

APPENDIX 'A' – GEOTECHNICAL REPORT

GEOTECHNICAL REPORTS FOR:

Charles Street from Sutherland Avenue to Jarvis Avenue – Concrete Pavement Reconstruction
Pembina Highway Alley from Dowker Avenue to Pembina Highway - Concrete Pavement Reconstruction

PAVEMENT CORES FOR:

Jarvis Avenue from McPhillips Street to Parr Street – Asphalt Mill and Fill
Jarvis Avenue from Parr Street to Powers 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, 2025

Project/File: 123317463-2

Geoff Kerr
City of Winnipeg
1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

Good day Geoff,

Reference: 2025 Local Street Renewal Program (Contract 2) - Geotechnical Investigation

Stantec Consulting Ltd. (Stantec) was retained to undertake a factual geotechnical investigation for the 2025 Local Street Renewal Program (Contract 2) in Winnipeg, Manitoba. Use of this report is subject to the Statement of General Conditions provided in Appendix A.

The coring and drilling program was conducted from January 6 to January 24, 2025. A total of 19 locations were investigated with pavement coring and/or subsurface geotechnical drilling. Pavement coring was performed by Stantec's geotechnical field technologist, and drilling services were provided by Maple Leaf Drilling Ltd. under the supervision of Stantec's technologist. A Borehole Location Plan is provided in Appendix B.

1. Pavement Coring

A total of 19 pavement core samples were recovered to determine the in-place pavement thickness. In addition, 9 concrete core samples were tested to assess the in-place compressive strength of the concrete. One (1) concrete compressive strength test was cancelled due to the core sample being inadequate for testing (crumbly/fractured condition). The existing pavement thicknesses are summarized in Table 1 below, and the core photographs are provided in Appendix C.

2. Geotechnical Drilling

A total of 9 boreholes were investigated by geotechnical drilling. The boreholes were terminated at a depth of 2.0 m below the pavement, which resulted in borehole depths ranging from 2.6 to 2.75 m. 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. The testholes were examined for evidence of sloughing and groundwater seepage upon completion of drilling.

Reference: 2025 Local Street Renewal Program (Contract 2) - Geotechnical Investigation

The borehole records are provided in Appendix D. 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)*.

3. Existing Pavement Thicknesses

The existing pavement thicknesses are provided in the following table:

Table 1 – Existing Pavement Thicknesses

| Borehole No. | Street | Asphalt Thickness (mm) | Concrete Thickness (mm) | Total Pavement Thickness (mm) |
|--------------|--------------|------------------------|-------------------------|-------------------------------|
| 192 | Aikins St | 35 | 215 | 250 |
| 193 | Aikins St | 80 | 170 | 250 |
| 194 | Aikins St | 110 | 140 | 250 |
| 195 | Robinson St | 130 | 120 | 250 |
| 196 | Robinson St | 80 | 0 | 80 |
| 197 | Robinson St | 80 | 0 | 80 |
| 198 | Charles St | 80 | 170 | 250 |
| 199 | Charles St | 40 | 0 | 40 |
| 200 | Charles St | 150 | 0 | 150 |
| 201 | Radford St | 0 | 170 | 170 |
| 202 | Radford St | 0 | 190 | 190 |
| 203 | Battery St | 0 | 195 | 195 |
| 204 | Battery St | 0 | 150 | 150 |
| 205 | Mountain Ave | 55 | 235 | 290 |
| 206 | Mountain Ave | 70 | 210 | 280 |
| 207 | Mountain Ave | 60 | 240 | 300 |
| 208 | Mountain Ave | 40 | 230 | 270 |
| 209 | Mountain Ave | 100 | 225 | 325 |
| 210 | Mountain Ave | 70 | 180 | 250 |

4. Laboratory Testing

Laboratory determination of moisture content (ASTM D2216) was conducted on all soil samples. The results are provided on the attached borehole records.

Reference: 2025 Local Street Renewal Program (Contract 2) - Geotechnical Investigation

In addition, the following laboratory tests were conducted on select samples:

- 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 on test specimens compacted to 95% of the maximum dry density under soaked conditions.

Prior to compressive strength testing, the concrete core samples were conditioned in water at room temperature for 48 hours.

The laboratory test reports are provided in Appendix E.

5. Closure

Please contact the undersigned if you have any questions regarding this report.

Regards,

Stantec Consulting Ltd.



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



Jason Thompson C.E.T.
Principal – Manager, Materials Testing Services
Manitoba & Northwestern Ontario Operations
Phone: 204-928-4004
Mobile: 204-898-8290
jason.thompson@stantec.com

Attachment: Appendix A – Statement of General Conditions
Appendix B – Borehole Location Plan
Appendix C – Core Photographs
Appendix D – Borehole Records
Appendix E – Laboratory Test Reports

- Atterberg Limits Test Reports
- Particle-Size Analysis Reports
- Standard Proctor Test Reports
- CBR Test Reports
- Concrete 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.

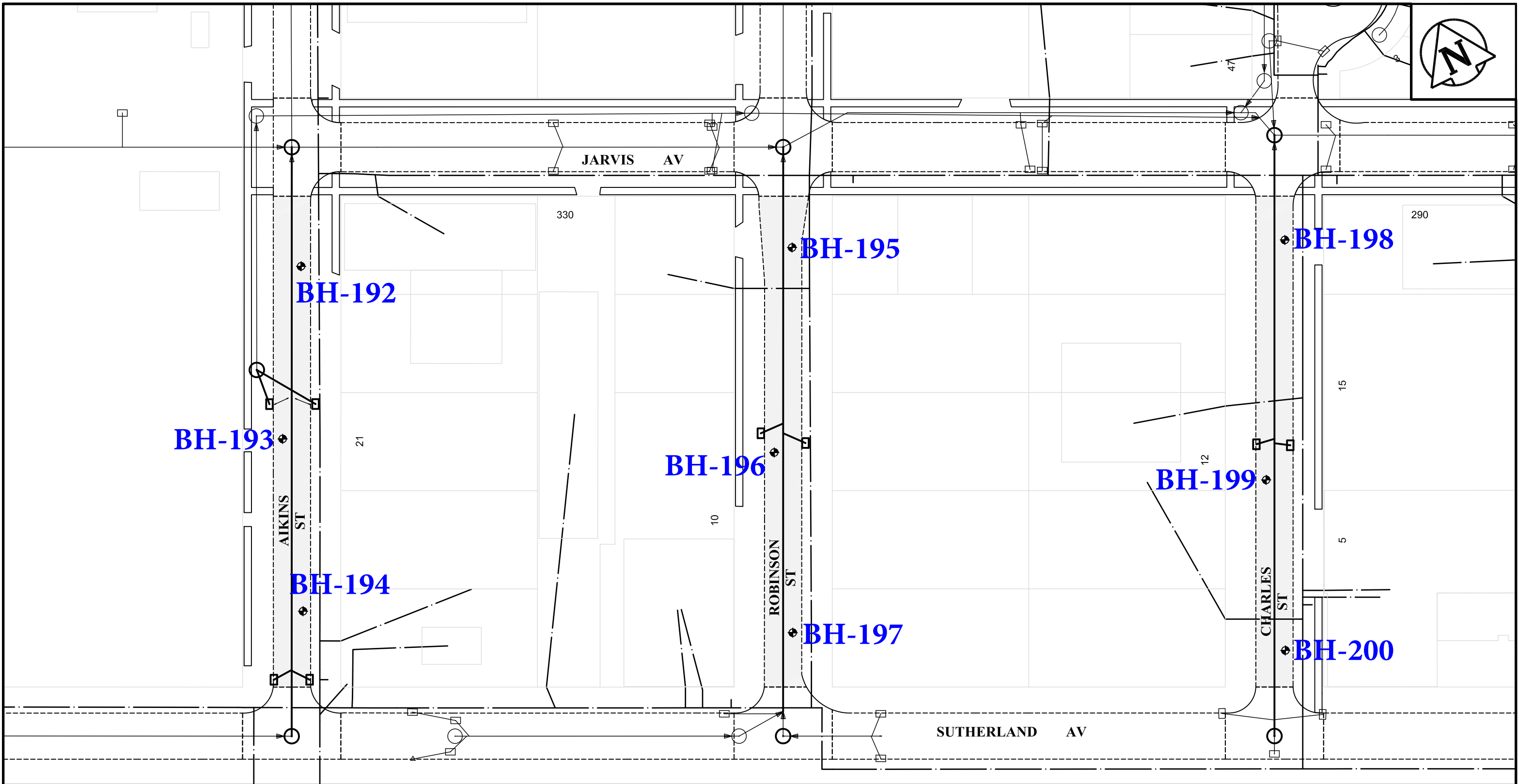
VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments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



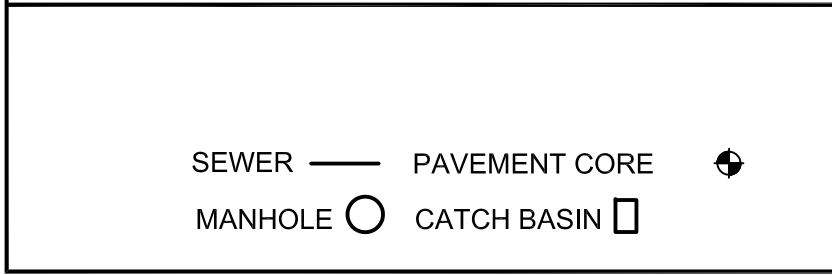
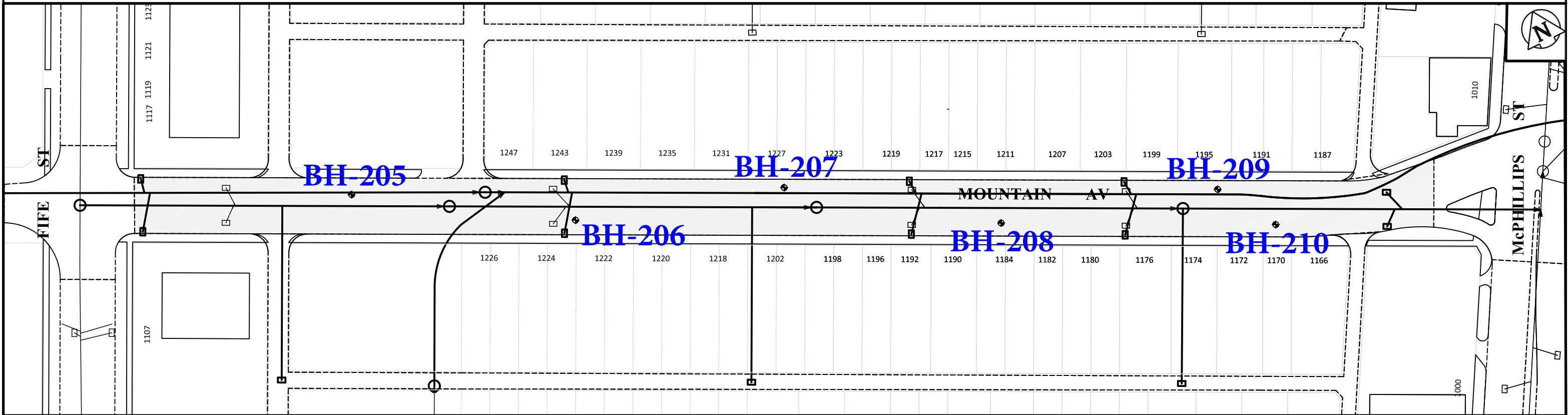
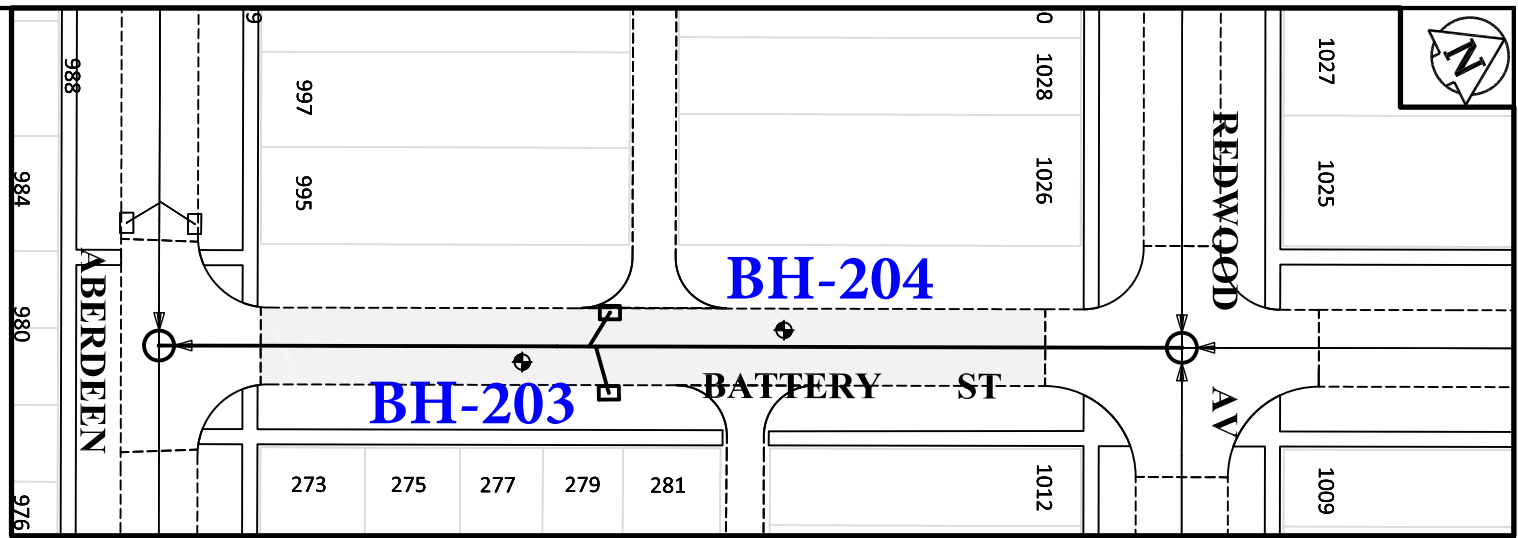
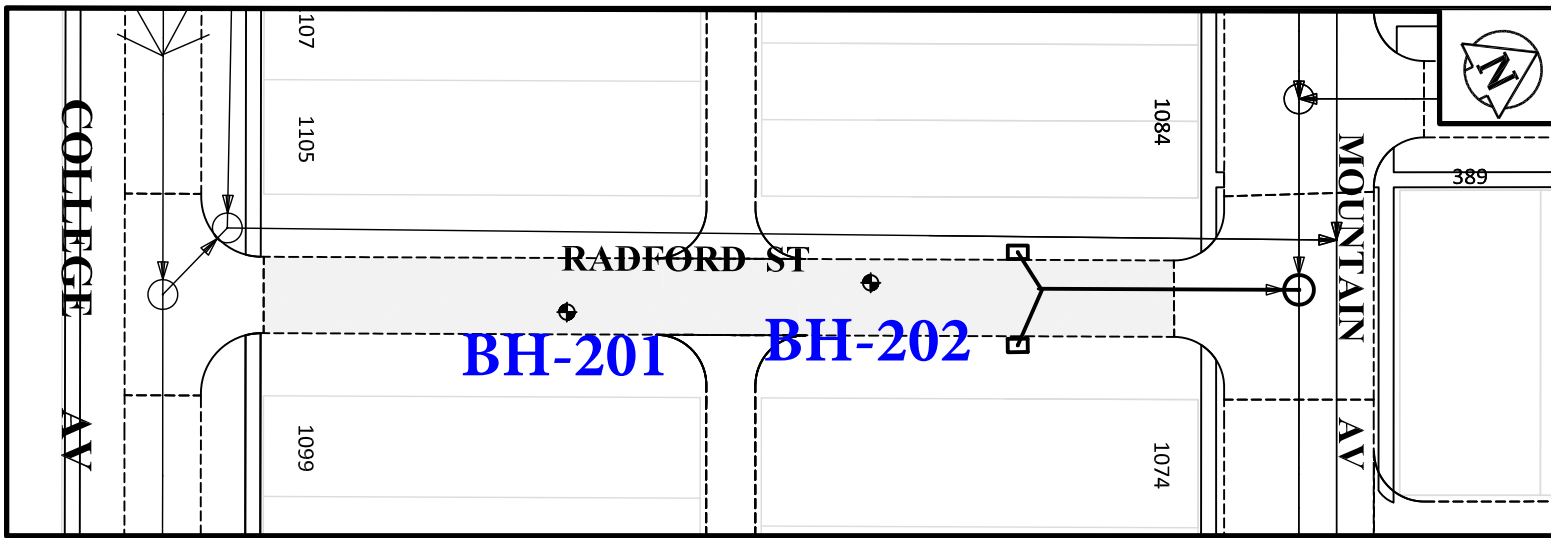
2025 LOCAL STREET RENEWAL PROGRAM CORING DRAWING - **CONTRACT 2**

AIKINS ST FROM JARVIS AV TO SUTHERLAND AV -
RECONSTRUCTION
ROBINSON ST FROM JARVIS AV TO SUTHERLAND AV -
RECONSTRUCTION
CHARLES ST FROM JARVIS AV TO SUTHERLAND AV -
RECONSTRUCTION

SEWER ——— BORE HOLE ◆ WATER MAIN/ WATERLINE - - - -
 MANHOLE ○ CATCH BASIN □

NOTE: DRILL 2.5m BOREHOLE AS PER SITE INVESTIGATION SPECIFICATION F3.4

| | |
|---------------------|------------------------|
| DATE: 11/14/2024 | DRAWING NO.: 1 of 2 |
| DRAWN BY: J.W. | SCALE: 1:750 |



NOTE: DRILL PAVEMENT CORES AS PER SITE INVESTIGATION SPECIFICATION F3.5

DATE: 11/12/2024
DRAWING NO.: 2 of 2
DRAWN BY: J.W.
SCALE: VARIES

2025 LOCAL STREET RENEWAL PROGRAM CORING DRAWING - CONTRACT 2

RADFORD ST FROM MOUNTAIN AV TO COLLEGE AV - MAJOR REHABILITATION
BATTERY ST FROM REDWOOD AV TO ABERDEEN AV - MINOR REHABILITATION
MOUNTAIN AV FROM McPHILLIPS ST TO FIFE ST - MAJOR REHABILITATION

Appendix C

Core Photographs



Figure 1 – Core Sample No. 192 - Aikins St



Figure 2 – Core Sample No. 193 – Aikins St



Figure 3 – Core Sample No. 194 - Aikins St



Figure 4 – Core Sample No. 195 – Robinson St



Figure 5 – Core Sample No. 196 – Robinson St



Figure 6 – Core Sample No. 197 – Robinson St



Figure 7 – Core Sample No. 198 – Charles St



Figure 8 – Core Sample No. 199 – Charles St



Figure 9 – Core Sample No. 200 – Charles St



Figure 10 – Core Sample No. 201 – Radford St



Figure 11 – Core Sample No. 202 – Radford St



Figure 12 – Core Sample No. 203 – Battery St



Figure 13 – Core Sample No. 204 – Battery St



Figure 14 – Core Sample No. 205 – Mountain Ave



Figure 15 – Core Sample No. 206 – Mountain Ave



Figure 16 – Core Sample No. 207 – Mountain Ave



Figure 17 – Core Sample No. 208 – Mountain Ave



Figure 18 – Core Sample No. 209 – Mountain Ave



Figure 19 – Core Sample No. 210 – Mountain Ave

Appendix D

Borehole Records

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Terminology describing common soil genesis

| | |
|----------------|---|
| <i>Rootmat</i> | vegetation, roots and moss with organic matter and topsoil typically forming a mattress at the ground surface |
| <i>Topsoil</i> | mixture of soil and humus capable of supporting vegetative growth |
| <i>Peat</i> | mixture of visible and invisible fragments of decayed organic matter |
| <i>Till</i> | unstratified glacial deposit which may range from clay to boulders |
| <i>Fill</i> | material below the surface identified as placed by humans (excluding buried services) |

Terminology describing soil structure

| | |
|-------------------|--|
| <i>Desiccated</i> | having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc. |
| <i>Fissured</i> | having cracks, and hence a blocky structure |
| <i>Varved</i> | composed of regular alternating layers of silt and clay |
| <i>Stratified</i> | composed of alternating successions of different soil types, e.g. silt and sand |
| <i>Layer</i> | > 75 mm in thickness |
| <i>Seam</i> | 2 mm to 75 mm in thickness |
| <i>Parting</i> | < 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:

| | |
|-----------------------------|---------------|
| <i>Trace, or occasional</i> | Less than 10% |
| <i>Some</i> | 10-20% |
| <i>Frequent</i> | > 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 2. A relationship between compactness condition and N-Value is shown in the following table.

| Compactness Condition | SPT N-Value |
|-----------------------|-------------|
| <i>Very Loose</i> | <4 |
| <i>Loose</i> | 4-10 |
| <i>Compact</i> | 10-30 |
| <i>Dense</i> | 30-50 |
| <i>Very Dense</i> | >50 |

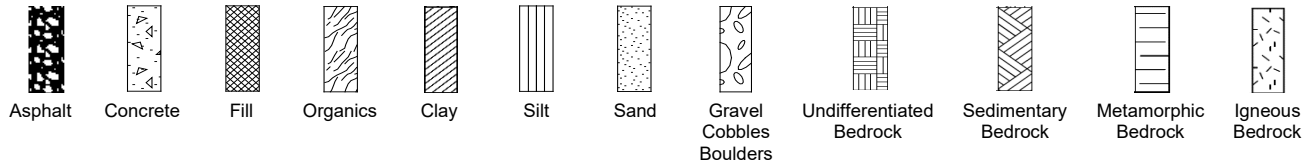
Terminology describing consistency of cohesive soils

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 | |
| <i>Very Soft</i> | <0.25 | <12.5 | <2 |
| <i>Soft</i> | 0.25 - 0.5 | 12.5 - 25 | 2-4 |
| <i>Firm</i> | 0.5 - 1.0 | 25 - 50 | 4-8 |
| <i>Stiff</i> | 1.0 - 2.0 | 50 - 100 | 8-15 |
| <i>Very Stiff</i> | 2.0 - 4.0 | 100 - 200 | 15-30 |
| <i>Hard</i> | >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. Not all bedrock strata plots are shown.



SAMPLE TYPE

| | | |
|------------------------|--|--|
| AS, BS, GS | | Auger sample; bulk sample; grab sample |
| DP | | Direct-Push sample (small diameter tube sampler hydraulically advanced) |
| PS | | Piston sample |
| SO | | Sonic tube |
| SS | | Split spoon sample (obtained by performing the Standard Penetration Test) |
| ST | | Shelby Tube or thin wall tube |
| SV | | Shear vane |
| RC HQ, NQ, BQ, etc. | | Rock Core; samples obtained with the use of standard size diamond coring bits. |

WATER LEVEL



Measured:
in standpipe, piezometer, or well



Inferred:
seepage noted or water level measured during or at completion of drilling

RECOVERY FOR SOIL SAMPLES

The recovery is recorded as the length of the soil sample recovered in the direct push, split spoon sampler, Shelby Tube, or sonic tube.

N-VALUE

Numbers in this column are the field results of the Standard Penetration Test (SPT): 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 for 75 mm or 50/75 mm). 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 |

ROCK DESCRIPTION

Except where specified below, terminology for describing rock is as defined by the International Society for Rock Mechanics (ISRM) 2007 publication "The Complete ISRM Suggested Methods for Rock Characterization, Testing and Monitoring: 1974-2006"

Total Core Recovery (TCR) denotes the sum of all measurable rock core recovered in one drill run. The value is noted as a percentage of recovered rock core based on the total length of the drill run.

Solid Core Recovery (SCR) is defined as total length of solid core divided by the total drilled length, presented as a percentage. Solid core is defined as core with one full diameter.

Rock Quality Designation (RQD) is a modified core recovery that incorporates only pieces of solid core that are equal to or greater than 10 cm (4") along the core axis. It is calculated as the total cumulative length of solid core (> 10 cm) as measured along the centerline of the core divided by the total length of borehole drilled for each drill run or geotechnical interval, presented as a percentage. RQD is determined in accordance with ASTM D6032.

Fracture Index (FI) is defined as the number of naturally occurring fractures within a given length of core. The Fracture Index is reported as a simple count of natural occurring fractures.

