APPENDIX A

GEOTECHNICAL REPORT

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April 7, 2025

KGS Group
895 Waverley Street
Winnipeg, Manitoba, R3T 5P4

Attention: Mr. Craig Rowbotham, P.Eng.
Transportation Department Head

Re: 2025 City of Winnipeg Local Street Program – 25-R-05
Report of Geotechnical Investigations and Test Results - Rev 0

Dear Mr. Rowbotham

This letter summarizes KGS Group's geotechnical investigation and assessment results for the 2025 City of Winnipeg (COW) Local Street Program – 25-R-05 in Winnipeg, Manitoba. KGS Group's scope of service for this project was outlined in our proposal no. 25-000-0102 titled "City of Winnipeg 2025 Local Street Program 25-R-05 – Geotechnical Services" dated January 23, 2025.

Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) was retained to complete pavement and subsurface investigations for approximately 2.2 km of local streets at eight (8) sites included in the 2025 project scope. Of the eight (8) sites, two (2) were identified as minor rehabilitations, one (1) was identified as a thin bituminous overlay, and five (5) were identified as reconstructions. Pavement coring and granular base investigations were completed for all eight (8) sites, with subgrade drilling investigations completed for the five (5) sites classified as reconstruction.

1.0 GEOTECHNICAL INVESTIGATIONS

Coring and subsequent identification of base materials was conducted at each of the eight (8) sites, with subgrade drilling and soil sampling completed at Whyte Avenue, Elgin Avenue, Kate Street, Prince Edward Street, and McFarlane Street N (Sites 03, 04, 05, 07, and 08, respectively). Only pavement coring was conducted at Irysh Avenue, Bury Street, and Alexander Avenue (Sites 01, 02, and 06, respectively). The scope of work required for each site investigation, such as the need for subgrade investigations, number of cores and test holes, and their locations were determined in accordance with the City of Winnipeg RFQ No. 331-2024 Stage 2 RFP Specifications (the "Specifications"). Core and test hole locations for each site are shown in the attached Figures 1 through 6, with location descriptions and approximate coordinates provided in Table 1.

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1.1 Coring and Sampling

Pavement coring was completed at each of the seven (7) sites using a surface mounted coring machine, fitted with either a 150 mm or 175 mm (approximately 6 in or 7 in) diameter core barrel. Upon completion of coring, KGS Group measured the granular base thickness via hand excavation and visually classified the material. Each test location was then backfilled to the bottom of pavement with excavated fill and patched to surface with asphalt cold patch. Individual cores were placed in pre-labeled bags and retained for photographs. Table 2 attached summarizes coring results in detail. Individual core photos can be found in Appendix A.

1.2 Subgrade Drilling and Sampling

Subgrade drilling and soil sampling were conducted along the streets set for reconstruction in accordance with the Specifications. This included Whyte Avenue, Elgin Avenue, Kate Street, Prince Edward Street, and McFarlane Street N (Sites 03, 04, 05, 07, and 08, respectively). Fifteen (15) test holes were advanced between the five (5) reconstruction project sites, as follows:

- Whyte Avenue: three (3) test holes
- Elgin Avenue: four (4) test holes
- Kate Street: two (2) test holes
- Prince Edward Street: three (3) test holes
- McFarlane Street N: three (3) test holes

Test holes were advanced using a truck-mounted geotechnical drill rig. Public utility clearances were obtained prior to the investigation program. Private utility clearances were not obtained, and as such, the locations of watermain and sewer service lines provided to KGS Group were approximate. Therefore, eight (8) test holes which were located in areas with a high number of service lines were advanced to a depth of 2.0 m (6.5 ft) below ground surface (BGS), and the remaining seven (7) test holes were advanced to a depth of 3.0 m (10 ft) BGS. Soil samples were collected at regular increments, at depths of approximately 0.6, 0.9, 1.2, 1.6, and 2.0 below the pavement surface. Visual identification of the encountered soils was completed throughout the full depth of each test hole. There was no water encountered in any of the test holes during drilling. Observations were made throughout drilling and upon completion for sloughing, squeezing, and caving-in depths of the test holes and summarized in Table 3 below. All test holes were backfilled with auger cuttings combined with bentonite chips to the base of pavement and patched to surface with asphalt cold mix.

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TABLE 3: OBSERVED TEST HOLE CONDITIONS

Site No, Name	Test Hole ID	Depth of Drilling (m)	Depth of Hole Upon Completion (m)
03, Whyte Avenue	TH25-07	3.0	3.0
	TH25-08	2.0	2.0
	TH25-09	2.0	1.5
04, Elgin Avenue	TH25-03	2.0	1.5
	TH25-04	2.0	2.0
	TH25-05	3.0	2.4
	TH25-06	3.0	2.9
05, Kate Street	TH25-01	3.0	2.7
	TH25-02	3.0	2.7
07, Prince Edward Street	TH25-10	3.0	2.7
	TH25-11	3.0	3.0
	TH25-12	2.0	2.0
08, McFarlane Street N	TH25-13	2.0	1.8
	TH25-14	2.0	2.0
	TH25-15	2.0	1.8

Note: No groundwater was observed either during or upon completion of drilling for all test holes.

