATE TEST PROJECT.GPJ 2/8/24

Stantec

BOREHOLE RECORD

BH-15

CLIENT: **City of Winnipeg**
PROJECT: **2024 Local Street Renewals**
LOCATION: **Rosemount Avenue**
DATE BORED: **January 17 2024**

PROJECT NO.: **123316853**
BH ELEVATION: **N/A**
DATUM: **N/A**
WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**ASPHALT**						
		Firm black fat **CLAY (CH)**		AS				
								Sieve/Hydro at 0.7 m G 1% S 6% M 45% C 46%
1		Soft tan lean **CLAY (CL)**		AS				
				AS				
		Firm brown fat **CLAY (CH)**		AS				
2				AS				
3		**End of Borehole** • Borehole terminated at a depth of 2.700 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled with auger cuttings and bentonite chips. • Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.						
4								

UNDRAINED SHEAR STRENGTH, Cu (kPa)
▲ LABORATORY TEST ◆ FIELD VANE TEST
★ POCKET PENETROMETER □ POCKET SHEAR VANE
50 kPa 100 kPa 150 kPa 200 kPa

WATER CONTENT & ATTERBERG LIMITS W_P W W_L
✖ SPT (N-value) BLOWS/0.3m
Water Content (%) and Blow Count
10 20 30 40 50 60 70 80

BACKFILL

ELEVATION (m)

BACKFILL SYMBOL: ASPHALT, GROUT, CONCRETE, BENTONITE, DRILL CUTTINGS, SAND, SLOUGH

Drilling Contractor: Paddock Drilling Ltd.	Logged By: RB
Drilling Method: 125 mm SSA	Reviewed By: GB
Completion Depth: 2.7 m	Page 1 of 1

APPENDIX D

Core Photographs

Figure 1 – Core No. 1 (Brock St)

Figure 2 – Core No. 2 (Brock St)

Figure 3 – Core No. 3 (Brock St)

Figure 4 – Core No. 4 (Brock St)

Figure 5 – Core No. 5 (Queenston Bay)

Figure 6 – Core No. 6 (Queenston Bay)

Figure 7 – Core No. 7 (Queenston Bay)

APPENDIX E

Laboratory Test Reports

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 1

DATE SAMPLED: 2024.Jan.15
SAMPLED BY: Stantec Consulting Ltd.

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

DATE TESTED: 2024.Jan.25
TESTED BY: Carson Cockwell

MATERIAL IDENTIFICATION

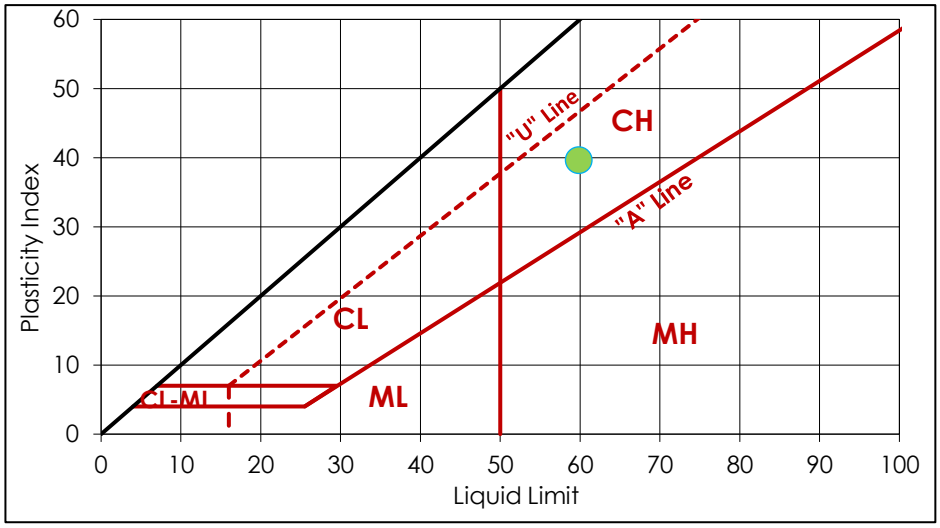
CLIENT FIELD ID BH-01, 1000 mm

STANTEC SAMPLE NO. 2972

LIQUID LIMIT		
TRIAL	1	2
BLOWS	23	21
MC (%)	60	61

PLASTIC LIMIT		
TRIAL	1	2
MC (%)	20	20

LIQUID LIMIT, LL	60
PLASTIC LIMIT, PL	20
PLASTICITY INDEX, PI	40
AS REC'D MC (%)	30.70



COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 2

DATE SAMPLED: 2024.Jan.15
SAMPLED BY: Stantec Consulting Ltd.

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

DATE TESTED: 2024.Jan.25
TESTED BY: Carson Cockwell

MATERIAL IDENTIFICATION

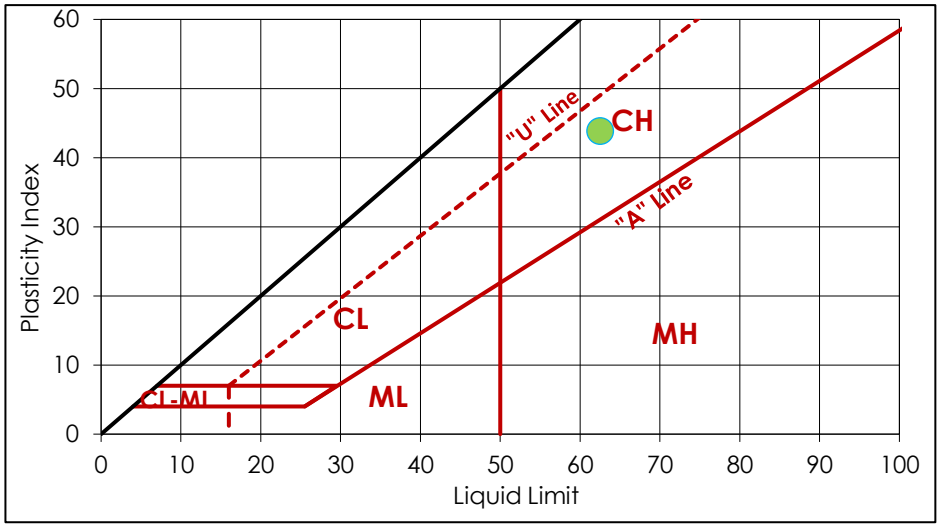
CLIENT FIELD ID BH-02, 1000 mm

STANTEC SAMPLE NO. 2973

LIQUID LIMIT		
TRIAL	1	2
BLOWS	28	27
MC (%)	62	61

PLASTIC LIMIT		
TRIAL	1	2
MC (%)	19	18

LIQUID LIMIT, LL	63
PLASTIC LIMIT, PL	19
PLASTICITY INDEX, PI	44
AS REC'D MC (%)	41.80



COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 3

DATE SAMPLED: 2024.Jan.15
SAMPLED BY: Stantec Consulting Ltd.

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

DATE TESTED: 2024.Jan.25
TESTED BY: Carson Cockwell

MATERIAL IDENTIFICATION

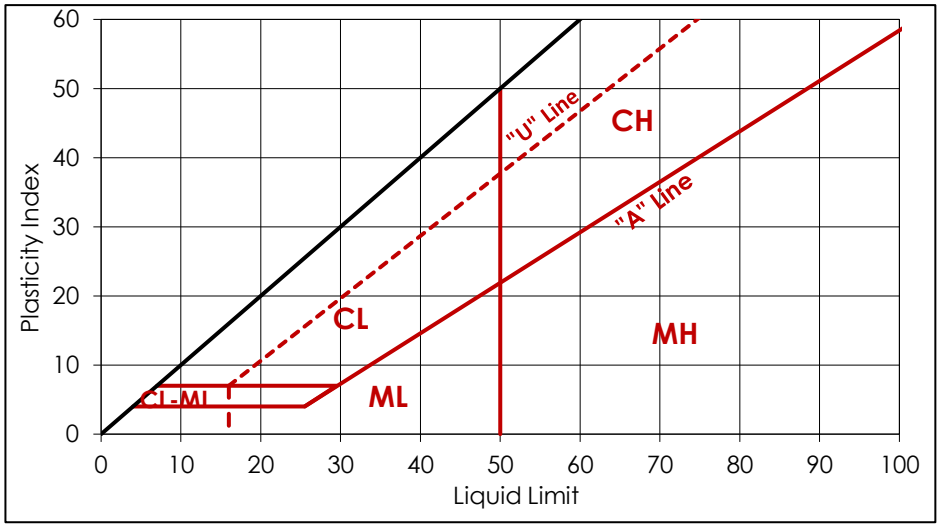
CLIENT FIELD ID BH-03, 1000 mm

STANTEC SAMPLE NO. 2974

LIQUID LIMIT		
TRIAL	1	2
BLOWS	26	26
MC (%)	96	90

PLASTIC LIMIT		
TRIAL	1	2
MC (%)	20	22

LIQUID LIMIT, LL	94
PLASTIC LIMIT, PL	21
PLASTICITY INDEX, PI	73
AS REC'D MC (%)	42.00



COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 4

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.15
TESTED BY: Blair Dawson

MATERIAL IDENTIFICATION

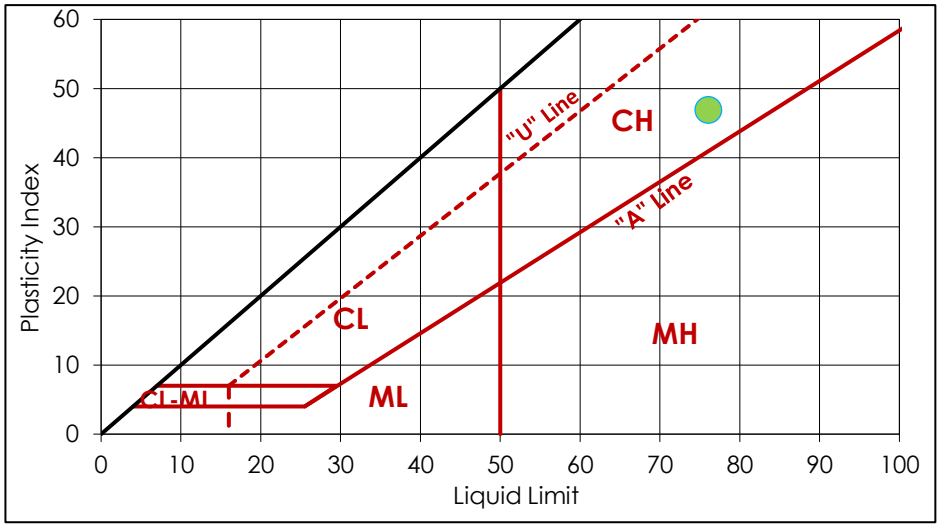
CLIENT FIELD ID BH-04, 1000 mm

STANTEC SAMPLE NO. 2941

LIQUID LIMIT		
TRIAL	1	2
BLOWS	25	26
MC (%)	77	75

PLASTIC LIMIT		
TRIAL	1	2
MC (%)	29	29

LIQUID LIMIT, LL	76
PLASTIC LIMIT, PL	29
PLASTICITY INDEX, PI	47
AS REC'D MC (%)	31.40



COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 5

DATE SAMPLED: 2024.Jan.17
SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.31
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

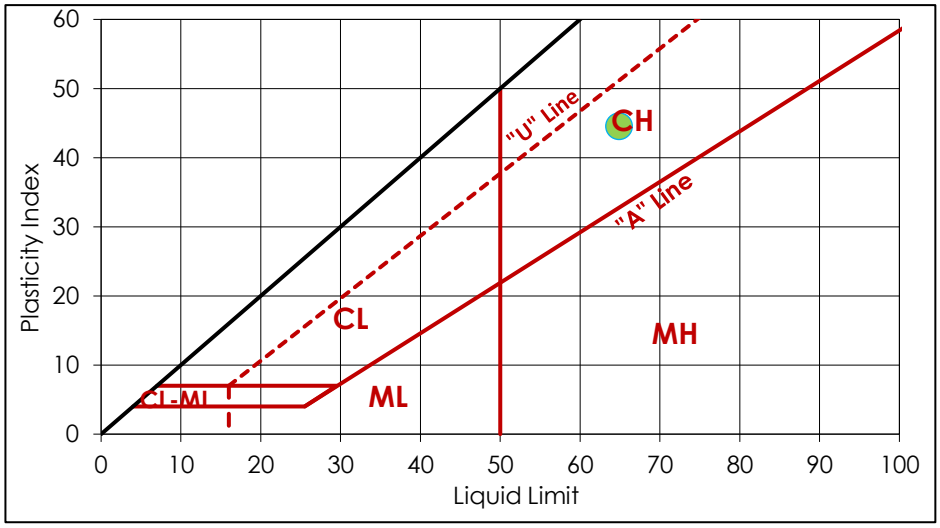
CLIENT FIELD ID BH-08, 640 mm

STANTEC SAMPLE NO. 2996

LIQUID LIMIT		
TRIAL	1	2
BLOWS	26	27
MC (%)	64	64

PLASTIC LIMIT		
TRIAL	1	2
MC (%)	21	20

LIQUID LIMIT, LL	65
PLASTIC LIMIT, PL	20
PLASTICITY INDEX, PI	45
AS REC'D MC (%)	27.70



COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 6

DATE SAMPLED: 2024.Jan.17
SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Feb.01
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