Terminology describing rock quality

| Rock Mass Quality | Rock Quality Designation Number (RQD) | Alternate (Colloquial) Rock Mass Quality | |
|--------------------------|--|---|---------------------------------|
| <i>Very Poor Quality</i> | 0-25 | <i>Very Severely Fractured</i> | <i>Crushed</i> |
| <i>Poor Quality</i> | 25-50 | <i>Severely Fractured</i> | <i>Shattered or Very Blocky</i> |
| <i>Fair Quality</i> | 50-75 | <i>Fractured</i> | <i>Blocky</i> |
| <i>Good Quality</i> | 75-90 | <i>Moderately Jointed</i> | <i>Sound</i> |
| <i>Excellent Quality</i> | 90-100 | <i>Intact</i> | <i>Very Sound</i> |

Terminology describing rock strength

| Strength Classification | Grade | Field Estimates of Uniaxial Compressive Strength | Unconfined Compressive Strength (MPa) |
|--------------------------------|--------------|---|--|
| <i>Extremely Weak</i> | R0 | Indented by thumbnail | <1 |
| <i>Very Weak</i> | R1 | Crumbles under firm blows of geological hammer, can be peeled with a pocketknife | 1 – 5 |
| <i>Weak</i> | R2 | Peeled by pocketknife with difficulty, shallow indentations made by firm blow with point of geological hammer | 5 – 25 |
| <i>Medium Strong</i> | R3 | Cannot be scraped or peeled with a pocketknife, can be fractured with single firm blow of geological hammer | 25 – 50 |
| <i>Strong</i> | R4 | More than one blow with geological hammer to fracture | 50 – 100 |
| <i>Very Strong</i> | R5 | Many blows with geological hammer to fracture | 100 – 250 |
| <i>Extremely Strong</i> | R6 | Can only be chipped with geological hammer | >250 |

Terminology describing rock weathering

| Term | Symbol | Description |
|----------------------|---------------|--|
| <i>Fresh</i> | W1 | No visible signs of rock weathering. Slight discoloration along major discontinuities |
| <i>Slightly</i> | W2 | Discoloration indicates weathering of rock on discontinuity surfaces. All the rock material may be discolored. |
| <i>Moderately</i> | W3 | Less than half the rock is decomposed and/or disintegrated into soil. |
| <i>Highly</i> | W4 | More than half the rock is decomposed and/or disintegrated into soil. |
| <i>Completely</i> | W5 | All the rock material is decomposed and/or disintegrated into soil. The original mass structure is still largely intact. |
| <i>Residual Soil</i> | W6 | All the rock converted to soil. Structure and fabric destroyed. |

Terminology describing rock with respect to discontinuity and bedding spacing

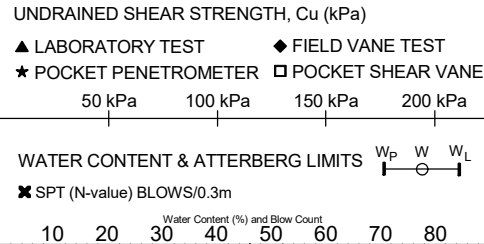
| Spacing (mm) | Discontinuities Spacing | Bedding |
|---------------------|--------------------------------|-------------------------|
| >6000 | <i>Extremely Wide</i> | - |
| 2000-6000 | <i>Very Wide</i> | <i>Very Thick</i> |
| 600-2000 | <i>Wide</i> | <i>Thick</i> |
| 200-600 | <i>Moderate</i> | <i>Medium</i> |
| 60-200 | <i>Close</i> | <i>Thin</i> |
| 20-60 | <i>Very Close</i> | <i>Very Thin</i> |
| <20 | <i>Extremely Close</i> | <i>Laminated</i> |
| <6 | - | <i>Thinly Laminated</i> |

CLIENT: City of Winnipeg
 PROJECT: 2025 Local Street Renewal Program (Contract 2)
 LOCATION: Aikins St
 DATE BORED: January 07 2025

PROJECT NO.: 123317463-2
 BH ELEVATION: N/A
 DATUM: N/A
 WATER LEVEL: N/A

| DEPTH (m) | ELEVATION (m) | SOIL DESCRIPTION (USCS) | STRATA PLOT | SAMPLES | | | | OTHER TESTS / REMARKS | UNDRAINED SHEAR STRENGTH, Cu (kPa) | | | | BACKFILL | ELEVATION (m) |
|-----------|---------------|--|-------------|---------|--------|------------------------|------------------|-----------------------|------------------------------------|---------|---------|---------|----------|---------------|
| | | | | TYPE | NUMBER | RECOVERY (mm) or TCR % | N-VALUE or RQD % | | 50 kPa | 100 kPa | 150 kPa | 200 kPa | | |
| 0 | | ASPHALT CONCRETE | | | | | | | | | | | | |
| | | Firm brown FAT CLAY (CH) | | | | | | | | | | | | |
| 1 | | Very soft tan SILT (ML) - some sand, trace clay | | AS | | | | | | | | | | |
| | | Firm brown FAT CLAY (CH) - some silt | | AS | | | | | | | | | | |
| 2 | | | | AS | | | | | | | | | | |
| | | | | AS | | | | | | | | | | |
| | | | | AS | | | | | | | | | | |
| 3 | | End of Borehole • Borehole terminated at a depth of 2.75 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled in accordance with the City of Winnipeg Street Cuts Manual. | | | | | | | | | | | | |

Sieve/Hydro at 1.2 m
 G 0% S 1% M 42% C 58%

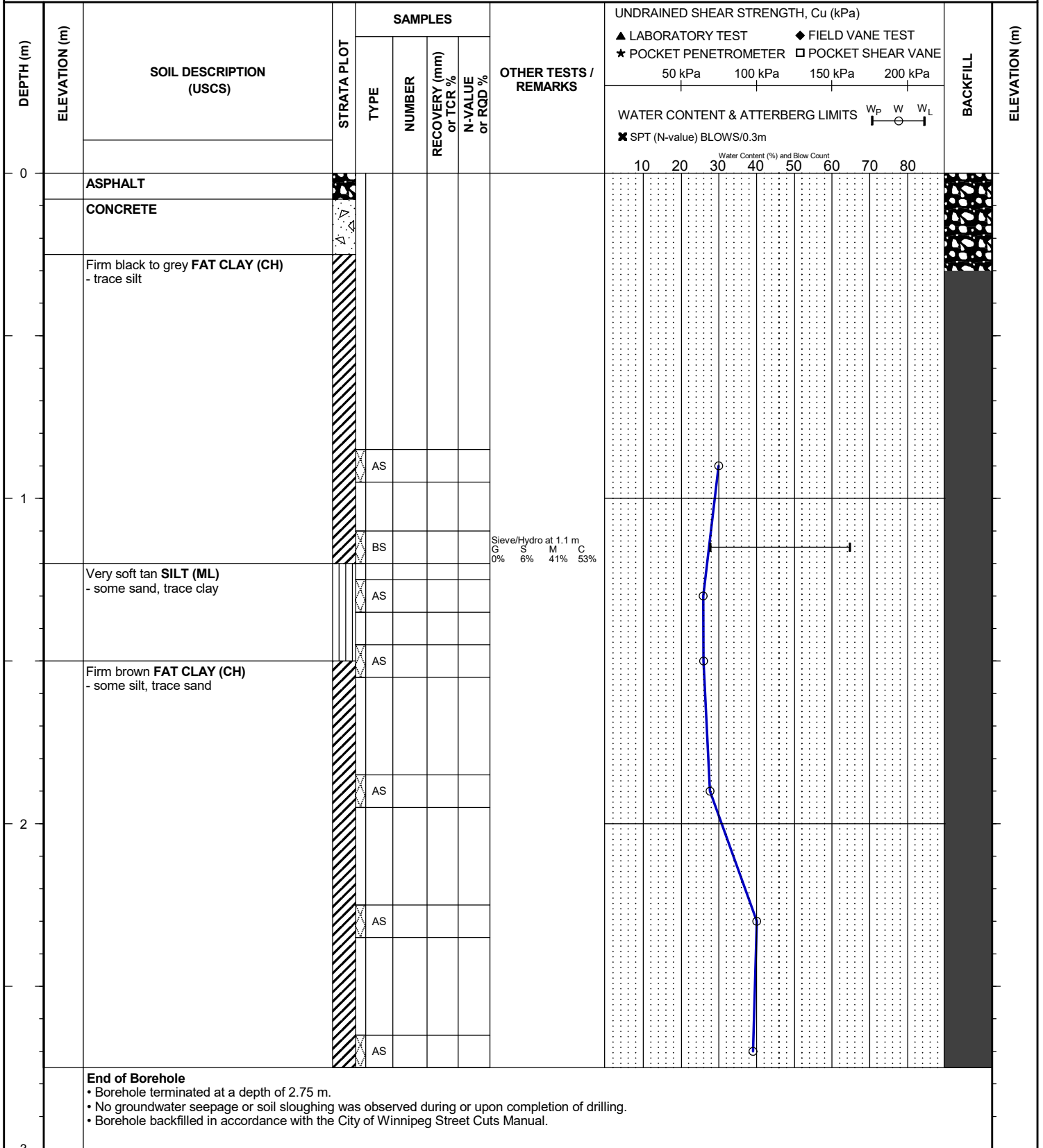


BACKFILL SYMBOL: ASPHALT GROUT CONCRETE
 BENTONITE DRILL CUTTINGS SAND SLOUGH

Drilling Contractor: Maple Leaf Drilling Ltd. Logged By: RB
 Drilling Method: 125 mm SSA Reviewed By: GB
 Completion Depth: 2.75 m Page 1 of 1

CLIENT: City of Winnipeg
 PROJECT: 2025 Local Street Renewal Program (Contract 2)
 LOCATION: Aikins St
 DATE BORED: January 07 2025

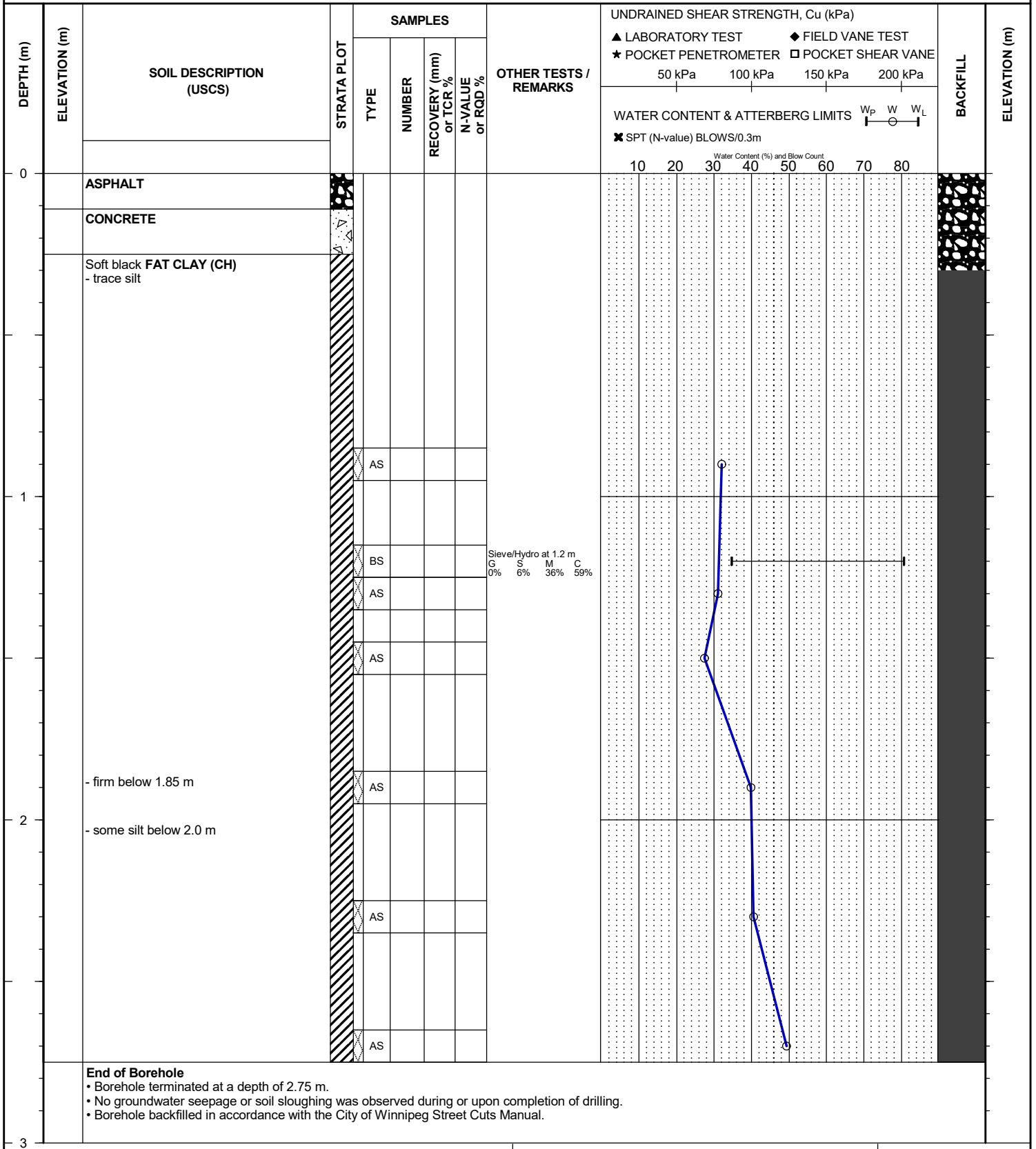
PROJECT NO.: 123317463-2
 BH ELEVATION: N/A
 DATUM: N/A
 WATER LEVEL: N/A



Printed Feb 21 2025 11:02:21 SOIL_123317463-2.GPJ 2/21/25

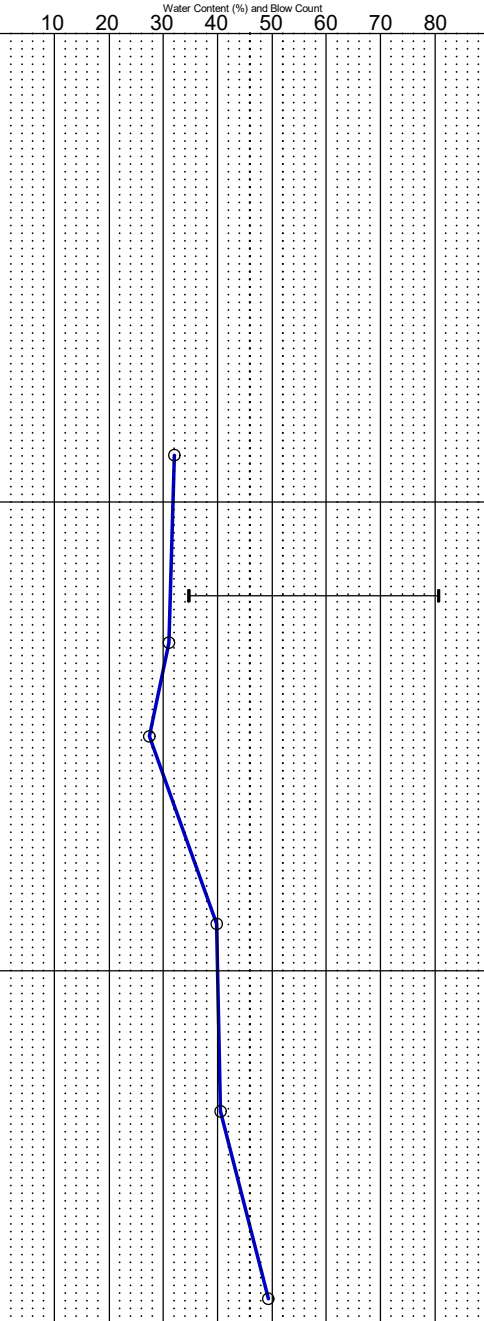
CLIENT: City of Winnipeg
 PROJECT: 2025 Local Street Renewal Program (Contract 2)
 LOCATION: Aikins St
 DATE BORED: January 07 2025

PROJECT NO.: 123317463-2
 BH ELEVATION: N/A
 DATUM: N/A
 WATER LEVEL: N/A



Sieve/Hydro at 1.2 m
 C 0% S 6% M 36% C 59%

UNDRAINED SHEAR STRENGTH, Cu (kPa)
 ▲ LABORATORY TEST ◆ FIELD VANE TEST
 ★ POCKET PENETROMETER □ POCKET SHEAR VANE
 WATER CONTENT & ATTERBERG LIMITS W_P W W_L
 ✕ SPT (N-value) BLOWS/0.3m



Printed Feb 21 2025 11:02:22 SOIL_123317463-2.GPJ_2/21/25

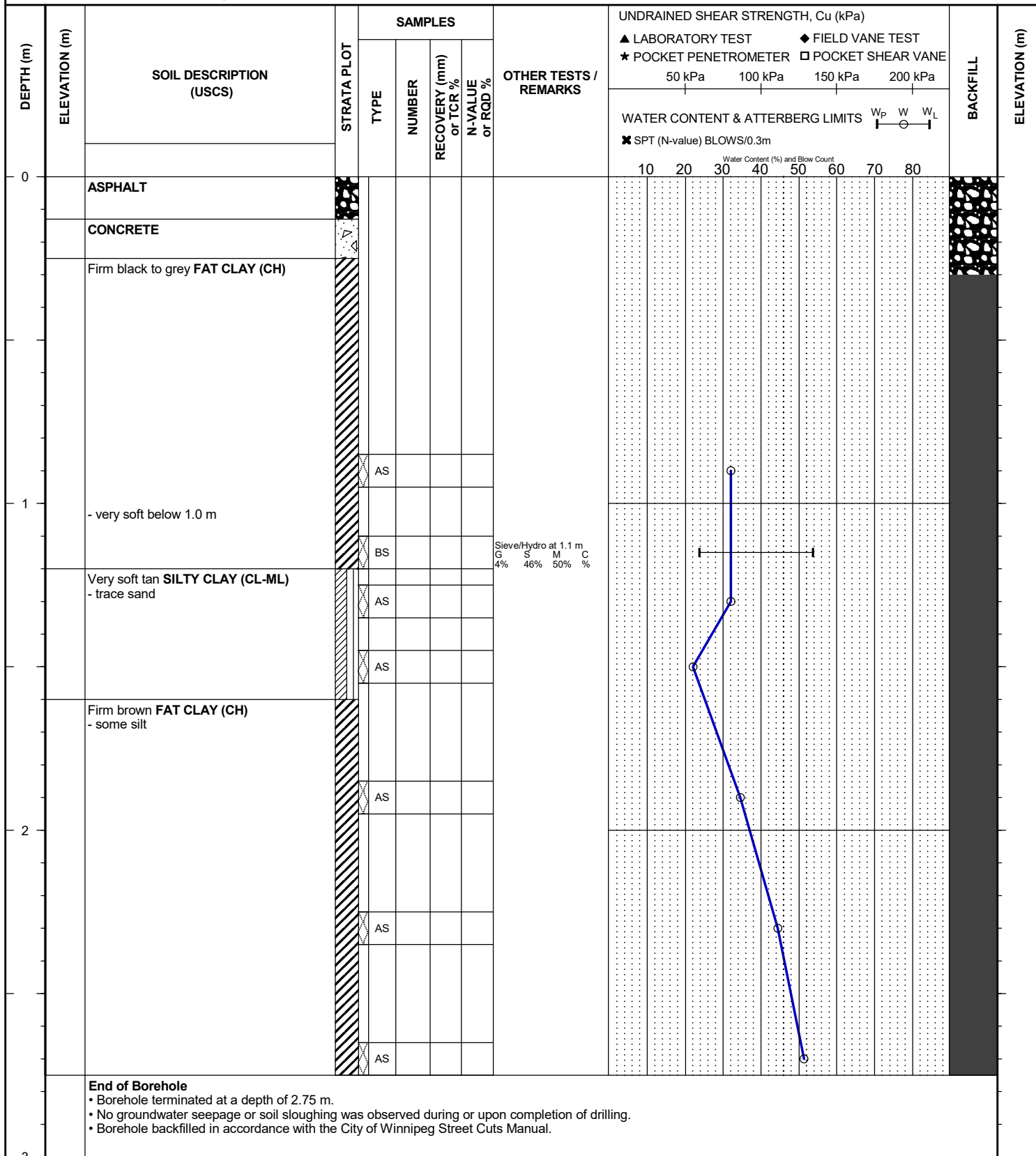
BACKFILL SYMBOL: ASPHALT GROUT CONCRETE
 BENTONITE DRILL CUTTINGS SAND SLOUGH

Drilling Contractor: Maple Leaf Drilling Ltd. Logged By: RB
 Drilling Method: 125 mm SSA Reviewed By: GB
 Completion Depth: 2.75 m Page 1 of 1

CLIENT: City of Winnipeg
 PROJECT: 2025 Local Street Renewal Program (Contract 2)
 LOCATION: Robinson St
 DATE BORED: January 07 2025

PROJECT NO.: 123317463-2
 BH ELEVATION: N/A
 DATUM: N/A

WATER LEVEL: N/A



Printed Feb 21 2025 11:02:23 SOIL_123317463-2.GPJ 2/21/25

BACKFILL SYMBOL ASPHALT GROUT CONCRETE
 BENTONITE DRILL CUTTINGS SAND SLOUGH

Drilling Contractor: Maple Leaf Drilling Ltd. Logged By: RB
 Drilling Method: 125 mm SSA Reviewed By: GB
 Completion Depth: 2.75 m Page 1 of 1

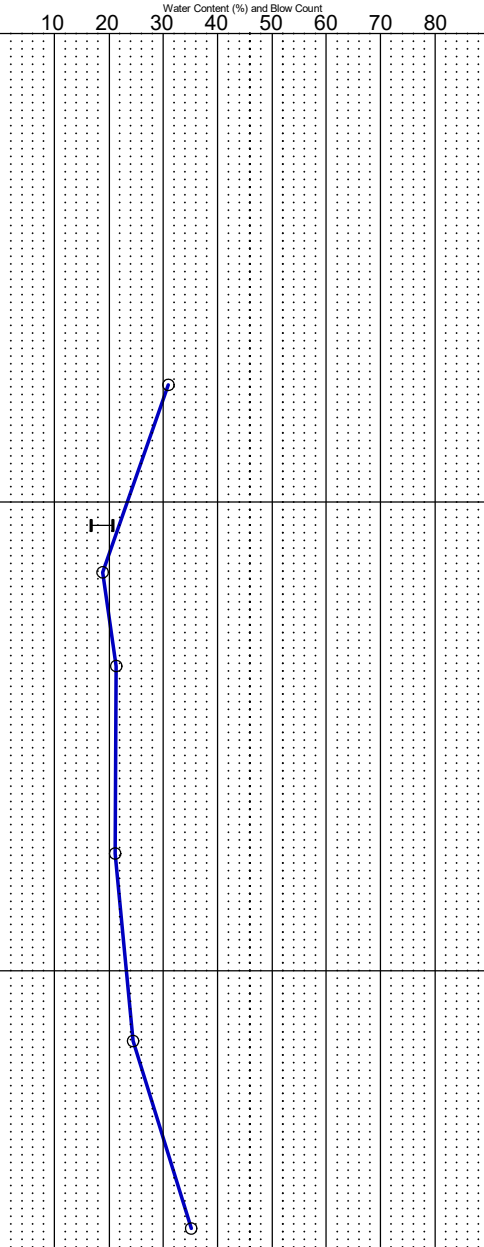
CLIENT: City of Winnipeg
 PROJECT: 2025 Local Street Renewal Program (Contract 2)
 LOCATION: Robinson St
 DATE BORED: January 07 2025

PROJECT NO.: 123317463-2
 BH ELEVATION: N/A
 DATUM: N/A
 WATER LEVEL: N/A

| DEPTH (m) | ELEVATION (m) | SOIL DESCRIPTION (USCS) | STRATA PLOT | SAMPLES | | | | OTHER TESTS / REMARKS | UNDRAINED SHEAR STRENGTH, Cu (kPa) | | | | BACKFILL | ELEVATION (m) |
|-----------|---------------|---|-------------|---------|--------|------------------------|------------------|-----------------------|------------------------------------|---------|---------|---------|----------|---------------|
| | | | | TYPE | NUMBER | RECOVERY (mm) or TCR % | N-VALUE or RQD % | | 50 kPa | 100 kPa | 150 kPa | 200 kPa | | |
| 0 | | ASPHALT | | | | | | | | | | | | |
| | | Firm black to grey FAT CLAY (CH) - trace silt | | | | | | | | | | | | |
| 1 | | Very soft tan SILTY CLAY (CL-ML) - trace sand | | AS | | | | | | | | | | |
| | | | | BS | | | | | | | | | | |
| | | | | AS | | | | | | | | | | |
| | | | | AS | | | | | | | | | | |
| | | | | AS | | | | | | | | | | |
| 2 | | Firm brown FAT CLAY (CH) - some silt, trace sand | | AS | | | | | | | | | | |
| | | | | AS | | | | | | | | | | |
| | | | | AS | | | | | | | | | | |
| 3 | | End of Borehole • Borehole terminated at a depth of 2.6 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled in accordance with the City of Winnipeg Street Cuts Manual. | | | | | | | | | | | | |

Sieve/Hydro at 1.0 m
 G S M C
 1% 3% 84% 13%

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



Printed Feb 21 2025 11:02:24 SOIL_123317463-2.GPJ 2/21/25

BACKFILL SYMBOL: ASPHALT GROUT CONCRETE
 BENTONITE DRILL CUTTINGS SAND SLOUGH

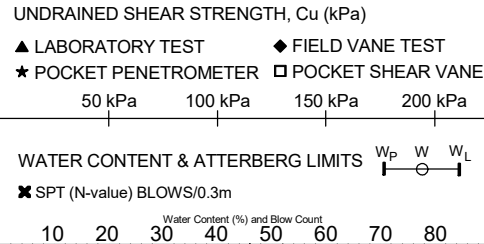
Drilling Contractor: Maple Leaf Drilling Ltd. Logged By: RB
 Drilling Method: 125 mm SSA Reviewed By: GB
 Completion Depth: 2.6 m Page 1 of 1

CLIENT: City of Winnipeg
 PROJECT: 2025 Local Street Renewal Program (Contract 2)
 LOCATION: Robinson St
 DATE BORED: January 07 2025

PROJECT NO.: 123317463-2
 BH ELEVATION: N/A
 DATUM: N/A
 WATER LEVEL: N/A

| DEPTH (m) | ELEVATION (m) | SOIL DESCRIPTION (USCS) | STRATA PLOT | SAMPLES | | | | OTHER TESTS / REMARKS | UNDRAINED SHEAR STRENGTH, Cu (kPa) | | | | BACKFILL | ELEVATION (m) |
|-----------|---------------|--|-------------|---------|--------|------------------------|------------------|-----------------------|------------------------------------|---------|---------|---------|----------|---------------|
| | | | | TYPE | NUMBER | RECOVERY (mm) or TCR % | N-VALUE or RQD % | | 50 kPa | 100 kPa | 150 kPa | 200 kPa | | |
| 0 | | ASPHALT | | | | | | | | | | | | |
| | | Firm black to grey FAT CLAY (CH) - trace silt | | | | | | | | | | | | |
| | | Soft tan SILT (ML) - trace sand, trace clay | | AS | | | | | | | | | | |
| 1 | | Firm brown FAT CLAY (CH) - some silt | | BS | | | | | | | | | | |
| | | | | AS | | | | | | | | | | |
| | | | | AS | | | | | | | | | | |
| 2 | | | | AS | | | | | | | | | | |
| | | | | AS | | | | | | | | | | |
| | | | | AS | | | | | | | | | | |
| 3 | | End of Borehole • Borehole terminated at a depth of 2.6 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled in accordance with the City of Winnipeg Street Cuts Manual. | | | | | | | | | | | | |

Sieve/Hydro at 1.0 m
 G S M C
 0% 6% 86% 8%



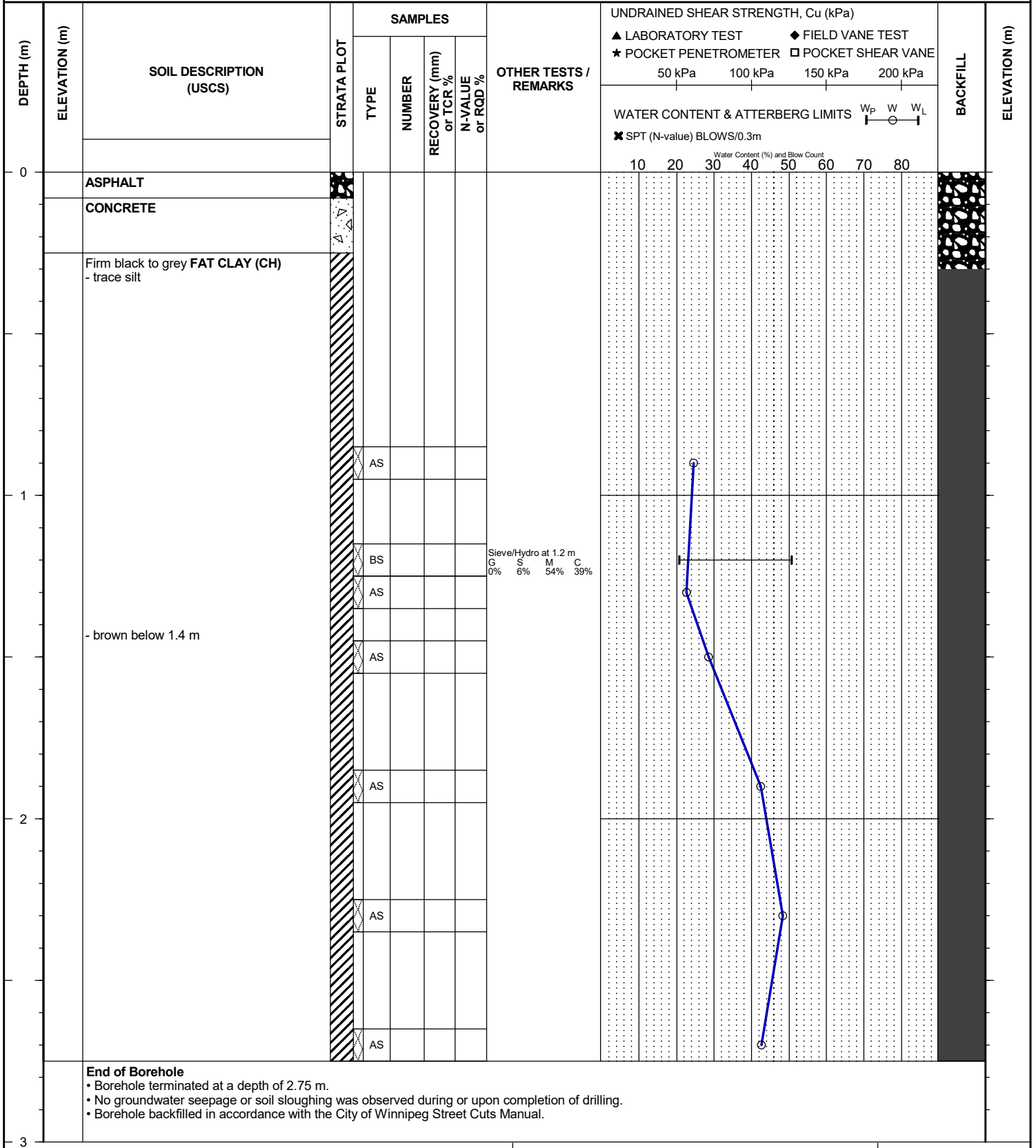
Printed Feb 21 2025 11:02:26 SOIL_123317463-2.GPJ 2/21/25

