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

January 31, 2023

Project/File: 123316298

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

Good day Erik,

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

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

The subsurface coring and drilling sampling program was conducted from January 9 to January 15, 2023. Pavement coring was performed by Stantec geotechnical personnel, and drilling services were provided by Maple Leaf Drilling Ltd. under Stantec's supervision. The borehole locations are shown on the attached Borehole Location Plan provided in **Appendix B**. The pavement cores were sampled with a 150 or 100 mm bit and boreholes were drilled with 125 mm solid stem augers. Geotechnical drilling boreholes were terminated at a depth of 2.5 m (Hartford Ave) and 2.0 m (Powers St) below pavement, and soil samples were obtained directly from the auger flights at 0.3 m intervals. Upon completion of drilling, the testholes were examined for evidence of sloughing and groundwater seepage. The soil classification used in the borehole records is as per ASTM D2487 – *Standard Practice for Classification of Soils for Engineering Purposes.* The borehole records are provided in **Appendix C** and core photographs are provided in **Appendix D**.

The following laboratory tests were conducted on select soil samples:

- ASTM D2216 - *Laboratory Determination of Water (Moisture) Content of Soil by Mass*
- ASTM D4318 - *Liquid Limit, Plastic Limit, and Plasticity Index of Soils*
- ASTM D7928 - *Particle-Size Distribution of Fine-Grained Soils Using The Sedimentation Analysis*
- 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 and under soaked conditions, and the concrete compressive strength tests were conducted under wet conditions. The moisture content results are shown on the borehole records, and the laboratory test reports are provided in **Appendix E**.

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

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

Regards,

STANTEC CONSULTING LTD.

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guillaume.beauce@stantec.com

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Manager, Materials Testing Services
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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

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.

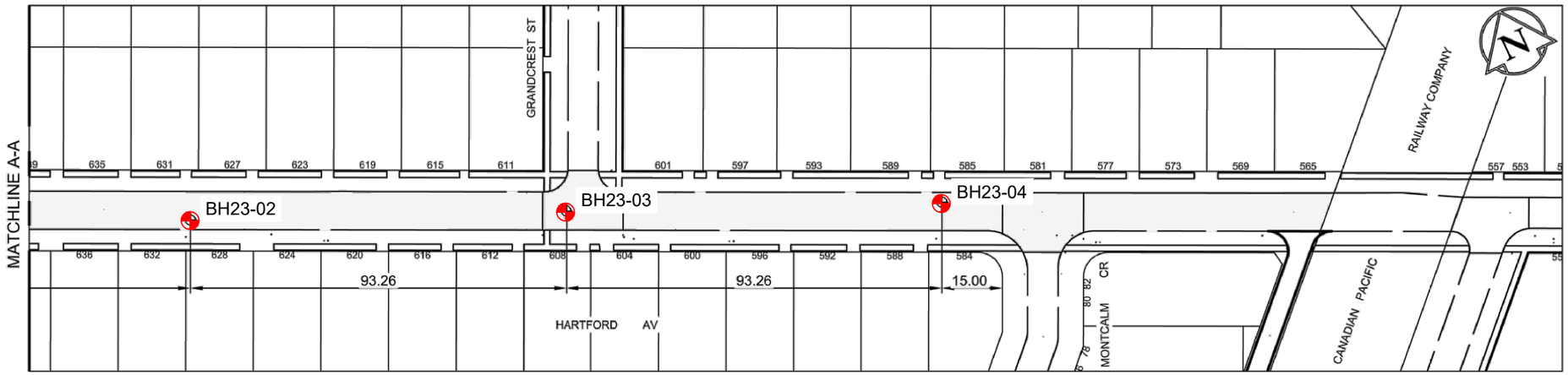
INTERPRETATION OF SITE CONDITIONS: Soil, rock, or other material descriptions, and statements regarding their condition, made in this report are based on site conditions encountered by Stantec at the time of the work and at the specific testing and/or sampling locations. Classifications and statements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

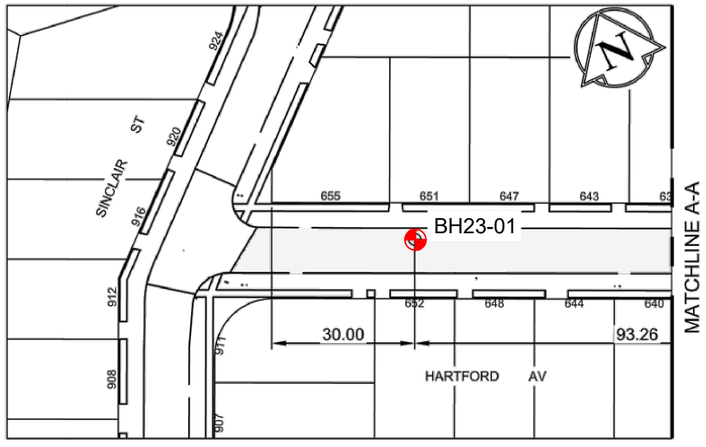
VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments 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: -GEOTECHNICAL TESTHOLES 2m DEPTH
-RECONSTRUCTION

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

TESTHOLE

DATE:	DRAWING NO.:
18/02/2021	1
DRAWN BY: M.A.D.	SCALE: N.T.S.

2023 LOCAL STREET RENEWAL PROGRAM

CORING DRAWING
HARTFORD AV : FROM CP RAIL TO SINCLAIR ST

ORIGINAL SHEET - ISO 11x17 - v17.05

2023-01-24
123316298

\\CA0196-PPFSS01\WorkGroup\1233\active\123316298\field_data\drawings\16298_BHLP.dwg HARTFORD
2023/01/25 11:07 AM By: Boughton, Lee

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

Legend

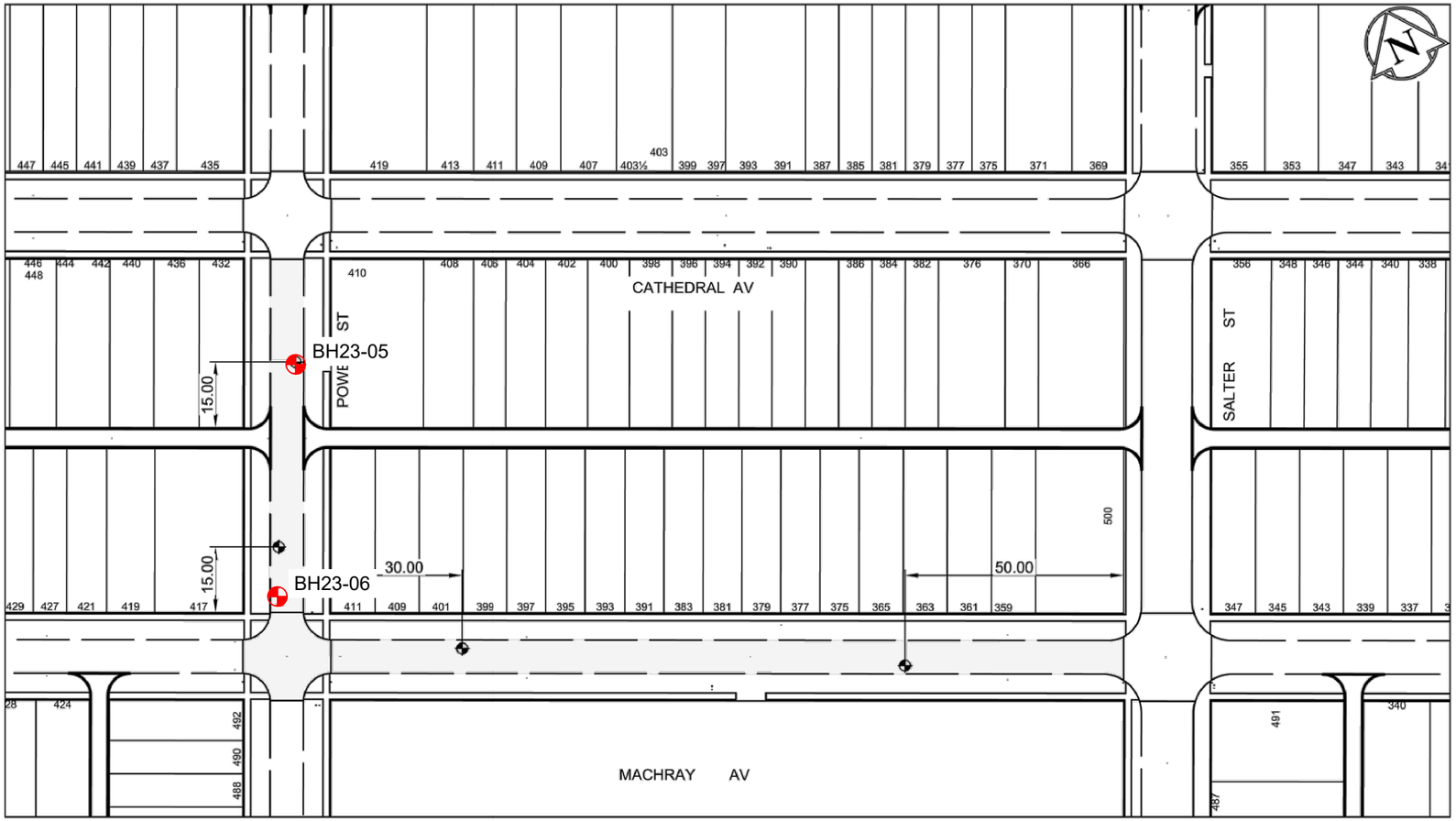
APPROXIMATE BOREHOLE LOCATION

Scale

Client/Project
CITY OF WINNIPEG
2023 LOCAL STREET RENEWALS PROGRAM
WINNIPEG, MB

Figure No.
HARTFORD

Title
BOREHOLE LOCATION PLAN



NOTE: POWERS AVE - RECONSTRUCTION,
GEOTECHNICAL TESTHOLES 2m DEPTH
MACHRAY AVE - MAJOR REHABILITATION,
DRILL PAVEMENT CORES ONLY

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

TESTHOLE

DATE:	DRAWING NO.:
18/02/2021	1
DRAWN BY:	SCALE:
M.A.D.	N.T.S.

2023 LOCAL STREET RENEWAL PROGRAM

CORING DRAWING
MACHRAY AV: FROM SALTER ST TO POWERS ST
POWERS ST: FROM CATHEDRAL AV TO MACHRAY AV

ORIGINAL SHEET - ISO 11x17 - v17.05

2023-01-24
123316298

\\CA0196-PPFSS01\WorkGroup\1233\active\123316298\field_data\drawings\16298_BHLP.dwg POWERS
2023/01/25 11:08 AM By: Boughton, Lee

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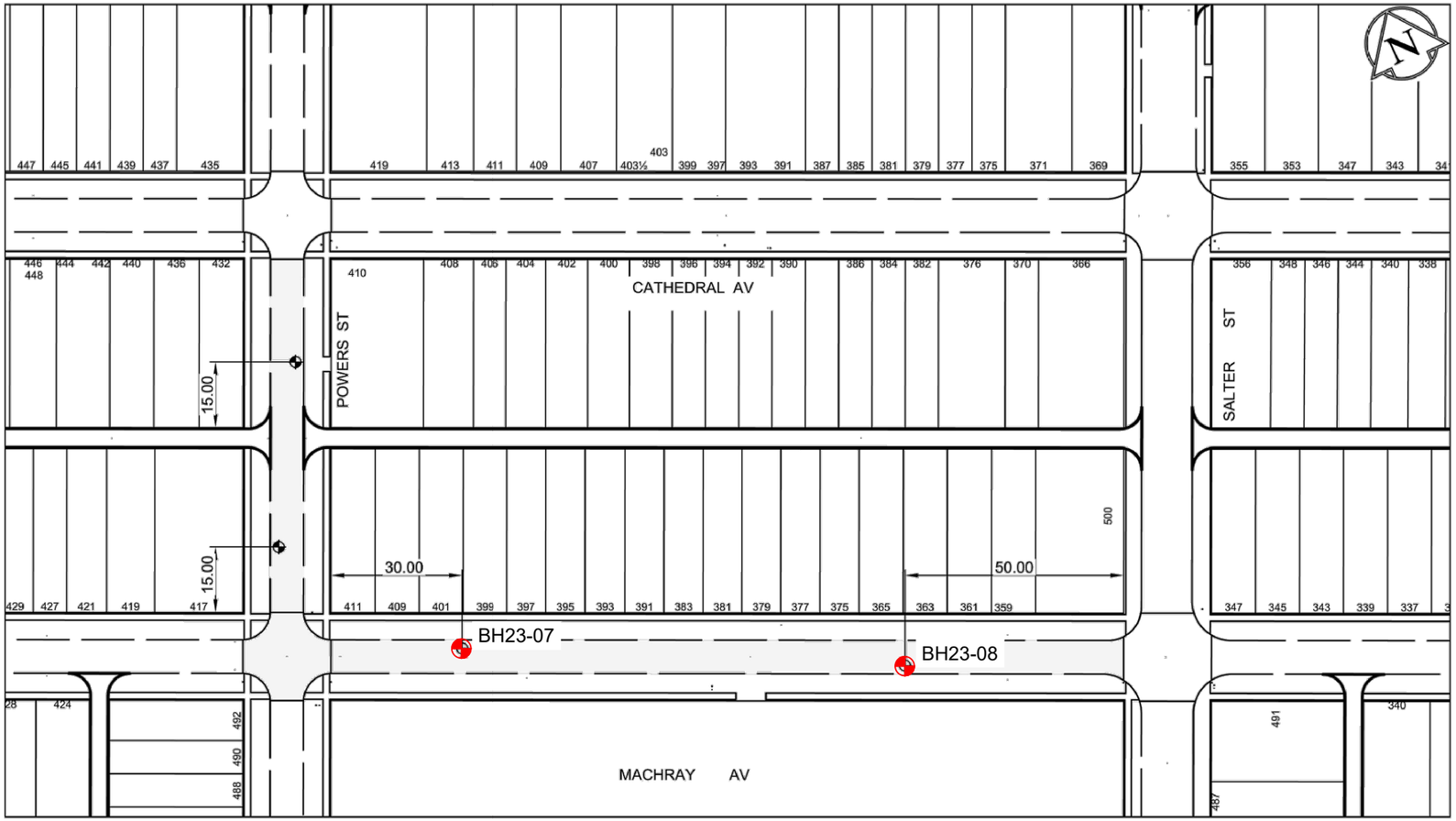
APPROXIMATE BOREHOLE LOCATION

Scale

Client/Project
CITY OF WINNIPEG
2023 LOCAL STREET RENEWALS PROGRAM
WINNIPEG, MB

Figure No.
POWERS

Title
BOREHOLE LOCATION PLAN



NOTE: POWERS AVE - RECONSTRUCTION,
GEOTECHNICAL TESTHOLES 2m DEPTH
MACHRAY AVE - MAJOR REHABILITATION,
DRILL PAVEMENT CORES ONLY

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

TESTHOLE

DATE:	DRAWING NO.:
18/02/2021	1
DRAWN BY:	SCALE:
M.A.D.	N.T.S.