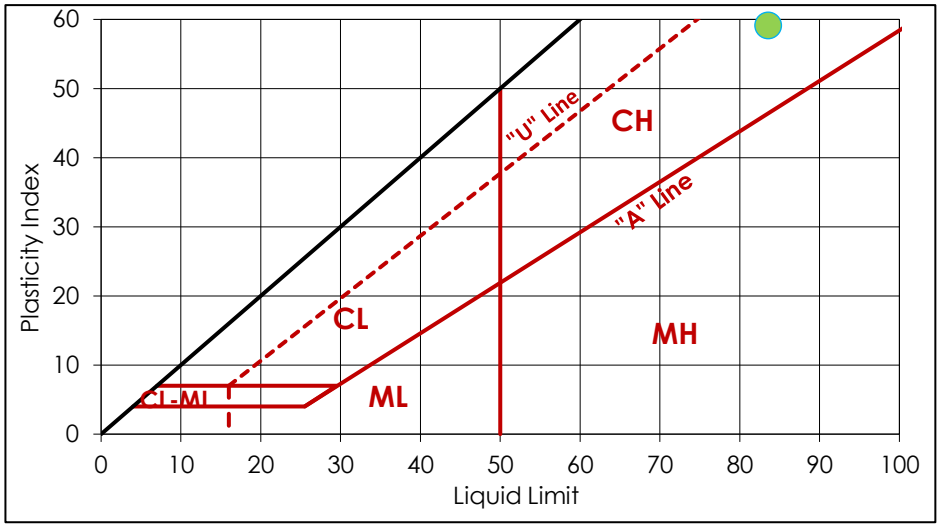
CLIENT FIELD ID BH-09, 640 mm

STANTEC SAMPLE NO. 2997

LIQUID LIMIT		
TRIAL	1	2
BLOWS	25	26
MC (%)	83	83

PLASTIC LIMIT		
TRIAL	1	2
MC (%)	24	25

LIQUID LIMIT, LL	84
PLASTIC LIMIT, PL	24
PLASTICITY INDEX, PI	59
AS REC'D MC (%)	34.90



COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 7

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.15
TESTED BY: Blair Dawson

MATERIAL IDENTIFICATION

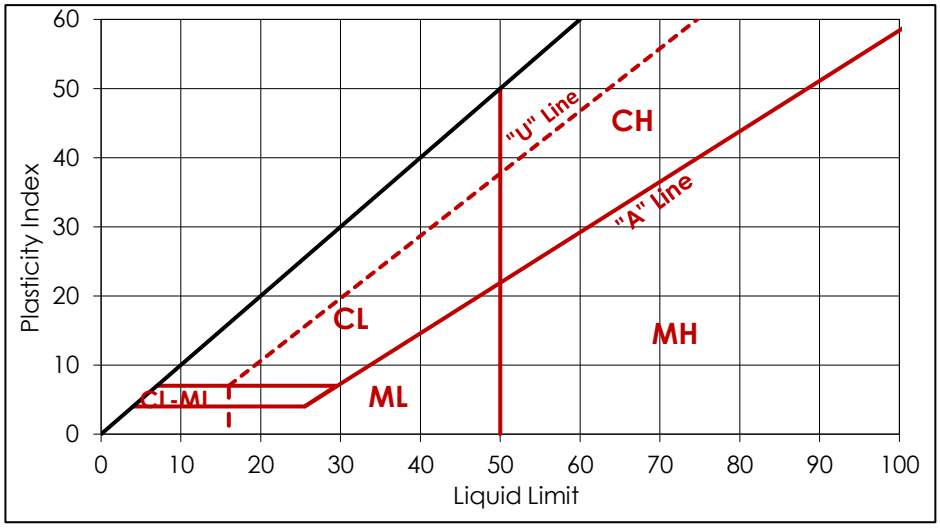
CLIENT FIELD ID BH-10, 650 mm

STANTEC SAMPLE NO. 2942

LIQUID LIMIT		
TRIAL	1	2
BLOWS	27	28
MC (%)	86	85

PLASTIC LIMIT		
TRIAL	1	2
MC (%)	24	25

LIQUID LIMIT, LL	86
PLASTIC LIMIT, PL	24
PLASTICITY INDEX, PI	62
AS REC'D MC (%)	32.98



COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 8

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.15
TESTED BY: Blair Dawson

MATERIAL IDENTIFICATION

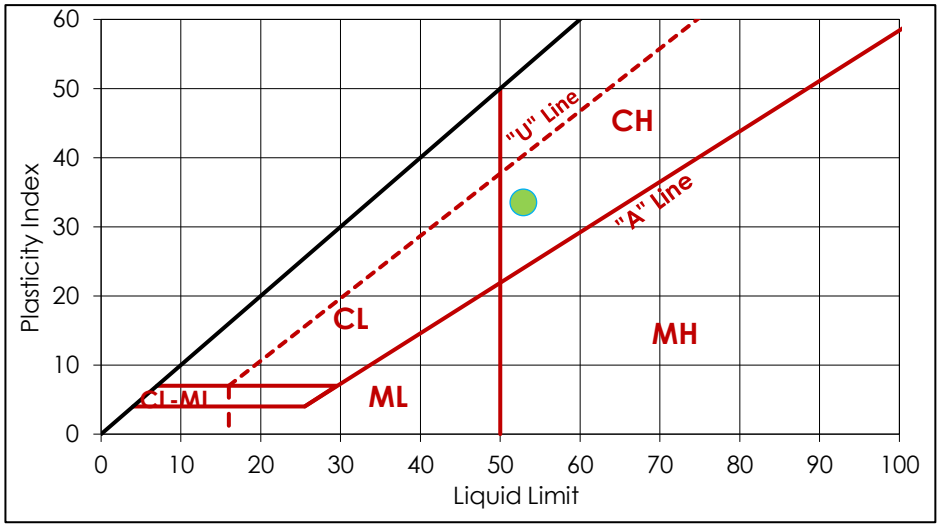
CLIENT FIELD ID BH-11, 650 mm

STANTEC SAMPLE NO. 2943

LIQUID LIMIT		
TRIAL	1	2
BLOWS	26	25
MC (%)	53	53

PLASTIC LIMIT		
TRIAL	1	2
MC (%)	20	19

LIQUID LIMIT, LL	53
PLASTIC LIMIT, PL	19
PLASTICITY INDEX, PI	33
AS REC'D MC (%)	24.94



COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 9

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.15
TESTED BY: Blair Dawson

MATERIAL IDENTIFICATION

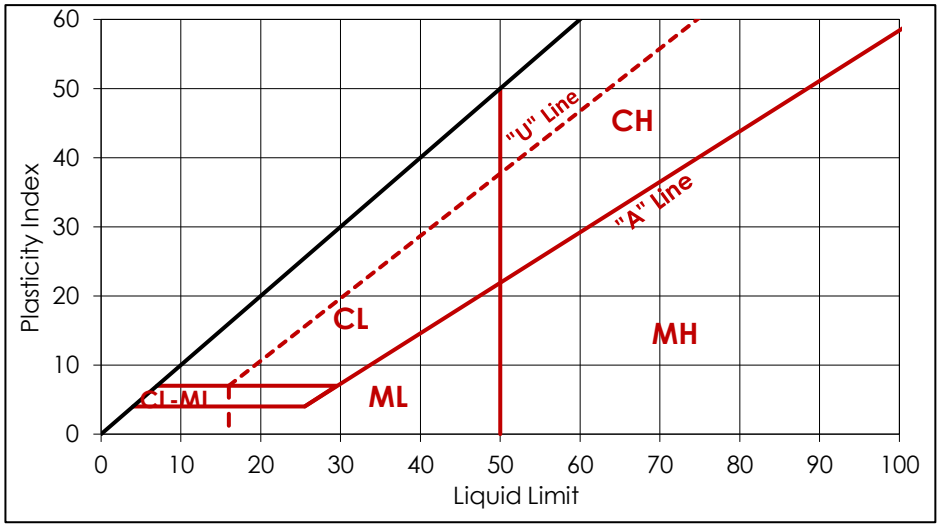
CLIENT FIELD ID BH-12, 700 mm

STANTEC SAMPLE NO. 2944

LIQUID LIMIT		
TRIAL	1	2
BLOWS	23	23
MC (%)	92	93

PLASTIC LIMIT		
TRIAL	1	2
MC (%)	25	25

LIQUID LIMIT, LL	91
PLASTIC LIMIT, PL	25
PLASTICITY INDEX, PI	66
AS REC'D MC (%)	31.78



COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 10

DATE SAMPLED: 2024.Jan.17
SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.31
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

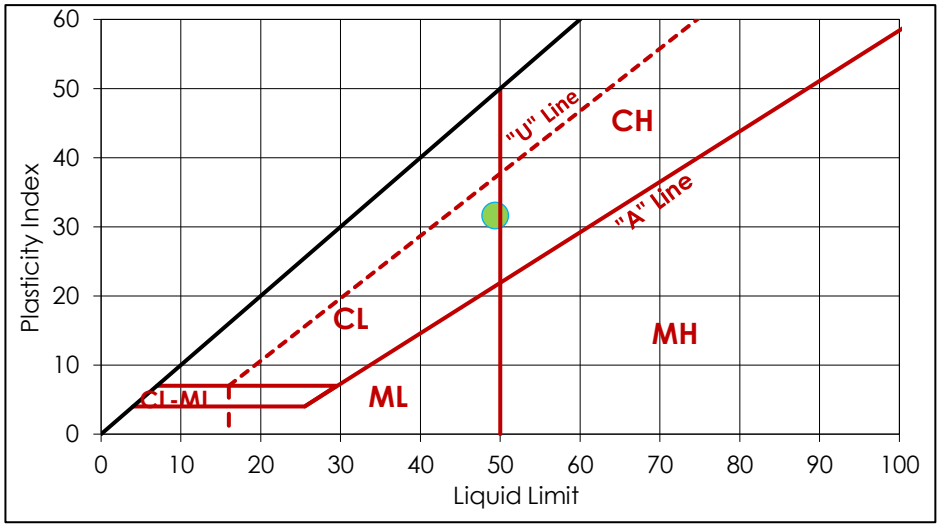
CLIENT FIELD ID BH-13, 650 mm

STANTEC SAMPLE NO. 2998

LIQUID LIMIT		
TRIAL	1	2
BLOWS	27	28
MC (%)	49	49

PLASTIC LIMIT		
TRIAL	1	2
MC (%)	18	18

LIQUID LIMIT, LL	49
PLASTIC LIMIT, PL	18
PLASTICITY INDEX, PI	32
AS REC'D MC (%)	29.20



COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 11

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.15
TESTED BY: Blair Dawson

MATERIAL IDENTIFICATION

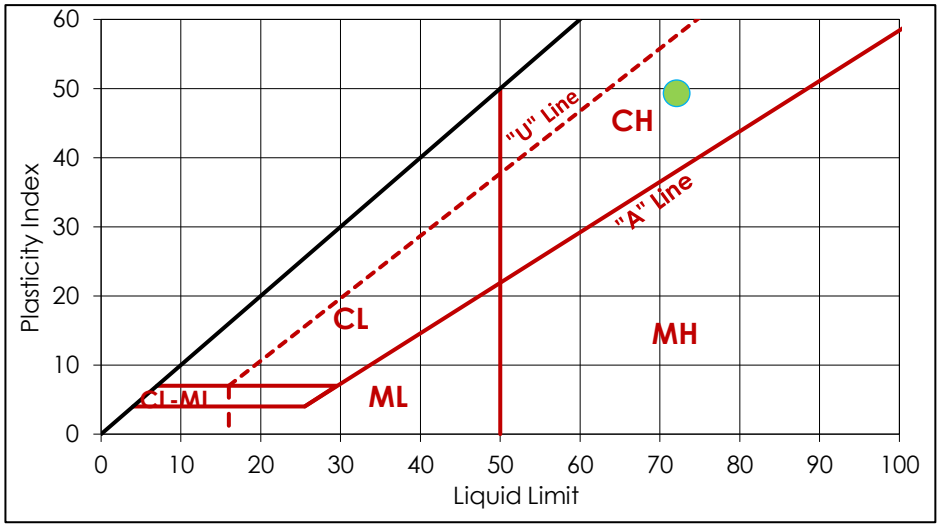
CLIENT FIELD ID BH-14, 650 mm

STANTEC SAMPLE NO. 2945

LIQUID LIMIT		
TRIAL	1	2
BLOWS	21	21
MC (%)	71	76

PLASTIC LIMIT		
TRIAL	1	2
MC (%)	23	23

LIQUID LIMIT, LL	72
PLASTIC LIMIT, PL	23
PLASTICITY INDEX, PI	49
AS REC'D MC (%)	26.28



COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 12

DATE SAMPLED: 2024.Jan.17
SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.31
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

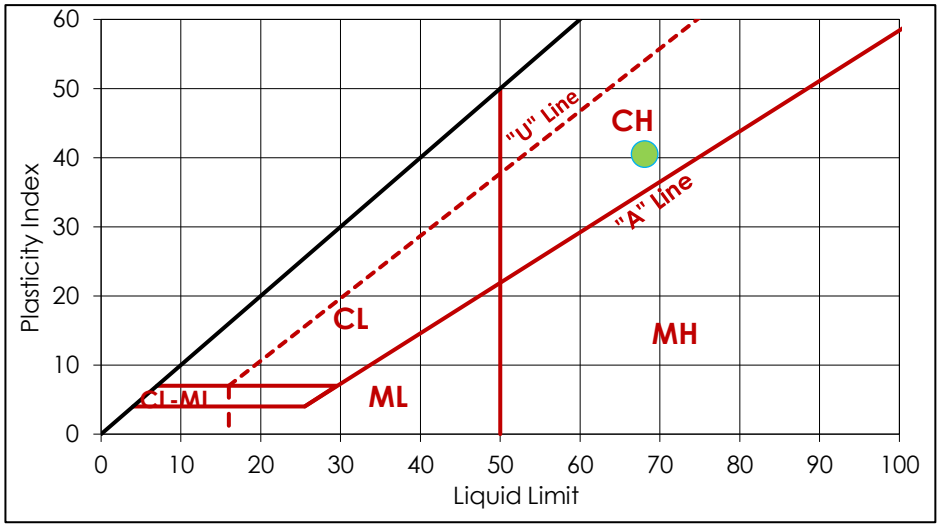
CLIENT FIELD ID BH-15, 650 mm

STANTEC SAMPLE NO. 2999

LIQUID LIMIT		
TRIAL	1	2
BLOWS	24	23
MC (%)	69	68

PLASTIC LIMIT		
TRIAL	1	2
MC (%)	28	27

LIQUID LIMIT, LL	68
PLASTIC LIMIT, PL	28
PLASTICITY INDEX, PI	40
AS REC'D MC (%)	31.80



COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 1

DATE SAMPLED: 2024.Jan.15
SAMPLED BY: Stantec Consulting Ltd.

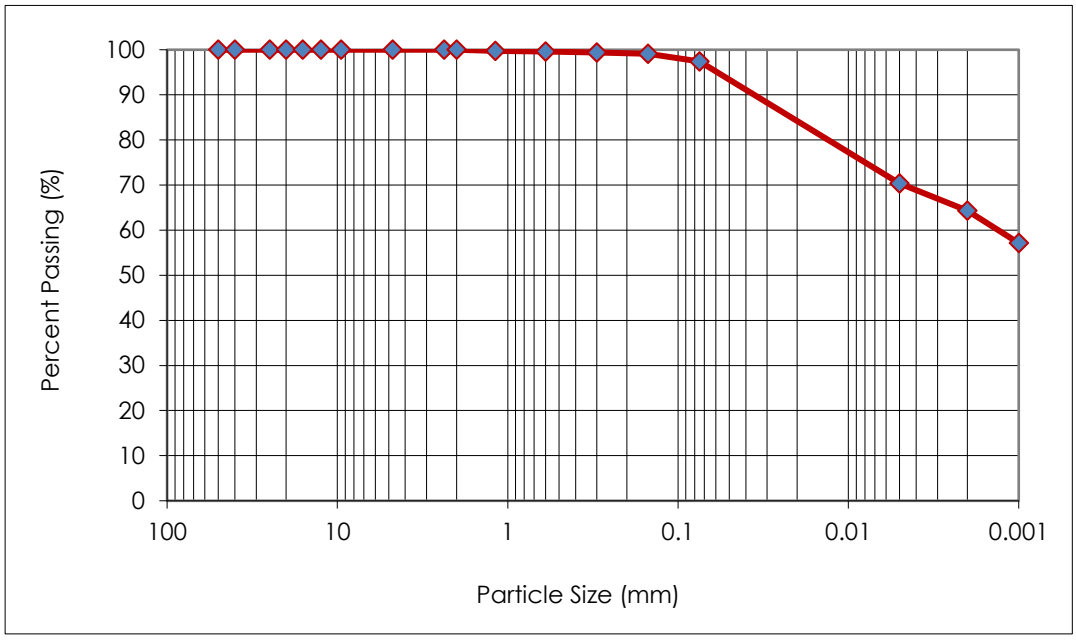
DATE RECEIVED: 2024.Jan.15
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.23
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-01, 1000 mm

STANTEC SAMPLE NO. 2972



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	99.7
0.600	99.6
0.300	99.4
0.150	99.1
0.075	97.4
0.005	70.4
0.002	64.3
0.001	57.1

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.0	0.5	2.1	33.1	64.3	57.1

COMMENTS
No comments.

REPORT DATE 2024.Jan.25

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 2

DATE SAMPLED: 2024.Jan.15
SAMPLED BY: Stantec Consulting Ltd.