BACKFILL SYMBOL: ASPHALT GROUT CONCRETE
 BENTONITE DRILL CUTTINGS SAND SLOUGH

Drilling Contractor: Maple Leaf Drilling Ltd. | Logged By: RB
 Drilling Method: 125 mm SSA | Reviewed By: GB
 Completion Depth: 2.6 m | Page 1 of 1

CLIENT: City of Winnipeg
 PROJECT: 2025 Local Street Renewal Program (Contract 2)
 LOCATION: Charles St
 DATE BORED: January 07 2025

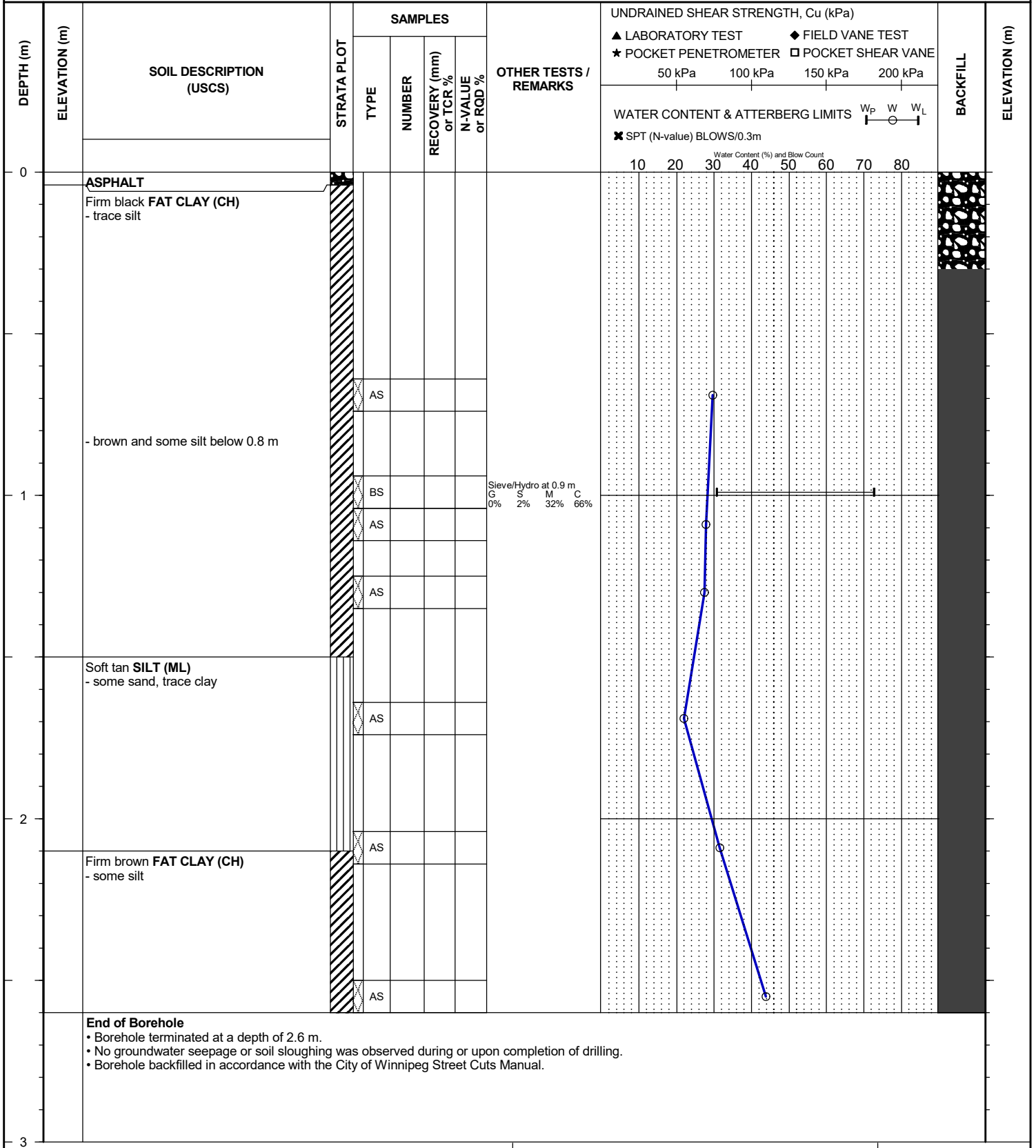
PROJECT NO.: 123317463-2
 BH ELEVATION: N/A
 DATUM: N/A
 WATER LEVEL: N/A



Printed Feb 21 2025 11:02:27 SOIL_123317463-2.GPJ_2/21/25

CLIENT: City of Winnipeg
 PROJECT: 2025 Local Street Renewal Program (Contract 2)
 LOCATION: Charles St
 DATE BORED: January 07 2025

PROJECT NO.: 123317463-2
 BH ELEVATION: N/A
 DATUM: N/A
 WATER LEVEL: N/A



Printed Feb 21 2025 11:02:28 SOIL_123317463-2.GPJ 2/21/25

CLIENT: City of Winnipeg
 PROJECT: 2025 Local Street Renewal Program (Contract 2)
 LOCATION: Charles St
 DATE BORED: January 07 2025

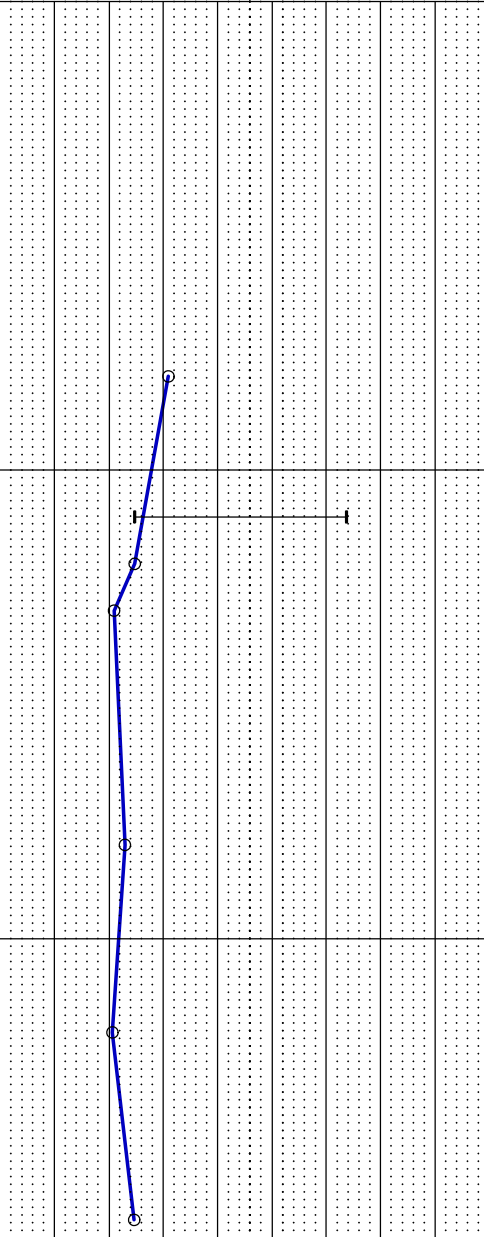
PROJECT NO.: 123317463-2
 BH ELEVATION: N/A
 DATUM: N/A
 WATER LEVEL: N/A

| DEPTH (m) | ELEVATION (m) | SOIL DESCRIPTION (USCS) | STRATA PLOT | SAMPLES | | | | OTHER TESTS / REMARKS | UNDRAINED SHEAR STRENGTH, Cu (kPa) | | | | BACKFILL | ELEVATION (m) |
|-----------|---------------|--|-------------|---------|--------|------------------------|------------------|-----------------------|------------------------------------|---------|---------|---------|----------|---------------|
| | | | | TYPE | NUMBER | RECOVERY (mm) or TCR % | N-VALUE or RQD % | | 50 kPa | 100 kPa | 150 kPa | 200 kPa | | |
| 0 | | ASPHALT FILL: granular base, 12.5 mm Firm black to grey FAT CLAY (CH) - trace silt | | | | | | | | | | | | |
| 1 | | Soft tan SILT (ML) - some sand, trace clay | | AS | | | | | | | | | | |
| 2 | | | | AS | | | | | | | | | | |
| 3 | | | | AS | | | | | | | | | | |
| 3 | | End of Borehole • Borehole terminated at a depth of 2.65 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Borehole backfilled in accordance with the City of Winnipeg Street Cuts Manual. | | | | | | | | | | | | |

Sieve/Hydro at 1.1 m
 C 0% S 1% M 38% C 61%

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
 10 20 30 40 50 60 70 80
Water Content (%) and Blow Count



Printed Feb 21 2025 11:02:29 SOIL 123317463-2.GPJ 2/21/25

BACKFILL SYMBOL: ASPHALT GROUT CONCRETE
 BENTONITE DRILL CUTTINGS SAND SLOUGH

Drilling Contractor: Maple Leaf Drilling Ltd. Logged By: RB
 Drilling Method: 125 mm SSA Reviewed By: GB
 Completion Depth: 2.65 m Page 1 of 1

Appendix E

Laboratory Testing Reports

- Atterberg Limits
- Particle-Size Analysis
- Standard Proctor
- California Bearing Ratio
- Concrete Compressive Strength

ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 1

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.30

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

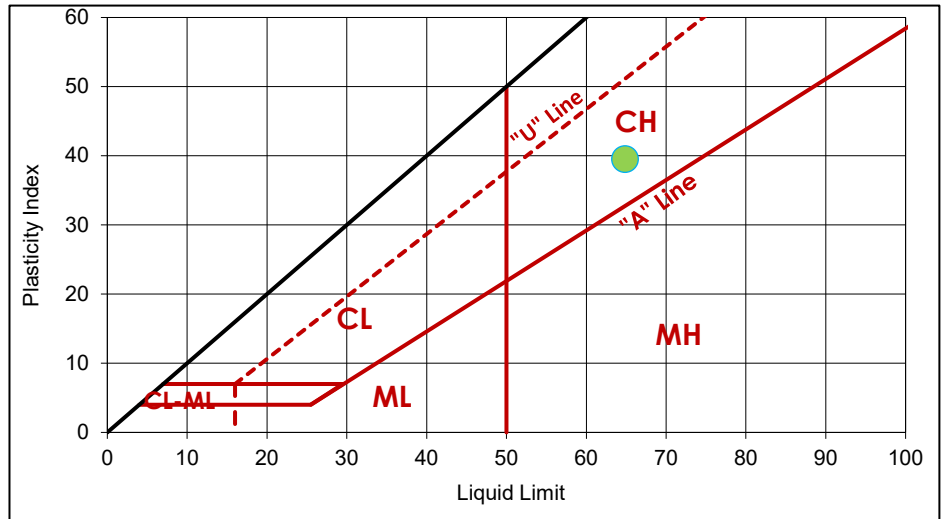
CLIENT FIELD ID BH-192, 1.2 m, Aikins St.

STANTEC SAMPLE NO. 5611

| TRIAL | LIQUID LIMIT | |
|--------|--------------|----|
| | 1 | 2 |
| BLOWS | 28 | 29 |
| MC (%) | 64 | 64 |

| TRIAL | PLASTIC LIMIT | |
|--------|---------------|----|
| | 1 | 2 |
| MC (%) | 25 | 25 |

| | |
|----------------------|------|
| LIQUID LIMIT, LL | 65 |
| PLASTIC LIMIT, PL | 25 |
| PLASTICITY INDEX, PI | 39 |
| AS REC'D MC (%) | 27.1 |



COMMENTS
 No comments.



REPORT DATE 2025.Feb.06

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

ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 2

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.30

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

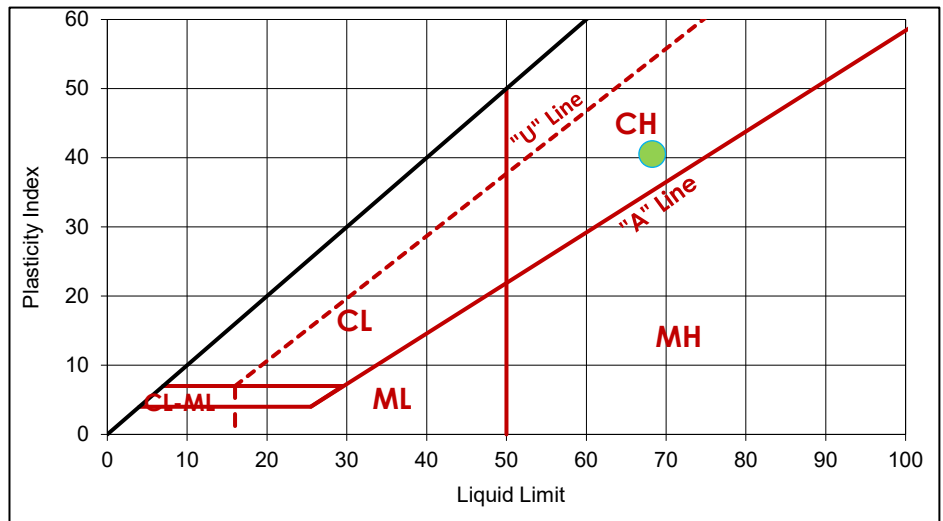
CLIENT FIELD ID BH-193, 1.2 m, Aikins St.

STANTEC SAMPLE NO. 5612

| | LIQUID LIMIT | |
|--------|--------------|----|
| TRIAL | 1 | 2 |
| BLOWS | 23 | 25 |
| MC (%) | 69 | 69 |

| | PLASTIC LIMIT | |
|--------|---------------|----|
| TRIAL | 1 | 2 |
| MC (%) | 28 | 28 |

| | |
|----------------------|------|
| LIQUID LIMIT, LL | 68 |
| PLASTIC LIMIT, PL | 28 |
| PLASTICITY INDEX, PI | 41 |
| AS REC'D MC (%) | 26.4 |



COMMENTS
 No comments.



REPORT DATE 2025.Feb.06

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

ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 3

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.30

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

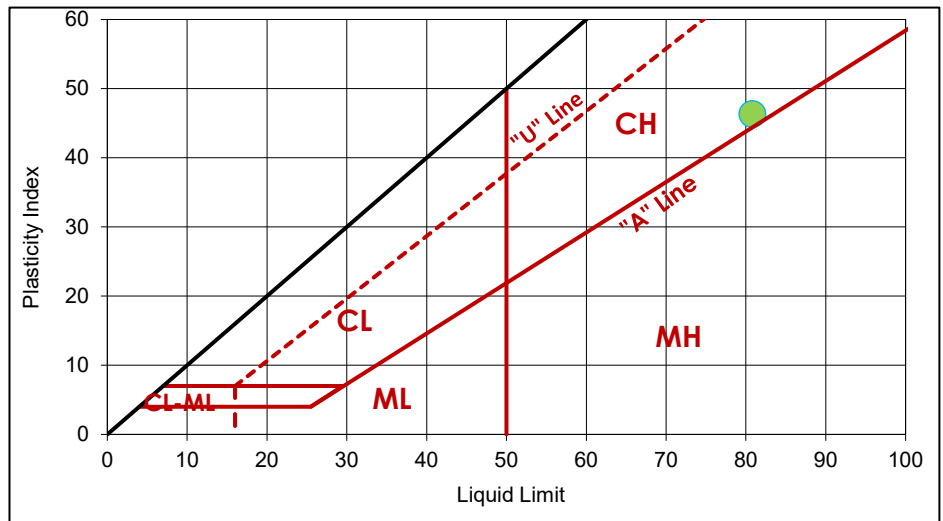
CLIENT FIELD ID BH-194, 1.2 m, Aikins St.

STANTEC SAMPLE NO. 5613

| | LIQUID LIMIT | |
|--------|--------------|----|
| TRIAL | 1 | 2 |
| BLOWS | 26 | 27 |
| MC (%) | 80 | 80 |

| | PLASTIC LIMIT | |
|--------|---------------|----|
| TRIAL | 1 | 2 |
| MC (%) | 35 | 34 |

| | |
|----------------------|------|
| LIQUID LIMIT, LL | 81 |
| PLASTIC LIMIT, PL | 35 |
| PLASTICITY INDEX, PI | 46 |
| AS REC'D MC (%) | 31.6 |



COMMENTS
 No comments.



REPORT DATE 2025.Feb.06

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

ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 4

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.29

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

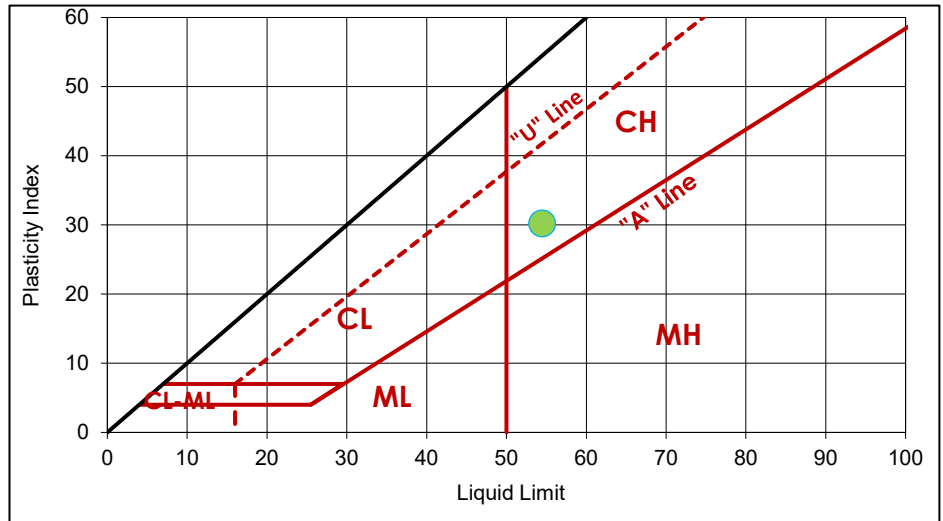
CLIENT FIELD ID BH-195, 1.2 m, Robinson St.

STANTEC SAMPLE NO. 5614

| TRIAL | LIQUID LIMIT | |
|--------|--------------|----|
| | 1 | 2 |
| BLOWS | 25 | 24 |
| MC (%) | 55 | 54 |

| TRIAL | PLASTIC LIMIT | |
|--------|---------------|----|
| | 1 | 2 |
| MC (%) | 24 | 24 |

| | |
|----------------------|------|
| LIQUID LIMIT, LL | 54 |
| PLASTIC LIMIT, PL | 24 |
| PLASTICITY INDEX, PI | 30 |
| AS REC'D MC (%) | 32.6 |



COMMENTS
 No comments.



REPORT DATE 2025.Feb.06

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

ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 5

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.29

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

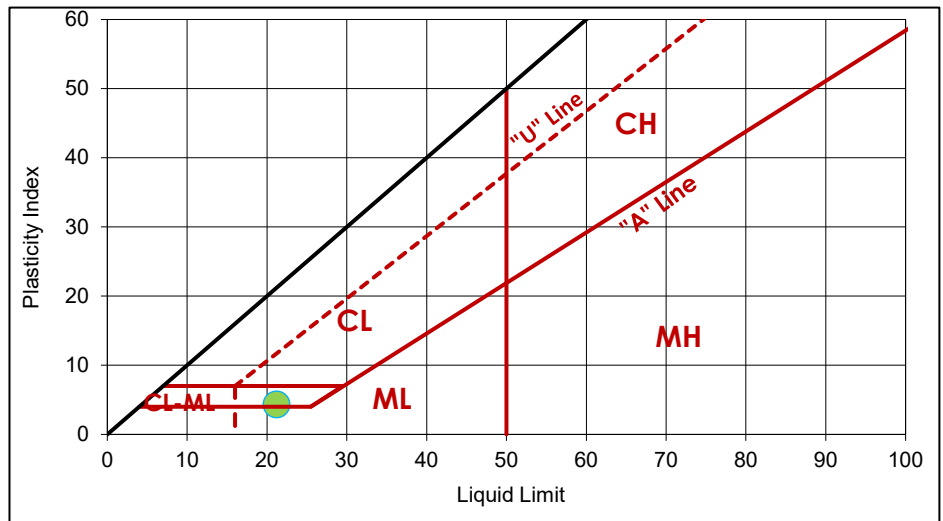
CLIENT FIELD ID BH-196, 1.0 m, Robinson St.

STANTEC SAMPLE NO. 5615

| | LIQUID LIMIT | |
|--------|--------------|----|
| TRIAL | 1 | 2 |
| BLOWS | 26 | 26 |
| MC (%) | 21 | 21 |

| | PLASTIC LIMIT | |
|--------|---------------|----|
| TRIAL | 1 | 2 |
| MC (%) | 17 | 17 |

| | |
|----------------------|------|
| LIQUID LIMIT, LL | 21 |
| PLASTIC LIMIT, PL | 17 |
| PLASTICITY INDEX, PI | 4 |
| AS REC'D MC (%) | 20.7 |



COMMENTS
 No comments.



REPORT DATE 2025.Feb.06

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

ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 6

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.29

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

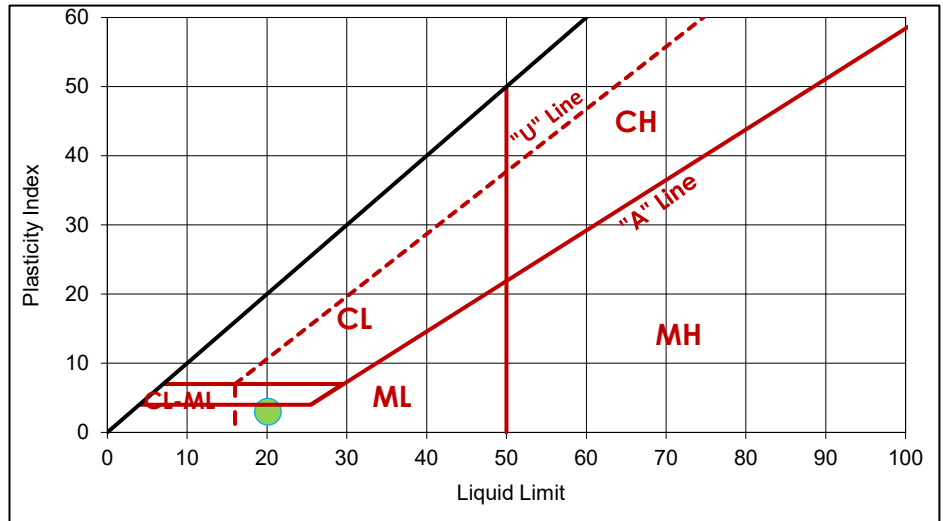
CLIENT FIELD ID BH-197, 1.0 m, Robinson St.

STANTEC SAMPLE NO. 5616

| | LIQUID LIMIT | |
|--------|--------------|----|
| TRIAL | 1 | 2 |
| BLOWS | 26 | 26 |
| MC (%) | 20 | 20 |

| | PLASTIC LIMIT | |
|--------|---------------|----|
| TRIAL | 1 | 2 |
| MC (%) | 17 | 17 |

| | |
|----------------------|------|
| LIQUID LIMIT, LL | 20 |
| PLASTIC LIMIT, PL | 17 |
| PLASTICITY INDEX, PI | 3 |
| AS REC'D MC (%) | 17.9 |



COMMENTS
 No comments.



REPORT DATE 2025.Feb.06

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



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 7

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.30

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

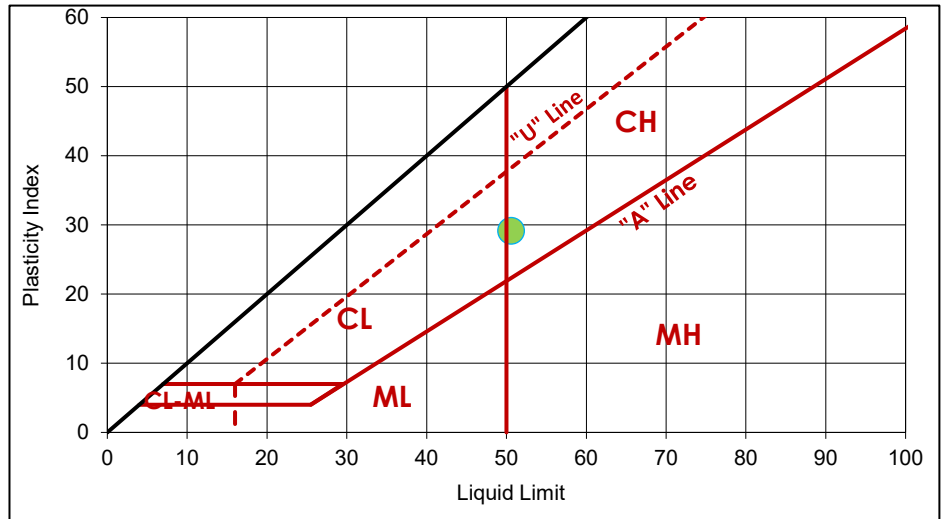
CLIENT FIELD ID BH-198, 1.2 m, Charles St.

STANTEC SAMPLE NO. 5617

| | LIQUID LIMIT | |
|--------|--------------|----|
| TRIAL | 1 | 2 |
| BLOWS | 23 | 24 |
| MC (%) | 51 | 51 |

| | PLASTIC LIMIT | |
|--------|---------------|----|
| TRIAL | 1 | 2 |
| MC (%) | 22 | 21 |

| | |
|----------------------|------|
| LIQUID LIMIT, LL | 51 |
| PLASTIC LIMIT, PL | 21 |
| PLASTICITY INDEX, PI | 29 |
| AS REC'D MC (%) | 23.2 |



COMMENTS
 No comments.

REPORT DATE 2025.Feb.06

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

ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 8

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.30

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

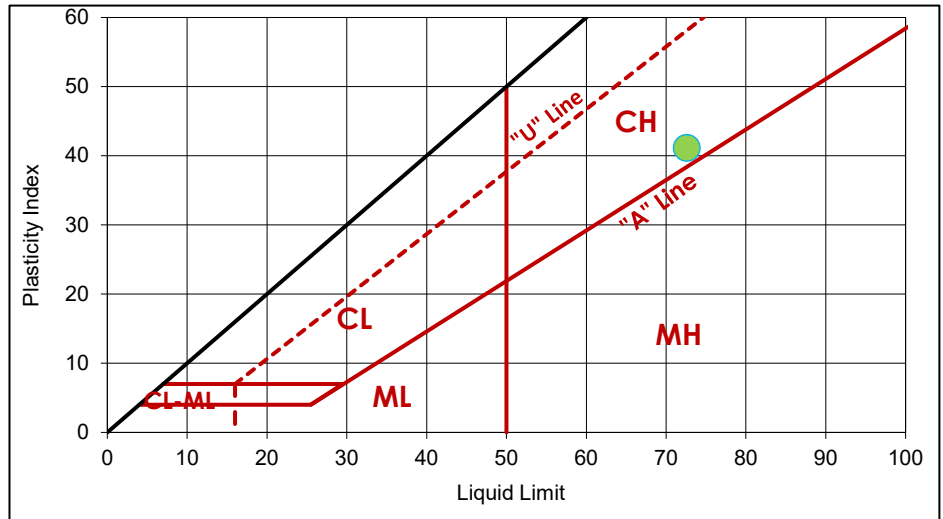
CLIENT FIELD ID BH-199, 0.9 m, Charles St.

STANTEC SAMPLE NO. 5618

| TRIAL | LIQUID LIMIT | |
|--------|--------------|----|
| | 1 | 2 |
| BLOWS | 25 | 24 |
| MC (%) | 73 | 73 |

| TRIAL | PLASTIC LIMIT | |
|--------|---------------|----|
| | 1 | 2 |
| MC (%) | 31 | 32 |

| | |
|----------------------|------|
| LIQUID LIMIT, LL | 73 |
| PLASTIC LIMIT, PL | 31 |
| PLASTICITY INDEX, PI | 41 |
| AS REC'D MC (%) | 28.4 |



COMMENTS
 No comments.