2023 LOCAL STREET RENEWAL PROGRAM

CORING DRAWING
MACHRAY AV: FROM SALTER ST TO POWERS ST
POWERS ST: FROM CATHEDRAL AV TO MACHRAY AV

ORIGINAL SHEET - ISO 11x17 - v17.05

2023-01-24
123316298

\\CA0196-PPFSS01\WorkGroup\1233\active\123316298\field_data\drawings\116298_BHLP.dwg MACHRAY
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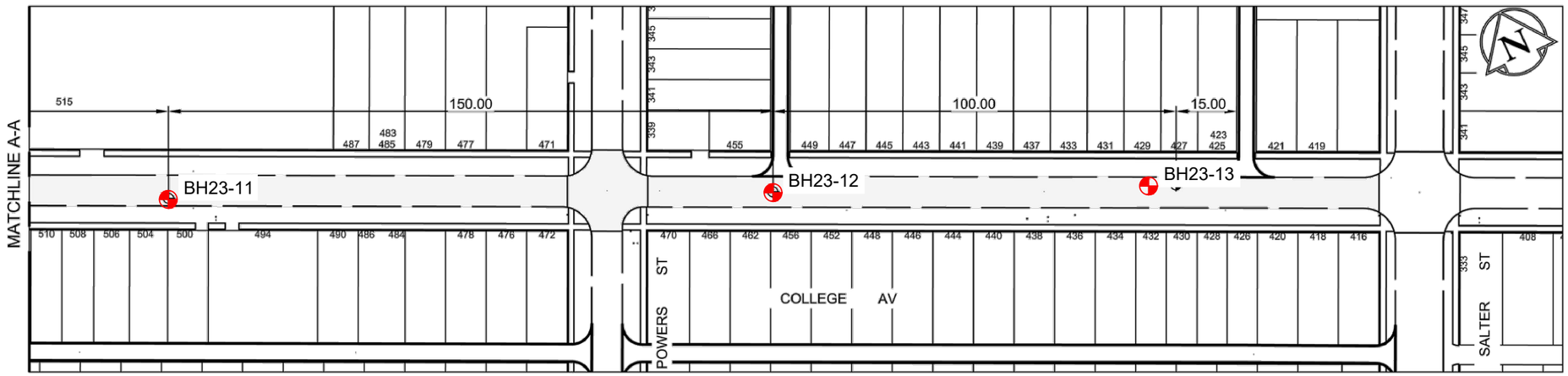
APPROXIMATE BOREHOLE LOCATION

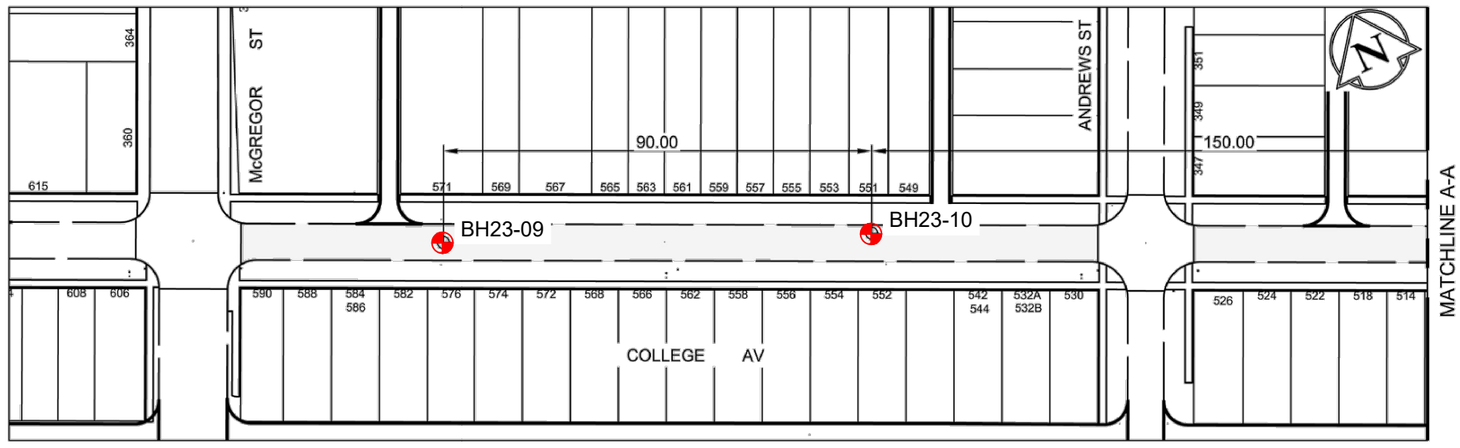
Scale

Client/Project
CITY OF WINNIPEG
2023 LOCAL STREET RENEWALS PROGRAM
WINNIPEG, MB

Figure No.
MACHRAY

Title
BOREHOLE LOCATION PLAN





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

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

TESTHOLE

DATE:	DRAWING NO.:
18/02/2021	1
DRAWN BY: M.A.D.	SCALE: N.T.S.

2023 LOCAL STREET RENEWAL PROGRAM

CORING DRAWING
COLLEGE AV: FROM SALTER ST TO McGREGOR ST

ORIGINAL SHEET - ISO 11x17 - v17.05

2023-01-24
123316298

\\CA0196-PPFSS01\WorkGroup\1233\active\123316298\field_data\drawings\16298_BHLP.dwg COLLEGE
2023/01/25 11:09 AM By: Boughton, Lee

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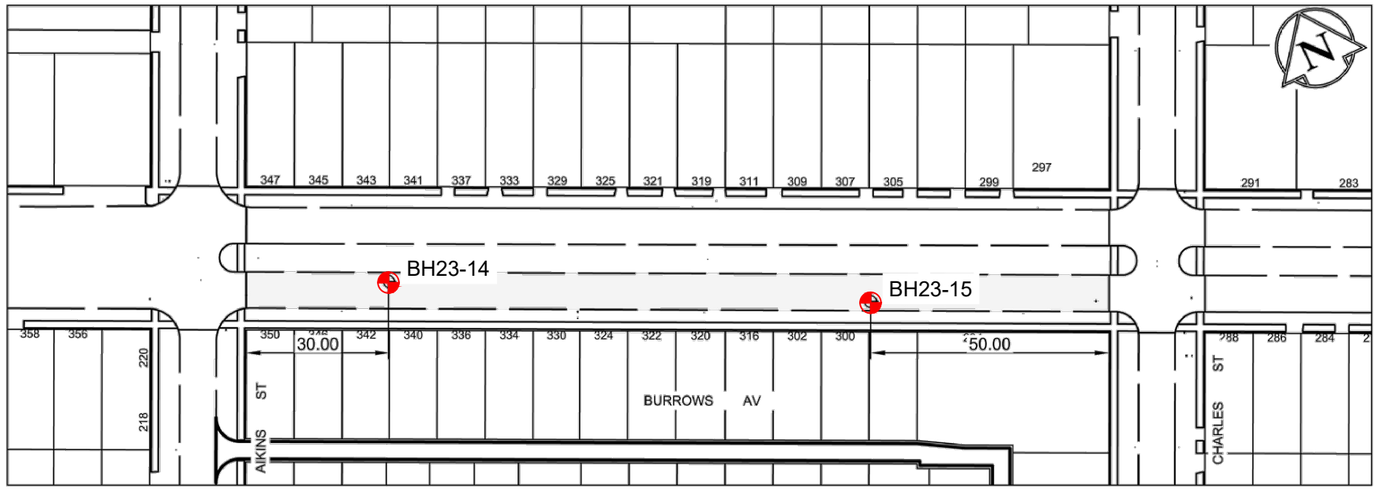
APPROXIMATE BOREHOLE LOCATION

Scale

Client/Project
CITY OF WINNIPEG
2023 LOCAL STREET RENEWALS PROGRAM
WINNIPEG, MB

Figure No.
COLLEGE

Title
BOREHOLE LOCATION PLAN



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

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

TESTHOLE

DATE:	DRAWING NO.:
18/02/2021	1
DRAWN BY:	SCALE:
M.A.D.	N.T.S.

2023 LOCAL STREET RENEWAL PROGRAM

CORING DRAWING
BURROWS AV (EB): FROM CHARLES ST TO AIKINS ST

ORIGINAL SHEET - ISO 11x17 - v17.05

2023-01-24
123316298

\\CA0196-PPFSS01\WorkGroup\1233\active\123316298\field_data\drawings\16298_BHLP.dwg BURROWS
2023/01/25 11:09 AM By: Boughton, Lee

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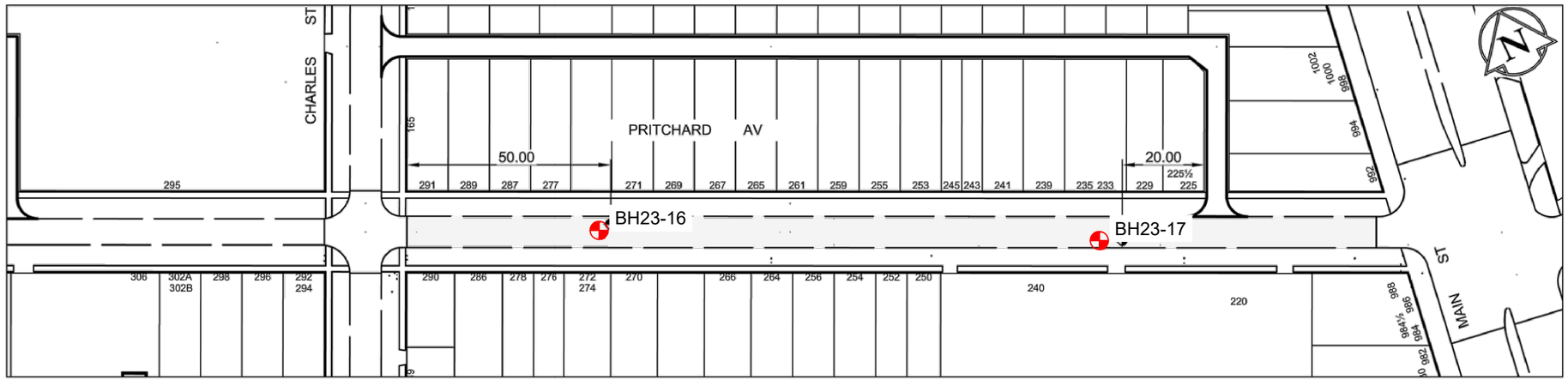
APPROXIMATE BOREHOLE LOCATION

Scale

Client/Project
CITY OF WINNIPEG
2023 LOCAL STREET RENEWALS PROGRAM
WINNIPEG, MB

Figure No.
BURROWS

Title
BOREHOLE LOCATION PLAN



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

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

TESTHOLE

DATE:	DRAWING NO.:
18/02/2021	1
DRAWN BY: M.A.D.	SCALE: N.T.S.

2023 LOCAL STREET RENEWAL PROGRAM

CORING DRAWING
PRITCHARD AV: FROM MAIN ST TO CHARLES ST

ORIGINAL SHEET - ISO 11x17 - v17.05

2023-01-24
123316298

\\CA0196-PPFSS01\WorkGroup\1233\active\123316298\field_data\drawings\16298_BHLP.dwg PRITCHARD
2023/01/25 11:10 AM By: Boughton, Lee

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APPROXIMATE BOREHOLE LOCATION

Scale

Client/Project
CITY OF WINNIPEG
2023 LOCAL STREET RENEWALS PROGRAM
WINNIPEG, MB

Figure No.
PRITCHARD

Title
BOREHOLE LOCATION PLAN

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

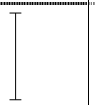
Numbers in this column are the field results of the Standard Penetration Test: the number of blows of a 140 pound (63.5 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (300 mm) into the soil. In accordance with ASTM D1586, the N-Value equals 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

BH23-01

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **Hartford Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 15, 2023 to January 9, 2022** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**ASPHALT:** 20 mm **CONCRETE:** 135 mm						
		Brown, moist, silty CLAY (CL-ML)		AS				
				AS				
				AS				Sieve/Hydro at 0.8 m G 0% S 8% M 81% C 12%
1				AS				
				AS				
				AS				
		- grey at 1.8 m		AS				
2				AS				
				AS				
		End of Borehole • The soil was frozen to a depth of 1.2 m. • No groundwater seepage or soil sloughing was observed upon completion of drilling. • Borehole stopped at a depth of 2.7 m.						
3								

UNDRAINED SHEAR STRENGTH, Cu (kPa)

LABORATORY TEST ▲ FIELD VANE TEST ◆

POCKET PEN. ★ 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/ MONITOR WELL/ PIEZOMETER

ELEVATION (m)

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

Drilling Contractor: Maple Leaf Drilling Ltd. | Logged By: LB

Drilling Method: 125 mm SSA | Reviewed By: GB

Completion Depth: 2.7 m | Page 1 of 1

Printed Jan 31 2023 11:1:18 STANTEC GEO 2016 123316298_STREET.RENEWALS.2023.GPJ GINT_1233_SOIL_2018_DATA_TEMP_REV2.GDT 1/31/23

Stantec

BOREHOLE RECORD

BH23-02

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **Hartford Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 15, 2023 to January 9, 2022** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**ASPHALT:** 30 mm **CONCRETE:** 140 mm						
		Brown, moist, lean CLAY (CL)		AS				
				AS				
				AS				Sieve/Hydro at 0.8 m G 0% S 6% M 77% C 17%
1				AS				
				AS				
				AS				
2				AS				
				AS				
				AS				
3		**End of Borehole** • The soil was frozen to a depth of 1.2 m. • No groundwater seepage or soil sloughing was observed upon completion of drilling. • Borehole stopped at a depth of 2.7 m.						

UNDRAINED SHEAR STRENGTH, Cu (kPa)

LABORATORY TEST ▲ FIELD VANE TEST ◆

POCKET PEN. ★ 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/ MONITOR WELL/ PIEZOMETER

ELEVATION (m)

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

Drilling Contractor: Maple Leaf Drilling Ltd. | Logged By: LB

Drilling Method: 125 mm SSA | Reviewed By: GB

Completion Depth: 2.7 m | Page 1 of 1

Printed Jan 31 2023 11:1:18 STANTEC GEO 2016 123316298_STREET.RENEWALS.2023.GPJ GINT_1233_SOIL_2018_DATA_TEMP_REV2.GDT 1/31/23

BOREHOLE RECORD

BH23-03

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **Hartford Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 15, 2023 to January 9, 2022** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**ASPHALT:** 20 mm **CONCRETE:** 135 mm						
		Brown, moist, silty CLAY (CL-ML)		AS				
				AS				
				AS				Sieve/Hydro at 0.8 m G 0% S 4% M 84% C 12%
1				AS				
				AS				
				AS				
2				AS				
				AS				
				AS				
3		**End of Borehole** • The soil was frozen to a depth of 1.2 m. • No groundwater seepage or soil sloughing was observed upon completion of drilling. • Borehole stopped at a depth of 2.7 m.						

UNDRAINED SHEAR STRENGTH, Cu (kPa)

LABORATORY TEST ▲ FIELD VANE TEST ◆

POCKET PEN. ★ 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/ MONITOR WELL/ PIEZOMETER

ELEVATION (m)

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

Drilling Contractor: Maple Leaf Drilling Ltd. | Logged By: LB

Drilling Method: 125 mm SSA | Reviewed By: GB

Completion Depth: 2.7 m | Page 1 of 1

Printed Jan 31 2023 11:1:19 STANTEC GEO 2016 123316298_STREET.RENEWALS.2023.GPJ GINT_1233_SOIL_2018_DATA_TEMP_REV2.GDT 1/31/23

Stantec

BOREHOLE RECORD

BH23-04

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **Hartford Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 15, 2023 to January 9, 2022** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**ASPHALT:** 20 mm **CONCRETE:** 155 mm						
		Black, moist, fat CLAY FILL (CH)		AS				
				AS				
				AS				Sieve/Hydro at 0.8 m G S M C 0% 6% 42% 52%
1				AS				
		Grey, moist, silty CLAY (CL-ML)		AS				
				AS				
2				AS				
				AS				
				AS				
3		**End of Borehole** • The soil was frozen to a depth of 1.2 m. • No groundwater seepage or soil sloughing was observed upon completion of drilling. • Borehole stopped at a depth of 2.7 m.						