Detailed Test holes logs for the above sites are attached within Appendix B.

1.3 Laboratory Testing

Laboratory testing was completed on select soil samples from the sites set for reconstruction. The frequency of testing was conducted in accordance with the Specifications. Testing was completed in a Canadian Council of Independent Laboratories (CCiL) certified laboratory. Testing for each site included the following:

- Five (5) moisture contents per test hole, for every test hole advanced
- One (1) Atterberg Limits and one (1) particle size analysis per test hole, for each test hole required to be tested as per Table 2 of the Specifications
- One (1) moisture-density relationship (standard Proctor) test, and one (1) California Bearing Ratio (CBR) test completed per project site. A bulk soil sample was collected from directly beneath the pavement structure to 0.9 m (3 ft) BGS of each test hole. The samples were then combined with other bulk samples from within the same site to make a composite sample, for the Proctor and CBR testing.

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Laboratory test results for are summarized and attached in Appendix C.

At the time of issuing this report, CBR testing was still underway, and results had not yet been received. Upon receipt of the CBR testing results the report will be updated and re-issued.

2.0 INVESTIGATION RESULTS

2.1 Pavement Structure and Stratigraphy

Table 2 attached provides a summary of the coring and test hole results. Site-specific summaries are presented in the following sections.

SITE 01: IRYSH AVENUE

A core investigation was conducted along Irysh Avenue, involving the extraction of three (3) cores from mid-slab locations. Locations of joints were difficult to find due to thick snow and ice cover during the time of the investigation. The pavement surface was composed of concrete with thicknesses ranging from 150 to 175 mm, generally increasing in thickness in the westbound direction. Granular base was observed below the pavement structure at all core locations with thicknesses varying between 86 and 117 mm. Dense, frozen conditions of the gravel base prevented observation of the underlying subgrade. Detailed core locations are illustrated in Figure 1.

SITE 02: BURY STREET

A core investigation was conducted along Bury Street, involving the extraction of three (3) cores: two (2) from mid-slab locations and one (1) from a joint location. The pavement surface was composed of concrete with thicknesses ranging from 155 to 175 mm. Granular base was observed below the pavement structure at all core locations with thicknesses varying between 28 to 43 mm, generally increasing in thickness in the southbound direction. Dense, frozen conditions of the gravel base prevented observation of the underlying subgrade. Detailed core locations are also illustrated in Figure 1.

SITE 03: WHYTE AVENUE

A core investigation was conducted along Whyte Avenue, involving the extraction of three (3) cores. Additional soil investigations were conducted at each of the test hole locations; one (1) advanced to a depth of 3.0 m (10 ft) below pavement surface, and two (2) advanced to a depth of 2.0 m (6.5 ft) below pavement surface. The general stratigraphy encountered within the test holes consisted of concrete pavement with clay fill base overlying lean and fat clay. A further description of each layer is provided below, with test hole logs provided in Appendix B and test hole locations shown in Figure 2.

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Asphalt – The pavement surface consisted of asphalt with varying thicknesses of 60 to 140 mm.

Concrete – Concrete was encountered directly below the asphalt with varying thicknesses of 75 to 135 mm.

Gravel Fill – Gravel fill was encountered directly below the concrete in one test hole, TH25-09, with a thickness of 95 mm. The fill was frozen, fine grained, and with fine to coarse sand.

Clay Fill – Clay fill material was encountered directly below the concrete in two test holes and below the gravel fill in TH25-09. The thickness varied between 170 to 180 mm. The fill was dark grey, frozen, and intermixed with granular.

Lean Clay (CL) – Lean clay was encountered below the clay fill in all test holes, except TH25-09. The lean clay was light brown, frozen, silty, trace fine sand.

One (1) Atterberg limits test was completed on the lean clay with results indicating a liquid limit of 28, plastic limit of 17, and plasticity index of 11, classifying the material as low plasticity. One (1) particle size analysis test was completed and indicated 0% gravel, 9% sand, 75% silt, and 16% clay. Moisture contents within the clay ranged from 18 to 22%.

Fat Clay (CH) – Fat clay was generally encountered below the lean clay, except for TH25-09 where it was encountered below the clay fill and to the depth of exploration in all test holes. The fat clay was generally brown, frozen, trace to with silt, trace fine to coarse sand, and moist below frozen material.