REPORT DATE 2025.Feb.06

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

ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 9

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.31

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

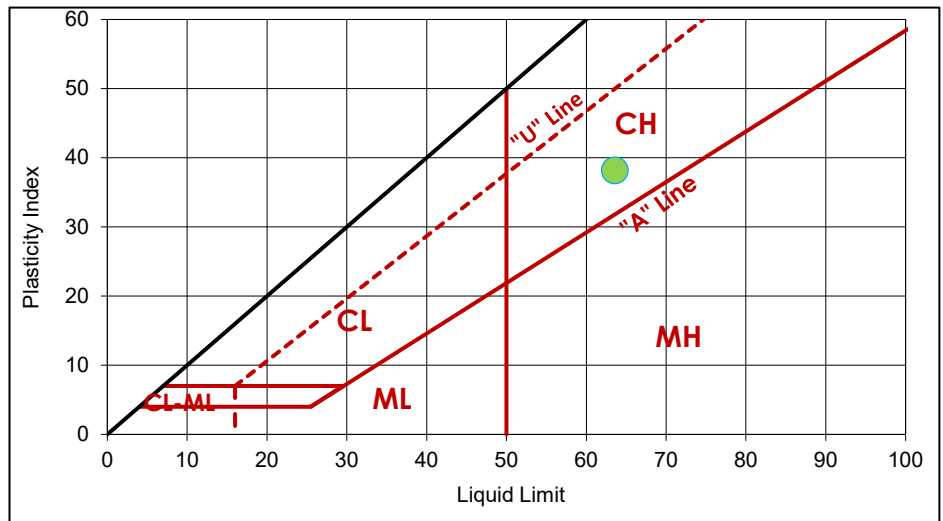
CLIENT FIELD ID BH-200, 1.1 m, Charles St.

STANTEC SAMPLE NO. 5619

| | LIQUID LIMIT | |
|--------|--------------|----|
| TRIAL | 1 | 2 |
| BLOWS | 21 | 23 |
| MC (%) | 65 | 64 |

| | PLASTIC LIMIT | |
|--------|---------------|----|
| TRIAL | 1 | 2 |
| MC (%) | 26 | 25 |

| | |
|----------------------|------|
| LIQUID LIMIT, LL | 64 |
| PLASTIC LIMIT, PL | 25 |
| PLASTICITY INDEX, PI | 38 |
| AS REC'D MC (%) | 25.3 |



COMMENTS
 No comments.



REPORT DATE 2025.Feb.06

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

ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 1

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.24

SAMPLED BY: Stantec Consulting Ltd.

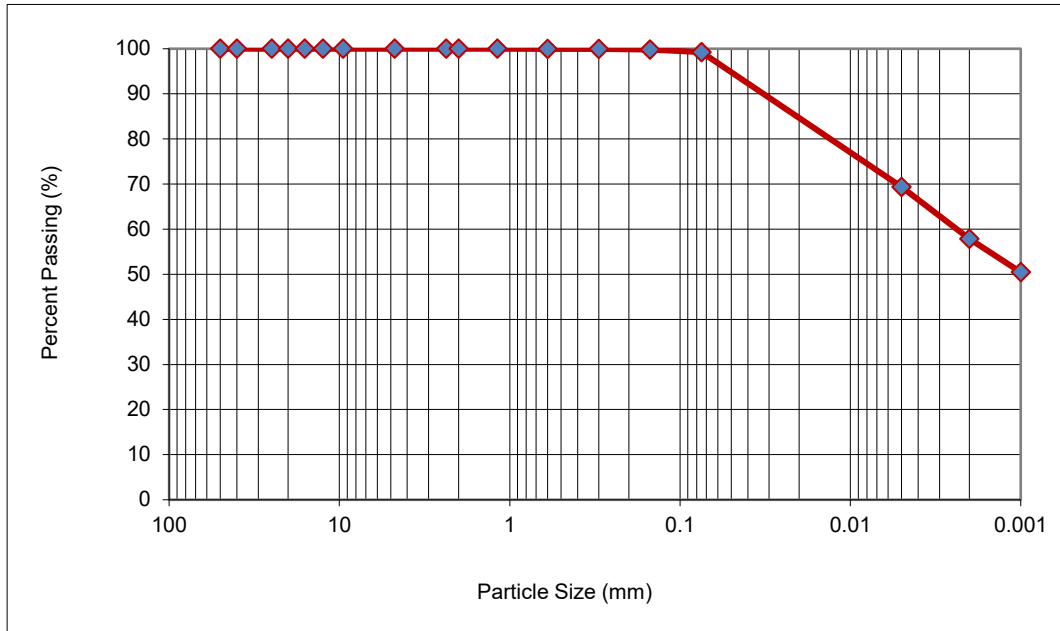
SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-192. 1.2 m, Aikins St.

STANTEC SAMPLE NO. 5611



| 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 | 99.3 |
| 0.005 | 69.4 |
| 0.002 | 57.8 |
| 0.001 | 50.5 |

| Gravel | Sand | | | Silt | Clay | Colloids |
|--------|--------|--------|------|------|------|----------|
| | Coarse | Medium | Fine | | | |
| 0.0 | 0.0 | 0.0 | 0.7 | 41.5 | 57.8 | 50.5 |

COMMENTS
 No comments.



REPORT DATE 2025.Feb.06

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

ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 2

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.27

SAMPLED BY: Stantec Consulting Ltd.

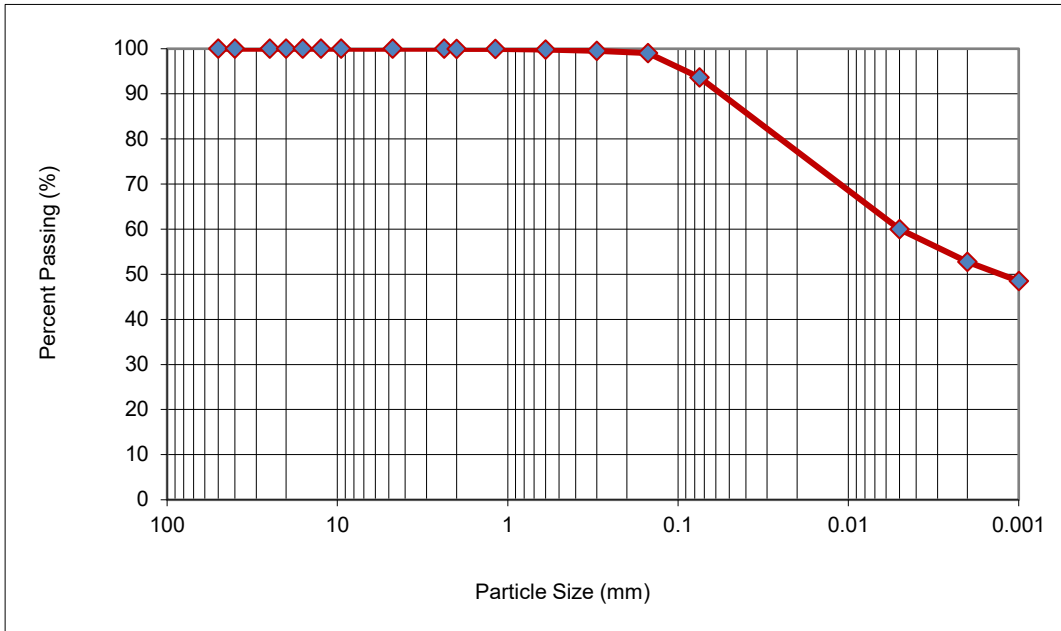
SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-193. 1.2 m, Aikins St.

STANTEC SAMPLE NO. 5612



| 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 | 99.5 |
| 0.150 | 99.1 |
| 0.075 | 93.7 |
| 0.005 | 60.0 |
| 0.002 | 52.7 |
| 0.001 | 48.5 |

| Gravel | Sand | | | Silt | Clay | Colloids |
|--------|--------|--------|------|------|------|----------|
| | Coarse | Medium | Fine | | | |
| 0.0 | 0.0 | 0.4 | 5.9 | 41.0 | 52.7 | 48.5 |

COMMENTS
 No comments.



REPORT DATE 2025.Feb.06

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

ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 3

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.27

SAMPLED BY: Stantec Consulting Ltd.

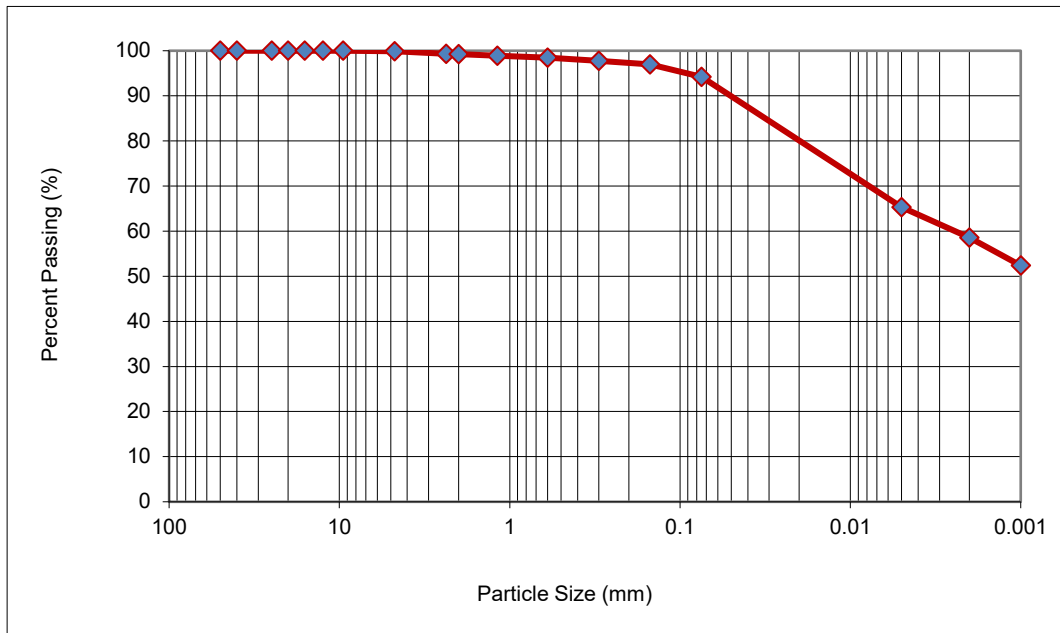
SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-194. 1.2 m, Aikins St.

STANTEC SAMPLE NO. 5613



| 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 | 99.3 |
| 2.00 | 99.3 |
| 1.18 | 98.9 |
| 0.600 | 98.5 |
| 0.300 | 97.7 |
| 0.150 | 97.0 |
| 0.075 | 94.2 |
| 0.005 | 65.3 |
| 0.002 | 58.6 |
| 0.001 | 52.4 |

| Gravel | Sand | | | Silt | Clay | Colloids |
|--------|--------|--------|------|------|------|----------|
| | Coarse | Medium | Fine | | | |
| 0.1 | 0.6 | 1.3 | 3.8 | 35.6 | 58.6 | 52.4 |

COMMENTS
 No comments.



REPORT DATE 2025.Feb.06

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

ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 4

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.27

SAMPLED BY: Stantec Consulting Ltd.

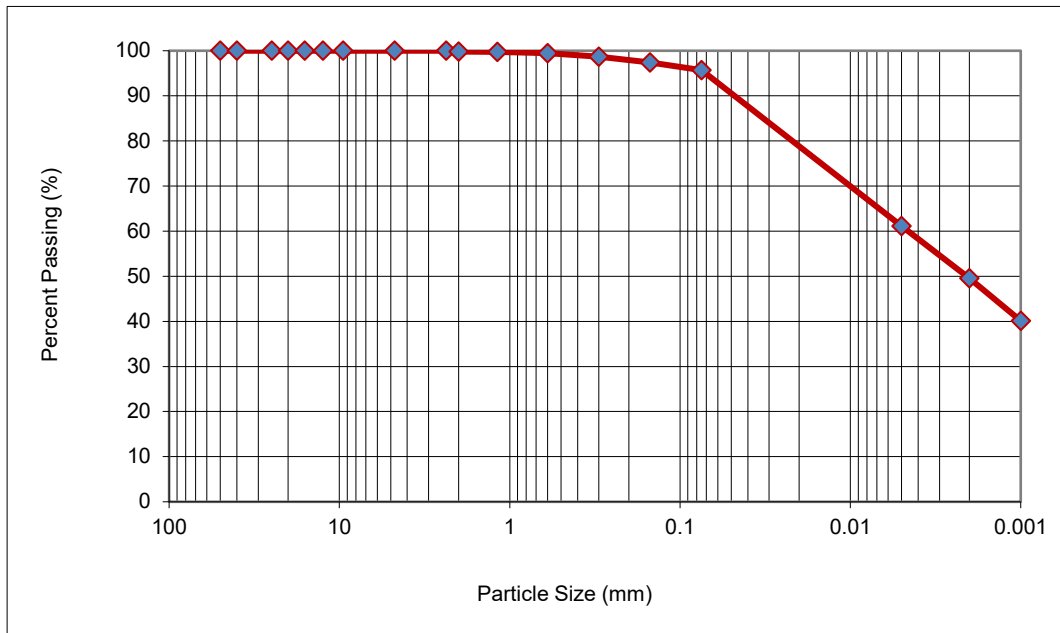
SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-195. 1.2 m, Robinson St.

STANTEC SAMPLE NO. 5614



| 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 | 99.8 |
| 1.18 | 99.8 |
| 0.600 | 99.5 |
| 0.300 | 98.7 |
| 0.150 | 97.4 |
| 0.075 | 95.7 |
| 0.005 | 61.1 |
| 0.002 | 49.5 |
| 0.001 | 40.1 |

| Gravel | Sand | | | Silt | Clay | Colloids |
|--------|--------|--------|------|------|------|----------|
| | Coarse | Medium | Fine | | | |
| 0.0 | 0.2 | 0.8 | 3.3 | 46.2 | 49.5 | 40.1 |

COMMENTS

No comments.



REPORT DATE 2025.Feb.06

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

ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 5

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.27

SAMPLED BY: Stantec Consulting Ltd.

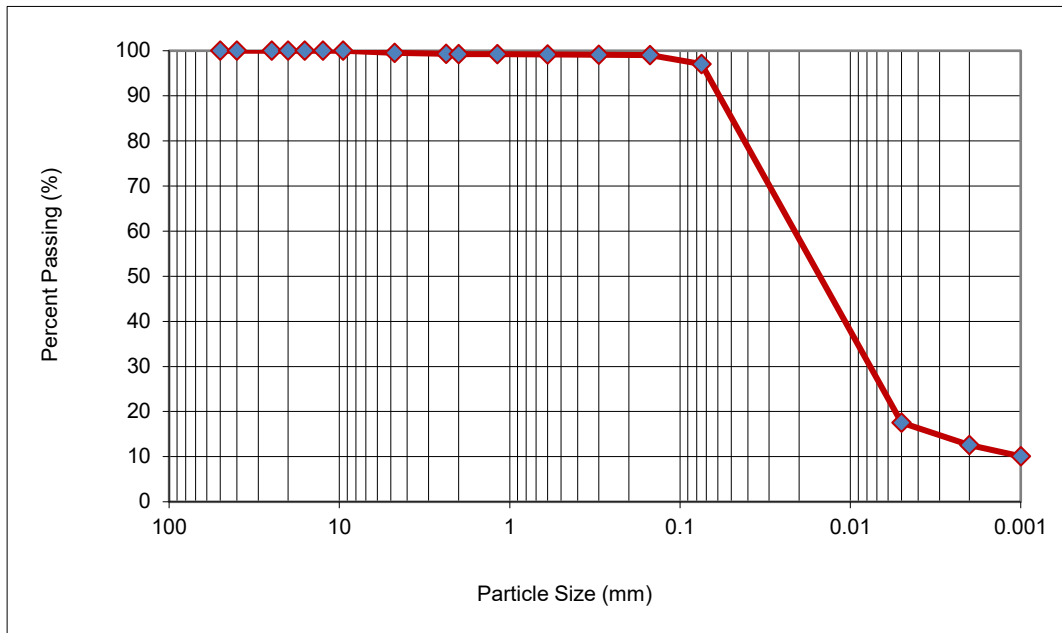
SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-196. 1.0 m, Robinson St.

STANTEC SAMPLE NO. 5615



| 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 | 99.3 |
| 2.00 | 99.2 |
| 1.18 | 99.2 |
| 0.600 | 99.2 |
| 0.300 | 99.1 |
| 0.150 | 99.1 |
| 0.075 | 97.0 |
| 0.005 | 17.6 |
| 0.002 | 12.6 |
| 0.001 | 10.1 |

| Gravel | Sand | | | Silt | Clay | Colloids |
|--------|--------|--------|------|------|------|----------|
| | Coarse | Medium | Fine | | | |
| 0.5 | 0.3 | 0.0 | 2.2 | 84.4 | 12.6 | 10.1 |

COMMENTS
 No comments.



REPORT DATE 2025.Feb.06

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

ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 7

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.24

SAMPLED BY: Stantec Consulting Ltd.

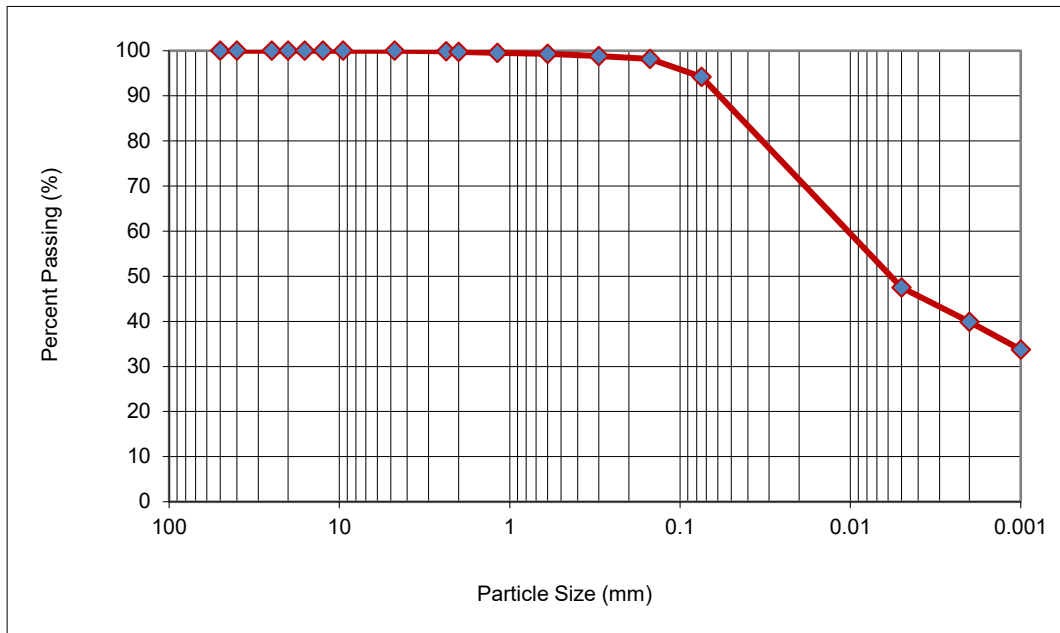
SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-198. 1.2 m, Charles St.

STANTEC SAMPLE NO. 5617



| Sieve Size (mm) | % Passing |
|-----------------|-----------|
| 50.0 | 100.0 |
| 40.0 | 100.0 |
| 25.0 | 100.0 |
| 20.0 | 100.0 |
| 16.0 | 100.0 |
| 12.5 | 100.0 |
| 9.5 | 100.0 |
| 4.75 | 100.0 |
| 2.36 | 99.9 |
| 2.00 | 99.7 |
| 1.18 | 99.6 |
| 0.600 | 99.3 |
| 0.300 | 98.8 |
| 0.150 | 98.2 |
| 0.075 | 94.2 |
| 0.005 | 47.5 |
| 0.002 | 39.9 |
| 0.001 | 33.7 |

| Gravel | Sand | | | Silt | Clay | Colloids |
|--------|--------|--------|------|------|------|----------|
| | Coarse | Medium | Fine | | | |
| 0.0 | 0.3 | 0.7 | 4.8 | 54.3 | 39.9 | 33.7 |

COMMENTS
 No comments.



REPORT DATE 2025.Feb.06

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

ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 8

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.24

SAMPLED BY: Stantec Consulting Ltd.

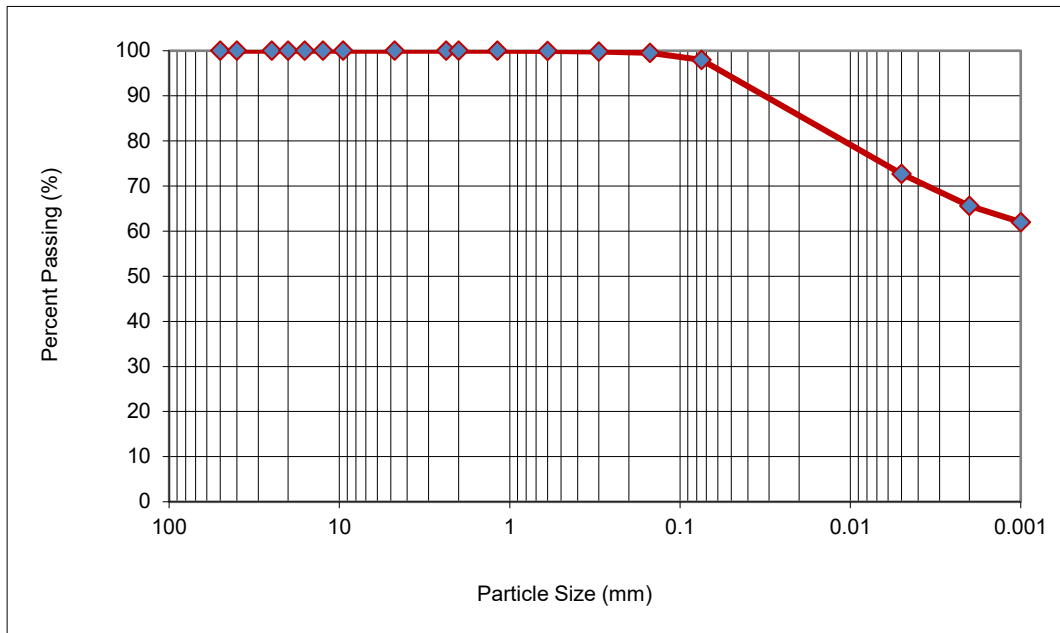
SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-199. 0.9 m, Charles St.

STANTEC SAMPLE NO. 5618



| Sieve Size (mm) | % Passing |
|-----------------|-----------|
| 50.0 | 100.0 |
| 40.0 | 100.0 |
| 25.0 | 100.0 |
| 20.0 | 100.0 |
| 16.0 | 100.0 |
| 12.5 | 100.0 |
| 9.5 | 100.0 |
| 4.75 | 100.0 |
| 2.36 | 100.0 |
| 2.00 | 100.0 |
| 1.18 | 100.0 |
| 0.600 | 100.0 |
| 0.300 | 99.8 |
| 0.150 | 99.5 |
| 0.075 | 98.0 |
| 0.005 | 72.7 |
| 0.002 | 65.6 |
| 0.001 | 62.0 |

| Gravel | Sand | | | Silt | Clay | Colloids |
|--------|--------|--------|------|------|------|----------|
| | Coarse | Medium | Fine | | | |
| 0.0 | 0.0 | 0.1 | 1.9 | 32.4 | 65.6 | 62.0 |

COMMENTS

No comments.



REPORT DATE 2025.Feb.06

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

ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2025 Local Street Renewal Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 9

DATE SAMPLED: 2025.Jan.07

DATE RECEIVED: 2025.Jan.07

DATE TESTED: 2025.Jan.27

SAMPLED BY: Stantec Consulting Ltd.

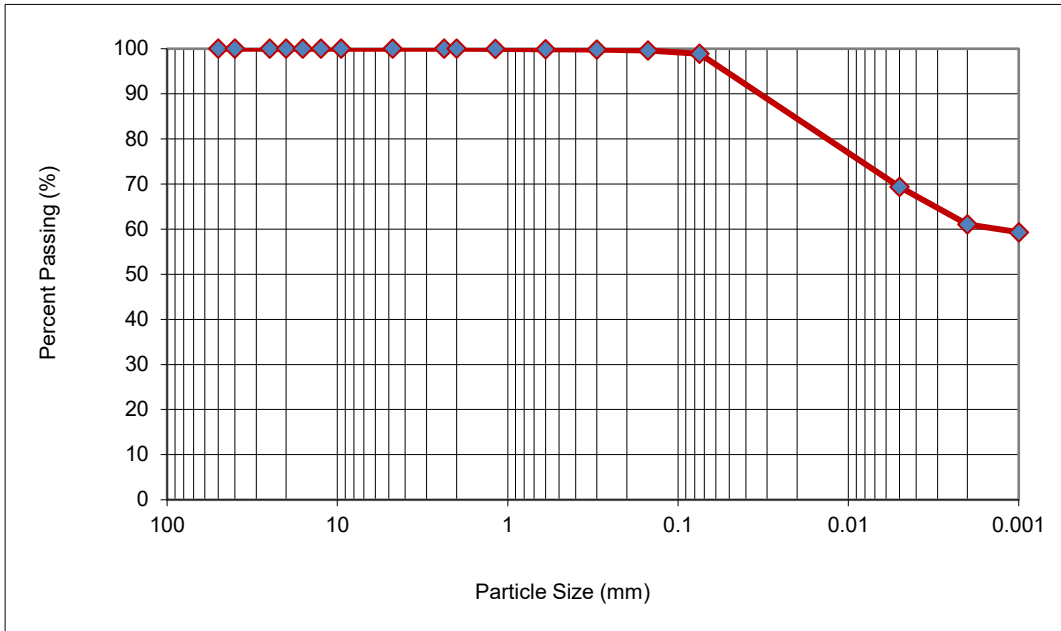
SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Rimanshi Gorasiya

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-200. 1.1 m, Charles St.

STANTEC SAMPLE NO. 5619



| Sieve Size (mm) | % Passing |
|-----------------|-----------|
| 50.0 | 100.0 |
| 40.0 | 100.0 |
| 25.0 | 100.0 |
| 20.0 | 100.0 |
| 16.0 | 100.0 |
| 12.5 | 100.0 |
| 9.5 | 100.0 |
| 4.75 | 100.0 |
| 2.36 | 100.0 |
| 2.00 | 100.0 |
| 1.18 | 100.0 |
| 0.600 | 99.9 |
| 0.300 | 99.8 |
| 0.150 | 99.6 |
| 0.075 | 98.9 |
| 0.005 | 69.3 |
| 0.002 | 61.1 |
| 0.001 | 59.3 |

| Gravel | Sand | | | Silt | Clay | Colloids |
|--------|--------|--------|------|------|------|----------|
| | Coarse | Medium | Fine | | | |
| 0.0 | 0.0 | 0.1 | 1.0 | 37.8 | 61.1 | 59.3 |

COMMENTS
 No comments.



REPORT DATE 2025.Feb.06

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

PROCTOR TEST REPORT

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

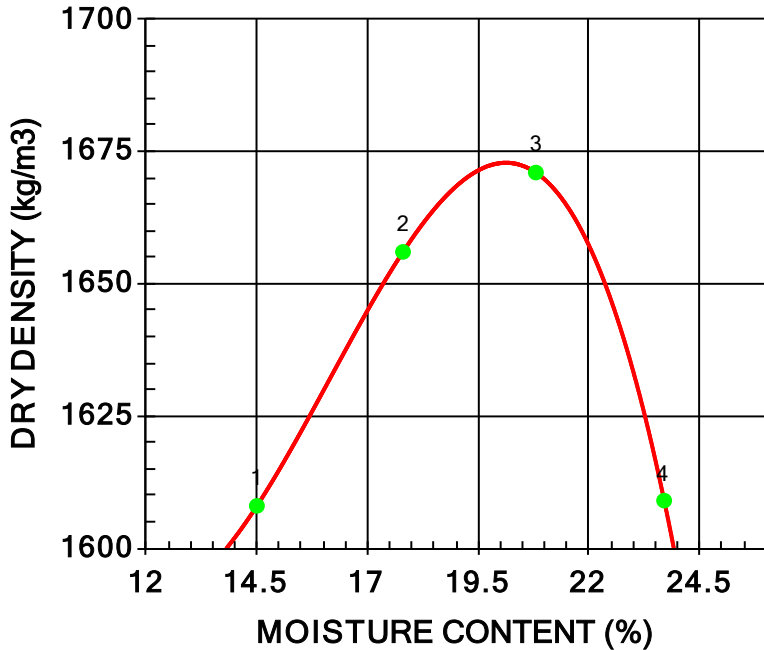
CLIENT City of Winnipeg
 C.C.