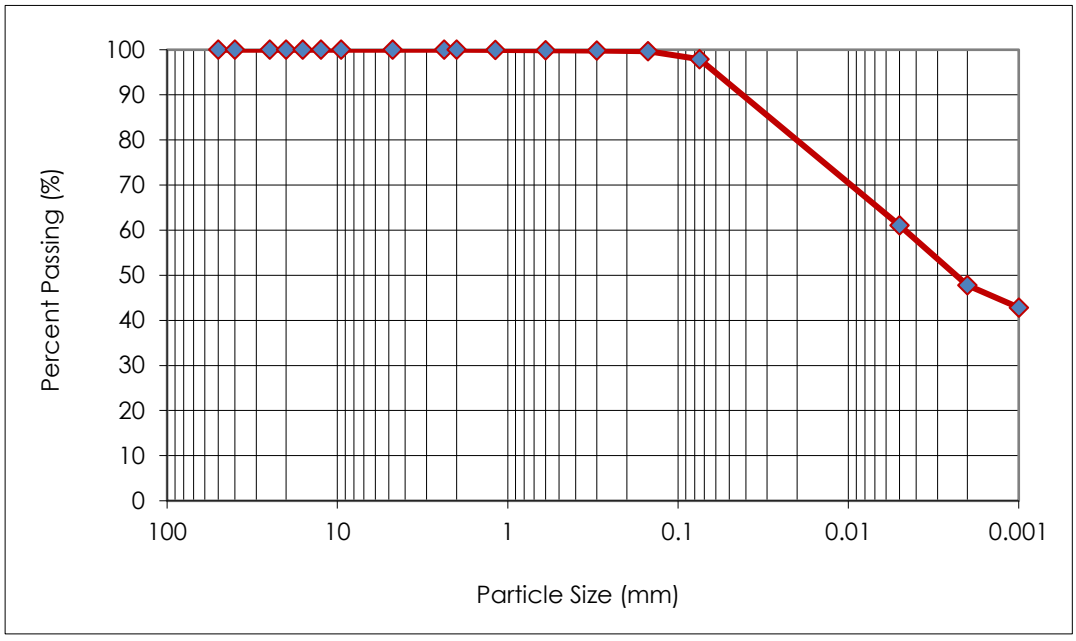
DATE RECEIVED: 2024.Jan.15
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.23
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-02, 1000 mm

STANTEC SAMPLE NO. 2973



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	97.9
0.005	61.1
0.002	47.8
0.001	42.8

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.0	0.1	2.0	50.1	47.8	42.8

COMMENTS
No comments.

REPORT DATE 2024.Jan.25

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 3

DATE SAMPLED: 2024.Jan.15
SAMPLED BY: Stantec Consulting Ltd.

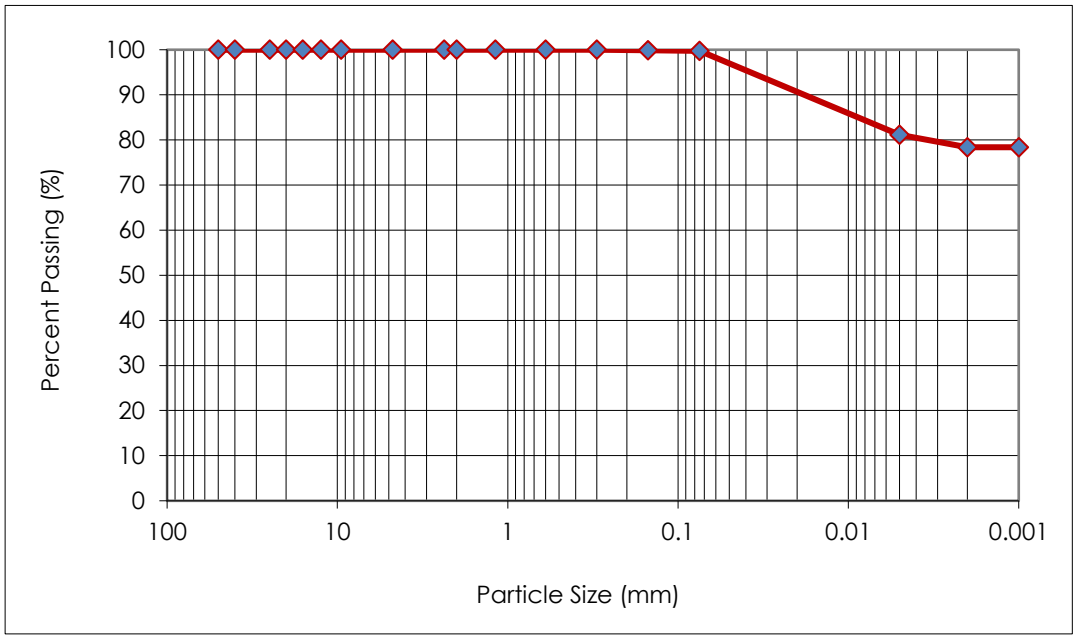
DATE RECEIVED: 2024.Jan.15
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.23
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-03, 1000 mm

STANTEC SAMPLE NO. 2974



Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	100.0
1.18	100.0
0.600	100.0
0.300	100.0
0.150	99.9
0.075	99.8
0.005	81.1
0.002	78.4
0.001	78.4

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.0	0.0	0.2	21.4	78.4	78.4

COMMENTS
No comments.

REPORT DATE 2024.Jan.25

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 4

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Stantec Consulting Ltd.

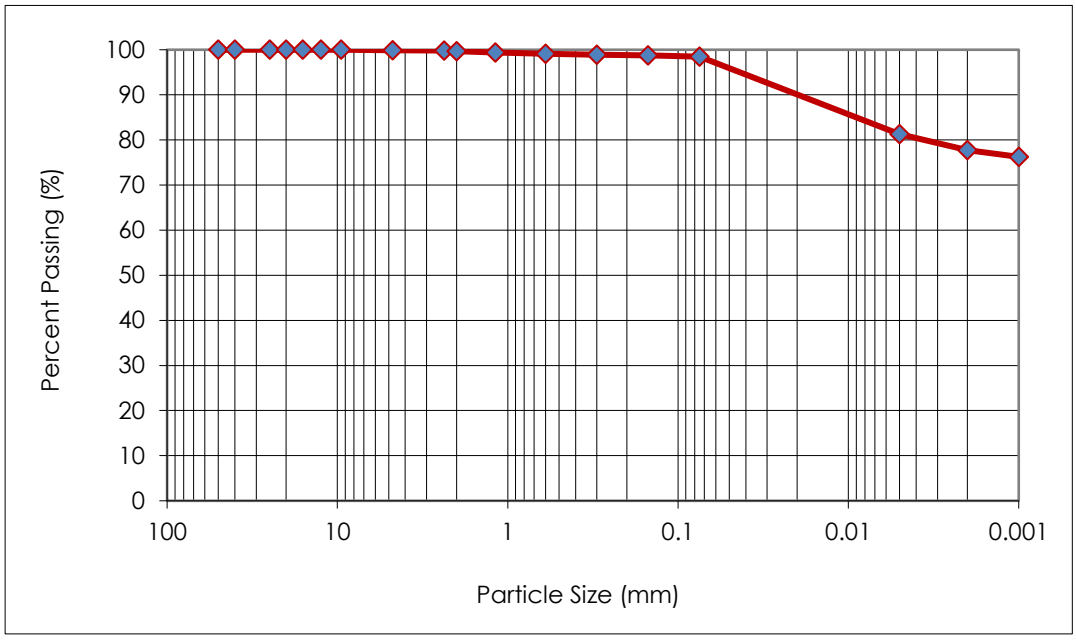
DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.10
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-04, 1000 mm

STANTEC SAMPLE NO. 2941



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	99.9
2.36	99.8
2.00	99.7
1.18	99.4
0.600	99.1
0.300	98.9
0.150	98.8
0.075	98.4
0.005	81.3
0.002	77.7
0.001	76.3

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.1	0.2	0.7	0.6	20.7	77.7	76.3

COMMENTS
No comments.

REPORT DATE 2024.Jan.15

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 5

DATE SAMPLED: 2024.Jan.15
SAMPLED BY: Stantec Consulting Ltd.

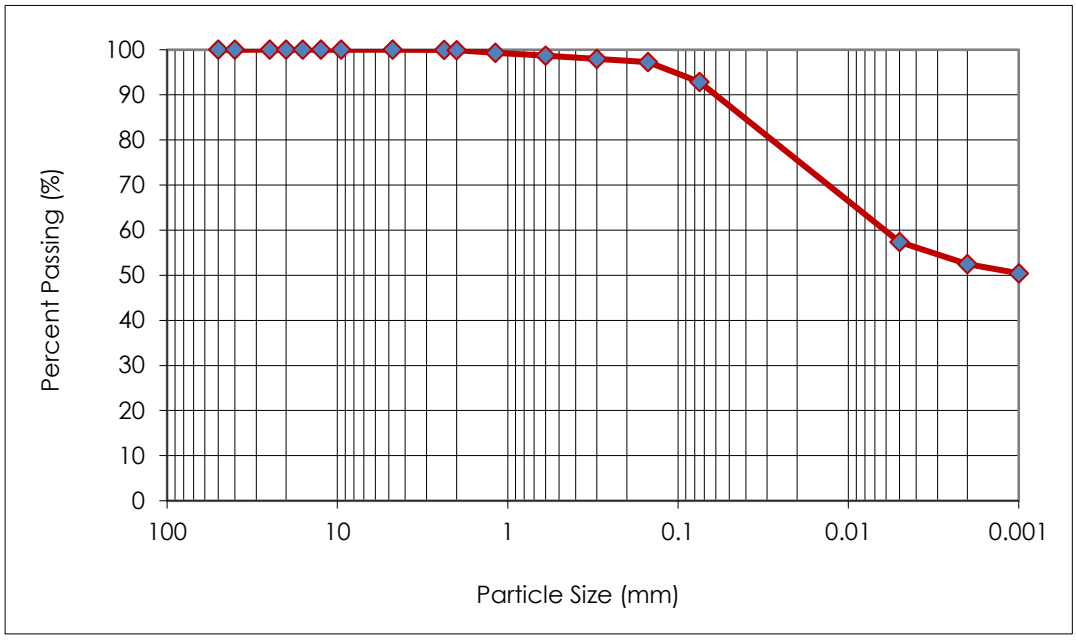
DATE RECEIVED: 2024.Jan.15
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.23
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-08, 640 mm

STANTEC SAMPLE NO. 2996



Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	99.9
2.00	99.9
1.18	99.3
0.600	98.7
0.300	97.9
0.150	97.2
0.075	92.9
0.005	57.4
0.002	52.5
0.001	50.4

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.1	1.7	5.3	40.4	52.5	50.4

COMMENTS
No comments.

REPORT DATE 2024.Jan.25

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 6

DATE SAMPLED: 2024.Jan.15
SAMPLED BY: Stantec Consulting Ltd.

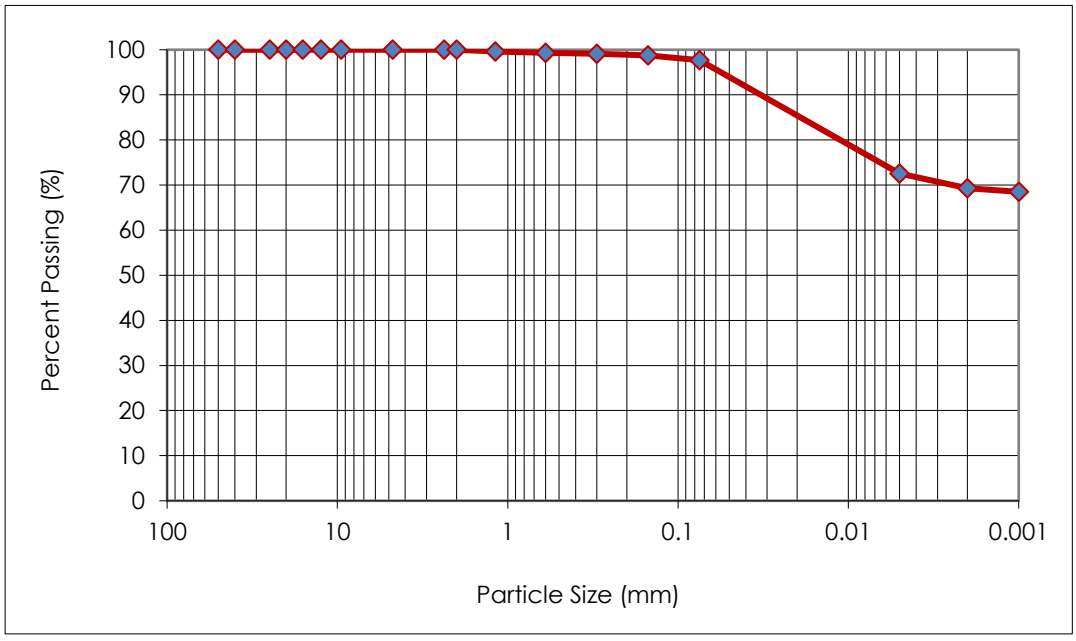
DATE RECEIVED: 2024.Jan.15
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.23
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-09, 640 mm

STANTEC SAMPLE NO. 2997



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	99.6
0.600	99.3
0.300	99.1
0.150	98.7
0.075	97.7
0.005	72.5
0.002	69.3
0.001	68.5

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.0	0.8	1.5	28.4	69.3	68.5

COMMENTS
No comments.

REPORT DATE 2024.Jan.25

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 7

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Stantec Consulting Ltd.

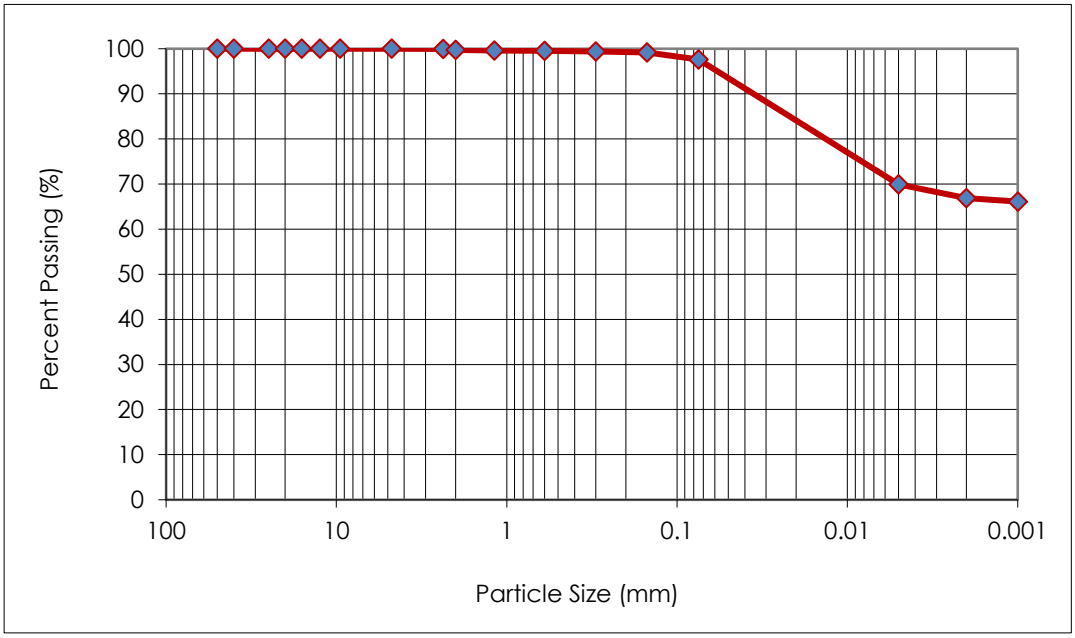
DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.10
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-10, 650 mm

STANTEC SAMPLE NO. 2942



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	99.8
1.18	99.6
0.600	99.5
0.300	99.4
0.150	99.2
0.075	97.6
0.005	69.9
0.002	66.9
0.001	66.1

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.2	0.4	1.8	30.7	66.9	66.1

COMMENTS
No comments.