UNDRAINED SHEAR STRENGTH, Cu (kPa)

LABORATORY TEST ▲ FIELD VANE TEST ◆

POCKET PEN. ★ 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/ MONITOR WELL/ PIEZOMETER

ELEVATION (m)

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

Drilling Contractor: Maple Leaf Drilling Ltd. | Logged By: LB

Drilling Method: 125 mm SSA | Reviewed By: GB

Completion Depth: 2.7 m | Page 1 of 1

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Stantec

BOREHOLE RECORD

BH23-05

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **Powers St, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 9, 2023 to January 11, 2023** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**ASPHALT:** 50 mm						
		CONCRETE: 135 mm						
		Black, moist, fat CLAY FILL (CH), trace organics		AS				
				AS				
		Tan, moist, lean CLAY (CL)		AS				Sieve/Hydro at 0.8 m G 0% S 6% M 72% C 22%
1				AS				
				AS				
				AS				
		Brown, moist, silty CLAY (CL-ML)		AS				
2		**End of Borehole** • The soil was frozen to a depth of 0.9 m. • No groundwater seepage or soil sloughing was observed upon completion of drilling. • Borehole stopped at a depth of 2.1 m.						

UNDRAINED SHEAR STRENGTH, Cu (kPa)

LABORATORY TEST ▲ FIELD VANE TEST ◆

POCKET PEN. ★ 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/ MONITOR WELL/ PIEZOMETER

ELEVATION (m)

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

Drilling Contractor: Maple Leaf Drilling Ltd. | Logged By: LB

Drilling Method: 125 mm SSA | Reviewed By: GB

Completion Depth: 2.1 m | Page 1 of 1

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BOREHOLE RECORD

BH23-06

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **Powers St, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 9, 2023 to January 11, 2023** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES TYPE	SAMPLES NUMBER	SAMPLES RECOVERY (mm) or TCR %	SAMPLES N-VALUE or RQD %	OTHER TESTS / REMARKS
0		**ASPHALT:** 50 mm						
		CONCRETE: 140 mm						
		Black, moist, fat CLAY FILL (CH), trace organics		AS				
				AS				
				AS				Sieve/Hydro at 0.8 m G 0% S 3% M 23% C 74%
1		Tan, moist, lean CLAY (CL)		AS				
				AS				
				AS				
		Brown, moist, silty CLAY (CL-ML)		AS				
2		**End of Borehole** • The soil was frozen to a depth of 0.9 m. • No groundwater seepage or soil sloughing was observed upon completion of drilling. • Borehole stopped at a depth of 2.1 m.						

UNDRAINED SHEAR STRENGTH, Cu (kPa)

LABORATORY TEST ▲ FIELD VANE TEST ◆

POCKET PEN. ★ 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/ MONITOR WELL/ PIEZOMETER

ELEVATION (m)

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

Drilling Contractor: Maple Leaf Drilling Ltd. | Logged By: LB

Drilling Method: 125 mm SSA | Reviewed By: GB

Completion Depth: 2.1 m | Page 1 of 1

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Stantec

BOREHOLE RECORD

BH23-07

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **Machray Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 12, 2023** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: RECOVERY (mm) or TCR %	SAMPLES: N-VALUE or RQD %	OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa) / WATER CONTENT & ATTERBERG LIMITS / SPT (N-value) BLOWS/0.3m	BACKFILL/ MONITOR WELL/ PIEZOMETER	ELEVATION (m)
0		**CONCRETE:** 165 mm									
		End of Borehole									

UNDRAINED SHEAR STRENGTH, Cu (kPa)
LABORATORY TEST ▲ FIELD VANE TEST ◆
POCKET PEN. ★ 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: Stantec | Logged By: LB
Drilling Method: Coring | Reviewed By: GB
Completion Depth: 0.165 m | Page 1 of 1

Printed Jan 31 2023 11:1:22 STANTEC GEO 2016 123316298_STREET.RENEWALS.2023.GPJ GINT_1233_SOIL_2018_DATA_TEMP_REV2.GDT 1/31/23

Stantec

BOREHOLE RECORD

BH23-08

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **Machray Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 12, 2023** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: RECOVERY (mm) or TCR %	SAMPLES: N-VALUE or RQD %	OTHER TESTS / REMARKS	BACKFILL/ MONITOR WELL/ PIEZOMETER	ELEVATION (m)
0		**CONCRETE:** 150 mm								
		End of Borehole								

UNDRAINED SHEAR STRENGTH, Cu (kPa)

LABORATORY TEST ▲ FIELD VANE TEST ◆

POCKET PEN. ★ 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: Stantec | Logged By: LB

Drilling Method: Coring | Reviewed By: GB

Completion Depth: 0.15 m | Page 1 of 1

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Stantec

BOREHOLE RECORD

BH23-09

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **College Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 11, 2023** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: RECOVERY (mm) or TCR %	SAMPLES: N-VALUE or RQD %	OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa) / WATER CONTENT & ATTERBERG LIMITS / SPT (N-value) BLOWS/0.3m	BACKFILL/ MONITOR WELL/ PIEZOMETER	ELEVATION (m)
0		**CONCRETE:** 160 mm									
		End of Borehole									

UNDRAINED SHEAR STRENGTH, Cu (kPa)
LABORATORY TEST ▲ FIELD VANE TEST ◆
POCKET PEN. ★ 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: Stantec | Logged By: LB
Drilling Method: Coring | Reviewed By: GB
Completion Depth: 0.16 m | Page 1 of 1

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Stantec

BOREHOLE RECORD

BH23-10

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **College Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 11, 2023** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: RECOVERY (mm) or TCR %	SAMPLES: N-VALUE or RQD %	OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa) / WATER CONTENT & ATTERBERG LIMITS / SPT (N-value) BLOWS/0.3m	BACKFILL/ MONITOR WELL/ PIEZOMETER	ELEVATION (m)
0		**CONCRETE:** 140 mm									
		End of Borehole									

UNDRAINED SHEAR STRENGTH, Cu (kPa)
LABORATORY TEST ▲ FIELD VANE TEST ◆
POCKET PEN. ★ 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: Stantec | Logged By: LB
Drilling Method: Coring | Reviewed By: GB
Completion Depth: 0.14 m | Page 1 of 1

Printed Jan 31 2023 11:1:24 STANTEC GEO 2016 123316298_STREET.RENEWALS.2023.GPJ GINT_1233_SOIL_2018_DATA_TEMP_REV2.GDT 1/31/23

Stantec

BOREHOLE RECORD

BH23-11

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **College Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 11, 2023** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: RECOVERY (mm) or TCR %	SAMPLES: N-VALUE or RQD %	OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa) / WATER CONTENT & ATTERBERG LIMITS / SPT (N-value) BLOWS/0.3m	BACKFILL/ MONITOR WELL/ PIEZOMETER	ELEVATION (m)
0		**CONCRETE:** 155 mm									
		End of Borehole									

UNDRAINED SHEAR STRENGTH, Cu (kPa)
LABORATORY TEST ▲ FIELD VANE TEST ◆
POCKET PEN. ★ 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: Stantec | Logged By: LB
Drilling Method: Coring | Reviewed By: GB
Completion Depth: 0.155 m | Page 1 of 1

Printed Jan 31 2023 11:1:25 STANTEC GEO 2016 123316298_STREET.RENEWALS.2023.GPJ GINT_1233_SOIL_2018_DATA_TEMP_REV2.GDT 1/31/23

Stantec

BOREHOLE RECORD

BH23-12

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **College Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 11, 2023** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: RECOVERY (mm) or TCR %	SAMPLES: N-VALUE or RQD %	OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa) / WATER CONTENT & ATTERBERG LIMITS / SPT (N-value) BLOWS/0.3m	BACKFILL/ MONITOR WELL/ PIEZOMETER	ELEVATION (m)
0		**CONCRETE:** 140 mm									
		End of Borehole									

UNDRAINED SHEAR STRENGTH, Cu (kPa)
LABORATORY TEST ▲ FIELD VANE TEST ◆
POCKET PEN. ★ 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: Stantec | Logged By: LB
Drilling Method: Coring | Reviewed By: GB
Completion Depth: 0.14 m | Page 1 of 1

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Stantec

BOREHOLE RECORD

BH23-13

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **College Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 11, 2023** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: RECOVERY (mm) or TCR %	SAMPLES: N-VALUE or RQD %	OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa) / WATER CONTENT & ATTERBERG LIMITS / SPT (N-value) BLOWS/0.3m	BACKFILL/ MONITOR WELL/ PIEZOMETER	ELEVATION (m)
0		**ASPHALT:** 5 mm **CONCRETE:** 120 mm									
		End of Borehole									

UNDRAINED SHEAR STRENGTH, Cu (kPa)

LABORATORY TEST ▲ FIELD VANE TEST ◆

POCKET PEN. ★ 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: Stantec | Logged By: LB

Drilling Method: Coring | Reviewed By: GB

Completion Depth: 0.125 m | Page 1 of 1

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Stantec

BOREHOLE RECORD

BH23-14

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **Burrows Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 10, 2023** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: RECOVERY (mm) or TCR %	SAMPLES: N-VALUE or RQD %	OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa) / WATER CONTENT & ATTERBERG LIMITS / SPT (N-value) BLOWS/0.3m	BACKFILL/ MONITOR WELL/ PIEZOMETER	ELEVATION (m)
0		**CONCRETE:** 230 mm									
		End of Borehole									

UNDRAINED SHEAR STRENGTH, Cu (kPa)

LABORATORY TEST ▲ FIELD VANE TEST ◆

POCKET PEN. ★ 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: Stantec | Logged By: LB

Drilling Method: Coring | Reviewed By: GB

Completion Depth: 0.23 m | Page 1 of 1

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Stantec

BOREHOLE RECORD

BH23-15

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **Burrows Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 10, 2023** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: RECOVERY (mm) or TCR %	SAMPLES: N-VALUE or RQD %	OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa) / WATER CONTENT & ATTERBERG LIMITS / SPT (N-value) BLOWS/0.3m	BACKFILL/ MONITOR WELL/ PIEZOMETER	ELEVATION (m)
0		**CONCRETE:** 240 mm									
		End of Borehole									

UNDRAINED SHEAR STRENGTH, Cu (kPa)
LABORATORY TEST ▲ FIELD VANE TEST ◆
POCKET PEN. ★ 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: Stantec | Logged By: LB
Drilling Method: Coring | Reviewed By: GB
Completion Depth: 0.24 m | Page 1 of 1

Printed Jan 31 2023 11:1:27 STANTEC GEO 2016 123316298_STREET.RENEWALS.2023.GPJ GINT_1233_SOIL_2018_DATA_TEMP_REV2.GDT 1/31/23

Stantec

BOREHOLE RECORD

BH23-16

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **Pritchard Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 11, 2023** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: RECOVERY (mm) or TCR %	SAMPLES: N-VALUE or RQD %	OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu (kPa) / WATER CONTENT & ATTERBERG LIMITS / SPT (N-value) BLOWS/0.3m	BACKFILL/ MONITOR WELL/ PIEZOMETER	ELEVATION (m)
0		**CONCRETE:** 155 mm									
		End of Borehole									

UNDRAINED SHEAR STRENGTH, Cu (kPa)
LABORATORY TEST ▲ FIELD VANE TEST ◆
POCKET PEN. ★ 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: Stantec | Logged By: LB
Drilling Method: Coring | Reviewed By: GB
Completion Depth: 0.155 m | Page 1 of 1

Printed Jan 31 2023 11:1:28 STANTEC GEO 2016 123316298_STREET.RENEWALS.2023.GPJ GINT_1233_SOIL_2018_DATA_TEMP_REV2.GDT 1/31/23

Stantec

BOREHOLE RECORD

BH23-17

CLIENT: **City of Winnipeg** PROJECT NO. : **123316298**

PROJECT: **2023 Local Street Renewals Program** BH ELEVATION: **N/A**

LOCATION: **Pritchard Ave, Winnipeg, MB** DATUM: **N/A**

DATE BORED: **January 10, 2023** WATER LEVEL: **N/A**

DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (USCS)	STRATA PLOT	SAMPLES: TYPE	SAMPLES: NUMBER	SAMPLES: RECOVERY (mm) or TCR %	SAMPLES: N-VALUE or RQD %	OTHER TESTS / REMARKS	BACKFILL / MONITOR WELL / PIEZOMETER	ELEVATION (m)
0		**CONCRETE:** 120 mm								
		End of Borehole								

UNDRAINED SHEAR STRENGTH, Cu (kPa)

LABORATORY TEST ▲ FIELD VANE TEST ◆

POCKET PEN. ★ 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: Stantec | Logged By: LB

Drilling Method: Coring | Reviewed By: GB

Completion Depth: 0.12 m | Page 1 of 1

Printed Jan 31 2023 11:1:28 STANTEC GEO 2016 123316298_STREET.RENEWALS.2023.GPJ GINT_1233_SOIL_2018_DATA_TEMP_REV2.GDT 1/31/23

APPENDIX D

Core Photographs

Figure 1 – Core No. 1 (Hartford Ave)

Figure 2 – Core No. 2 (Hartford Ave)

Figure 3 – Core No. 3 (Hartford Ave)

Figure 4 – Core No. 4 (Hartford Ave)

Figure 5 – Core No. 5 (Powers St)

Figure 6 – Core No. 6 (Powers St)

Figure 7 – Core No. 7 (Machray Ave)

Figure 8 – Core No. 8 (Machray Ave)

Figure 9 – Core 9 (College Ave)

Figure 10 – Core 10 (College Ave)

Figure 11 – Core 11 (College Ave)

Figure 12 – Core 12 (College Ave)

Figure 13 – Core 13 (College Ave)

Figure 14 – Core 14 (Burrows Ave)

Figure 15 – Core 15 (Burrows Ave)

Figure 16 – Core 16 (Pritchard Ave)

Figure 17 – Core 17 (Pritchard Ave)

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: Erik Hansen

PROJECT 2023 Local Streets Renewals Program

PROJECT NO. 123316298

REPORT NO. 1

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

DATE RECEIVED: 2023.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.25
TESTED BY: Donald Eliazar

SAMPLE ID: BH23-01, 2.8' (Hartford Ave)

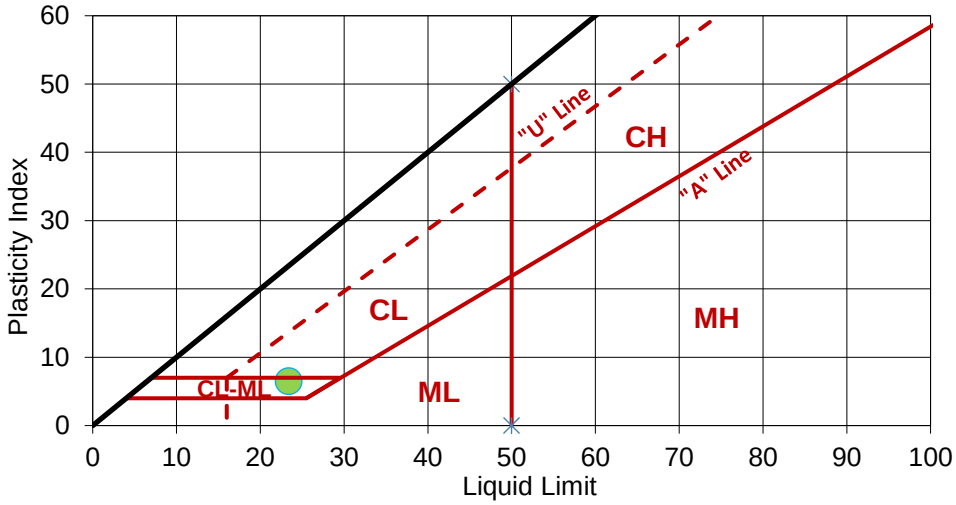
LIQUID LIMIT

TRIAL	1	2
BLOWS	25	27
MC (%)	23	23
Corr. MC (%)	23	24

PLASTIC LIMIT

TRIAL	1	2
MC (%)	17	17

LIQUID LIMIT, LL	23
PLASTIC LIMIT, PL	17
PLASTICITY INDEX, PI	6
AS REC'D MC (%)	19.5



COMMENTS:

REPORT DATE 2023.Jan.30

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

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

Design with community in mind

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: Erik Hansen

PROJECT 2023 Local Streets Renewals Program

PROJECT NO. 123316298

REPORT NO. 2

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

DATE RECEIVED: 2023.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.26
TESTED BY: Blair Dawson