Undrained shear strengths of the clay were estimated during drilling using a handheld Torvane and ranged from 15 kPa to 90 kPa, classifying the clay as soft to stiff in consistency. One (1) Atterberg limits test was completed on the fat clay with results indicating a liquid limit of 67, plastic limit of 24, and plasticity index of 43, classifying the material as high plasticity. One (1) particle size analysis test was completed and indicated 1% gravel, 7% sand, 74% silt, and 18% clay. Moisture contents within the clay ranged from 21 to 54% and generally increased with depth.

SITE 04: ELGIN AVENUE

A core investigation was conducted along Elgin Avenue, involving the extraction of four (4) cores. Additional soil investigations were conducted at each of the test hole locations; two (2) advanced to a depth of 3.0 m (10 ft) below pavement surface, and two (2) advanced to a depth of 2.0 m (6.5 ft) below pavement surface. The general stratigraphy encountered within the test holes consisted of asphalt pavement with gravel and clay fill overlying lean clay. A further description of each layer is provided below, with test hole logs provided in Appendix B and test hole locations shown in Figure 3.

Asphalt – The pavement surface consisted of asphalt with varying thicknesses of 60 to 125 mm.

Gravel Fill – Gravel fill was encountered directly below the concrete in all the test hole and had a varying thickness of 85 to 275 mm. The fill was frozen, fine grained, and with fine to coarse sand.

Clay Fill – Clay fill was encountered directly below the gravel fill in all the test holes, except TH25-05. The thickness varied between 230 to 300 mm. The fill was dark grey to brown, frozen, some to with silt, and intermixed with granular.

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Lean Clay (CL) – Lean clay was encountered below the granular fill and clay fill in all test holes, except TH25-05. The lean clay was light brown to brown, frozen, silty, trace to with sand, and moist below frozen material.

Undrained shear strength of the clay was estimated during drilling below frozen material using a handheld Torvane and resulted in 15 kPa, classifying the clay as soft in consistency. Two (2) Atterberg limits tests were completed on the lean clay with results indicating liquid limits of 30 to 33, plastic limits of 16 to 17, and plasticity indices of 14 to 16, classifying the material as low plasticity. Two (2) particle size analysis tests were completed and indicated 0% gravel, 4% sand, 75 to 78% silt, and 18 to 21% clay. Moisture contents within the clay ranged from 20 to 30%.

Fat Clay (CH) – Fat clay was generally encountered below the lean clay in all test holes and to the depth of exploration, except for TH25-05 where it was encountered below the gravel fill. The fat clay was generally grey to brown, frozen, trace to with silt, trace sand, and moist below frozen material.

Undrained shear strengths of the clay were estimated during drilling using a handheld Torvane and ranged from 20 kPa to 95 kPa, classifying the clay as soft to stiff in consistency. One (1) Atterberg limits test was completed on the fat clay with results indicating a liquid limit of 80, plastic limit of 25, and plasticity index of 55, classifying the material as high plasticity. One (1) particle size analysis test was completed and indicated 0% gravel, 2% sand, 26% silt, and 72% clay. Moisture contents within the clay ranged from 20 to 55%.

SITE 05: KATE STREET

A core investigation was conducted along Kate Street, involving the extraction of two (2) cores from mid-slab locations. Additional soil investigations were conducted at each of the test hole locations and were advanced to a depth of 3.0 m (10 ft) below pavement surface. The general stratigraphy encountered within the test holes consisted of asphalt pavement overlying concrete, overlying granular and clay fill, overlying lean clay. A further description of each layer is provided below, with test hole logs provided in Appendix B and test hole locations shown in Figure 3.

Asphalt – The pavement surface consisted of asphalt with varying thicknesses of 40 to 170 mm.

Concrete – Concrete was encountered directly below the asphalt in only one test hole, TH25-01 with thicknesses of 70 mm.

Gravel Fill – Gravel fill was encountered directly below the concrete in all the test hole and had a varying thickness of 70 to 170 mm. The fill was frozen, fine grained, and with fine to coarse sand.

Clay Fill – Clay fill was encountered directly below the gravel fill in TH25-01 with thickness of 125 mm. The fill was black, frozen, and trace fine to medium sand.

Lean Clay (CL) – Lean clay was encountered below the granular fill and clay fill in all test holes. The lean clay was light brown, frozen, silty, and trace to with sand.

Two (2) Atterberg limits tests were completed on the lean clay with results indicating liquid limits of 31 to 35, plastic limits of 17, and plasticity indices of 14 to 18, classifying the material as low plasticity. Two (2) particle size analysis tests were completed and indicated 0 to 1% gravel, 3 to 6% sand, 74 to 78% silt, and 18 to 20% clay. Moisture contents within the clay ranged from 20 to 30%.

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Fat Clay (CH) – Fat clay was encountered below the lean clay in all test holes and to the depth of exploration. The fat clay was generally brown, frozen, trace to with silt, trace fine to medium sand, and moist below frozen material.