REPORT DATE 2024.Jan.15

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 8

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Stantec Consulting Ltd.

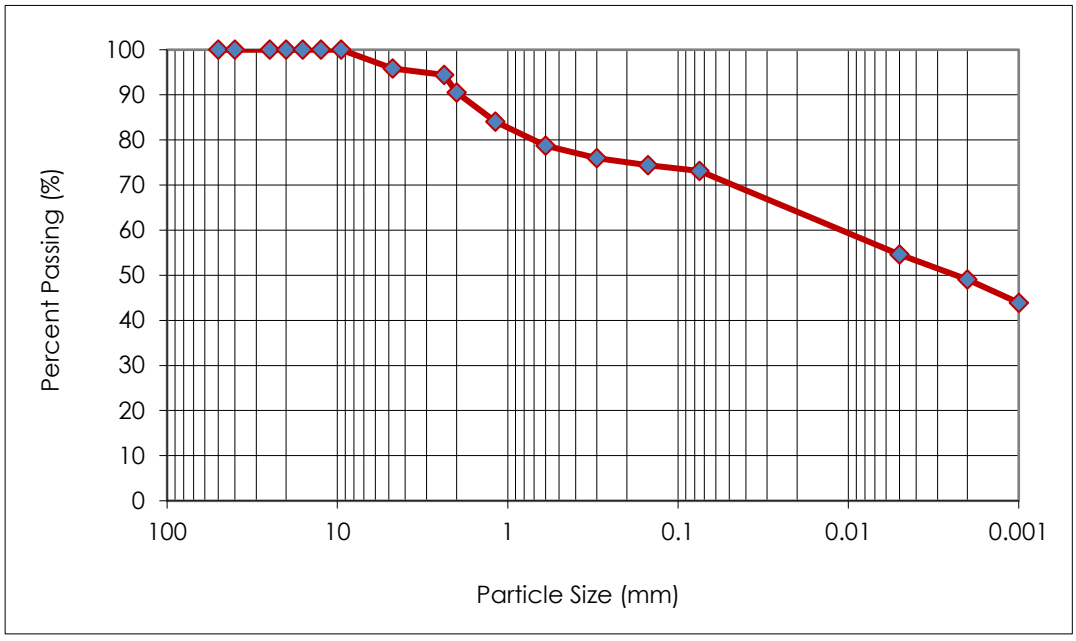
DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.10
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-11, 650 mm

STANTEC SAMPLE NO. 2943



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	95.8
2.36	94.4
2.00	90.5
1.18	84.1
0.600	78.7
0.300	75.9
0.150	74.4
0.075	73.1
0.005	54.6
0.002	49.1
0.001	43.9

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
4.2	5.3	13.4	4.0	24.0	49.1	43.9

COMMENTS
No comments.

REPORT DATE 2024.Jan.15

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 9

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Stantec Consulting Ltd.

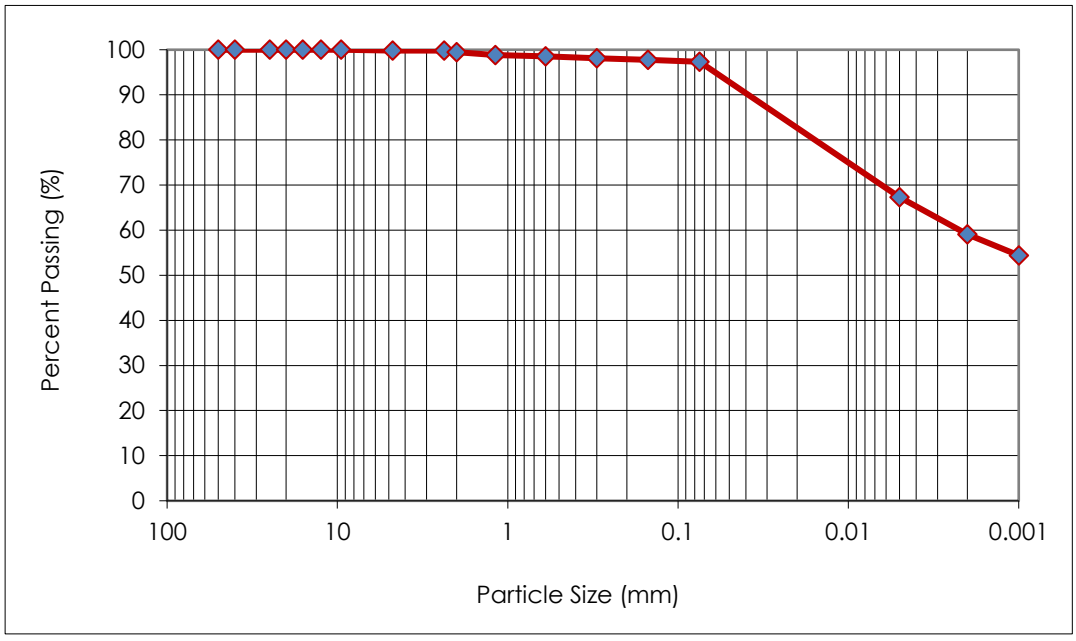
DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.10
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-12, 700 mm

STANTEC SAMPLE NO. 2944



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	99.9
2.36	99.8
2.00	99.5
1.18	98.8
0.600	98.5
0.300	98.1
0.150	97.8
0.075	97.3
0.005	67.3
0.002	59.1
0.001	54.4

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.1	0.4	1.2	1.0	38.2	59.1	54.4

COMMENTS
No comments.

REPORT DATE 2024.Jan.15

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 10

DATE SAMPLED: 2024.Jan.15
SAMPLED BY: Stantec Consulting Ltd.

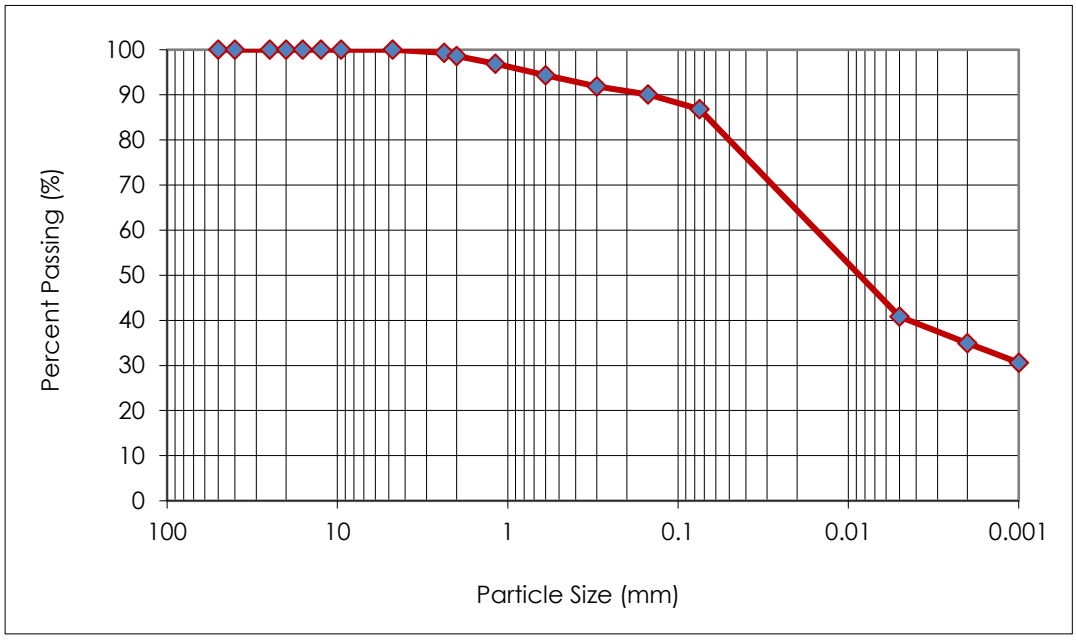
DATE RECEIVED: 2024.Jan.15
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.23
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-13, 640 mm

STANTEC SAMPLE NO. 2998



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	99.3
2.00	98.6
1.18	96.9
0.600	94.3
0.300	91.9
0.150	90.1
0.075	86.9
0.005	40.9
0.002	34.9
0.001	30.6

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	1.4	5.7	6.0	52.0	34.9	30.6

COMMENTS
No comments.

REPORT DATE 2024.Jan.25

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 11

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Stantec Consulting Ltd.

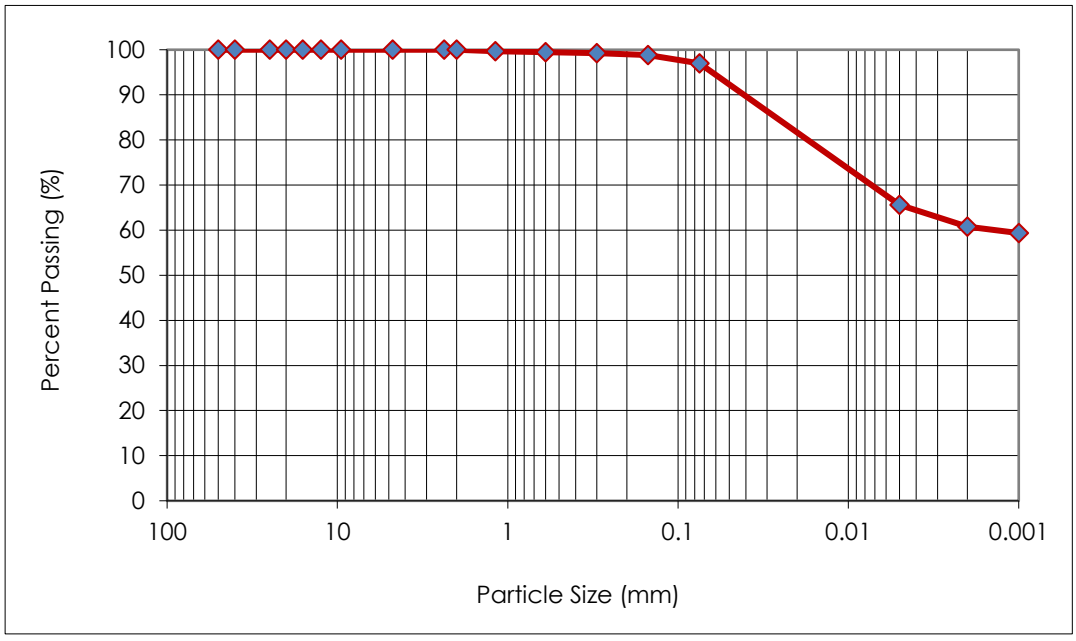
DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.10
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-14, 650 mm

STANTEC SAMPLE NO. 2945



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	99.7
0.600	99.5
0.300	99.2
0.150	98.8
0.075	97.0
0.005	65.6
0.002	60.8
0.001	59.4

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.0	0.7	2.3	36.2	60.8	59.4

COMMENTS
No comments.

REPORT DATE 2024.Jan.15

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec Consulting Ltd.
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
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853

REPORT NO. 12

DATE SAMPLED: 2024.Jan.15
SAMPLED BY: Stantec Consulting Ltd.

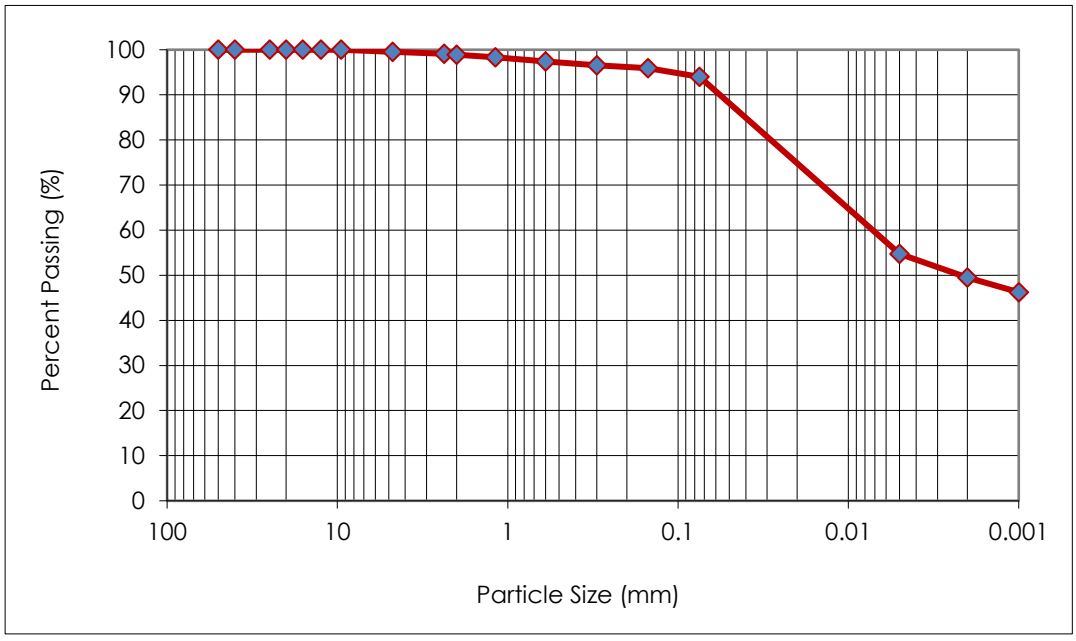
DATE RECEIVED: 2024.Jan.15
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.23
TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-15, 640 mm

STANTEC SAMPLE NO. 2999



Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	99.5
2.36	99.1
2.00	98.9
1.18	98.3
0.600	97.4
0.300	96.6
0.150	95.9
0.075	94.0
0.005	54.7
0.002	49.5
0.001	46.2

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.5	0.6	2.0	2.9	44.5	49.5	46.2

COMMENTS
No comments.

REPORT DATE 2024.Jan.25

REVIEWED BY Guillaume Beauce, P.Eng.
Geotechnical Engineer - Materials Testing Services

Stantec
199 Henlow Bay
Winnipeg, MB
R3Y 1G4
Email: jason.thompson@stantec.com

CERTIFIED BY CCIL

PROCTOR TEST REPORT

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

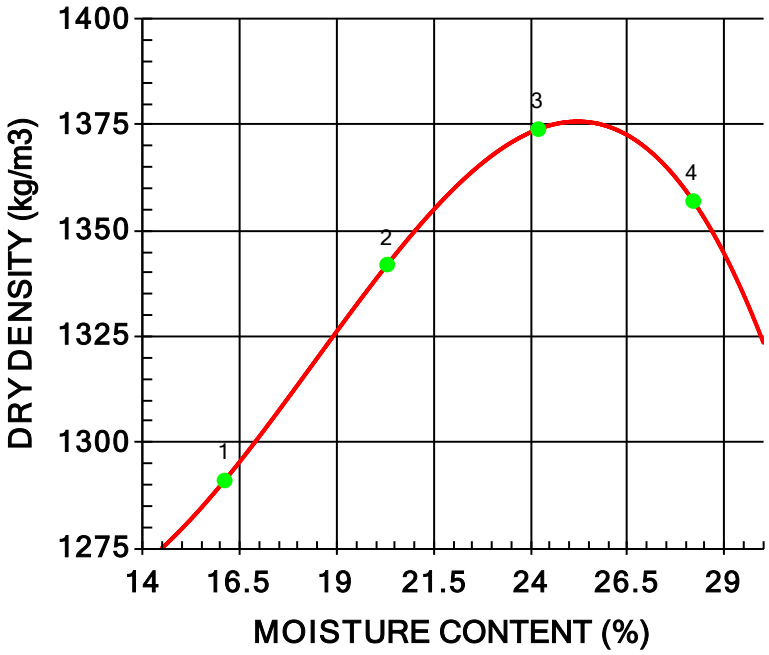
CLIENT City of Winnipeg
C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1
PROCTOR NO. 1 DATE SAMPLED 2024.Jan.15 DATE RECEIVED 2024.Jan.15 DATE TESTED 2024.Jan.24

INSITU MOISTURE	51.1 %	COMPACTION STANDARD	Standard Proctor, ASTM D698
TESTED BY	Donald Eliazar		
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Backfill		
SIZE	Clay	RAMMER TYPE	Manual
DESCRIPTION		PREPARATION	Moist
SUPPLIER	Existing Materials	OVERSIZE CORRECTION METHOD	None
SOURCE	Brock Street - BH-01, 1 m	RETAINED 4.75mm SCREEN	N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1499	1291	16.1
2	1614	1342	20.3
3	1707	1374	24.2
4	1740	1357	28.2

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1380	25.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2972.