SAMPLE ID: BH23-02, 2.9' (Hartford Ave)

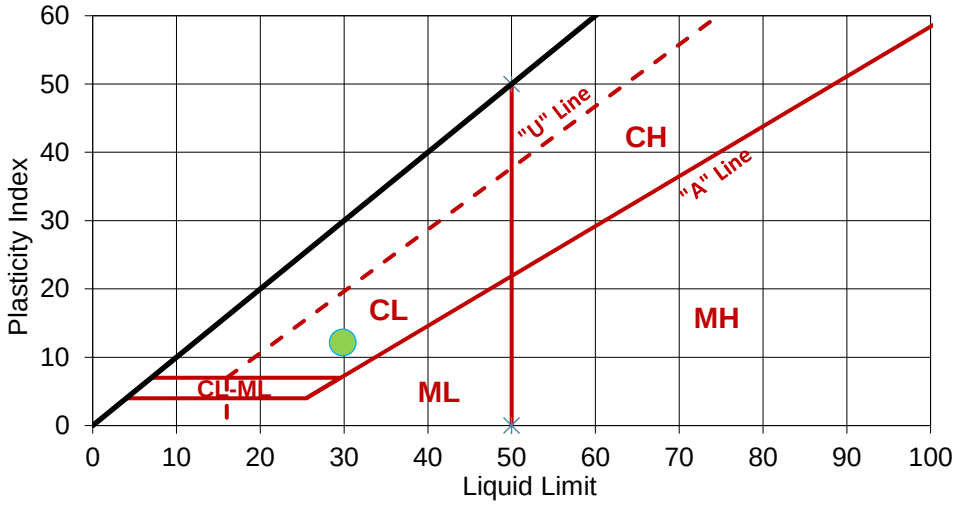
LIQUID LIMIT

TRIAL	1	2
BLOWS	21	21
MC (%)	30	31
Corr. MC (%)	30	30

PLASTIC LIMIT

TRIAL	1	2
MC (%)	18	18

LIQUID LIMIT, LL	30
PLASTIC LIMIT, PL	18
PLASTICITY INDEX, PI	12
AS REC'D MC (%)	21.5



COMMENTS:

REPORT DATE 2023.Jan.30

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

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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: Erik Hansen

PROJECT 2023 Local Streets Renewals Program

PROJECT NO. 123316298

REPORT NO. 3

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

DATE RECEIVED: 2023.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.26
TESTED BY: Blair Dawson

SAMPLE ID: BH23-03, 2.8' (Hartford Ave)

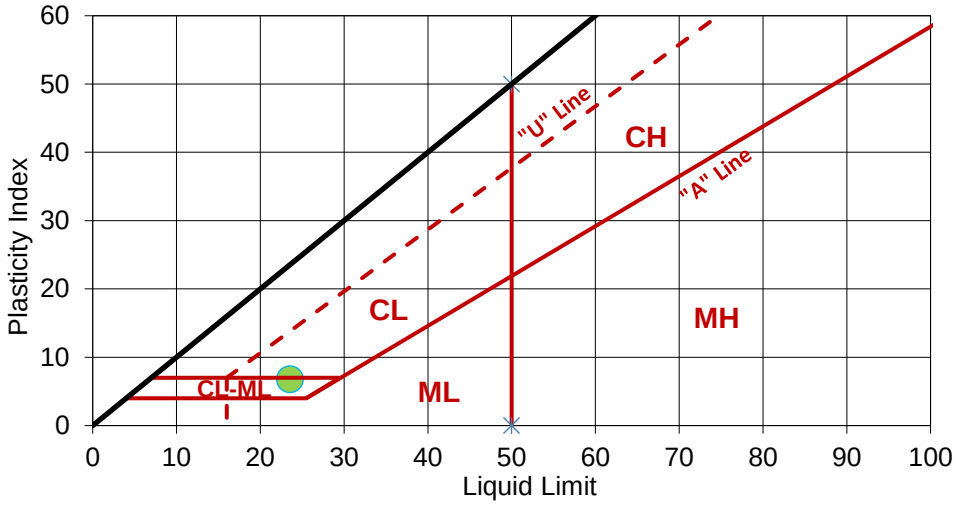
LIQUID LIMIT

TRIAL	1	2
BLOWS	25	24
MC (%)	25	23
Corr. MC (%)	25	22

PLASTIC LIMIT

TRIAL	1	2
MC (%)	17	17

LIQUID LIMIT, LL	24
PLASTIC LIMIT, PL	17
PLASTICITY INDEX, PI	7
AS REC'D MC (%)	20.7



COMMENTS:

REPORT DATE 2023.Jan.30

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

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Design with community in mind

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: Erik Hansen

PROJECT 2023 Local Streets Renewals Program

PROJECT NO. 123316298

REPORT NO. 4

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

DATE RECEIVED: 2023.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.25
TESTED BY: Donald Eliazar

SAMPLE ID: BH23-04, 2.9' (Hartford Ave)

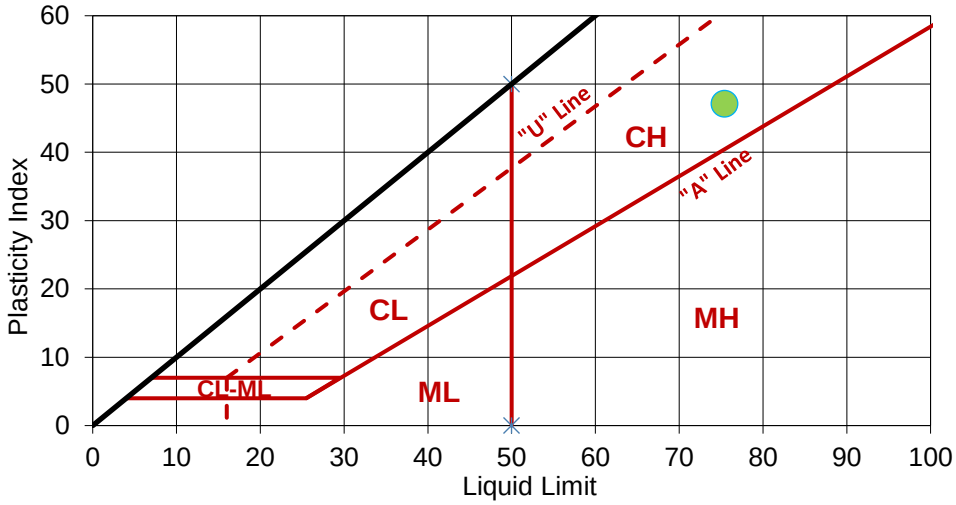
LIQUID LIMIT

TRIAL	1	2
BLOWS	24	26
MC (%)	75	76
Corr. MC (%)	75	76

PLASTIC LIMIT

TRIAL	1	2
MC (%)	28	29

LIQUID LIMIT, LL	75
PLASTIC LIMIT, PL	28
PLASTICITY INDEX, PI	47
AS REC'D MC (%)	33.6



COMMENTS:

REPORT DATE 2023.Jan.30

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

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Design with community in mind

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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: Erik Hansen

PROJECT 2023 Local Streets Renewals Program

PROJECT NO. 123316298

REPORT NO. 5

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

DATE RECEIVED: 2023.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.26
TESTED BY: Blair Dawson

SAMPLE ID: BH23-05, 2.9' (Powers St)

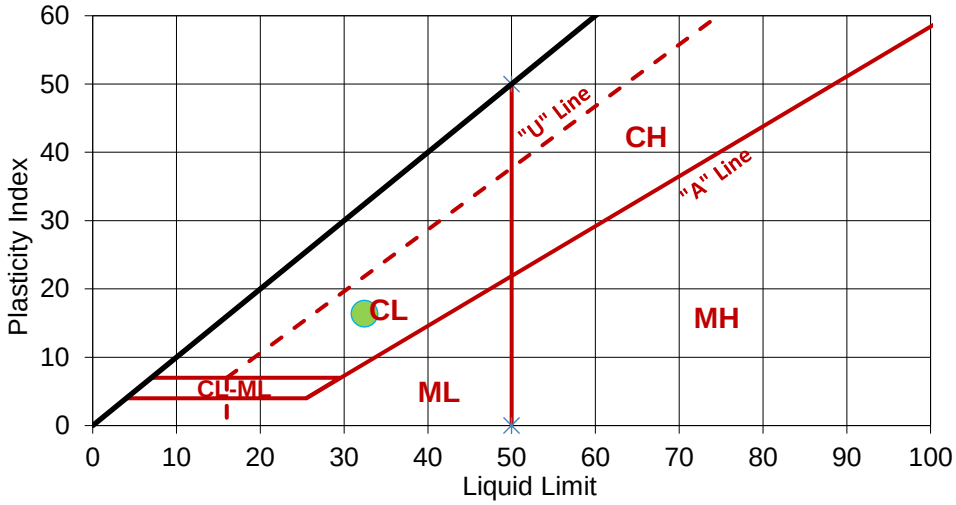
LIQUID LIMIT

TRIAL	1	2
BLOWS	23	25
MC (%)	32	33
Corr. MC (%)	32	33

PLASTIC LIMIT

TRIAL	1	2
MC (%)	15	17

LIQUID LIMIT, LL	32
PLASTIC LIMIT, PL	16
PLASTICITY INDEX, PI	16
AS REC'D MC (%)	29.1



COMMENTS:

REPORT DATE 2023.Jan.30

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

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Design with community in mind

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: Erik Hansen

PROJECT 2023 Local Streets Renewals Program

PROJECT NO. 123316298

REPORT NO. 6

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

DATE RECEIVED: 2023.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.27
TESTED BY: Larry Presado

SAMPLE ID: BH23-06, 2.9' (Powers St)

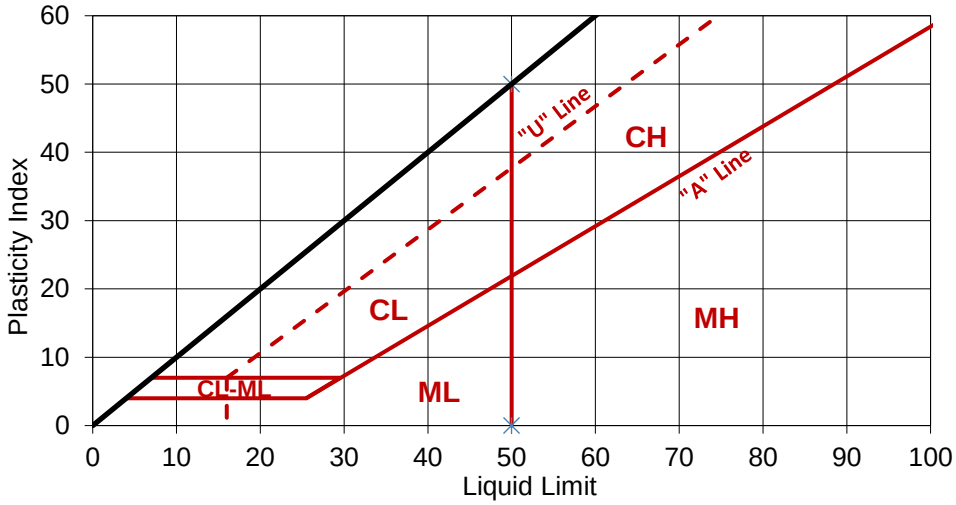
LIQUID LIMIT

TRIAL	1	2
BLOWS	24	23
MC (%)	93	94
Corr. MC (%)	93	93

PLASTIC LIMIT

TRIAL	1	2
MC (%)	29	28

LIQUID LIMIT, LL	93
PLASTIC LIMIT, PL	28
PLASTICITY INDEX, PI	65
AS REC'D MC (%)	34.4



COMMENTS:

REPORT DATE 2023.Jan.30

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

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Design with community in mind

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: Erik Hansen

PROJECT 2023 Local Streets Renewals Program

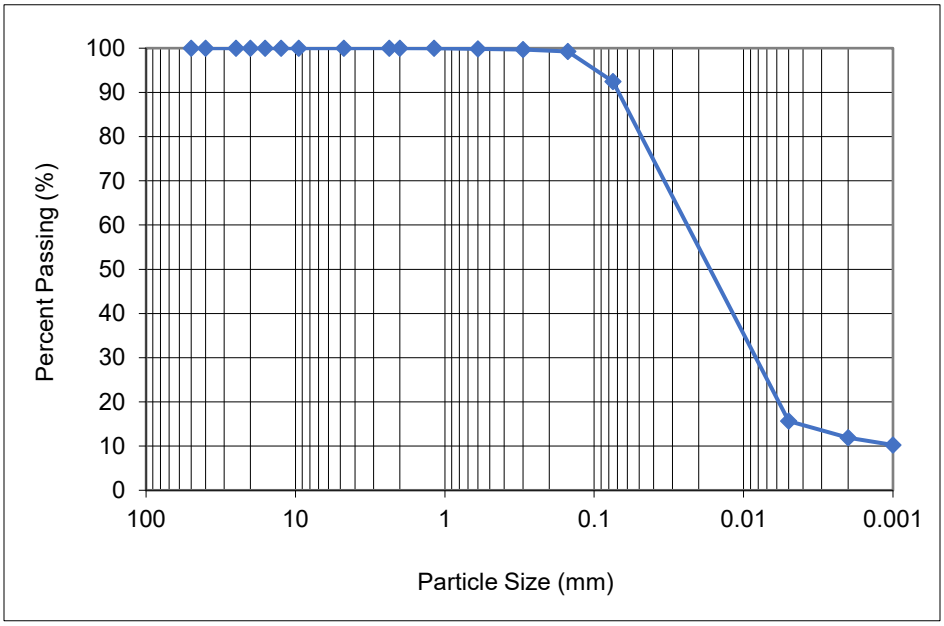
PROJECT NO. 123316298

REPORT NO. 1

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

DATE RECEIVED 2023.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.22
TESTED BY: Donald Eliazar



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	99.8
0.300	99.7
0.150	99.3
0.075	92.4
0.005	15.7
0.002	11.9
0.001	10.2

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.0	0.2	7.4	80.5	11.9	10.2

COMMENTS:
Material tested was identified as BH23-01, 2.8' (Hartford Ave).

REPORT DATE 2023.Jan.30

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

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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: Erik Hansen

PROJECT 2023 Local Streets Renewals Program

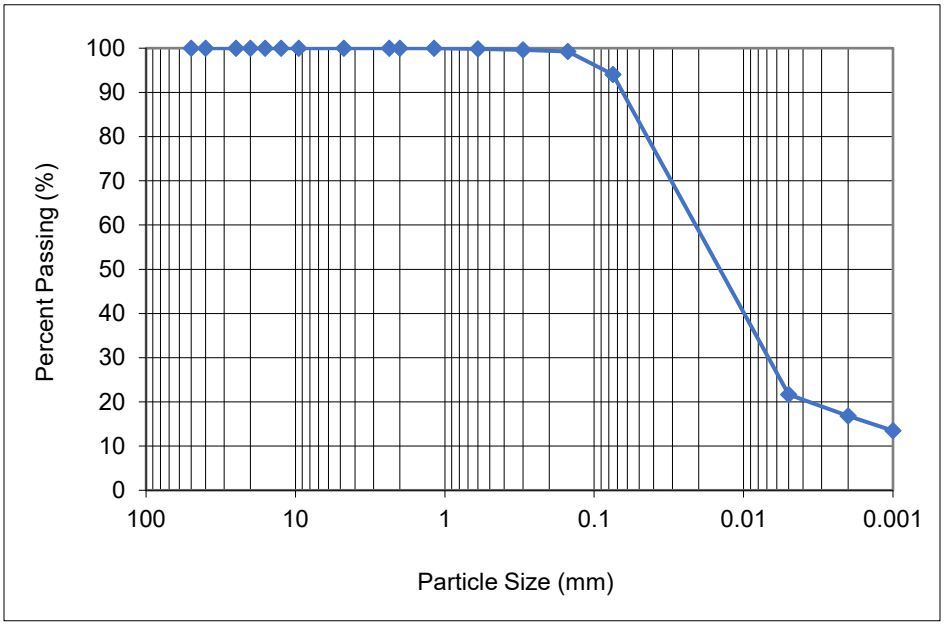
PROJECT NO. 123316298

REPORT NO. 2

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

DATE RECEIVED 2023.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.23
TESTED BY: Donald Eliazar



SIEVE SIZE (mm)	% PASSING
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	100.0
1.18	99.9
0.600	99.8
0.300	99.6
0.150	99.2
0.075	94.1
0.005	21.7
0.002	16.8
0.001	13.5

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.0	0.2	5.8	77.2	16.8	13.5

COMMENTS:
Material tested was identified as BH23-02, 2.9' (Hartford Ave).