ATTN: Geoff Kerr

PROJECT 2025 Local Street Renewal Program

PROJECT NO. 123317463-2 - Contract 2
 PROCTOR NO. 1 DATE SAMPLED 2025.Jan.07 DATE RECEIVED 2025.Jan.09 DATE TESTED 2025.Jan.22

| | | | |
|-------------------------|---------------------------|----------------------------|---------------------------------|
| INSITU MOISTURE | 26.7 % | COMPACTION STANDARD | Standard Proctor, ASTM D698 |
| TESTED BY | Donald Eliazar | COMPACTION PROCEDURE | A: 101.6mm Mold, Passing 4.75mm |
| MATERIAL IDENTIFICATION | | RAMMER TYPE | Manual |
| MAJOR COMPONENT | Subgrade | PREPARATION | Moist |
| SIZE | Fat Clay (CH) | OVERSIZE CORRECTION METHOD | None |
| DESCRIPTION | | RETAINED 4.75mm SCREEN | N/A % |
| SUPPLIER | Existing Materials | | |
| SOURCE | BH-192, 1.2 m (Aikins St) | | |



| TRIAL NUMBER | WET DENSITY (kg/m³) | DRY DENSITY (kg/m³) | MOISTURE CONTENT (%) |
|--------------|---------------------|---------------------|----------------------|
| 1 | 1841 | 1608 | 14.5 |
| 2 | 1951 | 1656 | 17.8 |
| 3 | 2018 | 1671 | 20.8 |
| 4 | 1990 | 1609 | 23.7 |

| | MAXIMUM DRY DENSITY (kg/m³) | OPTIMUM MOISTURE CONTENT (%) |
|--------------------|-----------------------------|------------------------------|
| CALCULATED | 1670 | 20.0 |
| OVERSIZE CORRECTED | | |

COMMENTS

Stantec Sample No. 5611.

PROCTOR TEST REPORT

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

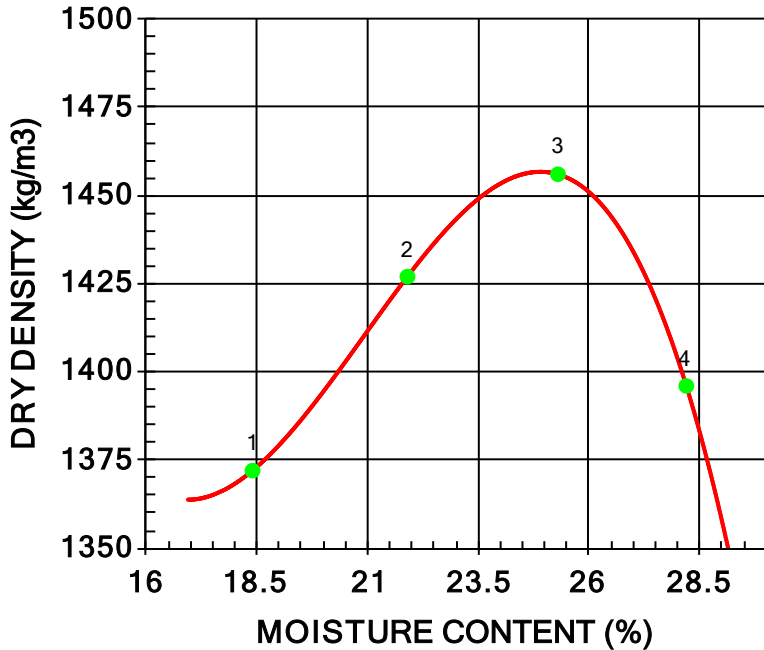
CLIENT City of Winnipeg
 C.C.

ATTN: Geoff Kerr

PROJECT 2025 Local Street Renewal Program

PROJECT NO. 123317463-2 - Contract 2
 PROCTOR NO. 2 DATE SAMPLED 2025.Jan.07 DATE RECEIVED 2025.Jan.09 DATE TESTED 2025.Jan.22

| | | | |
|-------------------------|---------------------------|----------------------------|------------------------------------|
| INSITU MOISTURE | 40.9 % | COMPACTION STANDARD | Standard Proctor, ASTM |
| TESTED BY | Donald Eliazar | | D698 |
| MATERIAL IDENTIFICATION | | COMPACTION PROCEDURE | A: 101.6mm Mold, Passing 4.75mm |
| MAJOR COMPONENT | Subgrade | RAMMER TYPE | Manual |
| SIZE | Fat Clay (CH) | PREPARATION | Moist |
| DESCRIPTION | | OVERSIZE CORRECTION METHOD | None |
| SUPPLIER | Existing Materials | RETAINED 4.75mm SCREEN | N/A % |
| SOURCE | BH-193, 1.2 m (Aikins St) | | |



| TRIAL NUMBER | WET DENSITY (kg/m³) | DRY DENSITY (kg/m³) | MOISTURE CONTENT (%) |
|--------------|---------------------|---------------------|----------------------|
| 1 | 1624 | 1372 | 18.4 |
| 2 | 1740 | 1427 | 21.9 |
| 3 | 1824 | 1456 | 25.3 |
| 4 | 1790 | 1396 | 28.2 |

| | MAXIMUM DRY DENSITY (kg/m³) | OPTIMUM MOISTURE CONTENT (%) |
|--------------------|-----------------------------|------------------------------|
| CALCULATED | 1460 | 25.0 |
| OVERSIZE CORRECTED | | |

COMMENTS

Stantec Sample No. 5612.



Jason Thompson, C.E.T.

PROCTOR TEST REPORT

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

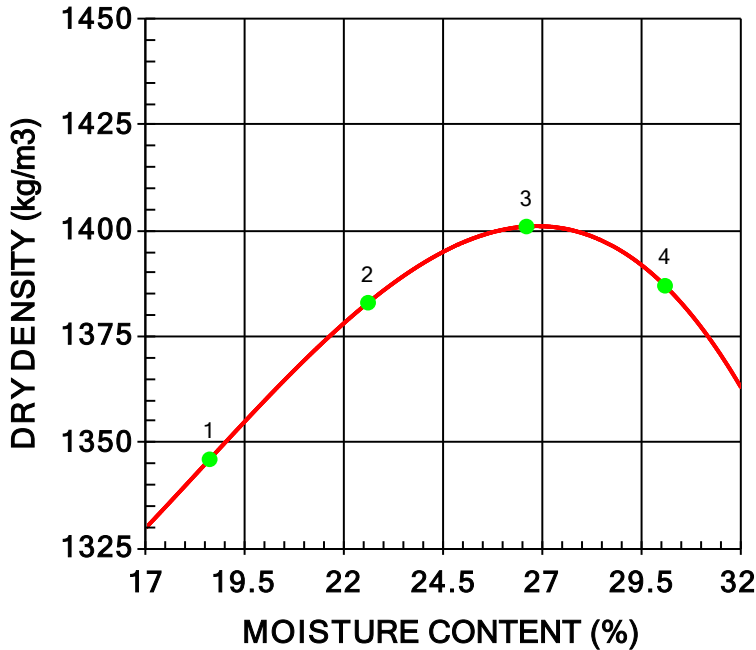
CLIENT City of Winnipeg
 C.C.

ATTN: Geoff Kerr

PROJECT 2025 Local Street Renewal Program

PROJECT NO. 123317463-2 - Contract 2
 PROCTOR NO. 3 DATE SAMPLED 2025.Jan.07 DATE RECEIVED 2025.Jan.09 DATE TESTED 2025.Jan.22

| | | | |
|-------------------------|---------------------------|----------------------------|------------------------------------|
| INSITU MOISTURE | 46.3 % | COMPACTION STANDARD | Standard Proctor, ASTM |
| TESTED BY | Donald Eliazar | | D698 |
| MATERIAL IDENTIFICATION | | COMPACTION PROCEDURE | A: 101.6mm Mold, Passing 4.75mm |
| MAJOR COMPONENT | Subgrade | RAMMER TYPE | Manual |
| SIZE | Fat Clay (CH) | PREPARATION | Moist |
| DESCRIPTION | | OVERSIZE CORRECTION METHOD | None |
| SUPPLIER | Existing Materials | RETAINED 4.75mm SCREEN | N/A % |
| SOURCE | BH-194, 1.2 m (Aikins St) | | |



| TRIAL NUMBER | WET DENSITY (kg/m³) | DRY DENSITY (kg/m³) | MOISTURE CONTENT (%) |
|--------------|---------------------|---------------------|----------------------|
| 1 | 1596 | 1346 | 18.6 |
| 2 | 1695 | 1383 | 22.6 |
| 3 | 1774 | 1401 | 26.6 |
| 4 | 1804 | 1387 | 30.1 |

| | MAXIMUM DRY DENSITY (kg/m³) | OPTIMUM MOISTURE CONTENT (%) |
|--------------------|-----------------------------|------------------------------|
| CALCULATED | 1400 | 27.0 |
| OVERSIZE CORRECTED | | |

COMMENTS

Stantec Sample No. 5613.

PROCTOR TEST REPORT

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

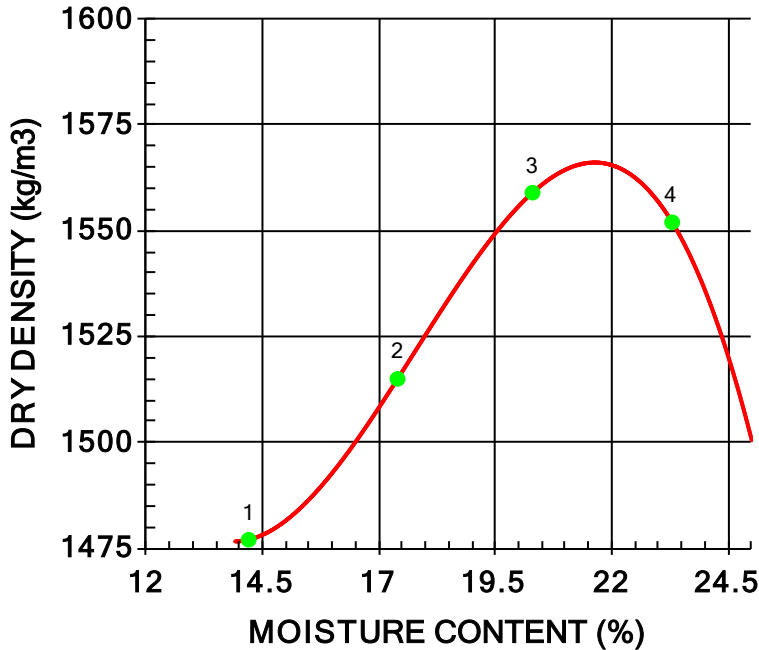
CLIENT City of Winnipeg
 C.C.

ATTN: Geoff Kerr

PROJECT 2025 Local Street Renewal Program

PROJECT NO. 123317463-2 - Contract 2
 PROCTOR NO. 4 DATE SAMPLED 2025.Jan.09 DATE RECEIVED 2025.Jan.09 DATE TESTED 2025.Jan.23

| | | | |
|-------------------------|-----------------------------|----------------------------|------------------------------------|
| INSITU MOISTURE | 27.8 % | COMPACTION STANDARD | Standard Proctor, ASTM |
| TESTED BY | Donald Eliazar | | D698 |
| MATERIAL IDENTIFICATION | | COMPACTION PROCEDURE | A: 101.6mm Mold, Passing 4.75mm |
| MAJOR COMPONENT | Subgrade | RAMMER TYPE | Manual |
| SIZE | Fat Clay (CH) | PREPARATION | Moist |
| DESCRIPTION | | OVERSIZE CORRECTION METHOD | None |
| SUPPLIER | Existing Materials | RETAINED 4.75mm SCREEN | N/A % |
| SOURCE | BH-195, 1.2 m (Robinson St) | | |



| TRIAL NUMBER | WET DENSITY (kg/m³) | DRY DENSITY (kg/m³) | MOISTURE CONTENT (%) |
|--------------|---------------------|---------------------|----------------------|
| 1 | 1687 | 1477 | 14.2 |
| 2 | 1779 | 1515 | 17.4 |
| 3 | 1876 | 1559 | 20.3 |
| 4 | 1913 | 1552 | 23.3 |

| | MAXIMUM DRY DENSITY (kg/m³) | OPTIMUM MOISTURE CONTENT (%) |
|--------------------|-----------------------------|------------------------------|
| CALCULATED | 1570 | 21.5 |
| OVERSIZE CORRECTED | | |

COMMENTS

Stantec Sample No. 5614.

PROCTOR TEST REPORT

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

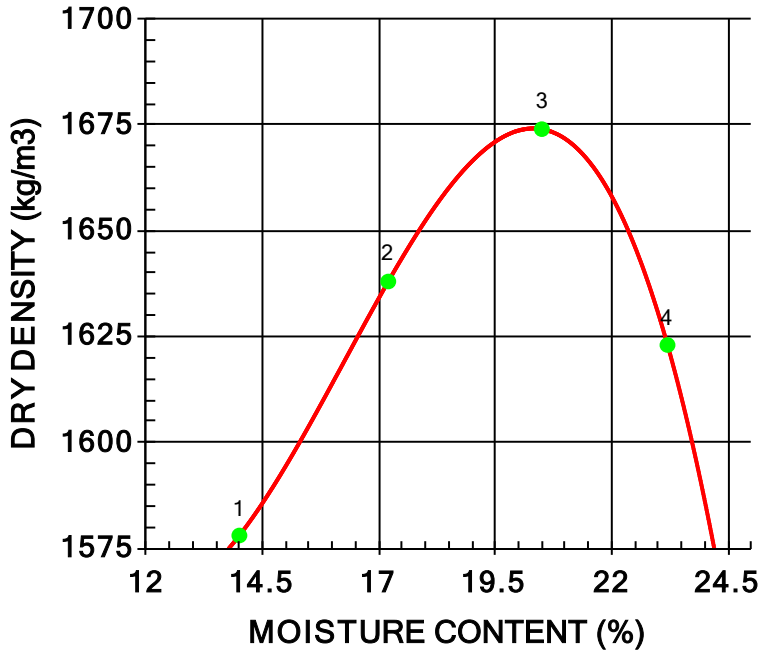
CLIENT City of Winnipeg
 C.C.

ATTN: Geoff Kerr

PROJECT 2025 Local Street Renewal Program

PROJECT NO. 123317463-2 - Contract 2
 PROCTOR NO. 5 DATE SAMPLED 2025.Jan.09 DATE RECEIVED 2025.Jan.09 DATE TESTED 2025.Jan.23

| | | | |
|-------------------------|-----------------------------|----------------------------|------------------------------------|
| INSITU MOISTURE | 35.5 % | COMPACTION STANDARD | Standard Proctor, ASTM |
| TESTED BY | Donald Eliazar | | D698 |
| MATERIAL IDENTIFICATION | | COMPACTION PROCEDURE | A: 101.6mm Mold, Passing 4.75mm |
| MAJOR COMPONENT | Subgrade | RAMMER TYPE | Manual |
| SIZE | Silty Clay (CL-ML) | PREPARATION | Moist |
| DESCRIPTION | | OVERSIZE CORRECTION METHOD | None |
| SUPPLIER | Existing Materials | RETAINED 4.75mm SCREEN | N/A % |
| SOURCE | BH-196, 1.0 m (Robinson St) | | |



| TRIAL NUMBER | WET DENSITY (kg/m³) | DRY DENSITY (kg/m³) | MOISTURE CONTENT (%) |
|--------------|---------------------|---------------------|----------------------|
| 1 | 1799 | 1578 | 14.0 |
| 2 | 1920 | 1638 | 17.2 |
| 3 | 2017 | 1674 | 20.5 |
| 4 | 2000 | 1623 | 23.2 |

| | MAXIMUM DRY DENSITY (kg/m³) | OPTIMUM MOISTURE CONTENT (%) |
|--------------------|-----------------------------|------------------------------|
| CALCULATED | 1670 | 20.5 |
| OVERSIZE CORRECTED | | |

COMMENTS

Stantec Sample No. 5615.

PROCTOR TEST REPORT

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

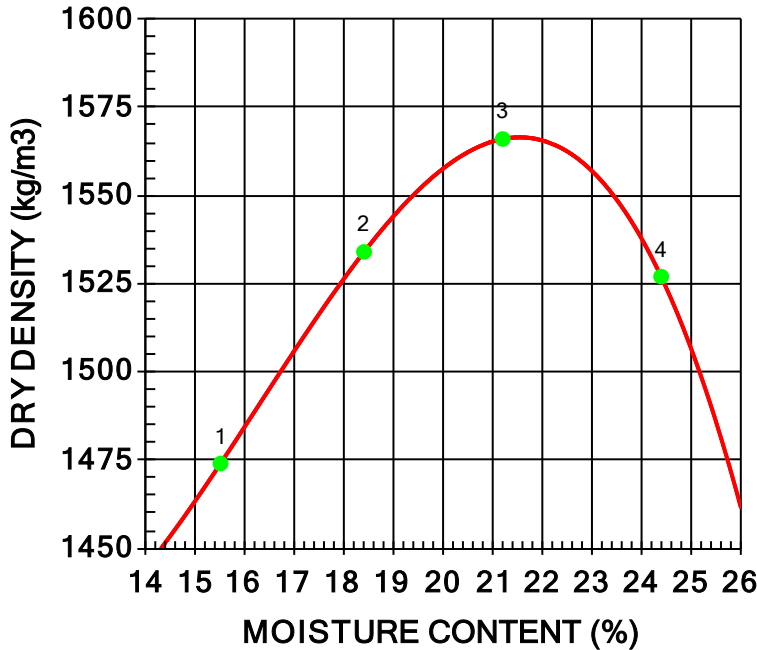
CLIENT City of Winnipeg
 C.C.

ATTN: Geoff Kerr

PROJECT 2025 Local Street Renewal Program

PROJECT NO. 123317463-2 - Contract 2
 PROCTOR NO. 6 DATE SAMPLED 2025.Jan.09 DATE RECEIVED 2025.Jan.09 DATE TESTED 2025.Jan.24

| | | | |
|-------------------------|-----------------------------|----------------------------|------------------------------------|
| INSITU MOISTURE | 31.6 % | COMPACTION STANDARD | Standard Proctor, ASTM |
| TESTED BY | Donald Eliazar | | D698 |
| MATERIAL IDENTIFICATION | | COMPACTION PROCEDURE | A: 101.6mm Mold, Passing 4.75mm |
| MAJOR COMPONENT | Subgrade | RAMMER TYPE | Manual |
| SIZE | Silt (ML) | PREPARATION | Moist |
| DESCRIPTION | | OVERSIZE CORRECTION METHOD | None |
| SUPPLIER | Existing Materials | RETAINED 4.75mm SCREEN | N/A % |
| SOURCE | BH-197, 1.0 m (Robinson St) | | |



| TRIAL NUMBER | WET DENSITY (kg/m³) | DRY DENSITY (kg/m³) | MOISTURE CONTENT (%) |
|--------------|---------------------|---------------------|----------------------|
| 1 | 1703 | 1474 | 15.5 |
| 2 | 1816 | 1534 | 18.4 |
| 3 | 1898 | 1566 | 21.2 |
| 4 | 1900 | 1527 | 24.4 |

| | MAXIMUM DRY DENSITY (kg/m³) | OPTIMUM MOISTURE CONTENT (%) |
|--------------------|-----------------------------|------------------------------|
| CALCULATED | 1570 | 21.5 |
| OVERSIZE CORRECTED | | |

COMMENTS

Stantec Sample No. 5616.

PROCTOR TEST REPORT

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

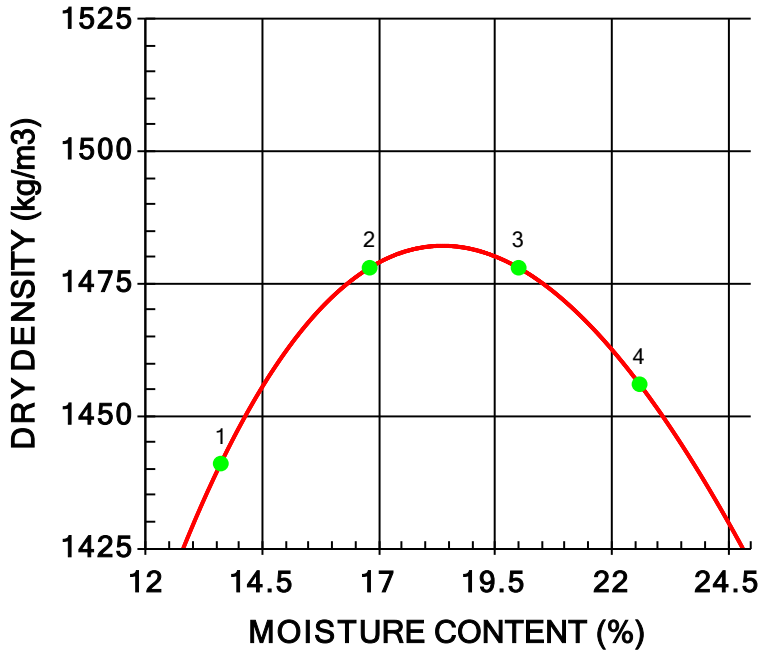
CLIENT City of Winnipeg
 C.C.

ATTN: Geoff Kerr

PROJECT 2025 Local Street Renewal Program

PROJECT NO. 123317463-2 - Contract 2
 PROCTOR NO. 7 DATE SAMPLED 2025.Jan.07 DATE RECEIVED 2025.Jan.07 DATE TESTED 2025.Jan.24

| | | | |
|-------------------------|----------------------------|----------------------------|------------------------------------|
| INSITU MOISTURE | 23.8 % | COMPACTION STANDARD | Standard Proctor, ASTM |
| TESTED BY | Donald Eliazar | | D698 |
| MATERIAL IDENTIFICATION | | COMPACTION PROCEDURE | A: 101.6mm Mold, Passing 4.75mm |
| MAJOR COMPONENT | Subgrade | RAMMER TYPE | Manual |
| SIZE | Fat Clay (CH) | PREPARATION | Moist |
| DESCRIPTION | | OVERSIZE CORRECTION METHOD | None |
| SUPPLIER | Existing Materials | RETAINED 4.75mm SCREEN | N/A % |
| SOURCE | BH-198, 1.2 m (Charles St) | | |



| TRIAL NUMBER | WET DENSITY (kg/m³) | DRY DENSITY (kg/m³) | MOISTURE CONTENT (%) |
|--------------|---------------------|---------------------|----------------------|
| 1 | 1637 | 1441 | 13.6 |
| 2 | 1726 | 1478 | 16.8 |
| 3 | 1774 | 1478 | 20.0 |
| 4 | 1785 | 1456 | 22.6 |

| | MAXIMUM DRY DENSITY (kg/m³) | OPTIMUM MOISTURE CONTENT (%) |
|--------------------|-----------------------------|------------------------------|
| CALCULATED | 1480 | 18.5 |
| OVERSIZE CORRECTED | | |

COMMENTS

Stantec Sample No. 5617.

PROCTOR TEST REPORT

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

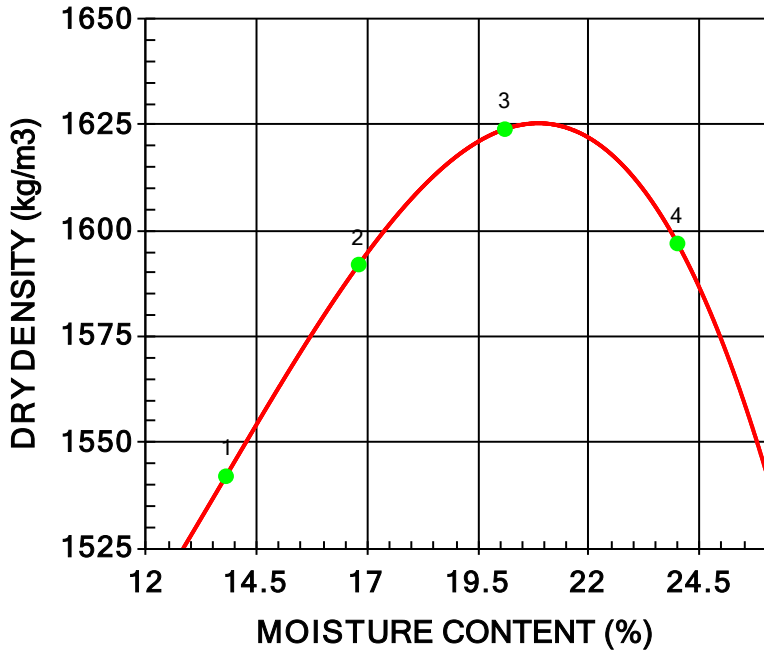
CLIENT City of Winnipeg
 C.C.

ATTN: Geoff Kerr

PROJECT 2025 Local Street Renewal Program

PROJECT NO. 123317463-2 - Contract 2
 PROCTOR NO. 8 DATE SAMPLED 2025.Jan.07 DATE RECEIVED 2025.Jan.07 DATE TESTED 2025.Jan.24

| | | | |
|-------------------------|----------------------------|----------------------------|------------------------------------|
| INSITU MOISTURE | 24.2 % | COMPACTION STANDARD | Standard Proctor, ASTM |
| TESTED BY | Donald Eliazar | | D698 |
| MATERIAL IDENTIFICATION | | COMPACTION PROCEDURE | A: 101.6mm Mold, Passing 4.75mm |
| MAJOR COMPONENT | Subgrade | RAMMER TYPE | Manual |
| SIZE | Fat Clay (CH) | PREPARATION | Moist |
| DESCRIPTION | | OVERSIZE CORRECTION METHOD | None |
| SUPPLIER | Existing Materials | RETAINED 4.75mm SCREEN | N/A % |
| SOURCE | BH-199, 0.9 m (Charles St) | | |



| TRIAL NUMBER | WET DENSITY (kg/m³) | DRY DENSITY (kg/m³) | MOISTURE CONTENT (%) |
|--------------|---------------------|---------------------|----------------------|
| 1 | 1755 | 1542 | 13.8 |
| 2 | 1859 | 1592 | 16.8 |
| 3 | 1950 | 1624 | 20.1 |
| 4 | 1980 | 1597 | 24.0 |

| | MAXIMUM DRY DENSITY (kg/m³) | OPTIMUM MOISTURE CONTENT (%) |
|--------------------|-----------------------------|------------------------------|
| CALCULATED | 1620 | 21.0 |
| OVERSIZE CORRECTED | | |

COMMENTS

Stantec Sample No. 5618.

PROCTOR TEST REPORT

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

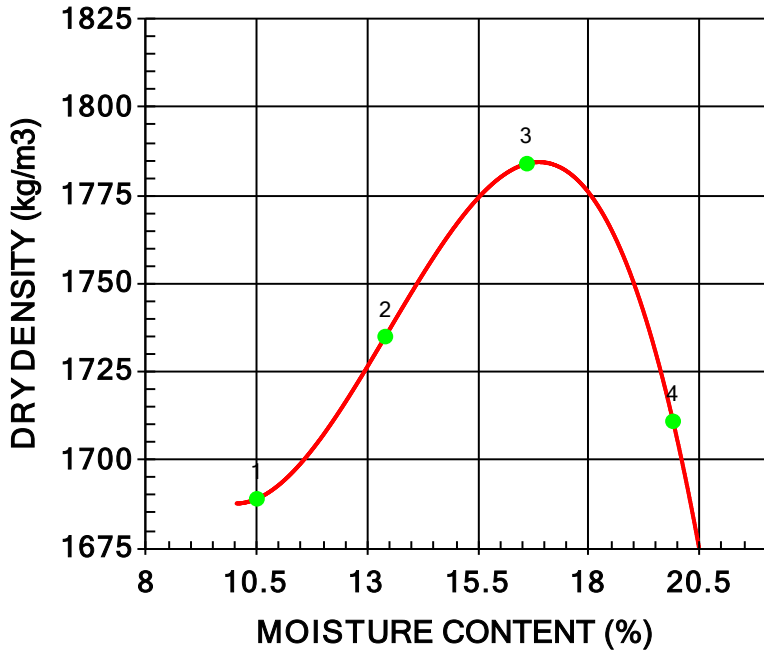
CLIENT City of Winnipeg
 C.C.