Page 1 of 1 2024.Jan.25 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.

Stantec
199 Henlow Bay
Winnipeg, MB
R3Y 1G4
Email: jason.thompson@stantec.com

CERTIFIED BY CCIL

PROCTOR TEST REPORT

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

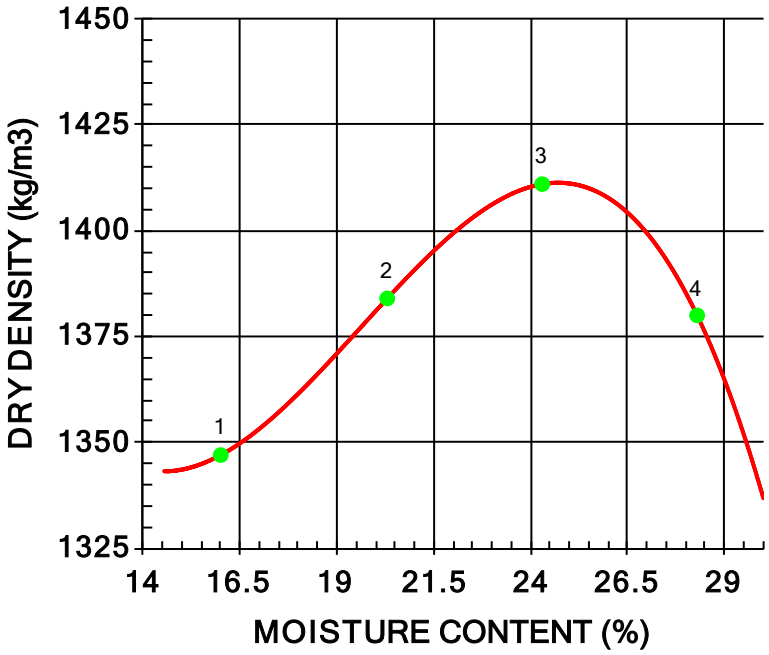
CLIENT City of Winnipeg
C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1
PROCTOR NO. 2 DATE SAMPLED 2024.Jan.15 DATE RECEIVED 2024.Jan.15 DATE TESTED 2024.Jan.24

INSITU MOISTURE	43.3 %	COMPACTION STANDARD	Standard Proctor, ASTM D698
TESTED BY	Donald Eliazar		
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Backfill		
SIZE	Clay	RAMMER TYPE	Manual
DESCRIPTION		PREPARATION	Moist
SUPPLIER	Existing Materials	OVERSIZE CORRECTION METHOD	None
SOURCE	Brock Street - BH-02, 1 m	RETAINED 4.75mm SCREEN	N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1563	1347	16.0
2	1665	1384	20.3
3	1754	1411	24.3
4	1771	1380	28.3

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

COMMENTS

Stantec Sample No. 2973.

Page 1 of 1 2024.Jan.25 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.

Stantec
199 Henlow Bay
Winnipeg, MB
R3Y 1G4
Email: jason.thompson@stantec.com

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PROCTOR TEST REPORT

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

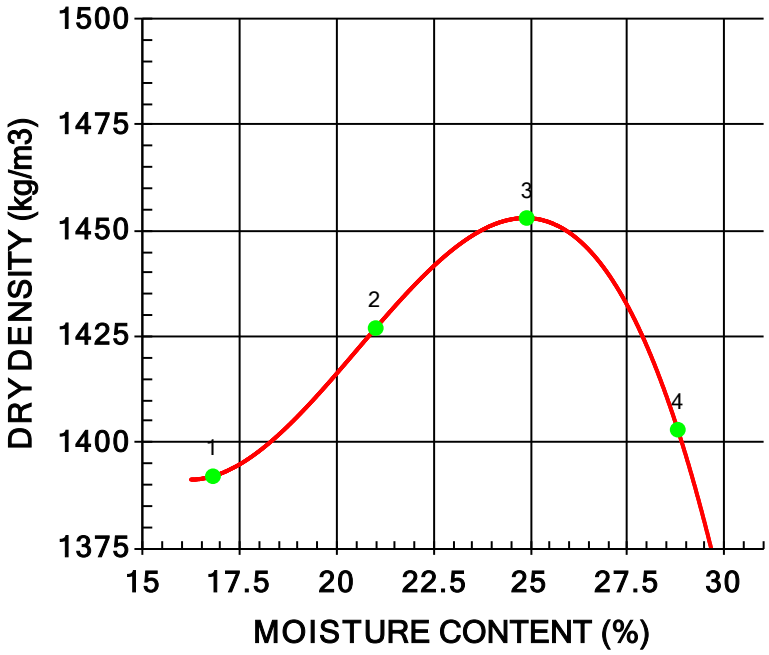
CLIENT City of Winnipeg
C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1
PROCTOR NO. 3 DATE SAMPLED 2024.Jan.15 DATE RECEIVED 2024.Jan.15 DATE TESTED 2024.Jan.24

INSITU MOISTURE	44.0 %	COMPACTION STANDARD	Standard Proctor, ASTM D698
TESTED BY	Donald Eliazar		
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Backfill		
SIZE	Clay	RAMMER TYPE	Manual
DESCRIPTION		PREPARATION	Moist
SUPPLIER	Existing Materials	OVERSIZE CORRECTION METHOD	None
SOURCE	Brock Street - BH-03, 1 m	RETAINED 4.75mm SCREEN	N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1626	1392	16.8
2	1727	1427	21.0
3	1815	1453	24.9
4	1807	1403	28.8

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1450	25.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2974.

 2024.Jan.25 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.

Stantec
199 Henlow Bay
Winnipeg, MB
R3Y 1G4
Email: jason.thompson@stantec.com

CERTIFIED BY CCIL

PROCTOR TEST REPORT

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

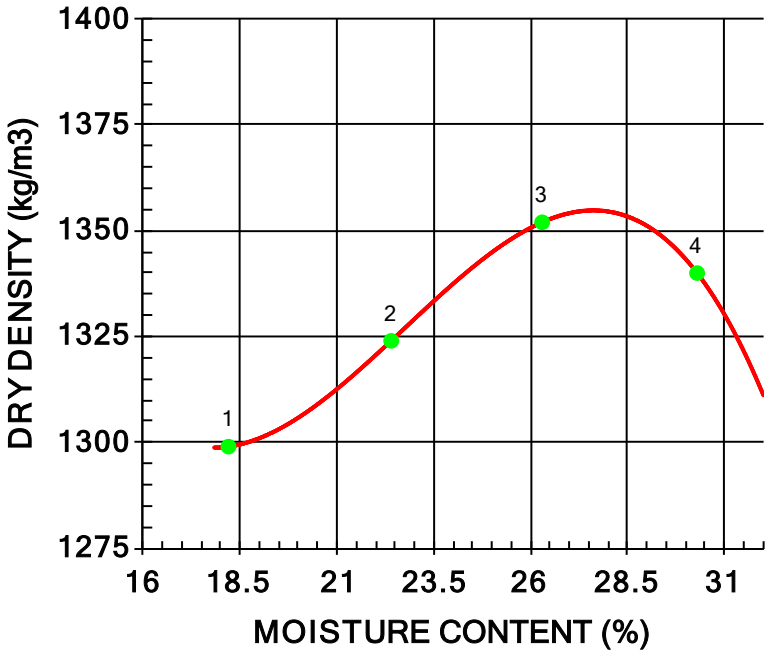
CLIENT City of Winnipeg
C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1
PROCTOR NO. 4 DATE SAMPLED 2024.Jan.08 DATE RECEIVED 2024.Jan.08 DATE TESTED 2024.Jan.11

INSITU MOISTURE	44.4 %	COMPACTION STANDARD	Standard Proctor, ASTM D698
TESTED BY	Ryan Bremner		
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Backfill		
SIZE	Clay	RAMMER TYPE	Manual
DESCRIPTION		PREPARATION	Moist
SUPPLIER	Existing Materials	OVERSIZE CORRECTION METHOD	None
SOURCE	Brock Street - BH-04, 1 m	RETAINED 4.75mm SCREEN	N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1536	1299	18.2
2	1621	1324	22.4
3	1707	1352	26.3
4	1746	1340	30.3

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1360	27.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2941.

 2024.Jan.15 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.

Stantec
199 Henlow Bay
Winnipeg, MB
R3Y 1G4
Email: jason.thompson@stantec.com

CERTIFIED BY CCIL

PROCTOR TEST REPORT

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

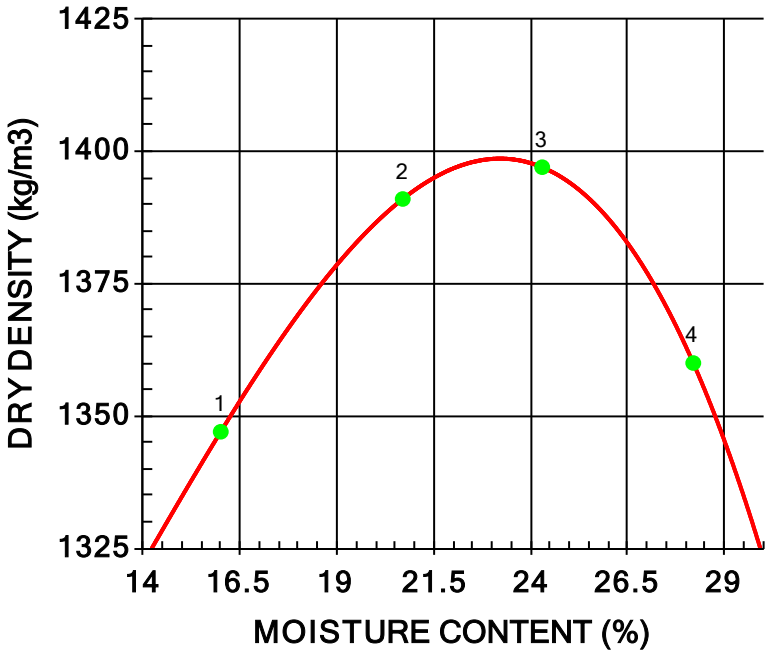
CLIENT City of Winnipeg
C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1
PROCTOR NO. 5 DATE SAMPLED 2024.Jan.17 DATE RECEIVED 2024.Jan.17 DATE TESTED 2024.Feb.01

INSITU MOISTURE	40.7 %	COMPACTION STANDARD	Standard Proctor, ASTM D698
TESTED BY	Pervez Safdar		
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Subgrade		
SIZE	Clay	RAMMER TYPE	Manual
DESCRIPTION		PREPARATION	Moist
SUPPLIER	Existing Materials	OVERSIZE CORRECTION METHOD	None
SOURCE	Edderton Ave - BH-08, 0.64 m	RETAINED 4.75mm SCREEN	N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1562	1347	16.0
2	1679	1391	20.7
3	1737	1397	24.3
4	1743	1360	28.2

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1400	23.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2996.

 2024.Feb.02 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.

Stantec
199 Henlow Bay
Winnipeg, MB
R3Y 1G4
Email: jason.thompson@stantec.com

CERTIFIED BY CCIL

PROCTOR TEST REPORT

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

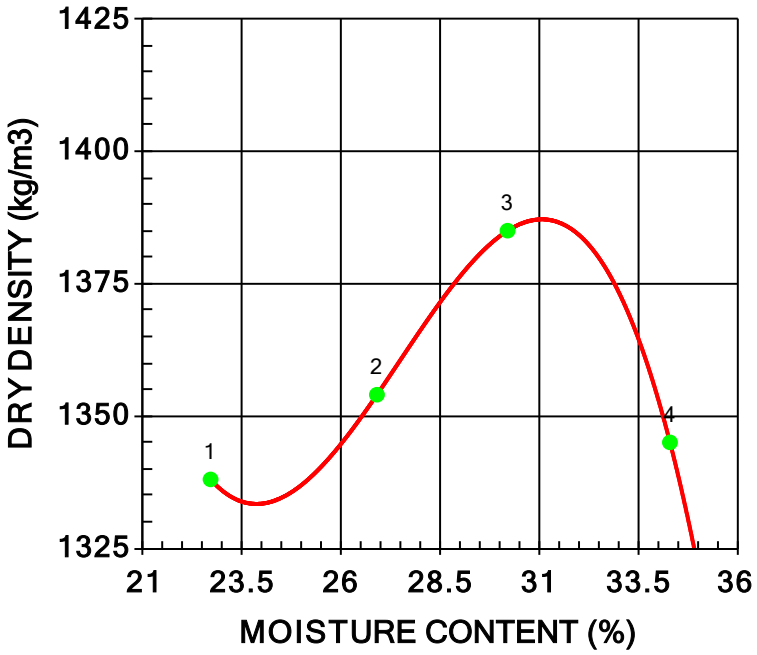
CLIENT City of Winnipeg
C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1
PROCTOR NO. 6 DATE SAMPLED 2024.Jan.17 DATE RECEIVED 2024.Jan.17 DATE TESTED 2024.Feb.01

INSITU MOISTURE	46.4 %	COMPACTION STANDARD	Standard Proctor, ASTM D698
TESTED BY	Donald Eliazar		
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Subgrade		
SIZE	Clay	RAMMER TYPE	Manual
DESCRIPTION		PREPARATION	Moist
SUPPLIER	Existing Materials	OVERSIZE CORRECTION METHOD	None
SOURCE	Edderton Ave - BH-09, 0.64 m	RETAINED 4.75mm SCREEN	N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1642	1338	22.7
2	1718	1354	26.9
3	1803	1385	30.2
4	1807	1345	34.3

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1390	31.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2997.

 2024.Feb.02 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.