REPORT DATE 2023.Jan.30

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

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Tel: (204) 488-6999

ASTM 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: Erik Hansen

PROJECT 2023 Local Streets Renewals Program

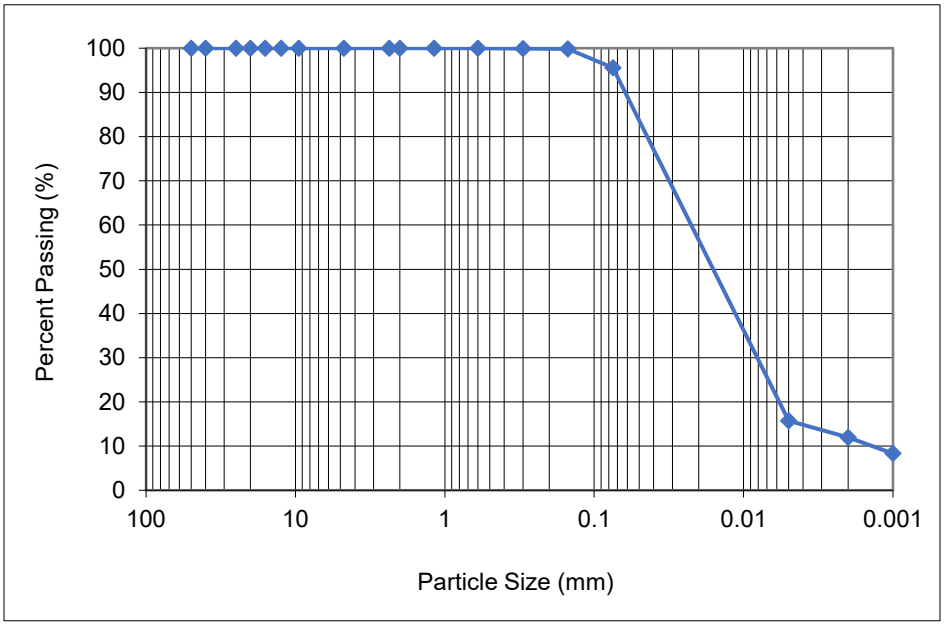
PROJECT NO. 123316298

REPORT NO. 3

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

DATE RECEIVED 2023.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.23
TESTED BY: Donald Eliazar



SIEVE SIZE (mm)	% PASSING
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	100.0
1.18	100.0
0.600	100.0
0.300	99.9
0.150	99.8
0.075	95.6
0.005	15.7
0.002	12.0
0.001	8.3

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.0	0.0	4.4	83.6	12.0	8.3

COMMENTS:
Material tested was identified as BH23-03, 2.8' (Hartford Ave).

REPORT DATE 2023.Jan.30

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

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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: Erik Hansen

PROJECT 2023 Local Streets Renewals Program

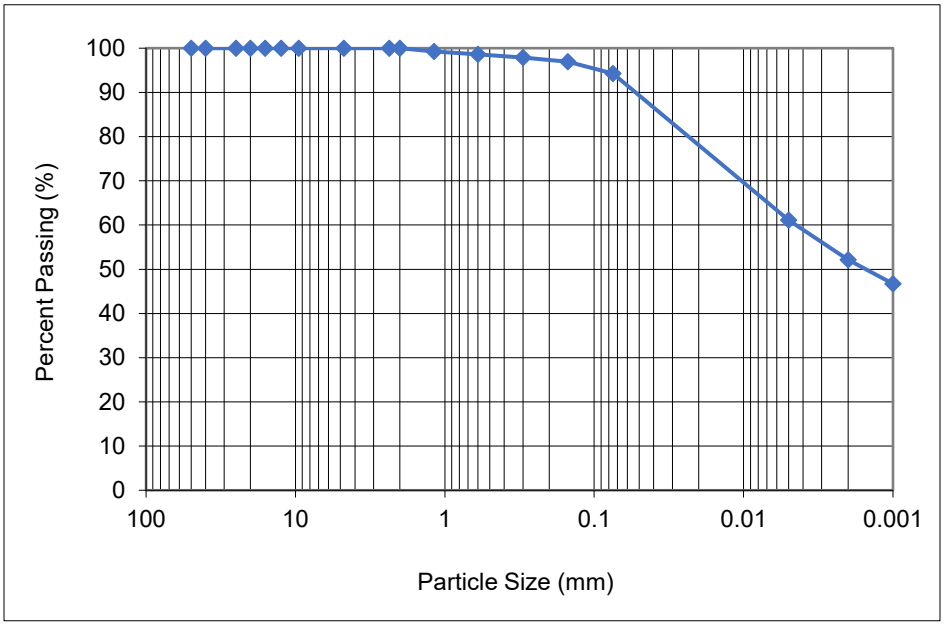
PROJECT NO. 123316298

REPORT NO. 4

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

DATE RECEIVED 2023.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.23
TESTED BY: Donald Eliazar



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	99.2
0.600	98.6
0.300	97.9
0.150	96.9
0.075	94.3
0.005	61.1
0.002	52.1
0.001	46.7

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.0	1.4	4.4	42.1	52.1	46.7

COMMENTS:
Material tested was identified as BH23-04, 2.9' (Hartford Ave).

REPORT DATE 2023.Jan.30

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

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Tel: (204) 488-6999

ASTM 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: Erik Hansen

PROJECT 2023 Local Streets Renewals Program

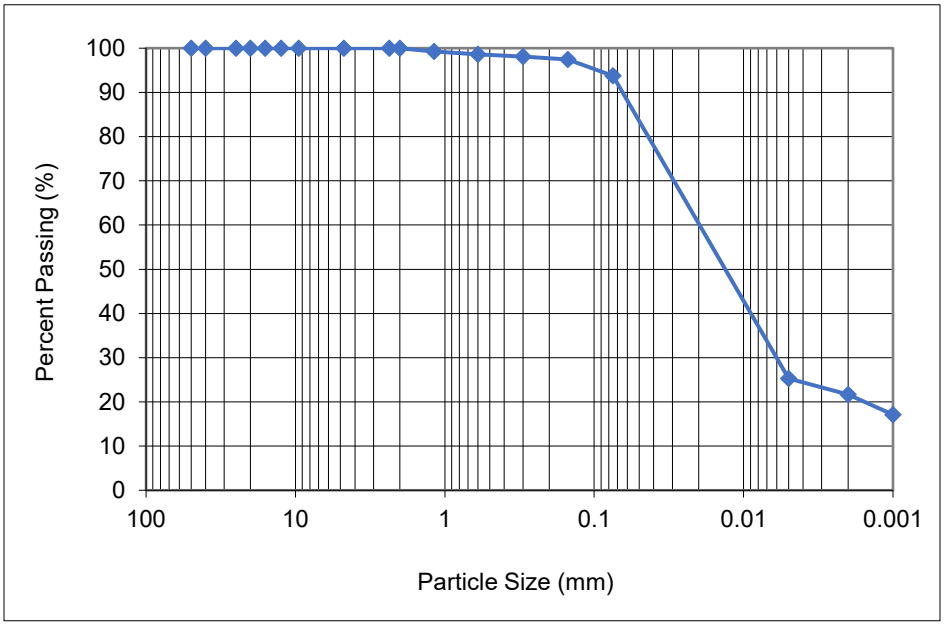
PROJECT NO. 123316298

REPORT NO. 5

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

DATE RECEIVED 2023.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.23
TESTED BY: Donald Eliazar



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	99.3
0.600	98.6
0.300	98.1
0.150	97.5
0.075	93.8
0.005	25.3
0.002	21.6
0.001	17.1

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.0	1.3	4.9	72.2	21.6	17.1

COMMENTS:
Material tested was identified as BH23-05, 2.9' (Powers St).

REPORT DATE 2023.Jan.30

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

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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: Erik Hansen

PROJECT 2023 Local Streets Renewals Program

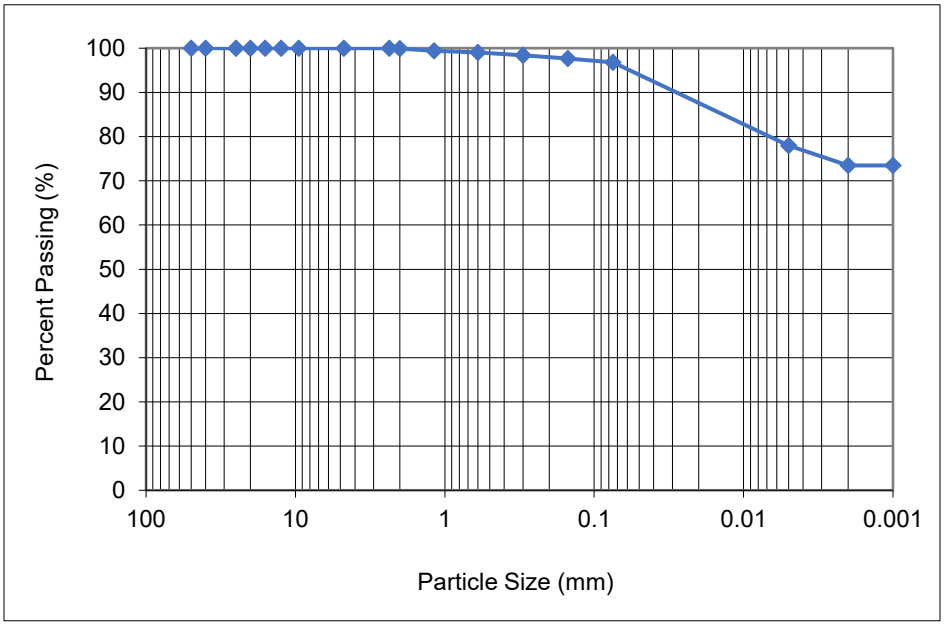
PROJECT NO. 123316298

REPORT NO. 6

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

DATE RECEIVED 2023.Jan.17
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.23
TESTED BY: Donald Eliazar



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	99.9
1.18	99.4
0.600	99.0
0.300	98.4
0.150	97.7
0.075	96.8
0.005	78.0
0.002	73.5
0.001	73.5

Gravel	Sand			Silt	Clay	Colloids
	Coarse	Medium	Fine			
0.0	0.1	0.9	2.2	23.3	73.5	73.5

COMMENTS:
Material tested was identified as BH23-06, 2.9' (Powers St).

REPORT DATE 2023.Jan.30

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

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Tel: (204) 488-6999

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For specific tests as listed on www.ccil.com

PROCTOR TEST REPORT

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

ATTN: ErikHansen

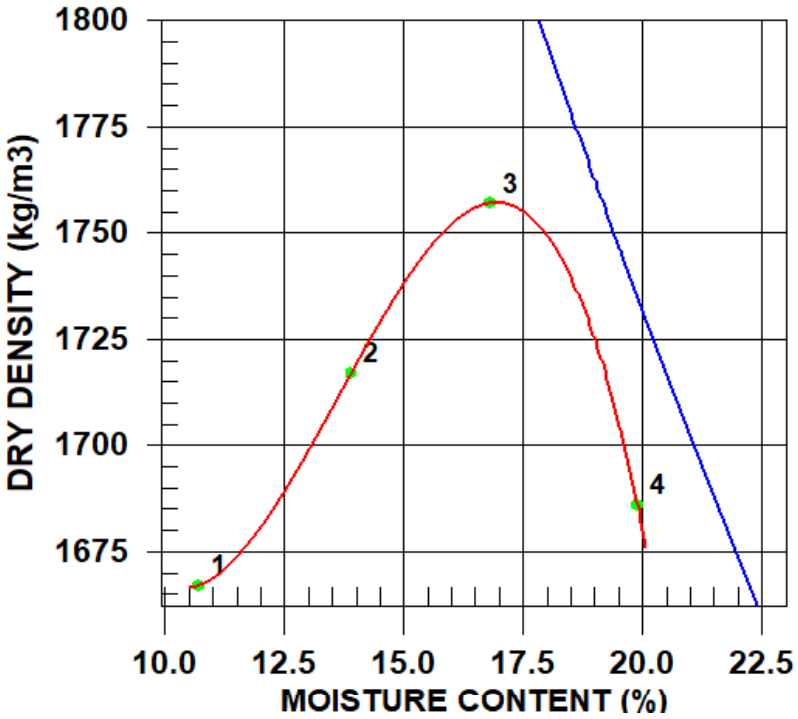
CLIENT City of Winnipeg Public Works Department
C.C.

PROJECT 2023 Local Street Renewals Program

PROJECT NO. 123316298-2
PROCTOR NO. 1 DATE SAMPLED 2023.Jan.16 DATE RECEIVED 2023.Jan.16 DATE TESTED 2023.Jan.19

INSITU MOISTURE 20.7 %
TESTED BY Donald Eliazar
MATERIAL IDENTIFICATION
MATERIAL USE Subgrade
MAX. NOMINAL SIZE
MATERIAL TYPE Clay
SUPPLIER Existing Material
SOURCE BH23-01, Hartford Ave

COMPACTION STANDARD Standard Proctor, ASTM D698
COMPACTION PROCEDURE A: 101.6mm Mold, Passing 4.75mm
RAMMER TYPE Manual
PREPARATION Dry
OVERSIZE CORRECTION METHOD None
RETAINED 4.75mm SCREEN



TRIAL NUMBER	WET DENSITY (kg/m3)	DRY DENSITY (kg/m3)	MOISTURE CONTENT (%)
1	1845	1667	10.7
2	1956	1717	13.9
3	2052	1757	16.8
4	2021	1686	19.9

	MAXIMUM DRY DENSITY (kg/m3)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED OVERSIZE CORRECTED	1760	17.0

COMMENTS

REVIEWED BY Jason Thompson, C.E.T.

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PROCTOR TEST REPORT

TO City of Winnipeg Public Works Department
104-1155 Pacific Ave.
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R3E 2P1

ATTN: ErikHansen

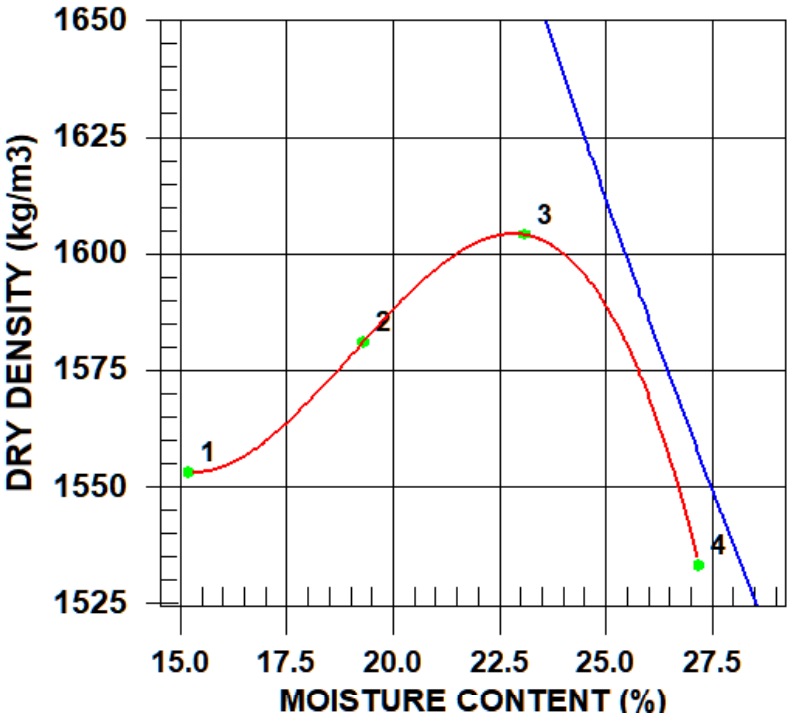
CLIENT City of Winnipeg Public Works Department
C.C.