ATTN: Geoff Kerr

PROJECT 2025 Local Street Renewal Program

PROJECT NO. 123317463-2 - Contract 2
 PROCTOR NO. 9 DATE SAMPLED 2025.Jan.07 DATE RECEIVED 2025.Jan.07 DATE TESTED 2025.Jan.24

| | | | |
|-------------------------|----------------------------|----------------------------|---------------------------------|
| INSITU MOISTURE | 23.7 % | COMPACTION STANDARD | Standard Proctor, ASTM D698 |
| TESTED BY | Donald Eliazar | COMPACTION PROCEDURE | A: 101.6mm Mold, Passing 4.75mm |
| MATERIAL IDENTIFICATION | | RAMMER TYPE | Manual |
| MAJOR COMPONENT | Subgrade | PREPARATION | Moist |
| SIZE | Fat Clay (CH) | OVERSIZE CORRECTION METHOD | None |
| DESCRIPTION | | RETAINED 4.75mm SCREEN | N/A % |
| SUPPLIER | Existing Materials | | |
| SOURCE | BH-200, 1.1 m (Charles St) | | |



| TRIAL NUMBER | WET DENSITY (kg/m³) | DRY DENSITY (kg/m³) | MOISTURE CONTENT (%) |
|--------------|---------------------|---------------------|----------------------|
| 1 | 1866 | 1689 | 10.5 |
| 2 | 1967 | 1735 | 13.4 |
| 3 | 2080 | 1784 | 16.6 |
| 4 | 2051 | 1711 | 19.9 |

| | MAXIMUM DRY DENSITY (kg/m³) | OPTIMUM MOISTURE CONTENT (%) |
|--------------------|-----------------------------|------------------------------|
| CALCULATED | 1780 | 17.0 |
| OVERSIZE CORRECTED | | |

COMMENTS

Stantec Sample No. 5619.

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

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Ave.
 Winnipeg, MB
 R3E 3P1

PROJECT 2025 Local Street Renewals Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 1

DATE SAMPLED: 2025.Jan.07
 SAMPLED BY: Larry Presado

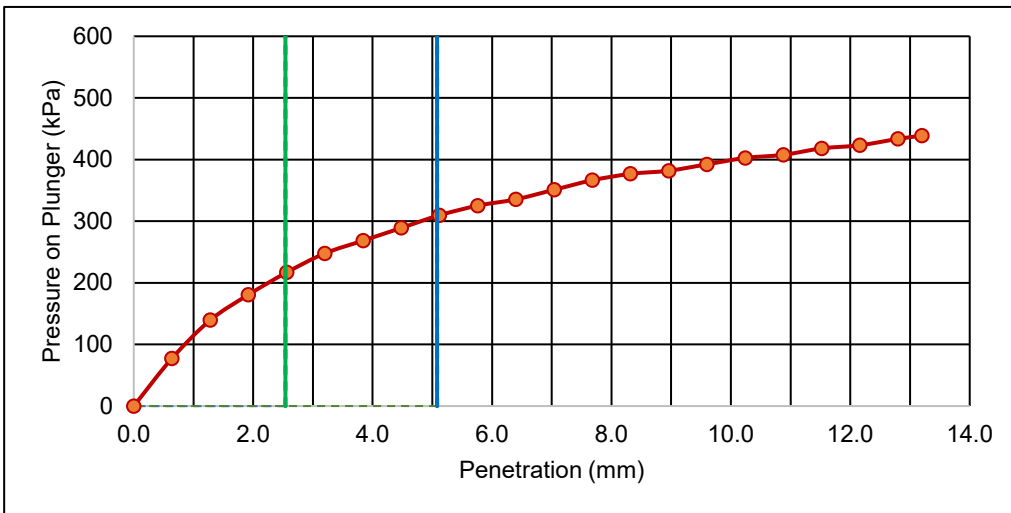
DATE RECEIVED: 2025.Jan.07
 SUBMITTED BY: Larry Presado

DATE TESTED: 2025.Jan.24
 TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

| | | | |
|-------------------|----------------|--------------------|----------------------------|
| MATERIAL USE | Subgrade | SUPPLIER | Existing Material |
| MAX. NOMINAL SIZE | < 4.75 mm | SOURCE | In Situ |
| MATERIAL TYPE | Fat Clay (CH) | SAMPLE LOCATION | BH-192, 1.2 m - Aikins St. |
| SPECIFICATION ID | Not Applicable | STANTEC SAMPLE NO. | 5611 |

| | | | |
|---------------------|-----------|---------------------------|------------------------|
| IMMERSION PERIOD | 96 ± 2 hr | TARGET MAX. DRY DENSITY | 1670 kg/m ³ |
| CONDITION OF SAMPLE | Soaked | TARGET OPTIMUM MOISTURE | 20.0 % |
| SURCHARGE MASS | 4.54 kg | | |
| +19 mm OVERSIZE | 0 % | AS-COMPACTED DRY DENSITY | 1585 kg/m ³ |
| SWELL OF SAMPLE | 2.42 % | AS-COMPACTED MOISTURE | 20.1 % |
| POST-TEST MOISTURE | 28.7 % | AS-COMPACTED % COMPACTION | 95 % |




**CBR VALUE AT 2.54 mm
PENETRATION**
3.1

**CBR VALUE AT 5.08 mm
PENETRATION**
3.1

COMMENTS

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

REPORT DATE 2025.Feb.10


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

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

 TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Ave.
 Winnipeg, MB
 R3E 3P1

 PROJECT 2025 Local Street Renewals Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 2

 DATE SAMPLED: 2025.Jan.07
 SAMPLED BY: Larry Presado

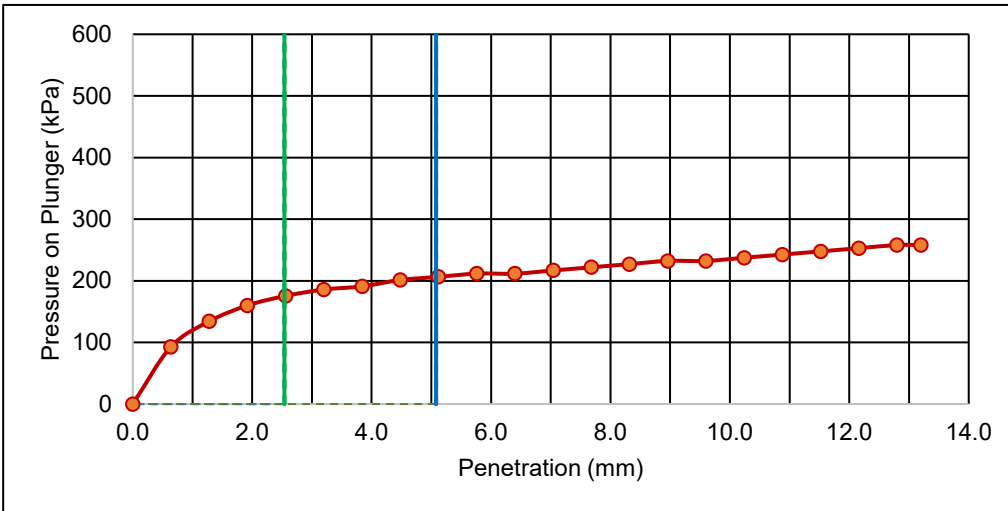
 DATE RECEIVED: 2025.Jan.07
 SUBMITTED BY: Larry Presado

 DATE TESTED: 2025.Jan.24
 TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

| | | | |
|-------------------|----------------|--------------------|----------------------------|
| MATERIAL USE | Subgrade | SUPPLIER | Existing Material |
| MAX. NOMINAL SIZE | < 4.75 mm | SOURCE | In Situ |
| MATERIAL TYPE | Fat Clay (CH) | SAMPLE LOCATION | BH-193, 1.2 m - Aikins St. |
| SPECIFICATION ID | Not Applicable | STANTEC SAMPLE NO. | 5612 |

| | | | |
|---------------------|-----------|---------------------------|------------------------|
| IMMERSION PERIOD | 96 ± 2 hr | TARGET MAX. DRY DENSITY | 1460 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 | 1385 kg/m ³ |
| SWELL OF SAMPLE | 3.12 % | AS-COMPACTED MOISTURE | 25.2 % |
| POST-TEST MOISTURE | 41.7 % | AS-COMPACTED % COMPACTION | 95 % |




**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 2025.Feb.10

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

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

 TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Ave.
 Winnipeg, MB
 R3E 3P1

 PROJECT 2025 Local Street Renewals Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 3

 DATE SAMPLED: 2025.Jan.07
 SAMPLED BY: Larry Presado

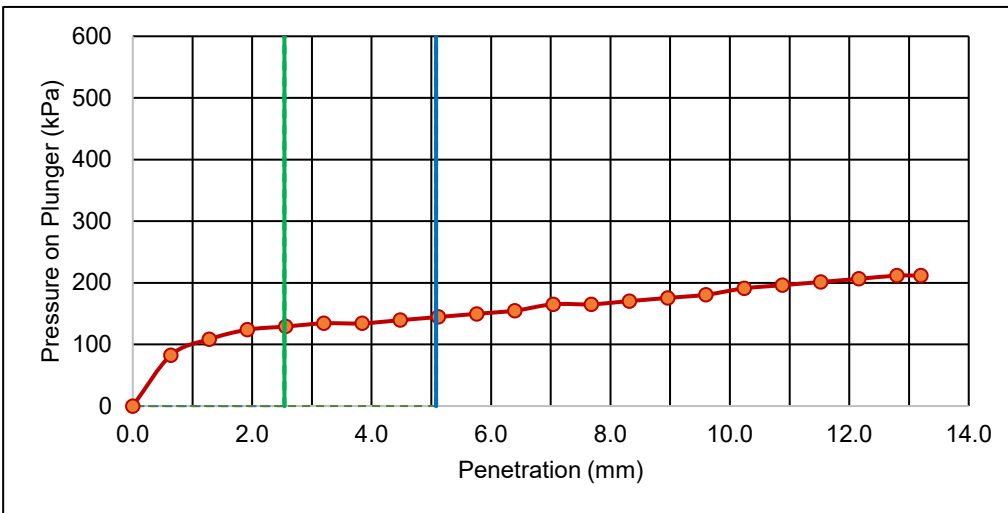
 DATE RECEIVED: 2025.Jan.07
 SUBMITTED BY: Larry Presado

 DATE TESTED: 2025.Jan.24
 TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

| | | | |
|-------------------|----------------|--------------------|----------------------------|
| MATERIAL USE | Subgrade | SUPPLIER | Existing Material |
| MAX. NOMINAL SIZE | < 4.75 mm | SOURCE | In Situ |
| MATERIAL TYPE | Fat Clay (CH) | SAMPLE LOCATION | BH-194, 1.2 m - Aikins St. |
| SPECIFICATION ID | Not Applicable | STANTEC SAMPLE NO. | 5613 |

| | | | |
|---------------------|-----------|---------------------------|------------------------|
| IMMERSION PERIOD | 96 ± 2 hr | TARGET MAX. DRY DENSITY | 1400 kg/m ³ |
| CONDITION OF SAMPLE | Soaked | TARGET OPTIMUM MOISTURE | 27.0 % |
| SURCHARGE MASS | 4.54 kg | | |
| +19 mm OVERSIZE | 0 % | AS-COMPACTED DRY DENSITY | 1330 kg/m ³ |
| SWELL OF SAMPLE | 4.30 % | AS-COMPACTED MOISTURE | 27.1 % |
| POST-TEST MOISTURE | 44.1 % | AS-COMPACTED % COMPACTION | 95 % |




| |
|---|
| CBR VALUE AT 2.54 mm PENETRATION 1.9 |
|---|

| |
|---|
| CBR VALUE AT 5.08 mm PENETRATION 1.4 |
|---|

COMMENTS

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

REPORT DATE 2025.Feb.10

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

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

 TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Ave.
 Winnipeg, MB
 R3E 3P1

 PROJECT 2025 Local Street Renewals Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 4

 DATE SAMPLED: 2025.Jan.07
 SAMPLED BY: Larry Presado

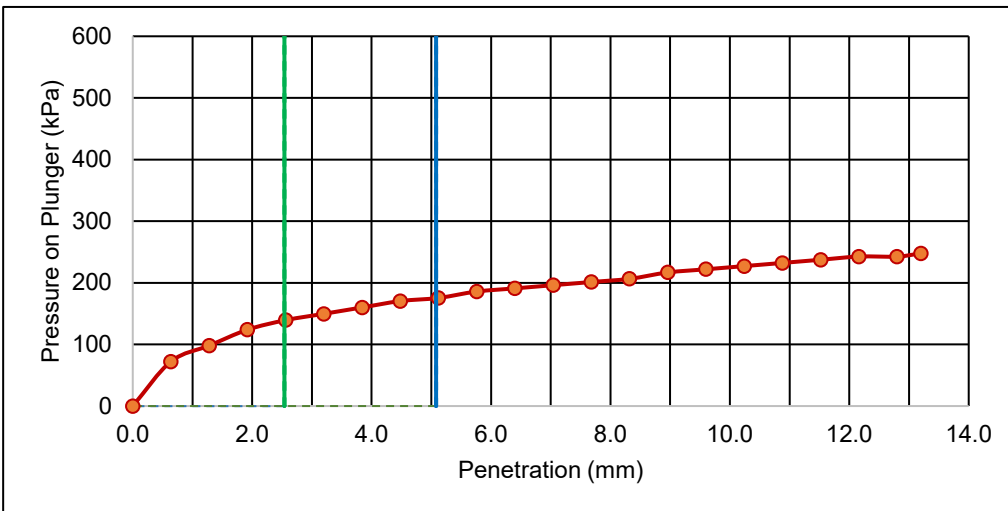
 DATE RECEIVED: 2025.Jan.07
 SUBMITTED BY: Larry Presado

 DATE TESTED: 2025.Jan.27
 TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

| | | | |
|-------------------|----------------|--------------------|------------------------------|
| MATERIAL USE | Subgrade | SUPPLIER | Existing Material |
| MAX. NOMINAL SIZE | < 4.75 mm | SOURCE | In Situ |
| MATERIAL TYPE | Fat Clay (CH) | SAMPLE LOCATION | BH-195, 1.2 m - Robinson St. |
| SPECIFICATION ID | Not Applicable | STANTEC SAMPLE NO. | 5614 |

| | | | |
|---------------------|-----------|---------------------------|------------------------|
| IMMERSION PERIOD | 96 ± 2 hr | TARGET MAX. DRY DENSITY | 1570 kg/m ³ |
| CONDITION OF SAMPLE | Soaked | TARGET OPTIMUM MOISTURE | 21.5 % |
| SURCHARGE MASS | 4.54 kg | | |
| +19 mm OVERSIZE | 0 % | AS-COMPACTED DRY DENSITY | 1490 kg/m ³ |
| SWELL OF SAMPLE | 5.34 % | AS-COMPACTED MOISTURE | 21.6 % |
| POST-TEST MOISTURE | 31.4 % | 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 2025.Feb.10

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

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

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Ave.
 Winnipeg, MB
 R3E 3P1

PROJECT 2025 Local Street Renewals Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 5

DATE SAMPLED: 2025.Jan.07
 SAMPLED BY: Larry Presado

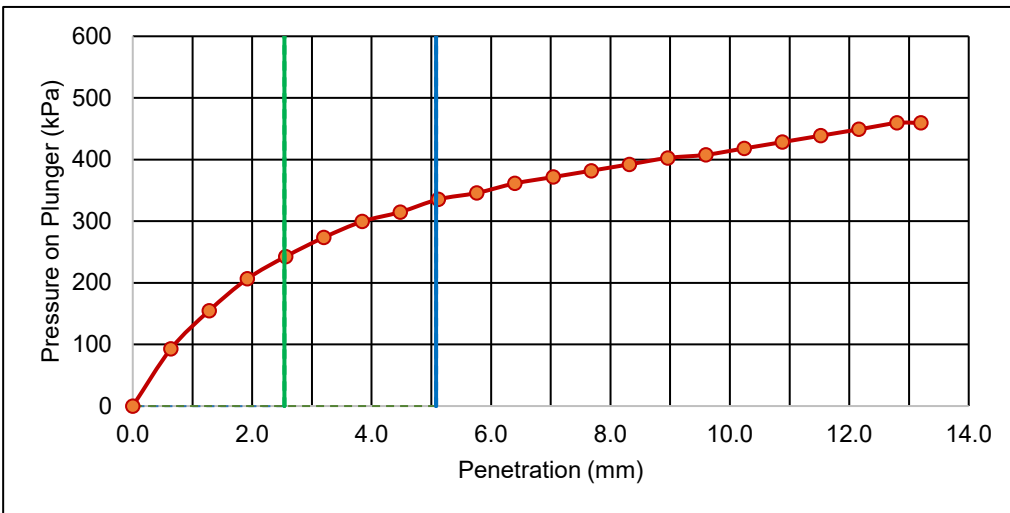
DATE RECEIVED: 2025.Jan.07
 SUBMITTED BY: Larry Presado

DATE TESTED: 2025.Jan.27
 TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

| | | | |
|-------------------|--------------------|--------------------|------------------------------|
| MATERIAL USE | Subgrade | SUPPLIER | Existing Material |
| MAX. NOMINAL SIZE | < 4.75 mm | SOURCE | In Situ |
| MATERIAL TYPE | Silty Clay (CL-ML) | SAMPLE LOCATION | BH-196, 1.0 m - Robinson St. |
| SPECIFICATION ID | Not Applicable | STANTEC SAMPLE NO. | 5615 |

| | | | |
|---------------------|-----------|---------------------------|------------------------|
| IMMERSION PERIOD | 96 ± 2 hr | TARGET MAX. DRY DENSITY | 1670 kg/m ³ |
| CONDITION OF SAMPLE | Soaked | TARGET OPTIMUM MOISTURE | 20.5 % |
| SURCHARGE MASS | 4.54 kg | | |
| +19 mm OVERSIZE | 0 % | AS-COMPACTED DRY DENSITY | 1487 kg/m ³ |
| SWELL OF SAMPLE | 2.24 % | AS-COMPACTED MOISTURE | 21.6 % |
| POST-TEST MOISTURE | 24.4 % | AS-COMPACTED % COMPACTION | 89 % |




**CBR VALUE AT 2.54 mm
PENETRATION**
3.5

**CBR VALUE AT 5.08 mm
PENETRATION**
3.3

COMMENTS

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

REPORT DATE 2025.Feb.10


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

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

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Ave.
 Winnipeg, MB
 R3E 3P1

PROJECT 2025 Local Street Renewals Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 6

DATE SAMPLED: 2025.Jan.07
 SAMPLED BY: Larry Presado

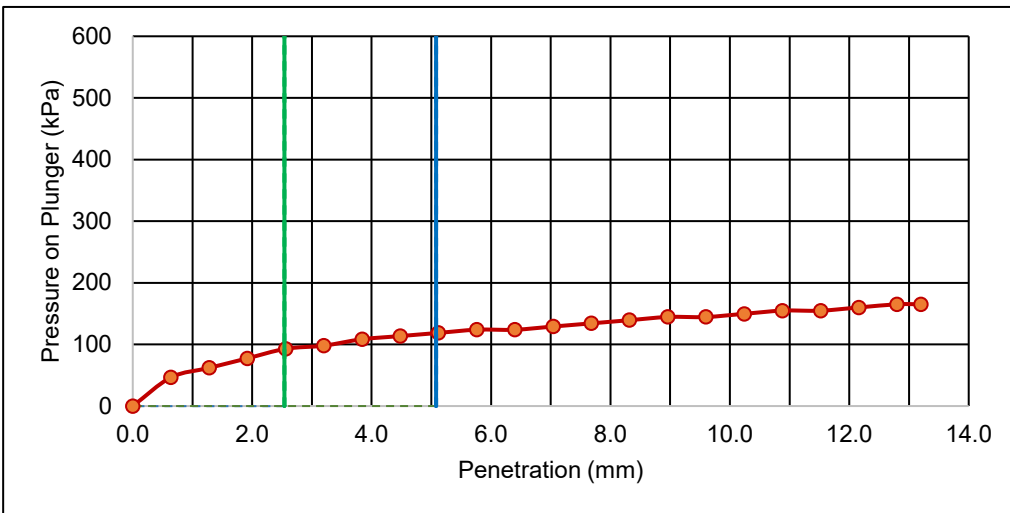
DATE RECEIVED: 2025.Jan.07
 SUBMITTED BY: Larry Presado

DATE TESTED: 2025.Jan.27
 TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

| | | | |
|-------------------|----------------|--------------------|------------------------------|
| MATERIAL USE | Subgrade | SUPPLIER | Existing Material |
| MAX. NOMINAL SIZE | < 4.75 mm | SOURCE | In Situ |
| MATERIAL TYPE | Silt (ML) | SAMPLE LOCATION | BH-197, 1.0 m - Robinson St. |
| SPECIFICATION ID | Not Applicable | STANTEC SAMPLE NO. | 5616 |

| | | | |
|---------------------|-----------|---------------------------|------------------------|
| IMMERSION PERIOD | 96 ± 2 hr | TARGET MAX. DRY DENSITY | 1570 kg/m ³ |
| CONDITION OF SAMPLE | Soaked | TARGET OPTIMUM MOISTURE | 21.5 % |
| SURCHARGE MASS | 4.54 kg | | |
| +19 mm OVERSIZE | 0 % | AS-COMPACTED DRY DENSITY | 1490 kg/m ³ |
| SWELL OF SAMPLE | 7.52 % | AS-COMPACTED MOISTURE | 21.6 % |
| POST-TEST MOISTURE | 35.6 % | AS-COMPACTED % COMPACTION | 95 % |




**CBR VALUE AT 2.54 mm
PENETRATION**
1.3

**CBR VALUE AT 5.08 mm
PENETRATION**
1.2

COMMENTS

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

REPORT DATE 2025.Feb.10


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

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

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Ave.
 Winnipeg, MB
 R3E 3P1

PROJECT 2025 Local Street Renewals Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 7

DATE SAMPLED: 2025.Jan.07
 SAMPLED BY: Larry Presado

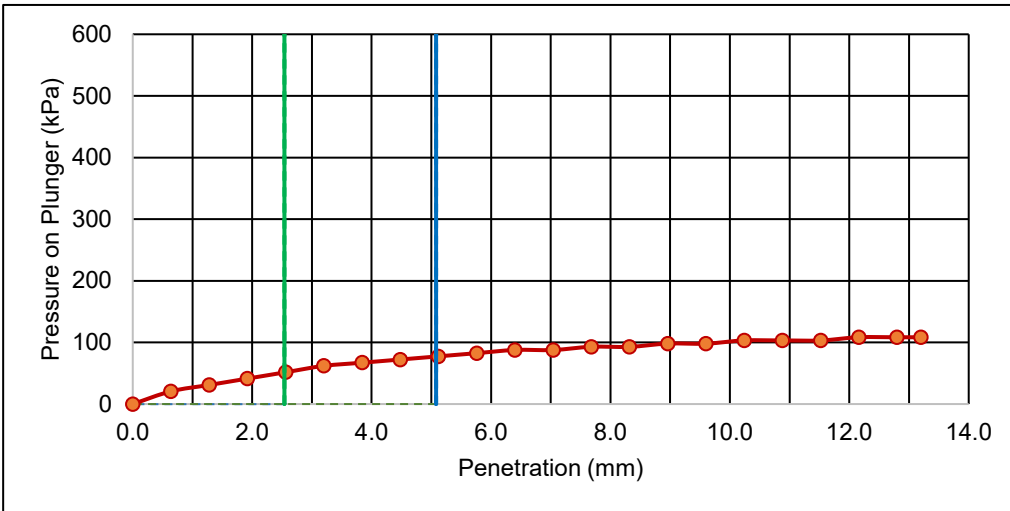
DATE RECEIVED: 2025.Jan.07
 SUBMITTED BY: Larry Presado

DATE TESTED: 2025.Jan.30
 TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

| | | | |
|-------------------|----------------|--------------------|-----------------------------|
| MATERIAL USE | Subgrade | SUPPLIER | Existing Material |
| MAX. NOMINAL SIZE | < 4.75 mm | SOURCE | In Situ |
| MATERIAL TYPE | Fat Clay (CH) | SAMPLE LOCATION | BH-198, 1.2 m - Charles St. |
| SPECIFICATION ID | Not Applicable | STANTEC SAMPLE NO. | 5617 |

| | | | |
|---------------------|-----------|---------------------------|------------------------|
| IMMERSION PERIOD | 96 ± 2 hr | TARGET MAX. DRY DENSITY | 1480 kg/m ³ |
| CONDITION OF SAMPLE | Soaked | TARGET OPTIMUM MOISTURE | 18.5 % |
| SURCHARGE MASS | 4.54 kg | | |
| +19 mm OVERSIZE | 0 % | AS-COMPACTED DRY DENSITY | 1406 kg/m ³ |
| SWELL OF SAMPLE | 9.26 % | AS-COMPACTED MOISTURE | 18.6 % |
| POST-TEST MOISTURE | 47.6 % | AS-COMPACTED % COMPACTION | 95 % |




**CBR VALUE AT 2.54 mm
PENETRATION**
0.7

**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.
 As per ASTM D1883 10.2, the sample should be re-run to confirm the higher CBR value at 5.08 mm.