Stantec
199 Henlow Bay
Winnipeg, MB
R3Y 1G4
Email: jason.thompson@stantec.com

CERTIFIED BY CCIL

PROCTOR TEST REPORT

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

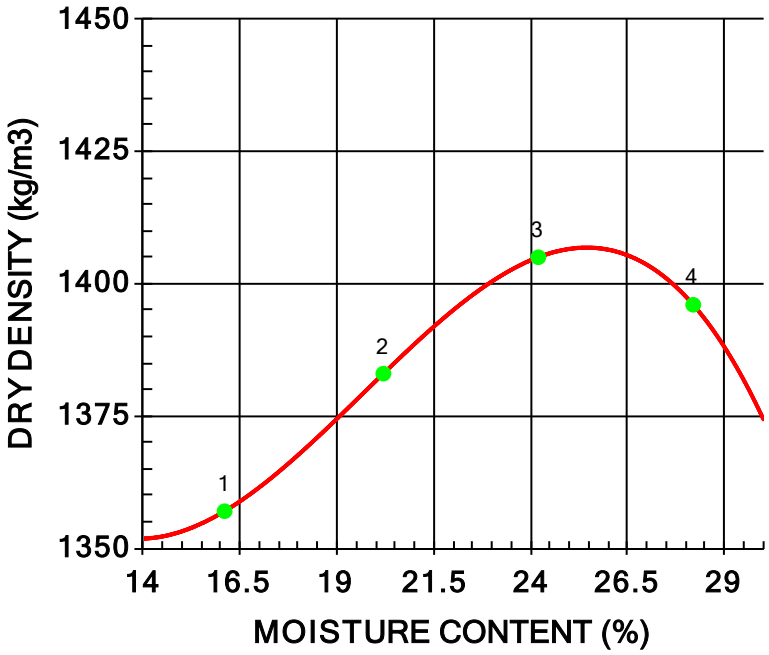
CLIENT City of Winnipeg
C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1
PROCTOR NO. 7 DATE SAMPLED 2024.Jan.08 DATE RECEIVED 2024.Jan.08 DATE TESTED 2024.Jan.11

INSITU MOISTURE	42.5 %	COMPACTION STANDARD	Standard Proctor, ASTM D698
TESTED BY	Ryan Bremner		
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Backfill		
SIZE	Clay	RAMMER TYPE	Manual
DESCRIPTION		PREPARATION	Moist
SUPPLIER	Existing Materials	OVERSIZE CORRECTION METHOD	None
SOURCE	Edderton Ave - BH-10, 0.65 m	RETAINED 4.75mm SCREEN	N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1575	1357	16.1
2	1662	1383	20.2
3	1745	1405	24.2
4	1790	1396	28.2

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1410	25.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2942.

 2024.Jan.15 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.

Stantec
199 Henlow Bay
Winnipeg, MB
R3Y 1G4
Email: jason.thompson@stantec.com

CERTIFIED BY CCIL

PROCTOR TEST REPORT

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

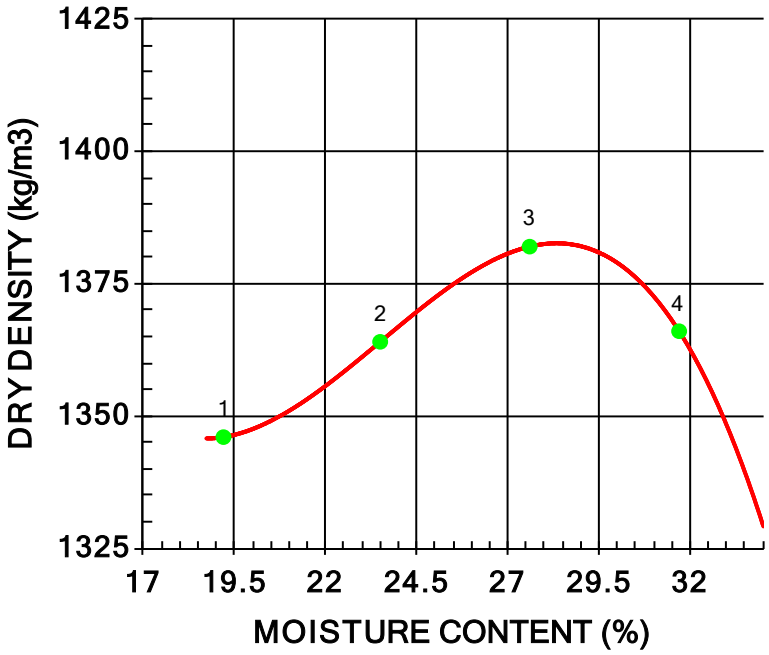
CLIENT City of Winnipeg
C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1
PROCTOR NO. 8 DATE SAMPLED 2024.Jan.08 DATE RECEIVED 2024.Jan.08 DATE TESTED 2024.Jan.12

INSITU MOISTURE	34.0 %	COMPACTION STANDARD	Standard Proctor, ASTM D698
TESTED BY	Madison Murphy		
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Backfill		
SIZE	Clay	RAMMER TYPE	Manual
DESCRIPTION		PREPARATION	Moist
SUPPLIER	Existing Materials	OVERSIZE CORRECTION METHOD	None
SOURCE	Edderton Ave - BH-11, 0.65 m	RETAINED 4.75mm SCREEN	N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1604	1346	19.2
2	1685	1364	23.5
3	1764	1382	27.6
4	1799	1366	31.7

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1380	28.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2943.

 2024.Jan.15 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.

199 Henlow Bay
Winnipeg, MB
R3Y 1G4
Email: jason.thompson@stantec.com

CERTIFIED BY CCIL

PROCTOR TEST REPORT

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

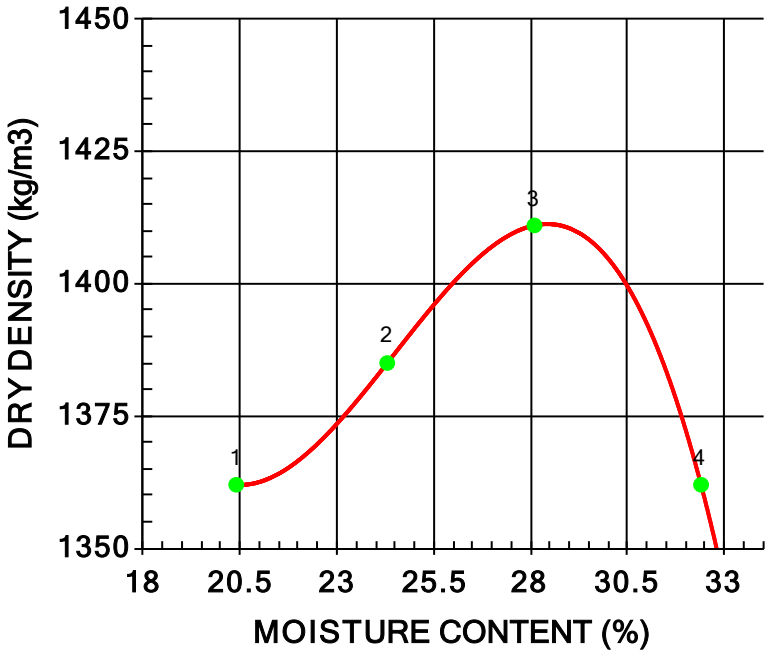
CLIENT City of Winnipeg
C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1
PROCTOR NO. 9 DATE SAMPLED 2024.Jan.08 DATE RECEIVED 2024.Jan.08 DATE TESTED 2024.Jan.11

INSITU MOISTURE	35.7 %	COMPACTION STANDARD	Standard Proctor, ASTM D698
TESTED BY	Ryan Bremner		
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Backfill		
SIZE	Clay	RAMMER TYPE	Manual
DESCRIPTION		PREPARATION	Moist
SUPPLIER	Existing Materials	OVERSIZE CORRECTION METHOD	None
SOURCE	Rosemount Ave - BH-12, 0.70 m	RETAINED 4.75mm SCREEN	N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1640	1362	20.4
2	1721	1385	24.3
3	1808	1411	28.1
4	1803	1362	32.4

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1410	28.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2944.

 2024.Jan.15 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.

Stantec
199 Henlow Bay
Winnipeg, MB
R3Y 1G4
Email: jason.thompson@stantec.com

CERTIFIED BY CCIL

PROCTOR TEST REPORT

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

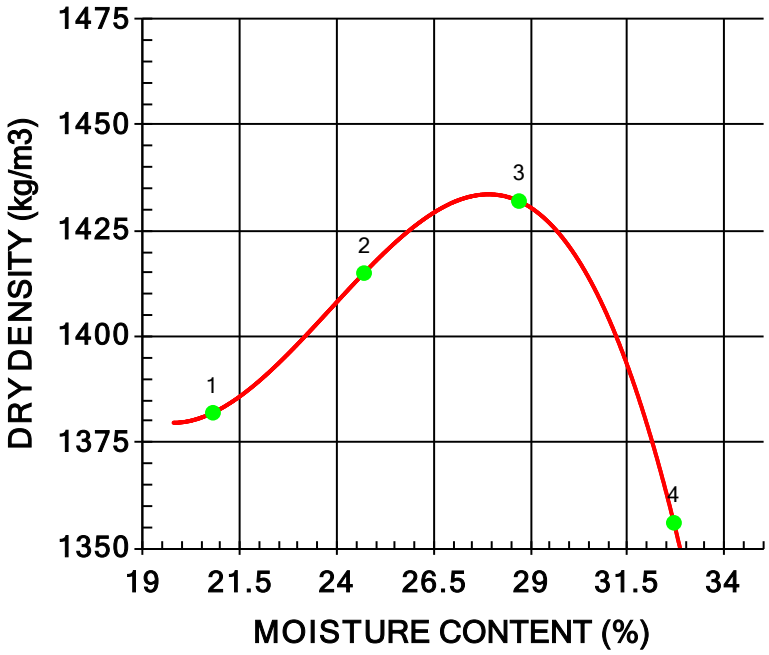
CLIENT City of Winnipeg
C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1
PROCTOR NO. 10 DATE SAMPLED 2024.Jan.17 DATE RECEIVED 2024.Jan.17 DATE TESTED 2024.Feb.01

INSITU MOISTURE	44.3 %	COMPACTION STANDARD	Standard Proctor, ASTM D698
TESTED BY	Donald Eliazar		
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Subgrade		
SIZE	Clay	RAMMER TYPE	Manual
DESCRIPTION		PREPARATION	Moist
SUPPLIER	Existing Materials	OVERSIZE CORRECTION METHOD	None
SOURCE	Rosemount Ave - BH-13, 0.65 m	RETAINED 4.75mm SCREEN	N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1670	1382	20.8
2	1765	1415	24.7
3	1843	1432	28.7
4	1799	1356	32.7

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1430	28.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2998.

 2024.Feb.02 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.

Stantec
199 Henlow Bay
Winnipeg, MB
R3Y 1G4
Email: jason.thompson@stantec.com

CERTIFIED BY CCIL

PROCTOR TEST REPORT

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

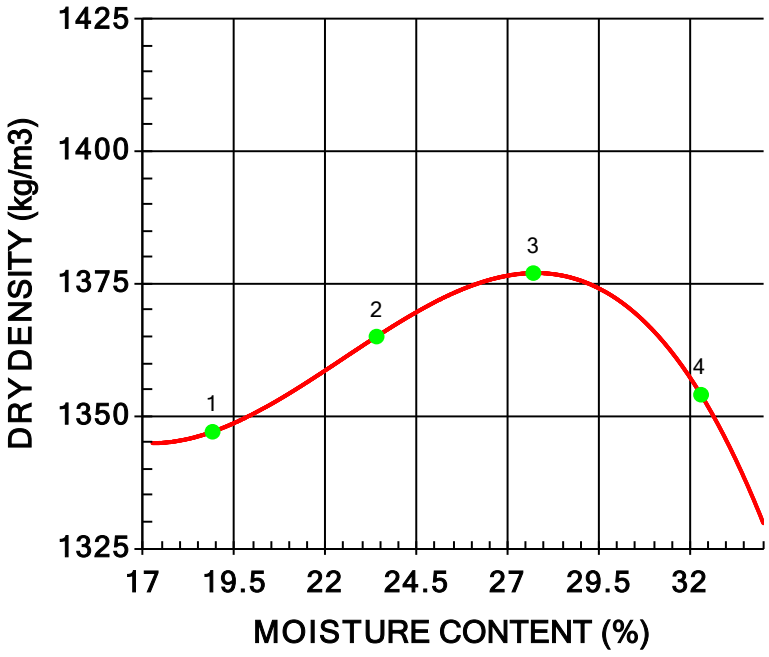
CLIENT City of Winnipeg
C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1
PROCTOR NO. 11 DATE SAMPLED 2024.Jan.08 DATE RECEIVED 2024.Jan.08 DATE TESTED 2024.Jan.12

INSITU MOISTURE	27.8 %	COMPACTION STANDARD	Standard Proctor, ASTM D698
TESTED BY	Madison Murphy		
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Backfill		
SIZE	Clay	RAMMER TYPE	Automatic
DESCRIPTION		PREPARATION	Moist
SUPPLIER	Existing Materials	OVERSIZE CORRECTION METHOD	None
SOURCE	Rosemount Ave - BH-14, 0.65 m	RETAINED 4.75mm SCREEN	N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1601	1347	18.9
2	1685	1365	23.4
3	1759	1377	27.7
4	1792	1354	32.3

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1380	28.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2945.

Page 1 of 1 2024.Jan.15 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.

Stantec
199 Henlow Bay
Winnipeg, MB
R3Y 1G4
Email: jason.thompson@stantec.com

CERTIFIED BY CCIL

PROCTOR TEST REPORT

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

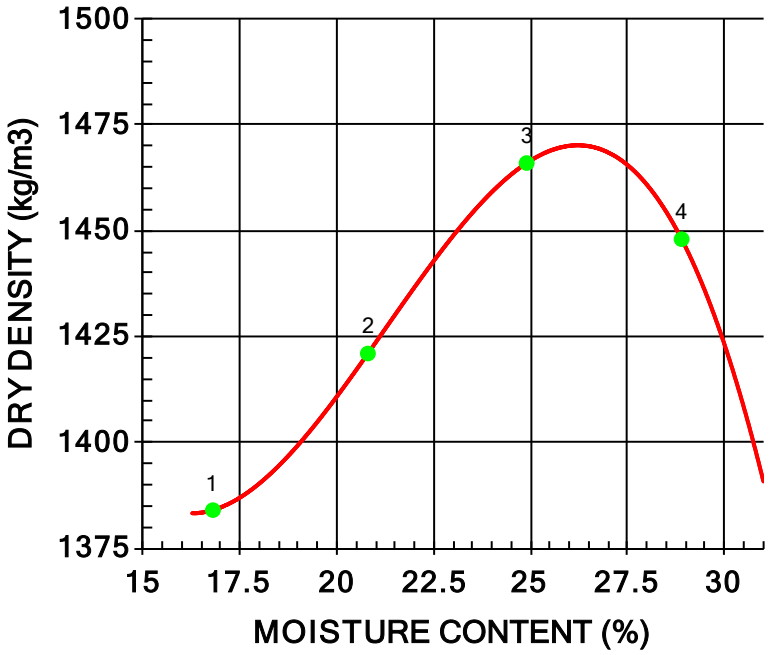
CLIENT City of Winnipeg
C.C.

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1
PROCTOR NO. 12 DATE SAMPLED 2024.Jan.17 DATE RECEIVED 2024.Jan.17 DATE TESTED 2024.Feb.01

INSITU MOISTURE	41.0 %	COMPACTION STANDARD	Standard Proctor, ASTM D698
TESTED BY	Pervez Safdar		
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Subgrade		
SIZE	Clay	RAMMER TYPE	Manual
DESCRIPTION		PREPARATION	Moist
SUPPLIER	Existing Materials	OVERSIZE CORRECTION METHOD	None
SOURCE	Rosemount Ave - BH-15, 0.65 m	RETAINED 4.75mm SCREEN	N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1616	1384	16.8
2	1717	1421	20.8
3	1831	1466	24.9
4	1866	1448	28.9

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1470	26.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2999.

 2024.Feb.02 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.