PROJECT 2023 Local Street Renewals Program

PROJECT NO. 123316298-2
PROCTOR NO. 2 DATE SAMPLED 2023.Jan.16 DATE RECEIVED 2023.Jan.16 DATE TESTED 2023.Jan.20

INSITU MOISTURE 27.7 %
TESTED BY Donald Eliazar
MATERIAL IDENTIFICATION
MATERIAL USE Subgrade
MAX. NOMINAL SIZE
MATERIAL TYPE Clay
SUPPLIER Existing Materials
SOURCE BH23-02, Hartford Ave

COMPACTION STANDARD Standard Proctor, ASTM D698
COMPACTION PROCEDURE A: 101.6mm Mold, Passing 4.75mm
RAMMER TYPE Manual
PREPARATION Moist
OVERSIZE CORRECTION METHOD None
RETAINED 4.75mm SCREEN



TRIAL NUMBER	WET DENSITY (kg/m3)	DRY DENSITY (kg/m3)	MOISTURE CONTENT (%)
1	1789	1553	15.2
2	1886	1581	19.3
3	1975	1604	23.1
4	1950	1533	27.2

	MAXIMUM DRY DENSITY (kg/m3)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED OVERSIZE CORRECTED	1600	23.0

COMMENTS

REVIEWED BY Jason Thompson, C.E.T.

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PROCTOR TEST REPORT

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

ATTN: ErikHansen

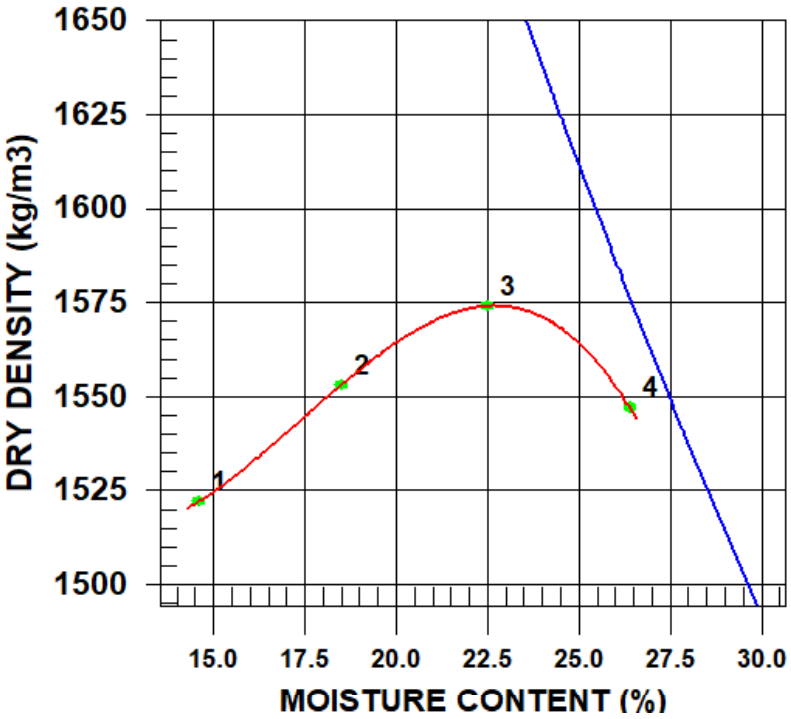
CLIENT City of Winnipeg Public Works Department
C.C.

PROJECT 2023 Local Street Renewals Program

PROJECT NO. 123316298-2
PROCTOR NO. 3 DATE SAMPLED 2023.Jan.16 DATE RECEIVED 2023.Jan.16 DATE TESTED 2023.Jan.19

INSITU MOISTURE 28.4 %
TESTED BY Donald Eliazar
MATERIAL IDENTIFICATION
MATERIAL USE Subgrade
MAX. NOMINAL SIZE
MATERIAL TYPE Clay
SUPPLIER Exsiting Material
SOURCE BH23-03, Hartford Ave

COMPACTION STANDARD Standard Proctor, ASTM D698
COMPACTION PROCEDURE A: 101.6mm Mold, Passing 4.75mm
RAMMER TYPE Manual
PREPARATION Dry
OVERSIZE CORRECTION METHOD None
RETAINED 4.75mm SCREEN



TRIAL NUMBER	WET DENSITY (kg/m3)	DRY DENSITY (kg/m3)	MOISTURE CONTENT (%)
1	1744	1522	14.6
2	1840	1553	18.5
3	1928	1574	22.5
4	1955	1547	26.4

	MAXIMUM DRY DENSITY (kg/m3)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED OVERSIZE CORRECTED	1570	22.5

COMMENTS

REVIEWED BY Jason Thompson, C.E.T.

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PROCTOR TEST REPORT

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

ATTN: ErikHansen

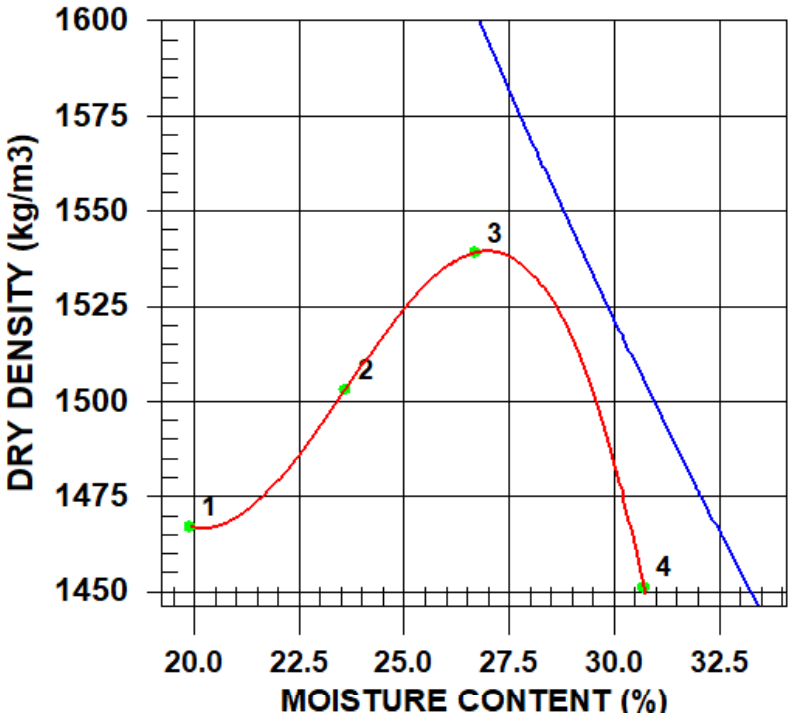
CLIENT City of Winnipeg Public Works Department
C.C.

PROJECT 2023 Local Street Renewals Program

PROJECT NO. 123316298-2
PROCTOR NO. 4 DATE SAMPLED 2023.Jan.16 DATE RECEIVED 2023.Jan.16 DATE TESTED 2023.Jan.19

INSITU MOISTURE 30.0 %
TESTED BY Donald Eliazar
MATERIAL IDENTIFICATION
MATERIAL USE Subgrade
MAX. NOMINAL SIZE
MATERIAL TYPE Clay
SUPPLIER Existing Material
SOURCE BH23-04, Hartford Ave

COMPACTION STANDARD Standard Proctor, ASTM D698
COMPACTION PROCEDURE A: 101.6mm Mold, Passing 4.75mm
RAMMER TYPE Manual
PREPARATION Dry
OVERSIZE CORRECTION METHOD None
RETAINED 4.75mm SCREEN



TRIAL NUMBER	WET DENSITY (kg/m3)	DRY DENSITY (kg/m3)	MOISTURE CONTENT (%)
1	1759	1467	19.9
2	1858	1503	23.6
3	1950	1539	26.7
4	1897	1451	30.7

	MAXIMUM DRY DENSITY (kg/m3)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED OVERSIZE CORRECTED	1540	27.0

COMMENTS

Page 1 of 1 2023.Jan.20

REVIEWED BY Jason Thompson, C.E.T.

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PROCTOR TEST REPORT

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

ATTN: ErikHansen

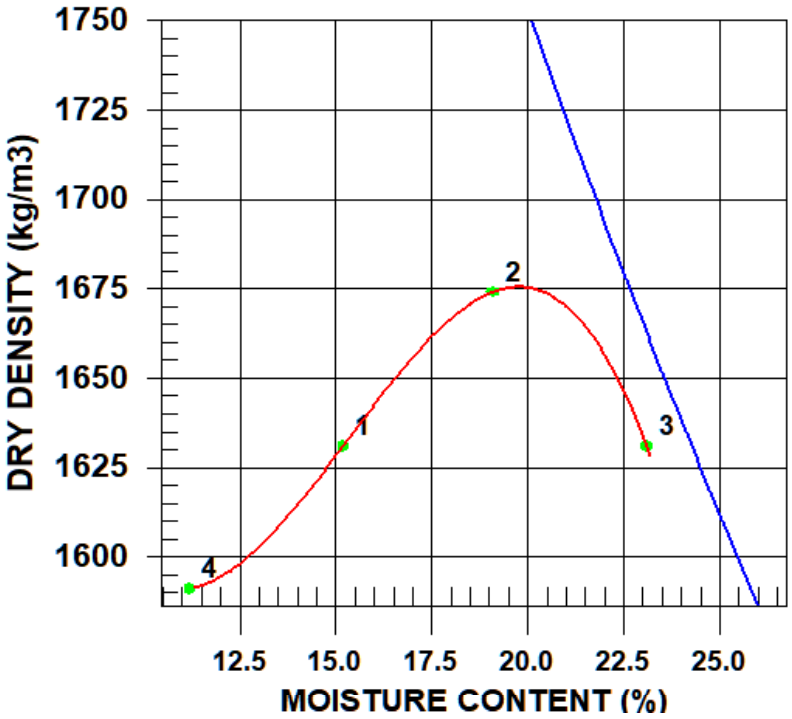
CLIENT City of Winnipeg Public Works Department
C.C.

PROJECT 2023 Local Street Renewals Program

PROJECT NO. 123316298-2
PROCTOR NO. 5 DATE SAMPLED 2023.Jan.16 DATE RECEIVED 2023.Jan.16 DATE TESTED 2023.Jan.20

INSITU MOISTURE 25.3 %
TESTED BY Donald Eliazar
MATERIAL IDENTIFICATION
MATERIAL USE Subgrade
MAX. NOMINAL SIZE
MATERIAL TYPE Clay
SUPPLIER Existing Materials
SOURCE BH23-05, Powers St

COMPACTION STANDARD Standard Proctor, ASTM D698
COMPACTION PROCEDURE A: 101.6mm Mold, Passing 4.75mm
RAMMER TYPE Manual
PREPARATION Moist
OVERSIZE CORRECTION METHOD None
RETAINED 4.75mm SCREEN



TRIAL NUMBER	WET DENSITY (kg/m3)	DRY DENSITY (kg/m3)	MOISTURE CONTENT (%)
1	1879	1631	15.2
2	1994	1674	19.1
3	2008	1631	23.1
4	1769	1591	11.2

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

COMMENTS

Page 1 of 1 2023.Jan.20

REVIEWED BY Jason Thompson, C.E.T.

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PROCTOR TEST REPORT

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

ATTN: ErikHansen

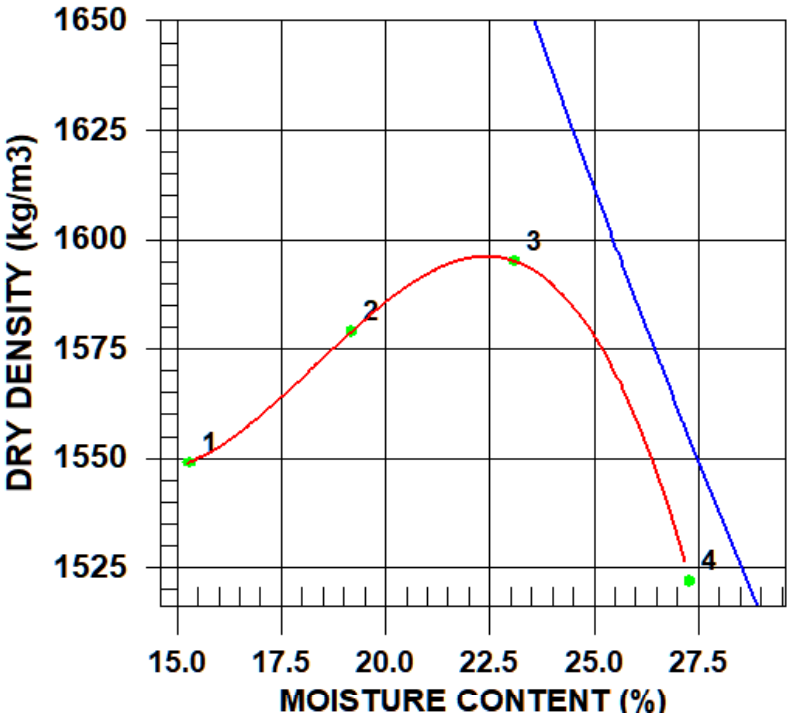
CLIENT City of Winnipeg Public Works Department
C.C.

PROJECT 2023 Local Street Renewals Program

PROJECT NO. 123316298-2
PROCTOR NO. 6 DATE SAMPLED 2023.Jan.16 DATE RECEIVED 2023.Jan.16 DATE TESTED 2023.Jan.20

INSITU MOISTURE 26.1 %
TESTED BY Donald Eliazar
MATERIAL IDENTIFICATION
MATERIAL USE Subgrade
MAX. NOMINAL SIZE
MATERIAL TYPE Clay
SUPPLIER Existing Materials
SOURCE BH23-06, Powers St

COMPACTION STANDARD Standard Proctor, ASTM D698
COMPACTION PROCEDURE A: 101.6mm Mold, Passing 4.75mm
RAMMER TYPE Manual
PREPARATION Moist
OVERSIZE CORRECTION METHOD None
RETAINED 4.75mm SCREEN



TRIAL NUMBER	WET DENSITY (kg/m3)	DRY DENSITY (kg/m3)	MOISTURE CONTENT (%)
1	1786	1549	15.3
2	1882	1579	19.2
3	1964	1595	23.1
4	1937	1522	27.3

	MAXIMUM DRY DENSITY (kg/m3)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED OVERSIZE CORRECTED	1600	22.5

COMMENTS

REVIEWED BY Jason Thompson, C.E.T.