REPORT DATE 2025.Feb.10


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

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

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Ave.
 Winnipeg, MB
 R3E 3P1

PROJECT 2025 Local Street Renewals Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 8

DATE SAMPLED: 2025.Jan.07
 SAMPLED BY: Larry Presado

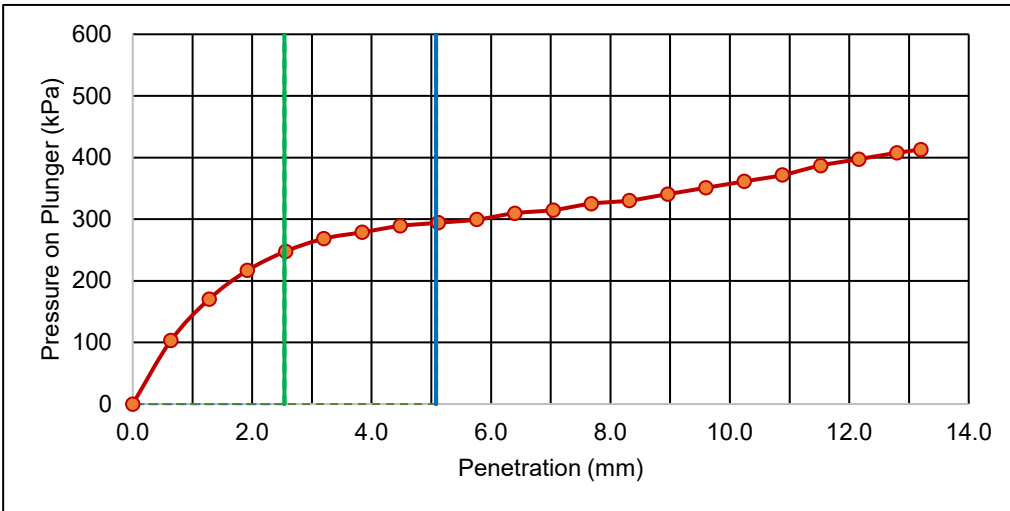
DATE RECEIVED: 2025.Jan.07
 SUBMITTED BY: Larry Presado

DATE TESTED: 2025.Jan.30
 TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

| | | | |
|-------------------|----------------|--------------------|-----------------------------|
| MATERIAL USE | Subgrade | SUPPLIER | Existing Material |
| MAX. NOMINAL SIZE | < 4.75 mm | SOURCE | In Situ |
| MATERIAL TYPE | Fat Clay (CH) | SAMPLE LOCATION | BH-199, 0.9 m - Charles St. |
| SPECIFICATION ID | Not Applicable | STANTEC SAMPLE NO. | 5618 |

| | | | |
|---------------------|-----------|---------------------------|------------------------|
| IMMERSION PERIOD | 96 ± 2 hr | TARGET MAX. DRY DENSITY | 1620 kg/m ³ |
| CONDITION OF SAMPLE | Soaked | TARGET OPTIMUM MOISTURE | 21.0 % |
| SURCHARGE MASS | 4.54 kg | | |
| +19 mm OVERSIZE | 0 % | AS-COMPACTED DRY DENSITY | 1538 kg/m ³ |
| SWELL OF SAMPLE | 2.28 % | AS-COMPACTED MOISTURE | 21.1 % |
| POST-TEST MOISTURE | 28.4 % | AS-COMPACTED % COMPACTION | 95 % |




CBR VALUE AT 2.54 mm PENETRATION
3.6

CBR VALUE AT 5.08 mm PENETRATION
2.9

COMMENTS

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

REPORT DATE 2025.Feb.10


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

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

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Ave.
 Winnipeg, MB
 R3E 3P1

PROJECT 2025 Local Street Renewals Program
 Contract 2

PROJECT NO. 123317463-2

ATTN Geoff Kerr

REPORT NO. 9

DATE SAMPLED: 2025.Jan.07
 SAMPLED BY: Larry Presado

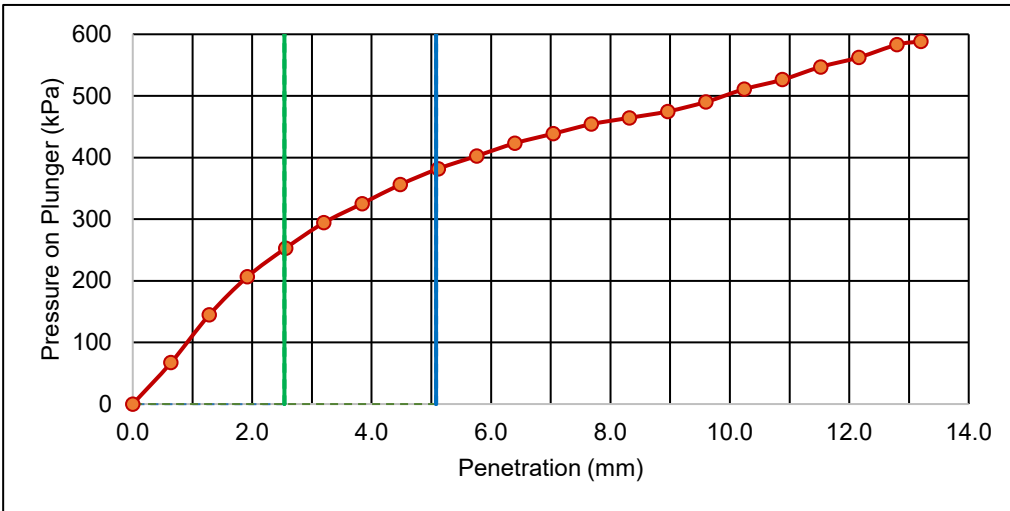
DATE RECEIVED: 2025.Jan.07
 SUBMITTED BY: Larry Presado

DATE TESTED: 2025.Jan.30
 TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

| | | | |
|-------------------|----------------|--------------------|-----------------------------|
| MATERIAL USE | Subgrade | SUPPLIER | Existing Material |
| MAX. NOMINAL SIZE | < 4.75 mm | SOURCE | In Situ |
| MATERIAL TYPE | Fat Clay (CH) | SAMPLE LOCATION | BH-200, 1.1 m - Charles St. |
| SPECIFICATION ID | Not Applicable | STANTEC SAMPLE NO. | 5619 |

| | | | |
|---------------------|-----------|---------------------------|------------------------|
| IMMERSION PERIOD | 96 ± 2 hr | TARGET MAX. DRY DENSITY | 1780 kg/m ³ |
| CONDITION OF SAMPLE | Soaked | TARGET OPTIMUM MOISTURE | 17.0 % |
| SURCHARGE MASS | 4.54 kg | | |
| +19 mm OVERSIZE | 0 % | AS-COMPACTED DRY DENSITY | 1691 kg/m ³ |
| SWELL OF SAMPLE | 1.64 % | AS-COMPACTED MOISTURE | 17.0 % |
| POST-TEST MOISTURE | 23.8 % | AS-COMPACTED % COMPACTION | 95 % |




**CBR VALUE AT 2.54 mm
PENETRATION**
3.6

**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.
 As per ASTM D1883 10.2, the sample should be re-run to confirm the higher CBR value at 5.08 mm.

REPORT DATE 2025.Feb.10


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

| Core No. | Street | Diameter (mm) | Length (mm) | L/D Ratio | Correction Factor | Peak Load (kN) | Compressive Strength (MPa) | |
|----------|--------------|---|-------------|-----------|-------------------|----------------|----------------------------|-----------|
| | | | | | | | Measured | Corrected |
| 201 | Radford St | 75.85 | 147.12 | 1.940 | 0.9952 | 199.49 | 44.15 | 43.94 |
| 202 | Radford St | 75.63 | 159.76 | 2.112 | 1.0000 | 198.20 | 44.12 | 44.12 |
| 203 | Battery St | 75.61 | 161.73 | 2.139 | 1.0000 | 189.97 | 42.31 | 42.31 |
| 204 | Battery St | 75.56 | 141.25 | 1.869 | 0.9895 | 228.94 | 51.06 | 50.52 |
| 205 | Mountain Ave | <i>Crumbly/fractured core; test cancelled</i> | | | | | | |
| 206 | Mountain Ave | 75.46 | 106.62 | 1.413 | 0.9496 | 243.26 | 54.39 | 51.65 |
| 207 | Mountain Ave | 75.66 | 67.13 | 0.887 | 0.8289 | 321.23 | 71.45 | 59.22 |
| 208 | Mountain Ave | 75.65 | 90.82 | 1.201 | 0.9182 | 194.64 | 43.30 | 39.76 |
| 209 | Mountain Ave | 75.65 | 181.50 | 2.399 | 1.0000 | 194.60 | 43.29 | 43.29 |
| 210 | Mountain Ave | 75.61 | 88.10 | 1.165 | 0.9096 | 234.50 | 52.23 | 47.51 |



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

January 23, 2026

Project/File: 123317987

Erik Hansen
City of Winnipeg
1155 Pacific Avenue
Winnipeg, MB R3E 3P1

Good day Erik,

Reference: 2026 Local Street Renewal Program (Contract 1) - Geotechnical Investigation

Stantec Consulting Ltd. (Stantec) was retained to undertake a factual geotechnical investigation for the 2026 Local Street Renewal Program (Contract 1) in Winnipeg, Manitoba. Use of this report is subject to the Statement of General Conditions provided in **Appendix A**.

A coring and drilling program was conducted from December 3 to December 16, 2025. A total of 10 locations were investigated with pavement coring and/or subsurface geotechnical drilling. Pavement coring was performed by Stantec's geotechnical field technologist, and drilling services were provided by Paddock Drilling Ltd. under the supervision of Stantec's technologist. A Borehole Location Plan is provided in **Appendix B**.

1. Pavement Coring

A total of 10 pavement core samples were recovered to determine the in-place pavement thickness. In addition, 8 concrete core samples were tested to assess the in-place compressive strength of the concrete. The existing pavement thicknesses are summarized in **Table 1** below, and core photographs are provided in **Appendix C**.

2. Geotechnical Drilling

A total of 2 boreholes were investigated by geotechnical drilling. The boreholes were terminated at a depth of 2.0 m below the pavement, which resulted in borehole depths of 2.1 m. 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. The testholes were examined for evidence of sloughing and groundwater seepage upon completion of drilling.

Reference: 2026 Local Street Renewal Program (Contract 1) - Geotechnical Investigation

The borehole records are provided in **Appendix D**. 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)*.

3. Pavement Thicknesses

The existing pavement thicknesses are provided in the following table:

Table 1 – Pavement Thicknesses

| Borehole No. | Street | Asphalt (mm) | Concrete (mm) | Total (mm) |
|--------------|------------|---------------------------|---------------|------------|
| 71 | Jarvis Ave | 0 | 210 | 210 |
| 72 | | 0 | 220 | 220 |
| 73 | | 0 | 210 | 210 |
| 74 | | 0 | 220 | 220 |
| 75 | | 0 | 195 | 195 |
| 76 | | 0 | 195 | 195 |
| 77 | | 0 | 230 | 230 |
| 78 | | 0 | 210 | 210 |
| 79 | | Alley (Dowker/Pembina) | 50 | 0 |
| 80 | 85 | | 0 | 85 |

4. Laboratory Testing

Laboratory determination of moisture content (ASTM D2216) was conducted on all soil samples. The results are provided on the attached borehole records.

In addition, the following laboratory tests were conducted on select samples:

- 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 on test specimens compacted to 95% of the maximum dry density under soaked conditions.

Prior to compressive strength testing, the concrete core samples were conditioned in water at room temperature for 48 hours.

Reference: 2026 Local Street Renewal Program (Contract 1) - Geotechnical Investigation

The laboratory test reports are provided in **Appendix E**.

5. Closure

Please contact the undersigned if you have any questions regarding this report.

Regards,

Stantec Consulting Ltd.



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



Jason Thompson C.E.T.
Principal – Manager, Materials Testing Services
Manitoba & Northwestern Ontario Operations
Phone: 204-928-4004
Mobile: 204-898-8290
jason.thompson@stantec.com

Attachment: Appendix A – Statement of General Conditions
Appendix B – Borehole Location Plan
Appendix C – Core Photographs
Appendix D – Borehole Records
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.

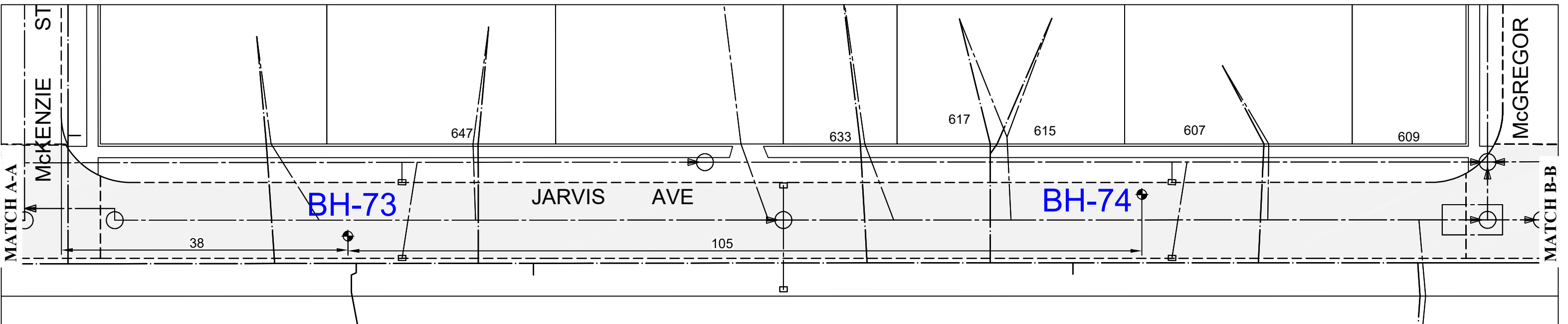
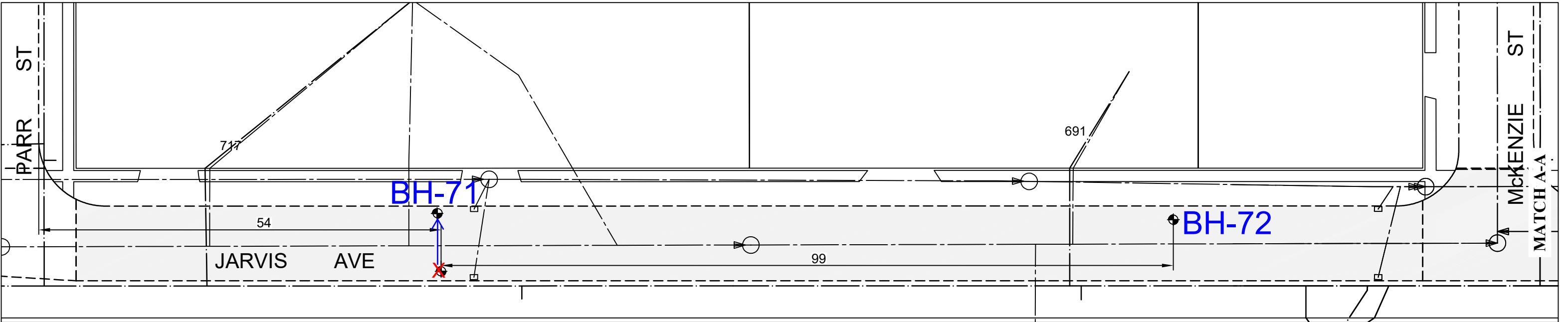
VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments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

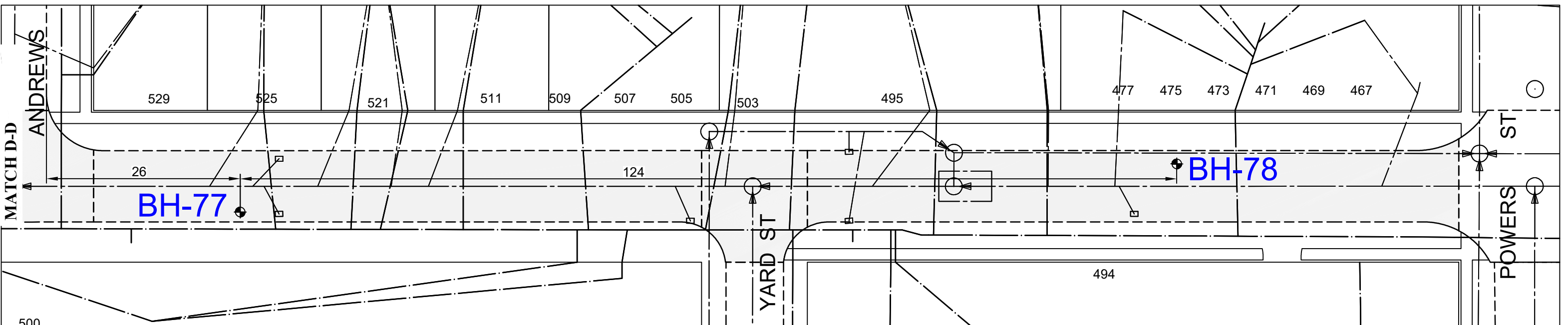
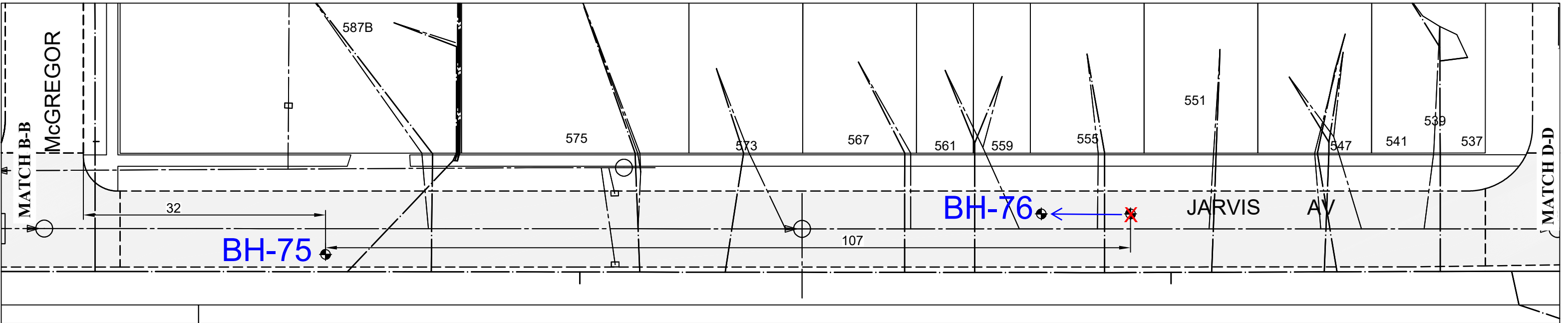


Appendix B

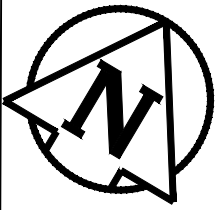
Borehole Location Plan



| | | | | | | |
|--|---------------------|---|------------------|------------------|--|--|
| | LDS/WWS | NOTE - JARVIS - 8 PAVEMENT CORES, MIN 2 MID SLAB | | | | 2026 LOCAL STREET RENEWAL PROGRAM CORING DRAWING - CONTRACT 1 |
| | WATERMAIN | | | | | |
| TESTHOLE | DATE: 10/07/2025 | DRAWING NO.: 1 of 2 | DRAWN BY: K.D | SCALE: N.T.S. | EXACT LOCATIONS OF TEST HOLES TO BE MARKED IN FIELD BY CONTRACT ADMINISTRATOR. | |
| JARVIS AVE FROM PARR TO MCKENZIE ST - TBO JARVIS AVE FROM MCKENZIE TO MCGREGOR ST - MINOR/MAJOR REHAB | | | | | | |



| | | | | | | | |
|--|---|------------------------|------------------|--|--|--|--|
| | NOTE - JARVIS - 8 PAVEMENT CORES, MIN 2 MID SLAB | | | | 2026 LOCAL STREET RENEWAL PROGRAM CORING DRAWING - CONTRACT 1 | | |
| | DATE: 10/07/2025 | DRAWING NO.: 2 of 2 | DRAWN BY: K.D | SCALE: N.T.S. | EXACT LOCATIONS OF TEST HOLES TO BE MARKED IN FIELD BY CONTRACT ADMINISTRATOR. | | |
| | | | | JARVIS AVE FROM McGREGOR TO ANDREWS - MINOR REHAB JARVIS AVE FROM ANDREWS TO POWERS - MAJOR REHAB | | | |



BH-80

50.00

1350

BH-79

1360

00.68

1382

975

PEMBINA HWY

DOWKER AV

LDS/WWS
WATERMAIN
TESTHOLE

NOTE-

- DOWKER ALLEY- ALL FULL DEPTH GEOTECHNICAL CORES- DEPTH 2.0m
- FOLLOW TABLE 2- BOREHOLES TESTING FREQUENCY

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

2026 LOCAL STREET RENEWAL PROGRAM CORING DRAWING - CONTRACT 1

10/21/2025

1 of 1

DRAWN BY:
J.W.

SCALE:
NTS

DOWKER ALLEY FROM DOWKER AV TO PEMBINA HWY -
RECONSTRUCTION

Appendix C

Core Photographs



Figure 1 – BH-71 – Jarvis Ave



Figure 2 – BH-72 – Jarvis Ave



Figure 3 – BH-73 – Jarvis Ave



Figure 4 – BH-74 – Jarvis Ave



Figure 5 – BH-75 – Jarvis Ave



Figure 6 – BH-76 – Jarvis Ave



Figure 7 – BH-77 – Jarvis Ave



Figure 8 – BH-78 – Jarvis Ave



Figure 9 – BH-79 – Alley (Dowker/Pembina)



Figure 10 – BH-80 – Alley (Dowker/Pembina)

Appendix D

Borehole Records

CLIENT: City of Winnipeg

 PROJECT NO.: 123317987

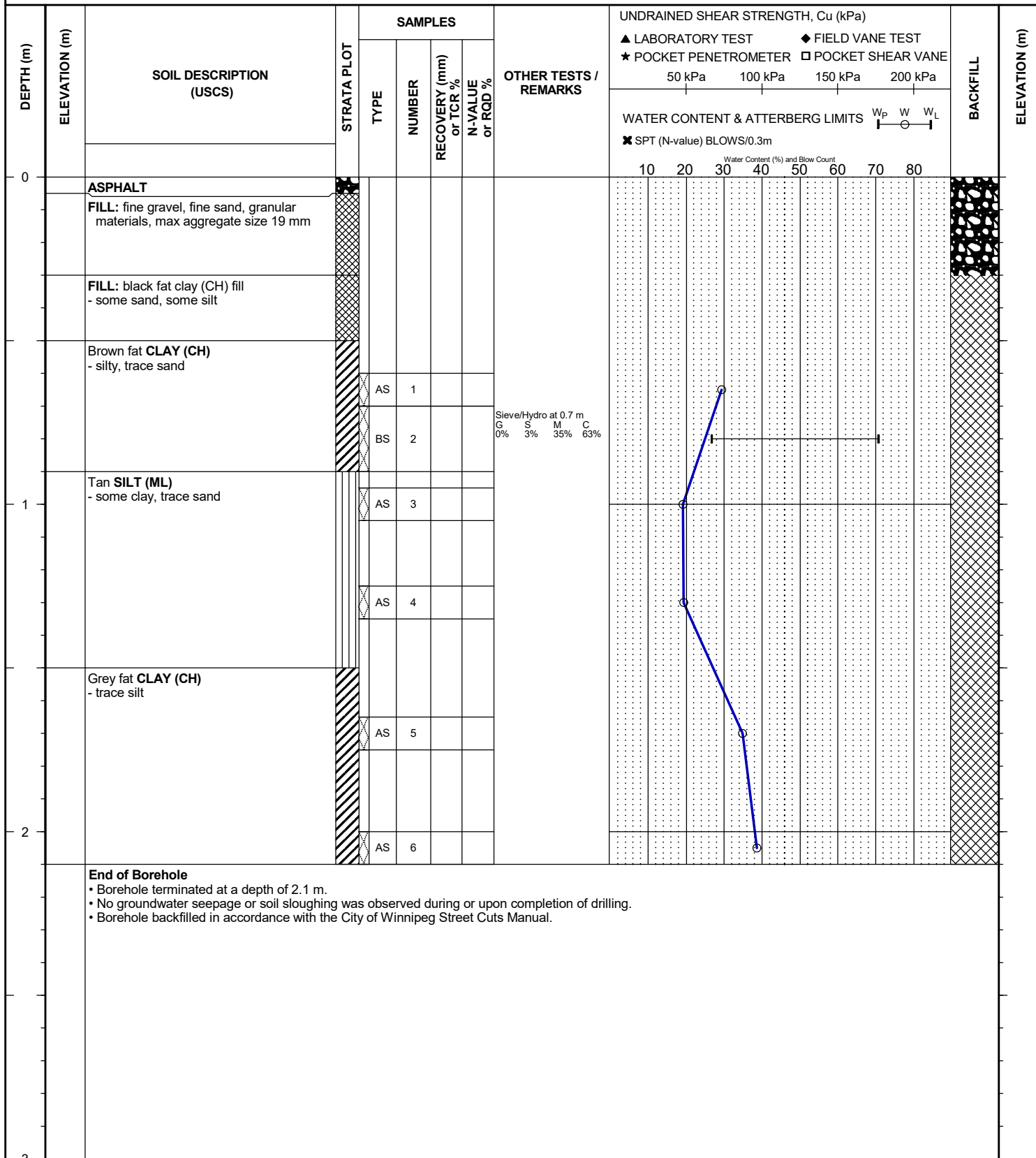
 PROJECT: 2026 Local Street Renewal Program – Contract 1

 BH ELEVATION: N/A

 LOCATION: Alley (Dowker St/Pembina Hwy)

 DATUM: N/A

 DATE BORED: December 03 2025

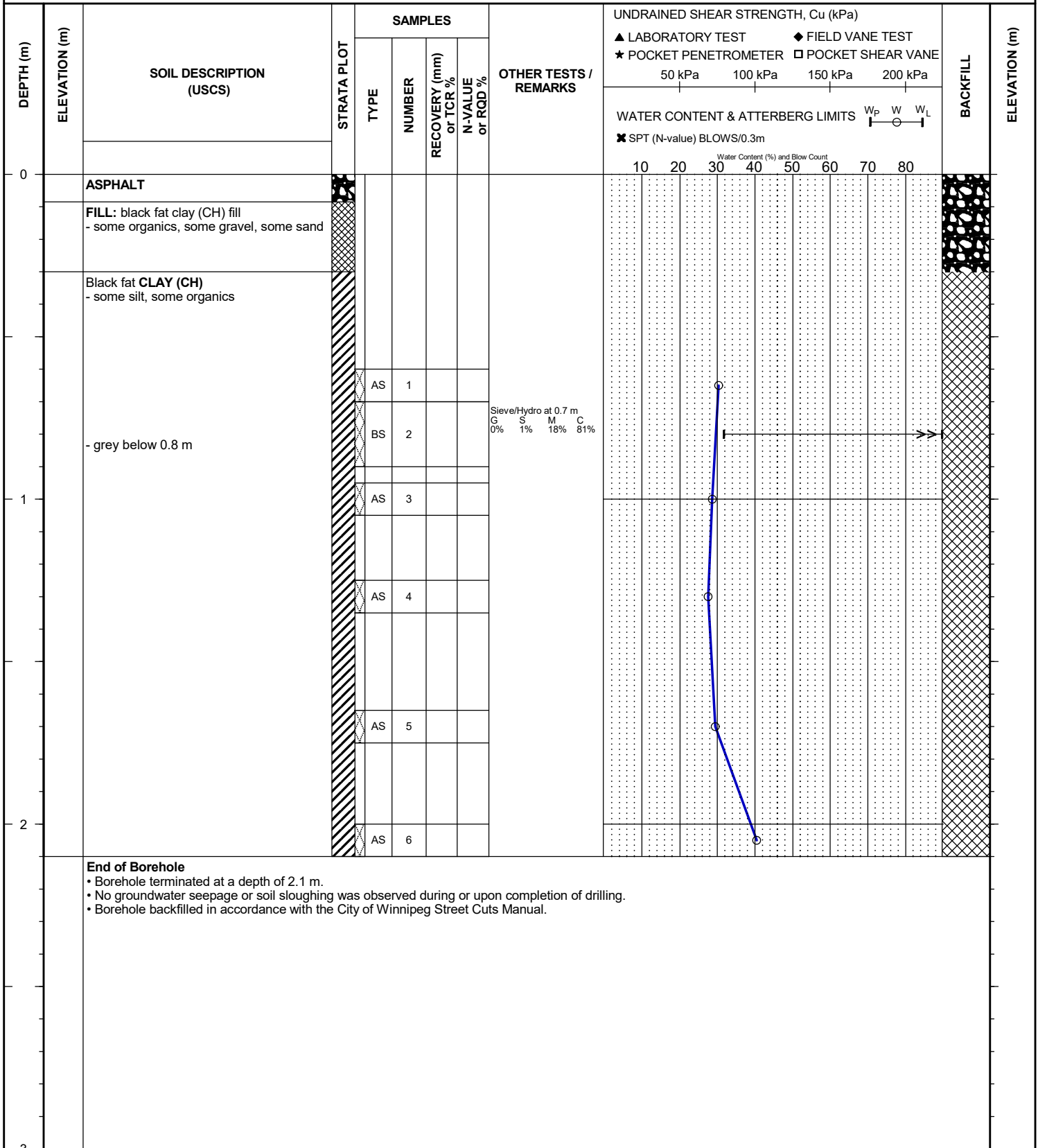
 WATER LEVEL: N/A


Printed Jan 23 2026 14:39:51 SOIL_123317987.GPJ 1/23/26

CLIENT: City of Winnipeg
 PROJECT: 2026 Local Street Renewal Program – Contract 1
 LOCATION: Alley (Dowker St/Pembina Hwy)
 DATE BORED: December 03 2025

PROJECT NO.: 123317987
 BH ELEVATION: N/A
 DATUM: N/A

WATER LEVEL: N/A



BACKFILL SYMBOL: ASPHALT GROUT CONCRETE
 BENTONITE DRILL CUTTINGS SAND SLOUGH

Drilling Contractor: Paddock Drilling Ltd. Logged By: BM
 Drilling Method: 125 mm SSA Reviewed By: GB
 Completion Depth: 2.1 m Page 1 of 1