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

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program - Contract 1

PROJECT NO. 123316853

REPORT NO. 1

DATE SAMPLED: 2024.Jan.15
SAMPLED BY: Ryan Bremner

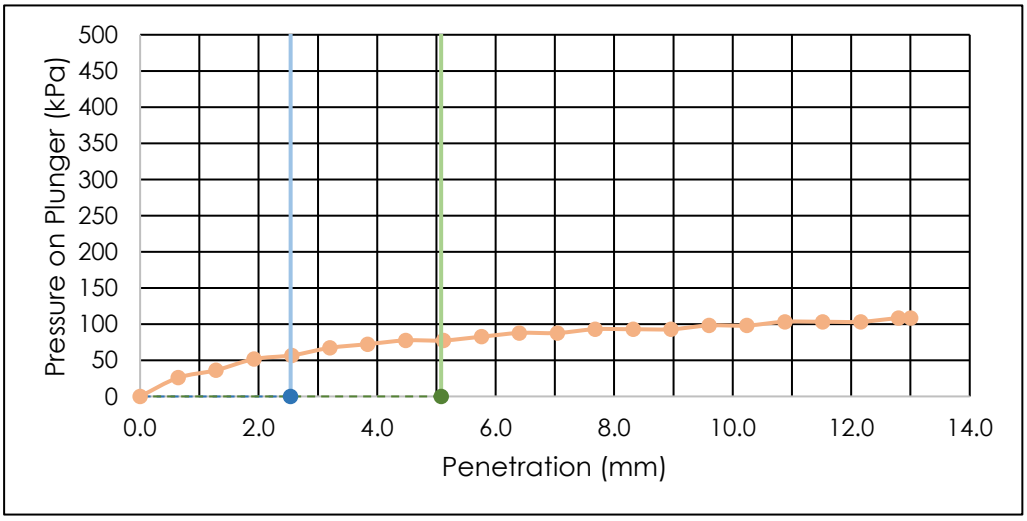
DATE RECEIVED: 2024.Jan.15
SUBMITTED BY: Ryan Bremner

DATE TESTED: 2024.Jan.29
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-01, 1.000m
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	2972

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1380 kg/m^3
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	25.0 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1310 kg/m^3
SWELL OF SAMPLE	0.10 %	AS-COMPACTED MOISTURE	25.1 %
POST-TEST MOISTURE	49.7 %	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.Feb.03

REVIEWED BY Jason Thompson, C.E.T.
Principal - Manager of Materials Testing Services

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, Public Works Department
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 2P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program - Contract 1

PROJECT NO. 123316853

REPORT NO. 2

DATE SAMPLED: 2024.Jan.15
SAMPLED BY: Stantec Consulting Ltd.

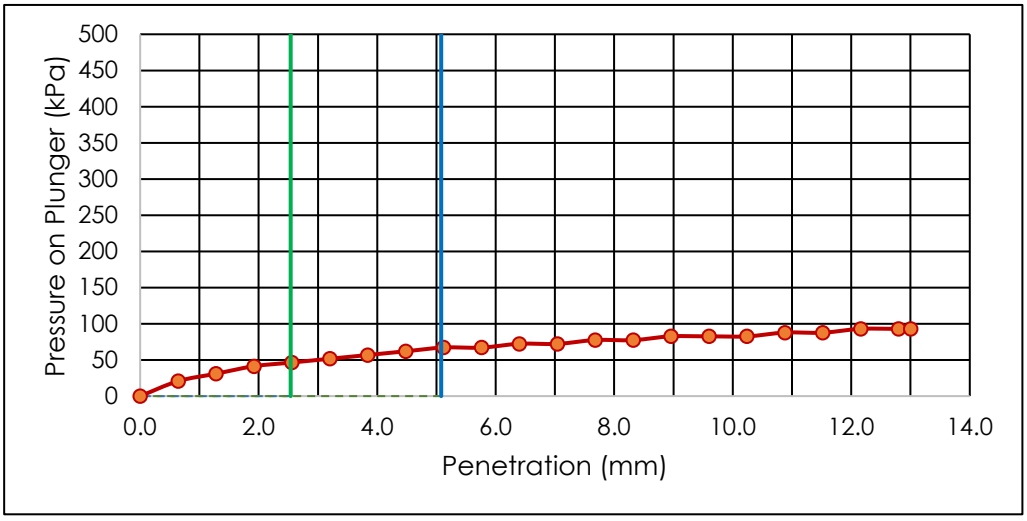
DATE RECEIVED: 2024.Jan.15
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Feb.03
TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	4.75 mm	SOURCE	Existing Material
MATERIAL TYPE	Silt and clay, with organics	SAMPLE LOCATION	BH-02, 1.000 m
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	2973

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1410 kg/m^3
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	24.5 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1338 kg/m^3
SWELL OF SAMPLE	10.02 %	AS-COMPACTED MOISTURE	24.6 %
POST-TEST MOISTURE	55.4 %	AS-COMPACTED % COMPACTION	95 %



CBR VALUE AT 2.54 mm PENETRATION
0.7

CBR VALUE AT 5.08 mm PENETRATION
0.7

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

REPORT DATE 2024.Feb.12

REVIEWED BY Jason Thompson, C.E.T.
Principal - Manager of Materials Testing Services

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, Public Works Department
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 2P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program - Contract 1

PROJECT NO. 123316853

REPORT NO. 3

DATE SAMPLED: 2024.Jan.15
SAMPLED BY: Stantec Consulting Ltd.

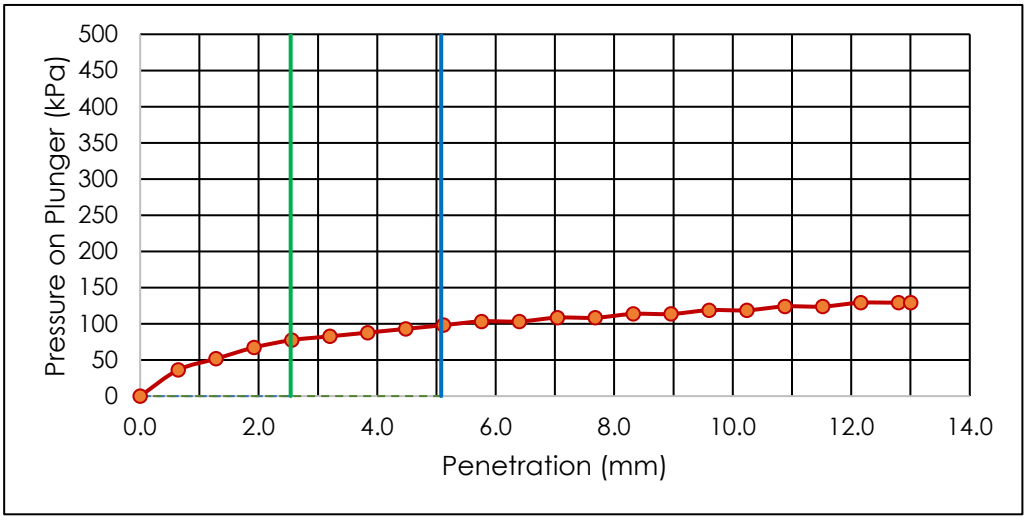
DATE RECEIVED: 2024.Jan.15
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Feb.02
TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	4.75 mm	SOURCE	Existing Material
MATERIAL TYPE	Silty Clay	SAMPLE LOCATION	BH-03, 1.000 m
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	2974

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1450 kg/m^3
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	25.0 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1375 kg/m^3
SWELL OF SAMPLE	8.16 %	AS-COMPACTED MOISTURE	25.1 %
POST-TEST MOISTURE	47.8 %	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.Feb.12

REVIEWED BY Jason Thompson, C.E.T.
Principal - Manager of Materials Testing Services

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

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program - Contract 1

PROJECT NO. 123316853

REPORT NO. 4

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Graeme Patrick

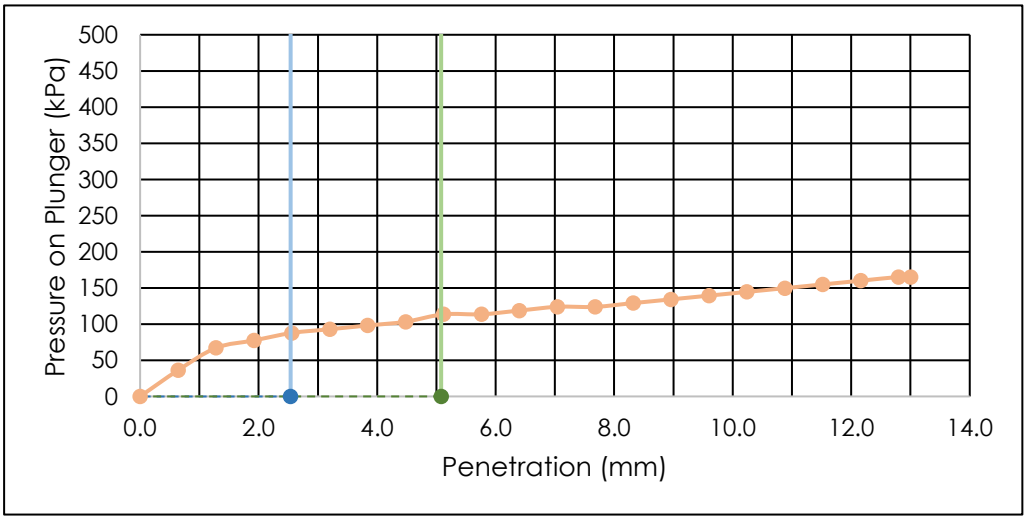
DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Graeme Patrick

DATE TESTED: 2024.Jan.16
TESTED BY: Madison Murphy

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	4.75 mm	SOURCE	Existing Material
MATERIAL TYPE	Silty Clay	SAMPLE LOCATION	BH-04, 1.000 m
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	2941

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1360 kg/m^3
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	27.5 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1293 kg/m^3
SWELL OF SAMPLE	0.05 %	AS-COMPACTED MOISTURE	27.6 %
POST-TEST MOISTURE	39.5 %	AS-COMPACTED % COMPACTION	95 %



CBR VALUE AT 2.54 mm PENETRATION
1.3

CBR VALUE AT 5.08 mm PENETRATION
1.1

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

REPORT DATE 2024.Jan.22

REVIEWED BY Jason Thompson, C.E.T.
Principal - Manager of Materials Testing Services

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, Public Works Department
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 2P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program - Contract 1

PROJECT NO. 123316853

REPORT NO. 5

DATE SAMPLED: 2024.Jan.17
SAMPLED BY: Stantec Consulting Ltd.

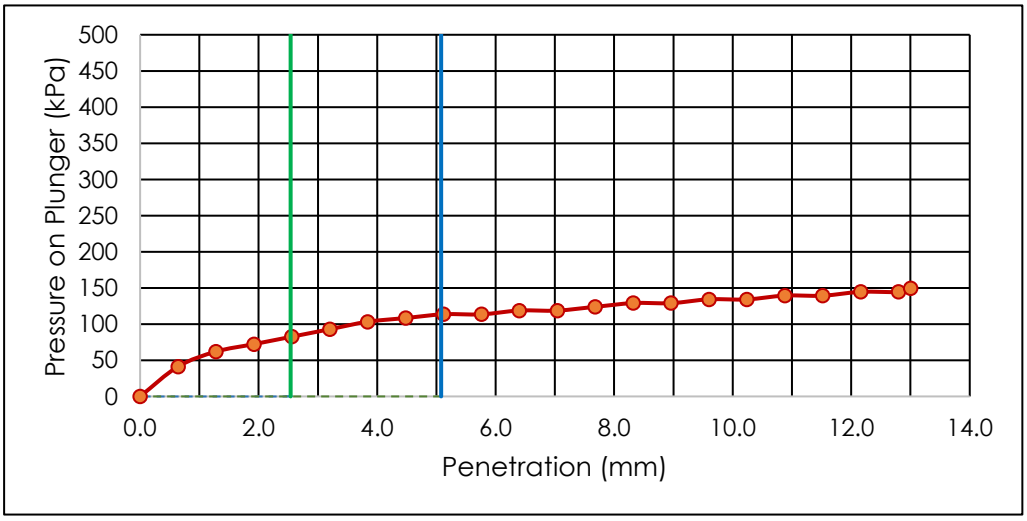
DATE RECEIVED: 2024.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Feb.12
TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	4.75 mm	SOURCE	Existing Material
MATERIAL TYPE	Silty Clay	SAMPLE LOCATION	BH-08, 0.640 m
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	2996

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1400 kg/m^3
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	23.0 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1330 kg/m^3
SWELL OF SAMPLE	7.38 %	AS-COMPACTED MOISTURE	23.1 %
POST-TEST MOISTURE	47.1 %	AS-COMPACTED % COMPACTION	95 %



CBR VALUE AT 2.54 mm PENETRATION
1.2

CBR VALUE AT 5.08 mm PENETRATION
1.1

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

REPORT DATE 2024.Feb.20

REVIEWED BY Jason Thompson, C.E.T.
Principal - Manager of Materials Testing Services

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, Public Works Department
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 2P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program - Contract 1

PROJECT NO. 123316853

REPORT NO. 6

DATE SAMPLED: 2024.Jan.17
SAMPLED BY: Stantec Consulting Ltd.

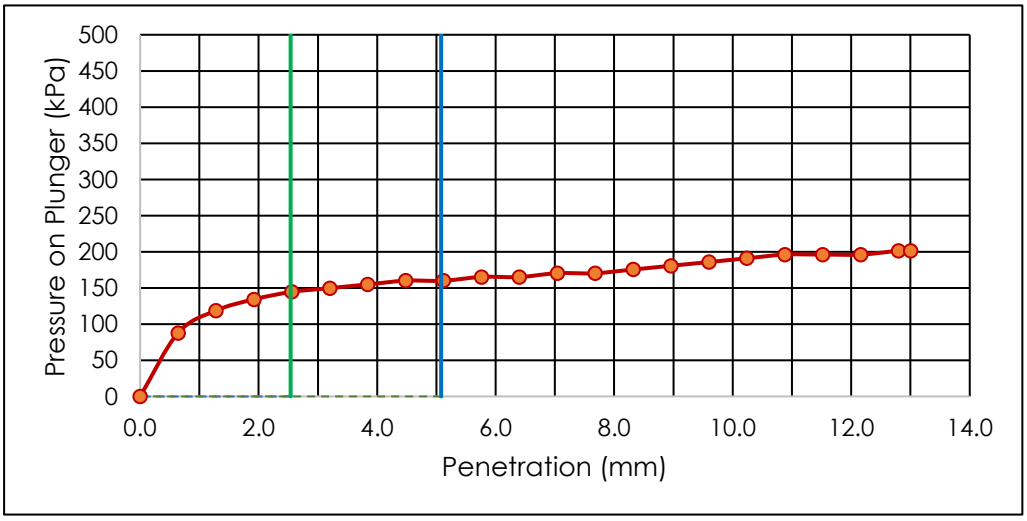
DATE RECEIVED: 2024.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Feb.15
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-09, 0.640 m
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	2997

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1390 kg/m^3
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	31.0 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1320 kg/m^3
SWELL OF SAMPLE	4.37 %	AS-COMPACTED MOISTURE	31.0 %
POST-TEST MOISTURE	49.1 %	AS-COMPACTED % COMPACTION	95 %



CBR VALUE AT 2.54 mm PENETRATION
2.1

CBR VALUE AT 5.08 mm PENETRATION
1.6

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

REPORT DATE 2024.Feb.20

REVIEWED BY Jason Thompson, C.E.T.
Principal - Manager of Materials Testing Services