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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 3P1

ATTN: Erik Hansen

PROJECT 2023 Local Streets & Pathway Renewals Program

PROJECT NO. 123316298

REPORT NO. 1 (Data page - see Page 2 for Chart)

DATE SAMPLED: 2023.Jan.16 DATE RECEIVED: 2023.Jan.16 DATE TESTED: 2023.Jan.25
SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Ryan Bremner

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	BH23-01, Hartford Avenue
MATERIAL TYPE	Clay	SAMPLE LOCATION	BH23-01, Hartford Avenue
SPECIFICATION	Not Applicable	STANTEC SAMPLE NO.	4894

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1760 kg/m^3
		TARGET OPTIMUM MOISTURE	17.0 %
CONDITION OF SAMPLE	Soaked		
		AS-COMPACTED MAX. DRY DENSITY	1673 kg/m^3
SURCHARGE MASS	4.54 kg	AS-COMPACTED MOISTURE CONTENT	17.0 %
SWELL OF SAMPLE	2.9%	POST-TEST MOISTURE CONTENT (TOP 25 mm)	26.4 %

CBR VALUE AT **2.54 mm** PENETRATION	**3.0**
CBR VALUE AT **5.08 mm** PENETRATION	**3.0**

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

REPORT DATE 2023.Jan.27

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

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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 3P1

ATTN: Erik Hansen

PROJECT 2023 Local Streets & Pathway Renewals Program

PROJECT NO. 123316298

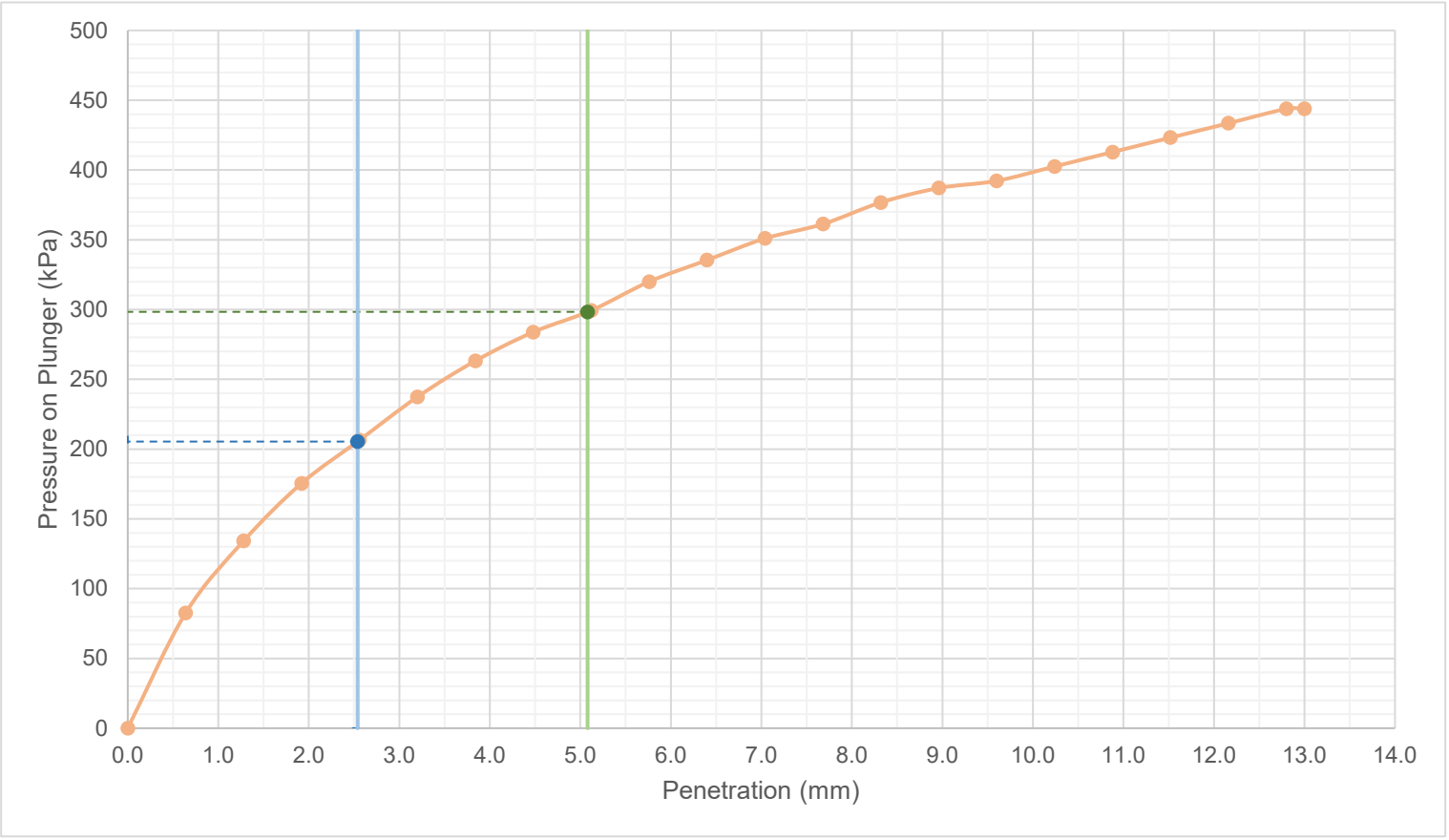
REPORT NO. 1 (Chart page - See Page 1 for Data)

DATE SAMPLED: 2023.Jan.16
SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2023.Jan.16
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.25
TESTED BY: Ryan Bremner

LOAD PENETRATION CURVE



REPORT DATE 2023.Jan.27

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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 3P1

ATTN: Erik Hansen

PROJECT 2023 Local Streets & Pathway Renewals Program

PROJECT NO. 123316298

REPORT NO. 2 (Data page - see Page 2 for Chart)

DATE SAMPLED: 2023.Jan.16 DATE RECEIVED: 2023.Jan.16 DATE TESTED: 2023.Jan.26
SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Ryan Bremner

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	BH23-02, Hartford Avenue
MATERIAL TYPE	Clay	SAMPLE LOCATION	BH23-02, Hartford Avenue
SPECIFICATION	Not Applicable	STANTEC SAMPLE NO.	4895

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1600 kg/m^3
		TARGET OPTIMUM MOISTURE	23.0 %
CONDITION OF SAMPLE	Soaked		
		AS-COMPACTED MAX. DRY DENSITY	1514 kg/m^3
SURCHARGE MASS	4.54 kg	AS-COMPACTED MOISTURE CONTENT	23.0 %
SWELL OF SAMPLE	3.9%	POST-TEST MOISTURE CONTENT (TOP 25 mm)	37.0 %

CBR VALUE AT **2.54 mm** PENETRATION	**2.1**
CBR VALUE AT **5.08 mm** PENETRATION	**1.9**

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

REPORT DATE 2023.Jan.27

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

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

TO City of Winnipeg, Public Works Department
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN: Erik Hansen

PROJECT 2023 Local Streets & Pathway Renewals Program

PROJECT NO. 123316298

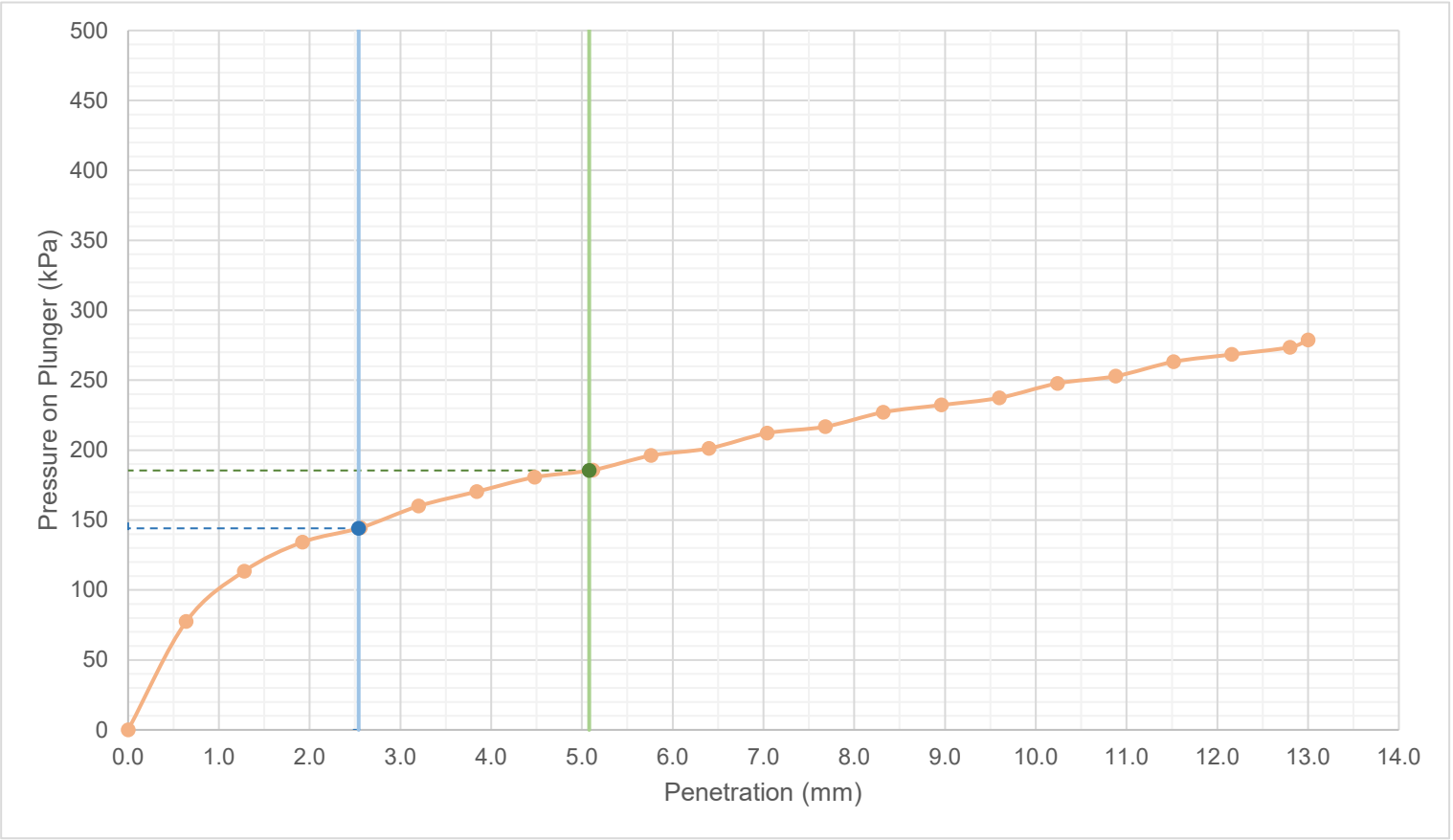
REPORT NO. 2 (Chart page - See Page 1 for Data)

DATE SAMPLED: 2023.Jan.16
SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2023.Jan.16
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.26
TESTED BY: Ryan Bremner

LOAD PENETRATION CURVE



REPORT DATE 2023.Jan.27

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Tel: (204) 488-6999

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

TO City of Winnipeg, Public Works Department
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN: Erik Hansen

PROJECT 2023 Local Streets & Pathway Renewals Program

PROJECT NO. 123316298

REPORT NO. 3 (Data page - see Page 2 for Chart)

DATE SAMPLED: 2023.Jan.16 DATE RECEIVED: 2023.Jan.16 DATE TESTED: 2023.Jan.25
SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Ryan Bremner

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	BH23-03, Hartford Avenue
MATERIAL TYPE	Clay	SAMPLE LOCATION	BH23-03, Hartford Avenue
SPECIFICATION	Not Applicable	STANTEC SAMPLE NO.	4896

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1570 kg/m^3
		TARGET OPTIMUM MOISTURE	22.5 %
CONDITION OF SAMPLE	Soaked		
		AS-COMPACTED MAX. DRY DENSITY	1496 kg/m^3
SURCHARGE MASS	4.54 kg	AS-COMPACTED MOISTURE CONTENT	22.3 %
SWELL OF SAMPLE	4.7%	POST-TEST MOISTURE CONTENT (TOP 25 mm)	36.3 %

CBR VALUE AT **2.54 mm** PENETRATION	**2.2**
CBR VALUE AT **5.08 mm** PENETRATION	**2.1**

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

REPORT DATE 2023.Jan.27

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

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

TO City of Winnipeg, Public Works Department
104 - 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

ATTN: Erik Hansen

PROJECT 2023 Local Streets & Pathway Renewals Program

PROJECT NO. 123316298

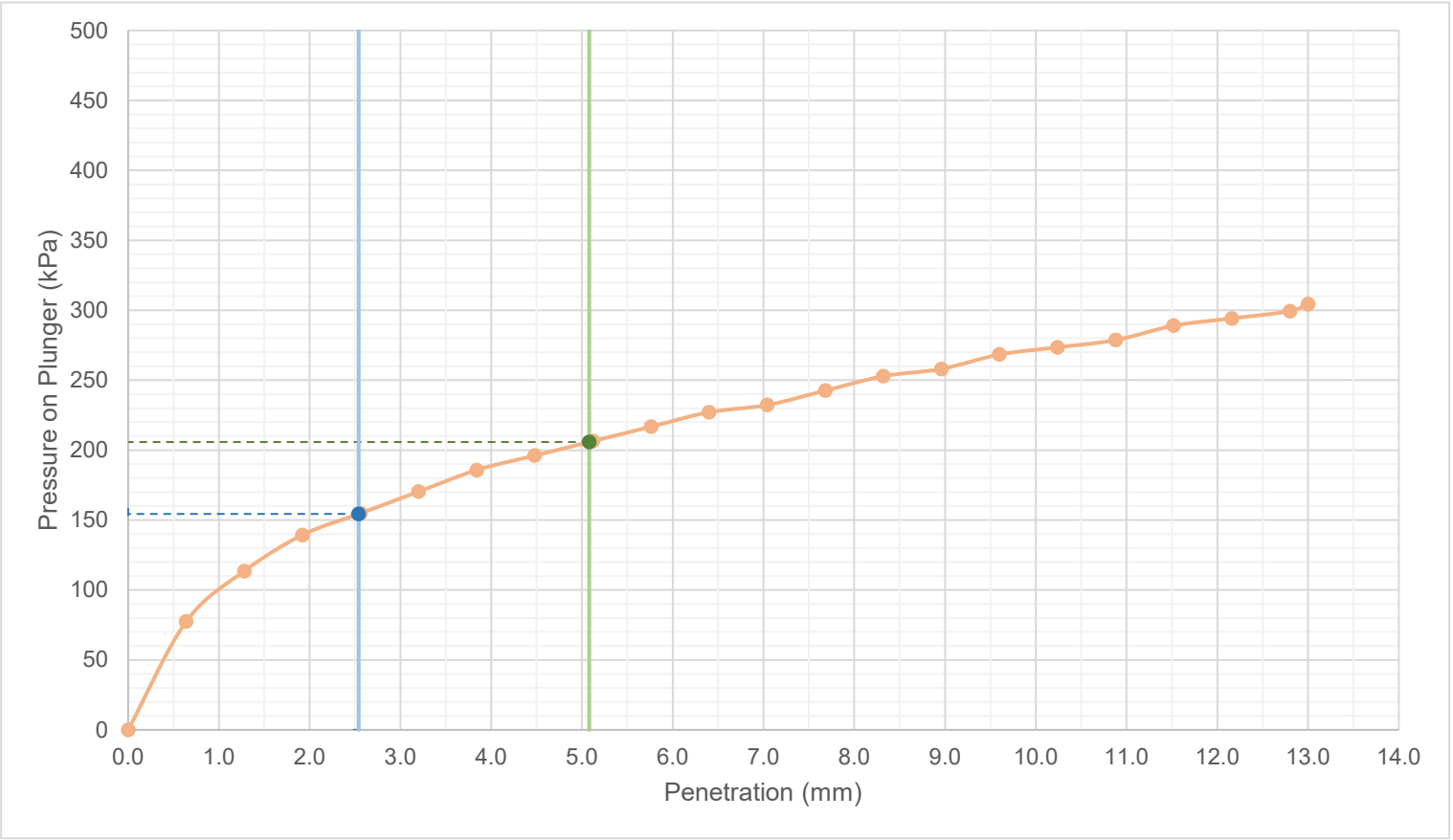
REPORT NO. 3 (Chart page - See Page 1 for Data)

DATE SAMPLED: 2023.Jan.16
SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2023.Jan.16
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2023.Jan.25
TESTED BY: Ryan Bremner

LOAD PENETRATION CURVE



REPORT DATE 2023.Jan.27

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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 3P1

ATTN: Erik Hansen

PROJECT 2023 Local Streets & Pathway Renewals Program

PROJECT NO. 123316298

REPORT NO. 4 (Data page - see Page 2 for Chart)

DATE SAMPLED: 2023.Jan.16 DATE RECEIVED: 2023.Jan.16 DATE TESTED: 2023.Jan.25
SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Ryan Bremner