Appendix E

Laboratory Test Reports

Table 2 – Core Compressive Strength Test Results

| Core No. | Street | Diameter (mm) | Length (mm) | L/D Ratio | Correction Factor | Peak Load (kN) | Compressive Strength (MPa) | |
|----------|-----------|---------------|-------------|-----------|-------------------|----------------|----------------------------|-----------|
| | | | | | | | Measured | Corrected |
| 71 | Jarvis St | 75.15 | 147.25 | 1.959 | 0.9967 | 140.33 | 31.64 | 31.53 |
| 72 | Jarvis St | 75.05 | 169.34 | 2.256 | 1.0000 | 159.15 | 35.98 | 35.98 |
| 73 | Jarvis St | 74.94 | 187.04 | 2.496 | 1.0000 | 217.15 | 49.23 | 49.23 |
| 74 | Jarvis St | 74.75 | 186.26 | 2.492 | 1.0000 | 178.77 | 40.74 | 40.74 |
| 75 | Jarvis St | 74.70 | 179.67 | 2.405 | 1.0000 | 245.00 | 55.90 | 55.90 |
| 76 | Jarvis St | 75.13 | 115.86 | 1.542 | 0.9634 | 260.47 | 58.75 | 56.60 |
| 77 | Jarvis St | 74.10 | 136.10 | 1.837 | 0.9870 | 192.42 | 44.62 | 44.04 |
| 78 | Jarvis St | 75.06 | 104.70 | 1.395 | 0.9474 | 201.81 | 45.61 | 43.21 |

ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Ave.
 Winnipeg, Manitoba
 R3E 3P1

PROJECT 2026 Local Street Renewal Program - Contract 1

PROJECT NO. 123317987

ATTN Erik Hansen

REPORT NO. 1

DATE SAMPLED: 2025.Dec.03

DATE RECEIVED: 2025.Dec.03

DATE TESTED: 2025.Dec.17

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Brent McAughey

MATERIAL IDENTIFICATION

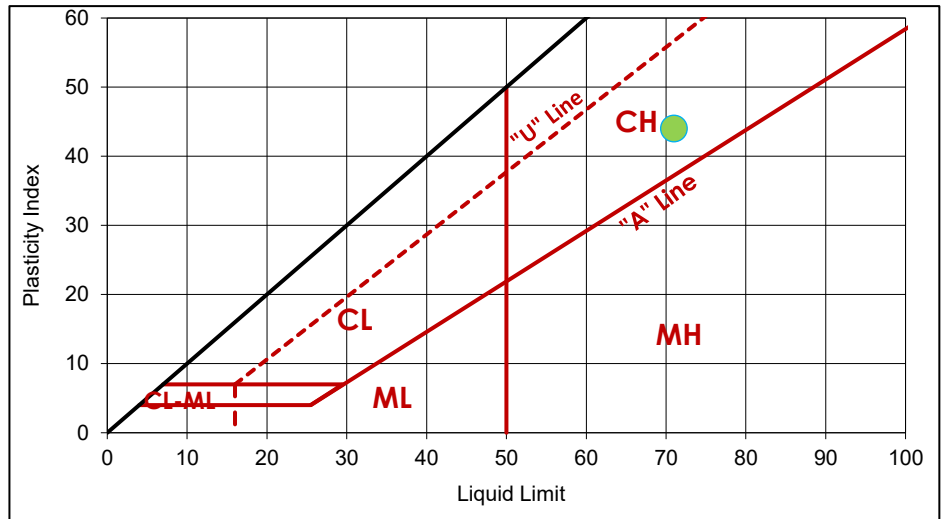
CLIENT FIELD ID BH-79, 0.7 m

STANTEC SAMPLE NO. 2649

| | LIQUID LIMIT | |
|--------|--------------|----|
| TRIAL | 1 | 2 |
| BLOWS | 22 | 22 |
| MC (%) | 72 | 72 |


| | PLASTIC LIMIT | |
|--------|---------------|----|
| TRIAL | 1 | 2 |
| MC (%) | 27 | 27 |

| | |
|----------------------|------|
| LIQUID LIMIT, LL | 72 |
| PLASTIC LIMIT, PL | 27 |
| PLASTICITY INDEX, PI | 45 |
| AS REC'D MC (%) | 29.9 |



COMMENTS
 No comments.

REPORT DATE 2026.Jan.09


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

ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Ave.
 Winnipeg, Manitoba
 R3E 3P1

PROJECT 2026 Local Street Renewal Program - Contract 1

PROJECT NO. 123317987

ATTN Erik Hansen

REPORT NO. 2

DATE SAMPLED: 2025.Dec.03

DATE RECEIVED: 2025.Dec.03

DATE TESTED: 2025.Dec.17

SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Brent McAughey

MATERIAL IDENTIFICATION

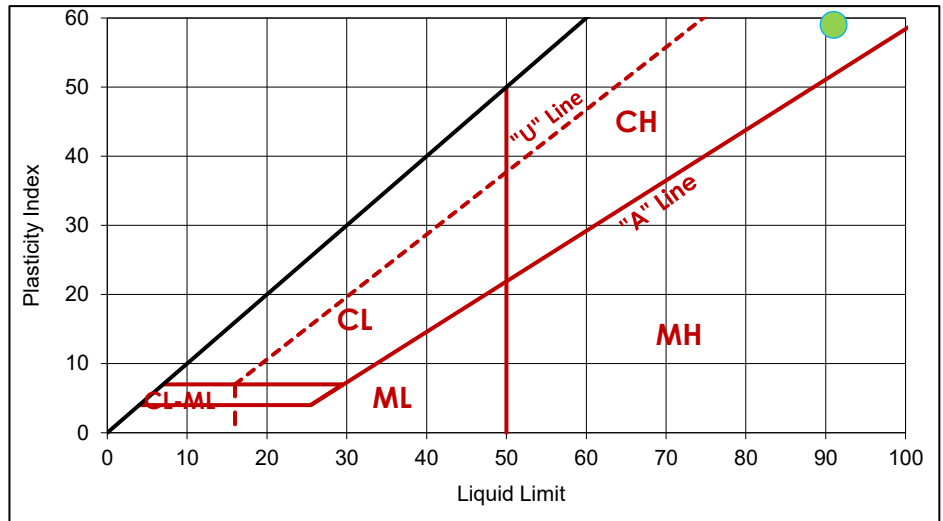
CLIENT FIELD ID BH-80, 0.7 m

STANTEC SAMPLE NO. 2650

| | LIQUID LIMIT | |
|--------|--------------|----|
| TRIAL | 1 | 2 |
| BLOWS | 24 | 23 |
| MC (%) | 92 | 92 |


| | PLASTIC LIMIT | |
|--------|---------------|----|
| TRIAL | 1 | 2 |
| MC (%) | 32 | 32 |

| | |
|----------------------|------|
| LIQUID LIMIT, LL | 91 |
| PLASTIC LIMIT, PL | 32 |
| PLASTICITY INDEX, PI | 59 |
| AS REC'D MC (%) | 30.9 |



COMMENTS
 No comments.

REPORT DATE 2026.Jan.09


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

ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Ave.
 Winnipeg, Manitoba
 R3E 3P1

PROJECT 2026 Local Street Renewal Program - Contract 1

PROJECT NO. 123317987

ATTN Erik Hansen

REPORT NO. 1

DATE SAMPLED: 2025.Dec.03

DATE RECEIVED: 2025.Dec.03

DATE TESTED: 2025.Dec.19

SAMPLED BY: Stantec Consulting Ltd.

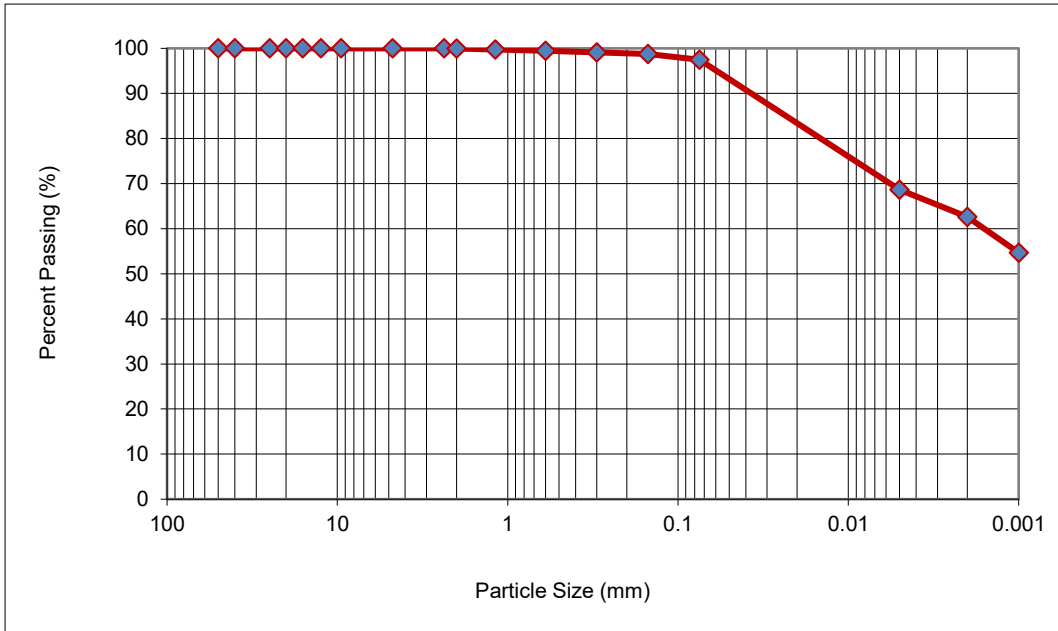
SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Madison Murphy

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-79, 0.7 m

STANTEC SAMPLE NO. 2649




| Sieve Size (mm) | % Passing |
|-----------------|-----------|
| 50.0 | 100.0 |
| 40.0 | 100.0 |
| 25.0 | 100.0 |
| 20.0 | 100.0 |
| 16.0 | 100.0 |
| 12.5 | 100.0 |
| 9.5 | 100.0 |
| 4.75 | 100.0 |
| 2.36 | 100.0 |
| 2.00 | 100.0 |
| 1.18 | 99.8 |
| 0.600 | 99.4 |
| 0.300 | 99.1 |
| 0.150 | 98.8 |
| 0.075 | 97.5 |
| 0.005 | 68.7 |
| 0.002 | 62.6 |
| 0.001 | 54.7 |

| Gravel | Sand | | | Silt | Clay | Colloids |
|--------|--------|--------|------|------|------|----------|
| | Coarse | Medium | Fine | | | |
| 0.0 | 0.0 | 0.8 | 1.7 | 34.9 | 62.6 | 54.7 |

COMMENTS
 No comments.

REPORT DATE 2026.Jan.02

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.

ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Dept.
 104 - 1155 Pacific Ave.
 Winnipeg, Manitoba
 R3E 3P1

PROJECT 2026 Local Street Renewal Program - Contract 1

PROJECT NO. 123317987

ATTN Erik Hansen

REPORT NO. 2

DATE SAMPLED: 2025.Dec.03

DATE RECEIVED: 2025.Dec.03

DATE TESTED: 2025.Dec.19

SAMPLED BY: Stantec Consulting Ltd.

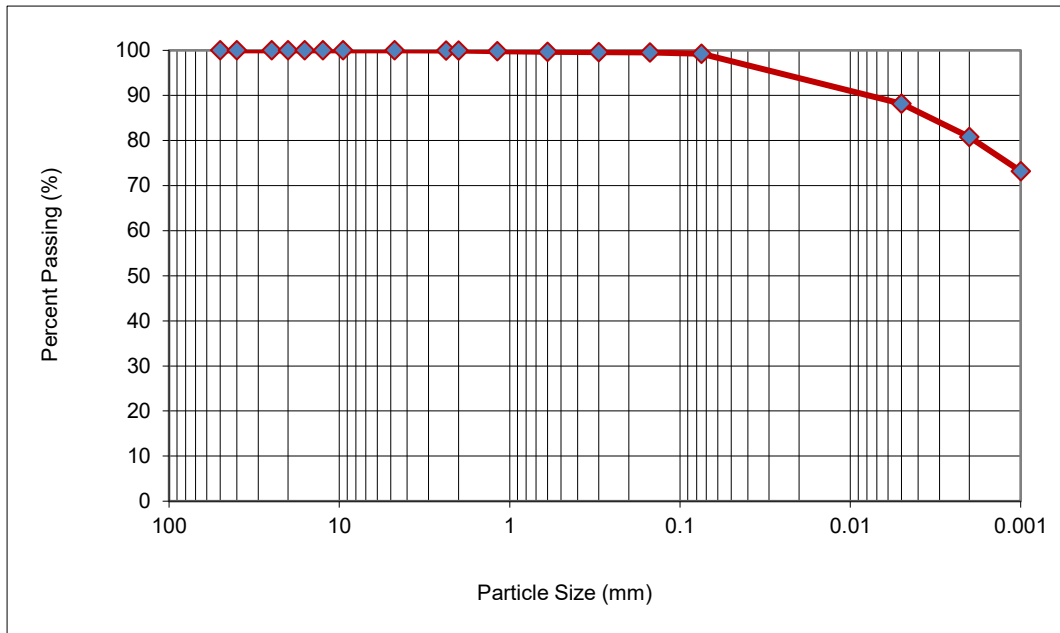
SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Madison Murphy

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-80, 0.7 m

STANTEC SAMPLE NO. 2650




| Sieve Size (mm) | % Passing |
|-----------------|-----------|
| 50.0 | 100.0 |
| 40.0 | 100.0 |
| 25.0 | 100.0 |
| 20.0 | 100.0 |
| 16.0 | 100.0 |
| 12.5 | 100.0 |
| 9.5 | 100.0 |
| 4.75 | 100.0 |
| 2.36 | 100.0 |
| 2.00 | 100.0 |
| 1.18 | 99.8 |
| 0.600 | 99.7 |
| 0.300 | 99.6 |
| 0.150 | 99.5 |
| 0.075 | 99.2 |
| 0.005 | 88.2 |
| 0.002 | 80.8 |
| 0.001 | 73.2 |

| Gravel | Sand | | | Silt | Clay | Colloids |
|--------|--------|--------|------|------|------|----------|
| | Coarse | Medium | Fine | | | |
| 0.0 | 0.0 | 0.4 | 0.4 | 18.4 | 80.8 | 73.2 |

COMMENTS
 No comments.

REPORT DATE 2026.Jan.02

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

PROCTOR TEST REPORT

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

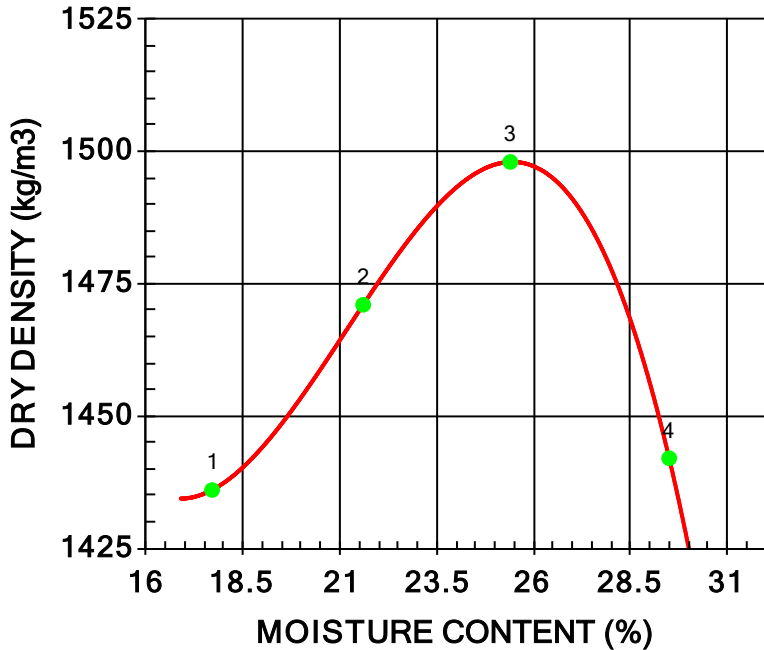
CLIENT City of Winnipeg
 C.C. City of Winnipeg

ATTN: Erik Hansen

PROJECT 2026 Local Street Renewal Program - Contract 1

PROJECT NO. 123317987-1 - Contract 1
 PROCTOR NO. 1 DATE SAMPLED 2025.Dec.03 DATE RECEIVED 2025.Dec.08 DATE TESTED 2025.Dec.11

| | | | |
|-------------------------|--------------------------|----------------------------|------------------------------------|
| INSITU MOISTURE | 37.6 % | COMPACTION STANDARD | Standard Proctor, ASTM |
| TESTED BY | Donald Eliazar | | D698 |
| MATERIAL IDENTIFICATION | | COMPACTION PROCEDURE | A: 101.6mm Mold, Passing 4.75mm |
| MAJOR COMPONENT | Subgrade | RAMMER TYPE | Manual |
| SIZE | | PREPARATION | Moist |
| DESCRIPTION | Fat Clay (CH) | OVERSIZE CORRECTION METHOD | None |
| SUPPLIER | Existing Materials | RETAINED 4.75mm SCREEN | N/A % |
| SOURCE | BH-79, 0.7 m below grade | | |



| TRIAL NUMBER | WET DENSITY (kg/m³) | DRY DENSITY (kg/m³) | MOISTURE CONTENT (%) |
|--------------|---------------------|---------------------|----------------------|
| 1 | 1690 | 1436 | 17.7 |
| 2 | 1789 | 1471 | 21.6 |
| 3 | 1878 | 1498 | 25.4 |
| 4 | 1867 | 1442 | 29.5 |

| | MAXIMUM DRY DENSITY (kg/m³) | OPTIMUM MOISTURE CONTENT (%) |
|--------------------|-----------------------------|------------------------------|
| CALCULATED | 1500 | 25.5 |
| OVERSIZE CORRECTED | | |

COMMENTS

Stantec Sample No. 2649.



Jason Thompson, C.E.T.

PROCTOR TEST REPORT

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

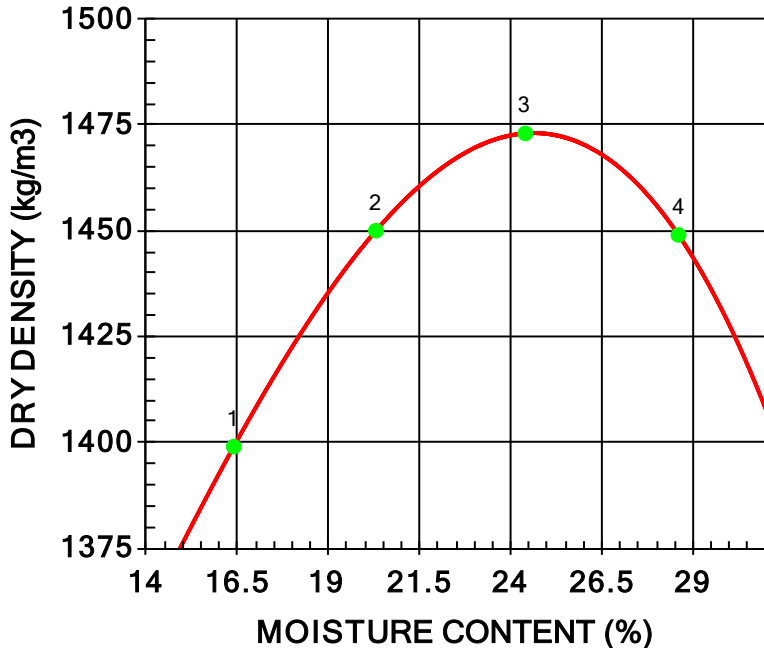
CLIENT City of Winnipeg
 C.C. City of Winnipeg

ATTN: Erik Hansen

PROJECT 2026 Local Street Renewal Program - Contract 1

PROJECT NO. 123317987-1 - Contract 1
 PROCTOR NO. 2 DATE SAMPLED 2025.Dec.03 DATE RECEIVED 2025.Dec.08 DATE TESTED 2025.Dec.11

| | | | |
|-------------------------|--------------------------|----------------------------|------------------------------------|
| INSITU MOISTURE | 31.7 % | COMPACTION STANDARD | Standard Proctor, ASTM |
| TESTED BY | Donald Eliazar | | D698 |
| MATERIAL IDENTIFICATION | | COMPACTION PROCEDURE | A: 101.6mm Mold, Passing 4.75mm |
| MAJOR COMPONENT | Subgrade | RAMMER TYPE | Manual |
| SIZE | | PREPARATION | Moist |
| DESCRIPTION | Fat Clay (CH) | OVERSIZE CORRECTION METHOD | None |
| SUPPLIER | Existing Materials | RETAINED 4.75mm SCREEN | N/A % |
| SOURCE | BH-80, 0.7 m below grade | | |



| TRIAL NUMBER | WET DENSITY (kg/m³) | DRY DENSITY (kg/m³) | MOISTURE CONTENT (%) |
|--------------|---------------------|---------------------|----------------------|
| 1 | 1629 | 1399 | 16.4 |
| 2 | 1744 | 1450 | 20.3 |
| 3 | 1832 | 1473 | 24.4 |
| 4 | 1863 | 1449 | 28.6 |

| | MAXIMUM DRY DENSITY (kg/m³) | OPTIMUM MOISTURE CONTENT (%) |
|--------------------|-----------------------------|------------------------------|
| CALCULATED | 1470 | 24.5 |
| OVERSIZE CORRECTED | | |

COMMENTS

Stantec Sample No. 2650.

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

TO City of Winnipeg
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2026 Local Street Renewal Program - Contract 1

PROJECT NO. 123317987-1

ATTN Erik Hansen

REPORT NO. 1

DATE SAMPLED: 2025.Dec.03

DATE RECEIVED: 2025.Dec.03

DATE TESTED: 2025.Dec.15

SAMPLED BY: Stantec Consulting Ltd.

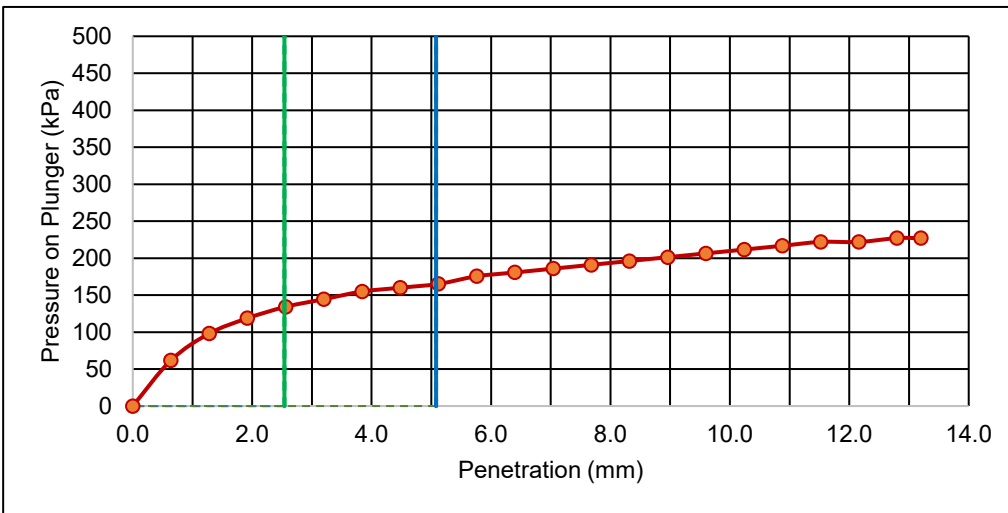
SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

| | | | |
|-------------------|----------------|--------------------|-------------------|
| MATERIAL USE | Subgrade | SUPPLIER | Existing Material |
| MAX. NOMINAL SIZE | < 4.75 mm | SOURCE | Bore hole |
| MATERIAL TYPE | Fat Clay (CH) | SAMPLE LOCATION | BH-79, 0.7 m |
| SPECIFICATION ID | Not Applicable | STANTEC SAMPLE NO. | 2649 |

| | | | |
|---------------------|-----------|---------------------------|------------------------|
| IMMERSION PERIOD | 96 ± 2 hr | TARGET MAX. DRY DENSITY | 1500 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 | 1426 kg/m ³ |
| SWELL OF SAMPLE | 5.93 % | AS-COMPACTED MOISTURE | 25.4 % |
| POST-TEST MOISTURE | 42.5 % | AS-COMPACTED % COMPACTION | 95 % |




CBR VALUE AT 2.54 mm PENETRATION
1.9

CBR VALUE AT 5.08 mm PENETRATION
1.6

COMMENTS

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

REPORT DATE 2025.Dec.22


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

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

TO City of Winnipeg
 104 - 1155 Pacific Avenue
 Winnipeg, Manitoba
 R3E 2P1

PROJECT 2026 Local Street Renewal Program - Contract 1

PROJECT NO. 123317987-1

ATTN Erik Hansen

REPORT NO. 2

DATE SAMPLED: 2025.Dec.03

DATE RECEIVED: 2025.Dec.03

DATE TESTED: 2025.Dec.15

SAMPLED BY: Stantec Consulting Ltd.

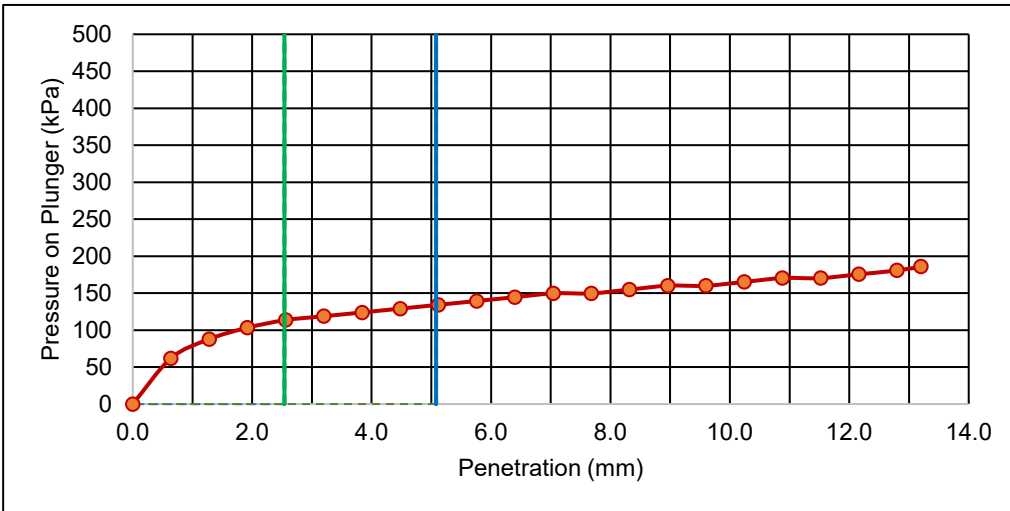
SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

| | | | |
|-------------------|----------------|--------------------|-------------------|
| MATERIAL USE | Subgrade | SUPPLIER | Existing Material |
| MAX. NOMINAL SIZE | < 4.75 mm | SOURCE | Bore hole |
| MATERIAL TYPE | Fat Clay (CH) | SAMPLE LOCATION | BH-80, 0.7 m |
| SPECIFICATION ID | Not Applicable | STANTEC SAMPLE NO. | 2650 |

| | | | |
|---------------------|-----------|---------------------------|------------------------|
| IMMERSION PERIOD | 96 ± 2 hr | TARGET MAX. DRY DENSITY | 1470 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 | 1399 kg/m ³ |
| SWELL OF SAMPLE | 6.39 % | AS-COMPACTED MOISTURE | 24.3 % |
| POST-TEST MOISTURE | 42.7 % | AS-COMPACTED % COMPACTION | 95 % |




CBR VALUE AT 2.54 mm PENETRATION
1.6

CBR VALUE AT 5.08 mm PENETRATION
1.3

COMMENTS

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

REPORT DATE 2025.Dec.22


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