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

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program - Contract 1

PROJECT NO. 123316853

REPORT NO. 7

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Graeme Patrick

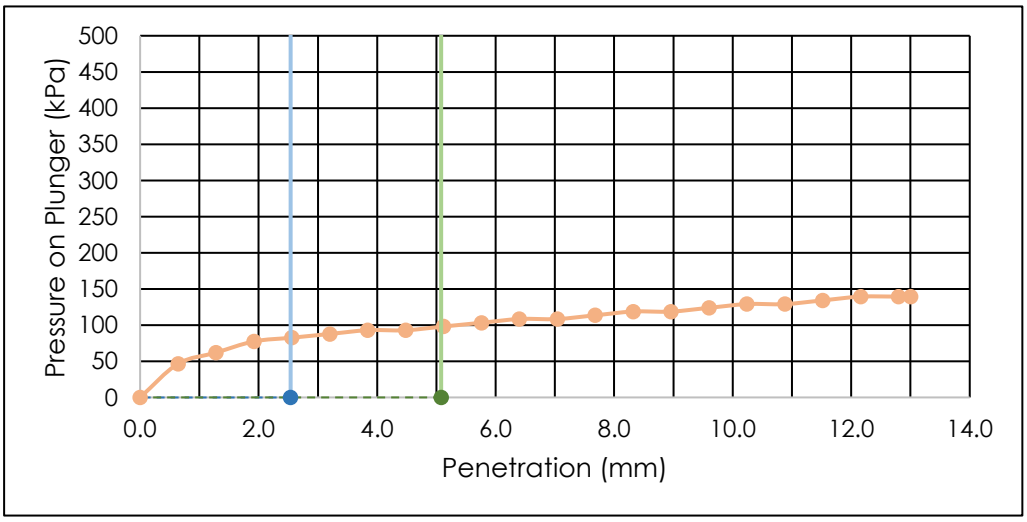
DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Graeme Patrick

DATE TESTED: 2024.Jan.16
TESTED BY: Madison Murphy

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	4.75 mm	SOURCE	Existing Material
MATERIAL TYPE	Silty Clay	SAMPLE LOCATION	BH-10, 0.650 m
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	2942

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1410 kg/m^3
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	25.5 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1340 kg/m^3
SWELL OF SAMPLE	0.04 %	AS-COMPACTED MOISTURE	25.5 %
POST-TEST MOISTURE	41.9 %	AS-COMPACTED % COMPACTION	95 %



CBR VALUE AT 2.54 mm PENETRATION
1.2

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.
Principal - Manager of Materials Testing Services

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

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program - Contract 1

PROJECT NO. 123316853

REPORT NO. 8

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Graeme Patrick

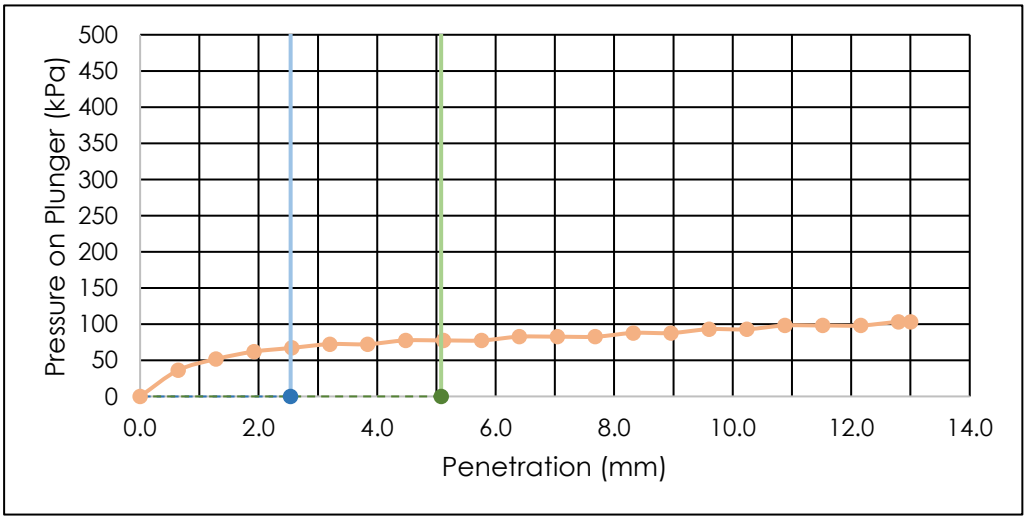
DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Graeme Patrick

DATE TESTED: 2024.Jan.16
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-11, 0.650m
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	2943

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1380 kg/m^3
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	28.5 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1312 kg/m^3
SWELL OF SAMPLE	0.07 %	AS-COMPACTED MOISTURE	28.5 %
POST-TEST MOISTURE	44.9 %	AS-COMPACTED % COMPACTION	95 %



CBR VALUE AT 2.54 mm PENETRATION
1.0

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.22

REVIEWED BY Jason Thompson, C.E.T.
Principal - Manager of Materials Testing Services

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

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program - Contract 1

PROJECT NO. 123316853

REPORT NO. 9

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Graeme Patrick

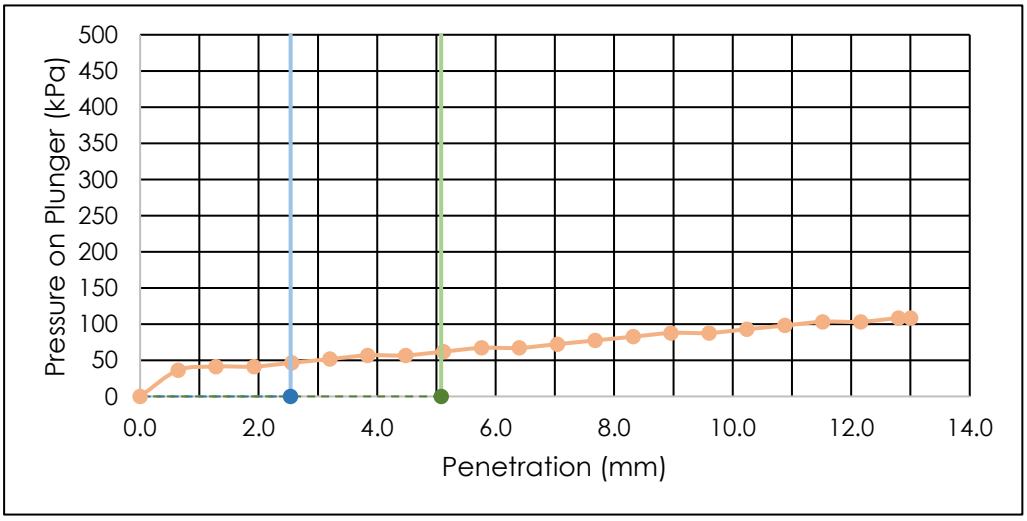
DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Graeme Patrick

DATE TESTED: 2024.Jan.16
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-12, 0.700 m
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	2944

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1410 kg/m^3
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	28.5 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1339 kg/m^3
SWELL OF SAMPLE	0.04 %	AS-COMPACTED MOISTURE	28.6 %
POST-TEST MOISTURE	39.8 %	AS-COMPACTED % COMPACTION	95 %



CBR VALUE AT 2.54 mm PENETRATION
0.7

CBR VALUE AT 5.08 mm PENETRATION
0.6

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.
Principal - Manager of Materials Testing Services

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, Public Works Department
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 2P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program - Contract 1

PROJECT NO. 123316853

REPORT NO. 10

DATE SAMPLED: 2024.Jan.17
SAMPLED BY: Stantec Consulting Ltd.

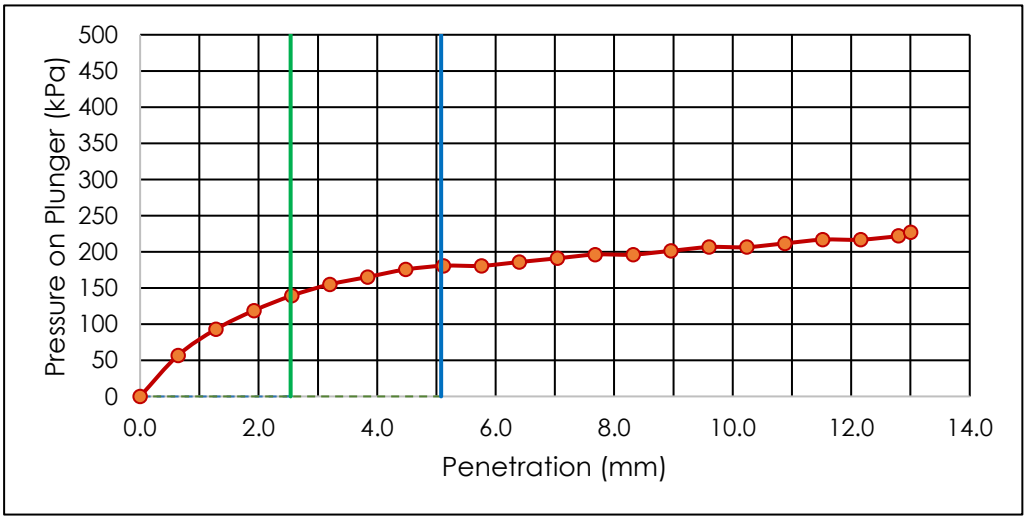
DATE RECEIVED: 2024.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Feb.15
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-13, 0.650 m
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	2998

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1430 kg/m^3
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	28.0 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1357 kg/m^3
SWELL OF SAMPLE	4.08 %	AS-COMPACTED MOISTURE	28.1 %
POST-TEST MOISTURE	43.5 %	AS-COMPACTED % COMPACTION	95 %



CBR VALUE AT 2.54 mm PENETRATION
2.0

CBR VALUE AT 5.08 mm PENETRATION
1.8

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

REPORT DATE 2024.Feb.20

REVIEWED BY Jason Thompson, C.E.T.
Principal - Manager of Materials Testing Services

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

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program - Contract 1

PROJECT NO. 123316853

REPORT NO. 11

DATE SAMPLED: 2024.Jan.08
SAMPLED BY: Graeme Patrick

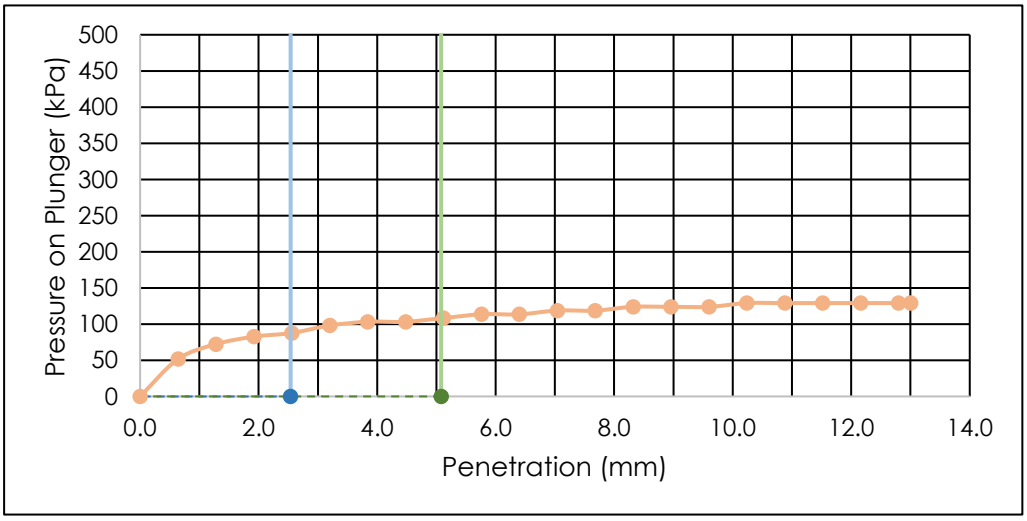
DATE RECEIVED: 2024.Jan.08
SUBMITTED BY: Graeme Patrick

DATE TESTED: 2024.Jan.16
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-14, 0.650 m
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	2945

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1380 kg/m^3
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	28.0 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1306 kg/m^3
SWELL OF SAMPLE	0.05 %	AS-COMPACTED MOISTURE	26.5 %
POST-TEST MOISTURE	44.7 %	AS-COMPACTED % COMPACTION	95 %



CBR VALUE AT 2.54 mm PENETRATION
1.3

CBR VALUE AT 5.08 mm PENETRATION
1.1

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

REPORT DATE 2024.Jan.22

REVIEWED BY Jason Thompson, C.E.T.
Principal - Manager of Materials Testing Services

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, Public Works Department
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 2P1

ATTN Richard Weibel

PROJECT 2024 Local Street Renewals Program - Contract 1

PROJECT NO. 123316853

REPORT NO. 12

DATE SAMPLED: 2024.Jan.17
SAMPLED BY: Stantec Consulting Ltd.

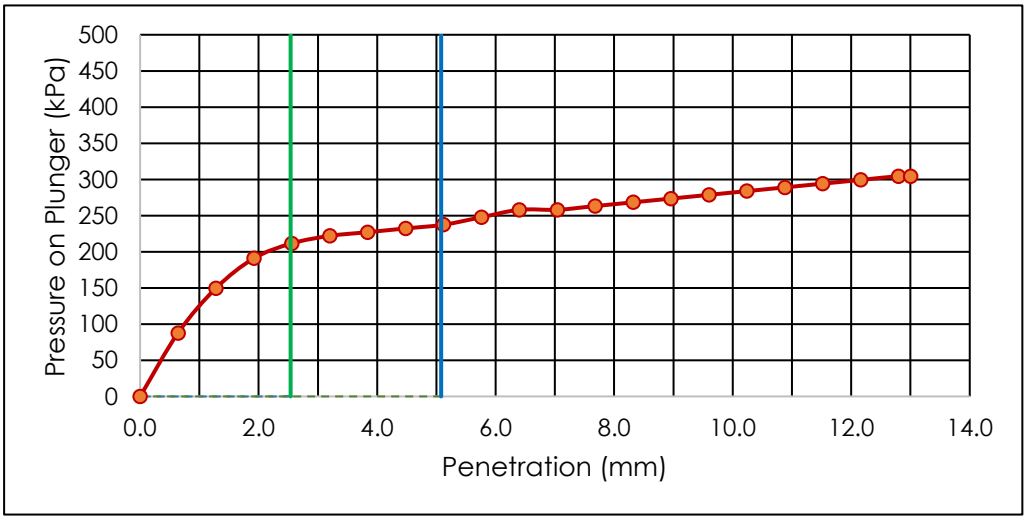
DATE RECEIVED: 2024.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Feb.15
TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	4.75 mm	SOURCE	Existing Material
MATERIAL TYPE	Clay with silt	SAMPLE LOCATION	BH-15, 0.650 m
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	2999

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1470 kg/m^3
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	26.0 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1396 kg/m^3
SWELL OF SAMPLE	3.86 %	AS-COMPACTED MOISTURE	26.1 %
POST-TEST MOISTURE	41.0 %	AS-COMPACTED % COMPACTION	95 %



CBR VALUE AT 2.54 mm PENETRATION
3.1

CBR VALUE AT 5.08 mm PENETRATION
2.4

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

REVIEWED BY Jason Thompson, C.E.T.
Principal - Manager of Materials Testing Services

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

Table 1 - Compressive Strength Test Data

Street	Core ID	Diameter (mm)	Length (mm)	L/D Ratio	Correction Factor	Peak Load (kN)	Compressive Strength (MPa)	
							Measured	Corrected
Queenston Bay	BH-05	76.50	100.50	1.314	0.9372	311.00	67.67	63.42
Queenston Bay	BH-07	76.62	178.30	> 2.000	1.0000	293.92	63.76	63.76

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

Reference Standard Construction Specifications:

(a) CW 3130, Clause 3.5 Supply and Installation of Geotextile Fabrics

(b) CW 3135, Clause 3.3 Supply and Installation of Geogrid

Asphalt Pavement Reconstructions	**CBR***
Brock Street from Mathers Avenue to Taylor Avenue	1.0
Rosemount Avenue from Beaumont Street to Derek Street	1.3
Edderton Avenue from Beaumont Street to Derek Street	1.3

* CBR for calculating overlap of Geotextile rolls and Geogrid rolls.