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	BH23-04, Hartford Avenue
MATERIAL TYPE	Clay	SAMPLE LOCATION	BH23-04, Hartford Avenue
SPECIFICATION	Not Applicable	STANTEC SAMPLE NO.	4897

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1540 kg/m^3
		TARGET OPTIMUM MOISTURE	27.0 %
CONDITION OF SAMPLE	Soaked		
		AS-COMPACTED MAX. DRY DENSITY	1464 kg/m^3
SURCHARGE MASS	4.54 kg	AS-COMPACTED MOISTURE CONTENT	27.0 %
SWELL OF SAMPLE	3.3%	POST-TEST MOISTURE CONTENT (TOP 25 mm)	40.6 %

CBR VALUE AT **2.54 mm** PENETRATION	**2.5**
CBR VALUE AT **5.08 mm** PENETRATION	**2.1**

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

REPORT DATE 2023.Jan.27

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

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Winnipeg, Manitoba
R3E 3P1

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PROJECT 2023 Local Streets & Pathway Renewals Program

PROJECT NO. 123316298

REPORT NO. 4 (Chart page - See Page 1 for Data)

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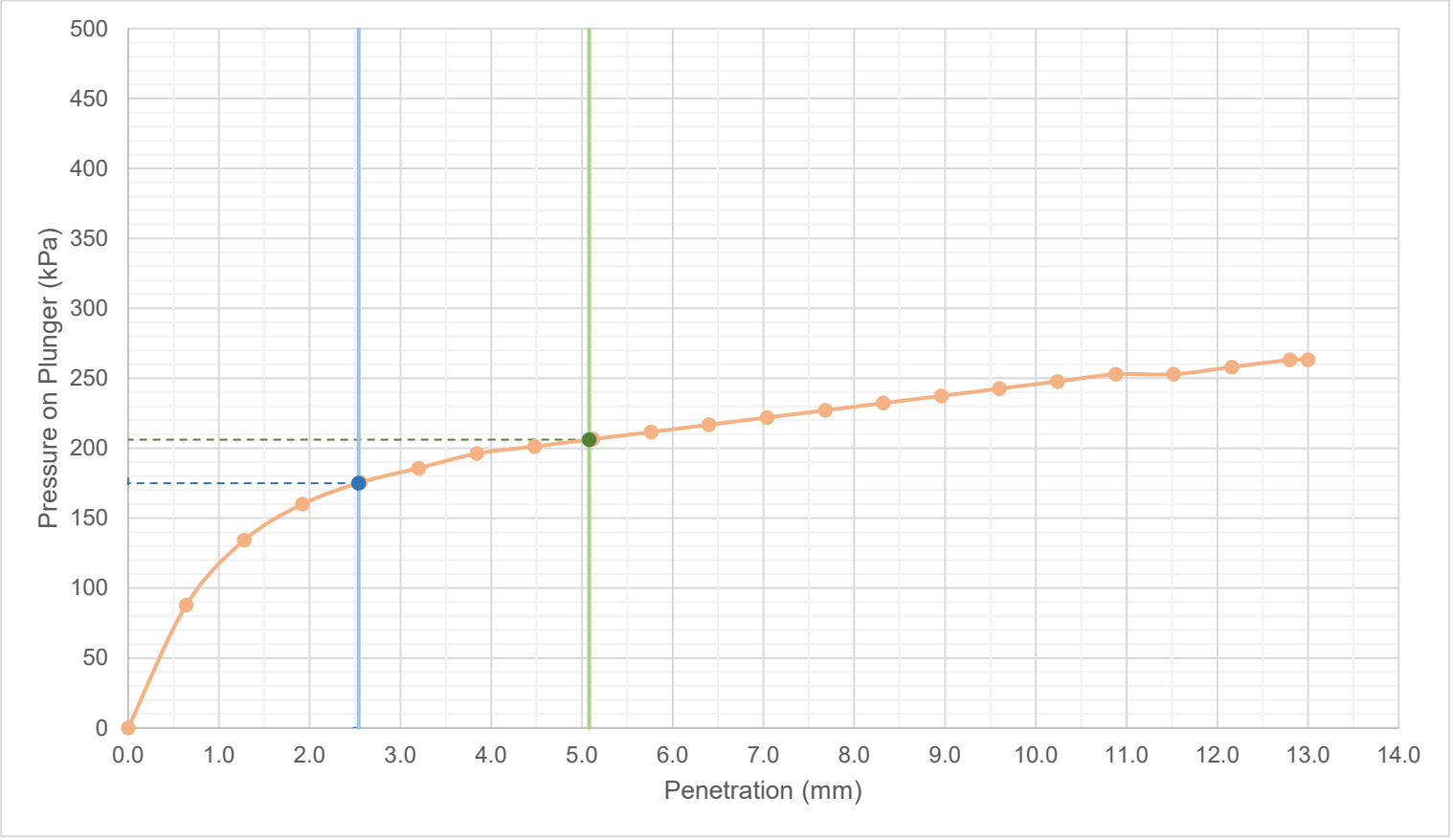
DATE TESTED: 2023.Jan.25
TESTED BY: Ryan Bremner

LOAD PENETRATION CURVE



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PROJECT 2023 Local Streets & Pathway Renewals Program

PROJECT NO. 123316298

REPORT NO. 5 (Data page - see Page 2 for Chart)

DATE SAMPLED: 2023.Jan.16 DATE RECEIVED: 2023.Jan.16 DATE TESTED: 2023.Jan.26
SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Ryan Bremner

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	BH23-05, Powers Street
MATERIAL TYPE	Clay	SAMPLE LOCATION	BH23-05, Powers Street
SPECIFICATION	Not Applicable	STANTEC SAMPLE NO.	4898

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1680 kg/m^3
		TARGET OPTIMUM MOISTURE	20.0 %
CONDITION OF SAMPLE	Soaked		
		AS-COMPACTED MAX. DRY DENSITY	1594 kg/m^3
SURCHARGE MASS	4.54 kg	AS-COMPACTED MOISTURE CONTENT	20.1 %
SWELL OF SAMPLE	1.3%	POST-TEST MOISTURE CONTENT (TOP 25 mm)	27.5 %

CBR VALUE AT **2.54 mm** PENETRATION	**6.2**
CBR VALUE AT **5.08 mm** PENETRATION	**5.2**

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

REPORT DATE 2023.Jan.27

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

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PROJECT 2023 Local Streets & Pathway Renewals Program

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REPORT NO. 5 (Chart page - See Page 1 for Data)

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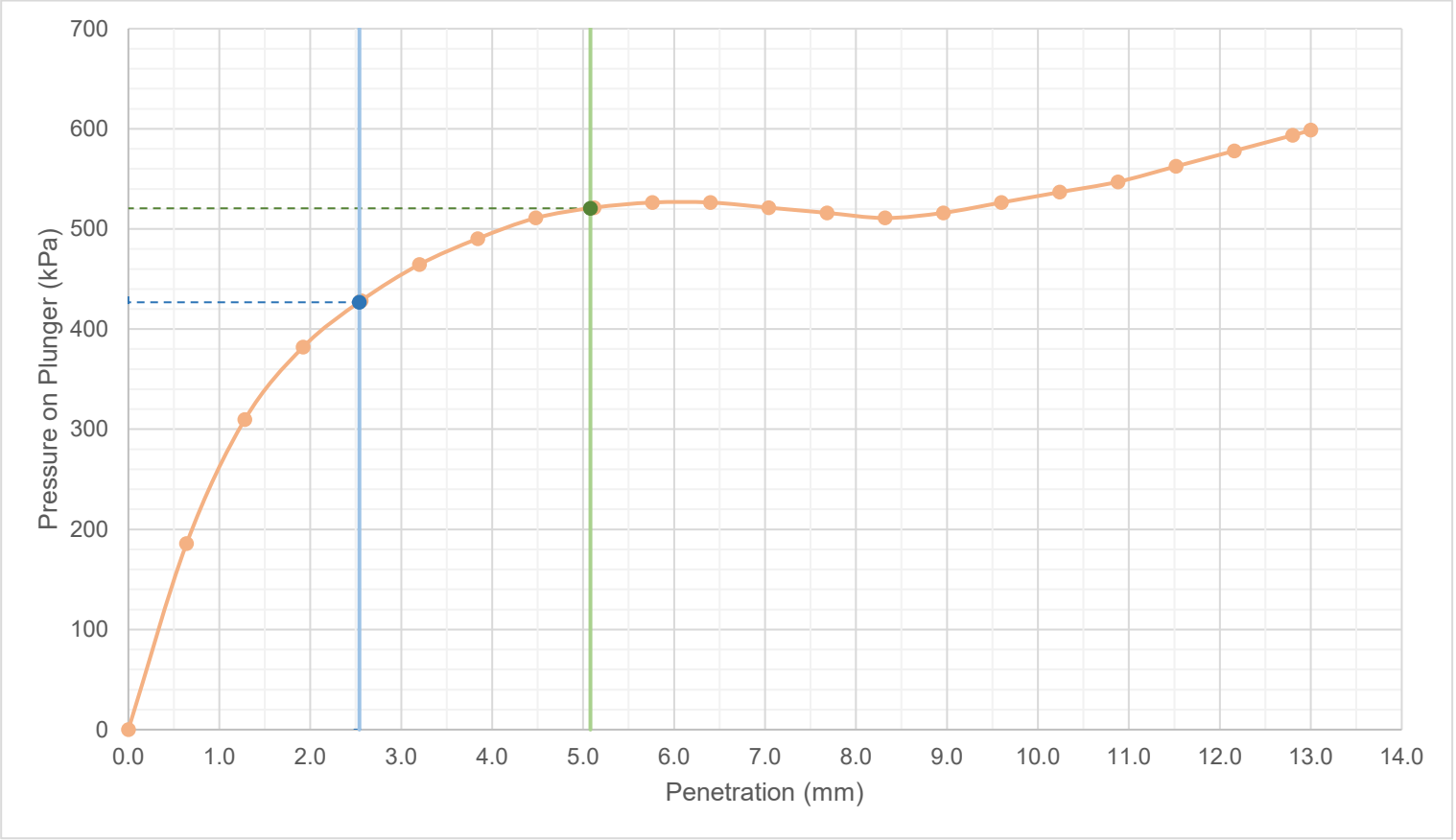
DATE TESTED: 2023.Jan.26
TESTED BY: Ryan Bremner

LOAD PENETRATION CURVE



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PROJECT 2023 Local Streets & Pathway Renewals Program

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REPORT NO. 6 (Data page - see Page 2 for Chart)

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SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Ryan Bremner

MATERIAL IDENTIFICATION

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	BH23-06, Powers Street
MATERIAL TYPE	Clay	SAMPLE LOCATION	BH23-06, Powers Street
SPECIFICATION	Not Applicable	STANTEC SAMPLE NO.	4899

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1600 kg/m^3
		TARGET OPTIMUM MOISTURE	22.5 %
CONDITION OF SAMPLE	Soaked		
		AS-COMPACTED MAX. DRY DENSITY	1521 kg/m^3
SURCHARGE MASS	4.54 kg	AS-COMPACTED MOISTURE CONTENT	22.5 %
SWELL OF SAMPLE	1.5%	POST-TEST MOISTURE CONTENT (TOP 25 mm)	31.0 %

CBR VALUE AT **2.54 mm** PENETRATION	**4.6**
CBR VALUE AT **5.08 mm** PENETRATION	**3.8**

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

REPORT DATE 2023.Jan.27

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

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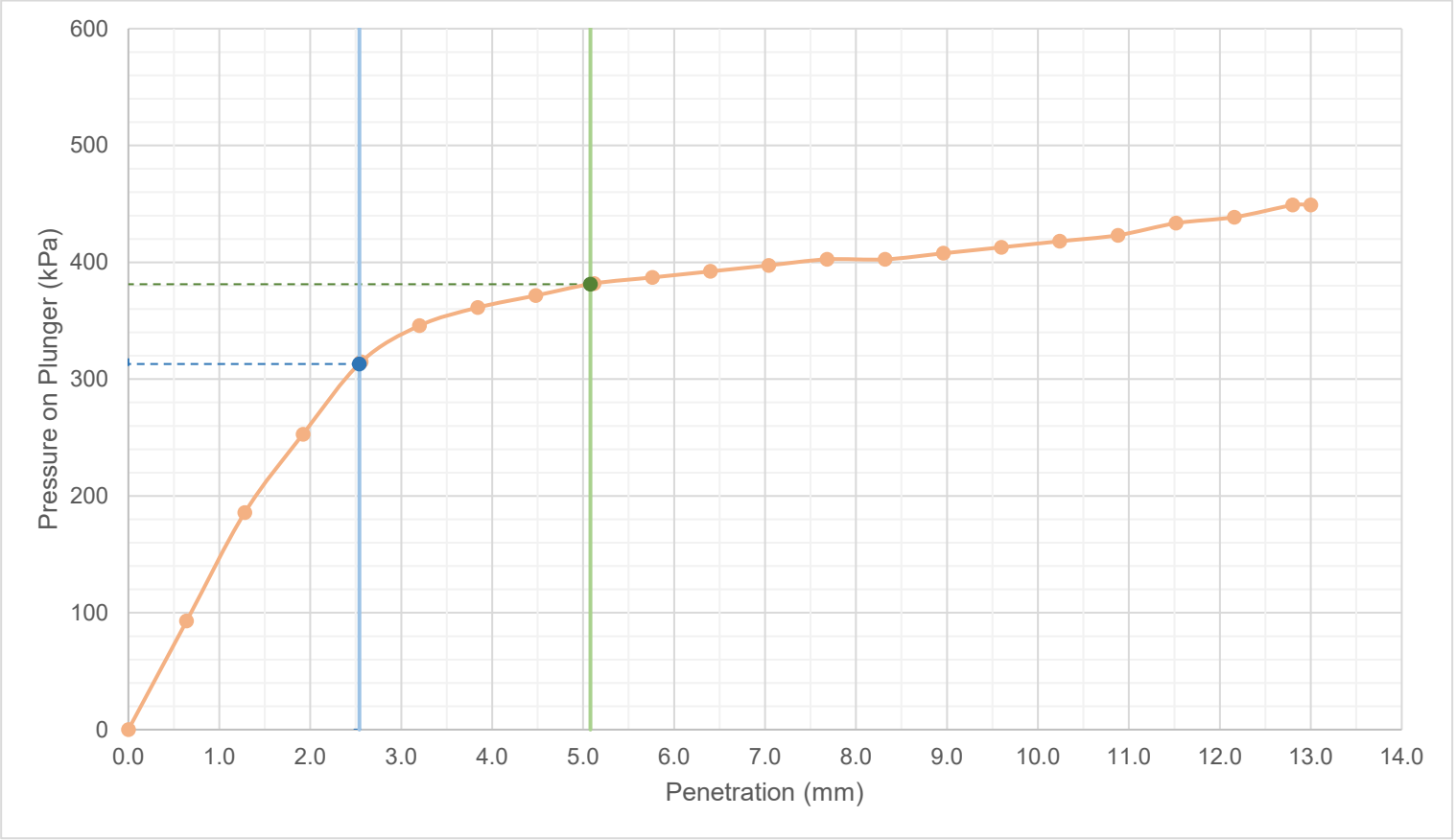

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Table 1 - Compressive Strength Test Data

Test No.	Core Identification	Diameter (mm)	Length (mm)	L/D Ratio	Correction Factor	Peak Load (kN)	Compressive Strength (MPa)	
							Measured	Corrected
1	BH-23-07	100	175	1.75	0.980	460.19	56.8	55.6
2	BH-23-11	100	165	1.65	0.972	445.87	55.0	53.5
3	BH-23-15	146	235	1.61	0.969	725.47	39.8	38.5
4	BH-23-16	100	104	1.04	0.880	549.55	67.8	59.7
5	BH-23-19	100	168	1.68	0.974	435.73	53.8	52.4