Undrained shear strengths of the clay were estimated during drilling using a handheld Torvane and ranged from 40 kPa to 60 kPa, classifying the clay as firm to stiff in consistency. Moisture contents within the clay ranged from 22 to 55%.

SITE 06: ALEXANDER AVENUE

A core investigation was conducted along Alexander Avenue, involving the extraction of five (5) cores: four (4) from mid-slab locations and one (1) from a joint location. Locations of joints were difficult to find due to thick snow and ice cover during the time of the investigation. The pavement surface was composed of concrete with thicknesses ranging from 205 to 235 mm. Granular base was observed below the pavement structure at all core locations with thicknesses varying between 24 and 74 mm. Dense, frozen conditions of the gravel base prevented observation of the underlying subgrade. Detailed core locations are illustrated in Figure 4.

SITE 07: PRINCE EDWARD STREET

A core investigation was conducted along Prince Edward Street, involving the extraction of three (3) cores from mid-slab locations. Additional soil investigations were conducted at each of the test hole locations; two (2) advanced to a depth of 3.0 m (10 ft) below pavement surface, and one (1) advanced to a depth of 2.0 m (6.5 ft) below pavement surface. The general stratigraphy encountered within the test holes consisted of asphalt pavement overlying concrete, overlying gravel fill, overlying fat clay. A further description of each layer is provided below, with test hole logs provided in Appendix B and test hole locations shown in Figure 5.

Asphalt – The pavement surface consisted of asphalt with varying thicknesses of 45 to 60 mm.

Concrete – Concrete was encountered underlying the asphalt with varying thicknesses of 155 to 205 mm.

Gravel Fill – Gravel fill was encountered directly below the concrete in all the test hole and had a varying thickness of 25 to 50 mm. The fill was frozen, fine grained, and with fine to coarse sand.

Fat Clay (CH) – Fat clay was encountered below the gravel fill and extended to the depth of exploration. The clay was grey to brown, frozen, trace to some sand, trace to some silt, and moist below frozen material.

Undrained shear strengths of the clay were estimated during drilling using a handheld Torvane. The readings ranged from 65 kPa to 95 kPa, classifying the clay as stiff in consistency. Two (2) Atterberg limits tests were completed on the clay with results indicating liquid limits of 80 to 81, plastic limits of 29 to 34, and plasticity indices between 46 to 52, classifying the material as of high plasticity. Two (2) particle size analysis tests were completed and indicated 0% gravel, 1% sand, 40 to 45% silt, and 54 to 59% clay. Moisture contents within the clay ranged from 30 to 40%.

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SITE 08: MCFARLANE STREET N

A core investigation was conducted along McFarlane Street N, involving the extraction of three (3) cores from mid-slab locations. Additional soil investigations were conducted at each of the test hole locations and were advanced to a depth of 2.0 m (6.5 ft) below pavement surface. The general stratigraphy encountered within the test holes consisted of asphalt pavement overlying concrete, overlying gravel fill, overlying fat clay. A further description of each layer is provided below, with test hole logs provided in Appendix B and test hole locations shown in Figure 6.

Asphalt – The pavement surface consisted of asphalt with varying thicknesses of 25 to 50 mm.

Concrete – Concrete was encountered underlying the asphalt with varying thicknesses of 155 to 205 mm.

Gravel Fill – Gravel fill was encountered directly below the concrete in only one test hole, TH25-13 with thickness of 140 mm. The fill was frozen, fine grained, and with fine to coarse sand.

Fat Clay (CH) – Fat clay was encountered below the concrete and gravel fill in all the test holes and extended to the depth of exploration. The clay was generally grey to brown, frozen, trace fine sand, trace to with silt, and moist below frozen material.

Undrained shear strengths of the clay were estimated during drilling using a handheld Torvane. The readings ranged from 30 kPa to 88 kPa, classifying the clay as firm to stiff in consistency. Two (2) Atterberg limits tests were completed on the clay with results indicating liquid limits of 70 to 75, plastic limits of 27 to 29, and plasticity indices between 43 to 46, classifying the material as of high plasticity. Two (2) particle size analysis tests were completed and indicated 0% gravel, 0 to 1% sand, 45 to 52% silt, and 47 to 55% clay. Moisture contents within the clay ranged from 25 to 33%.

3.0 CLOSURE

Should you have any questions regarding the enclosed information or require additional information, please contact the undersigned.

STATEMENT OF LIMITATIONS AND CONDITIONS

Limitations

This report has been prepared for KGS Group in accordance with the agreement between KGS Group's Geotechnical and Transportation departments (the "Agreement"). This report represents KGS Group's professional judgment and exercising due care consistent with the preparation of similar reports. The information, data, recommendations and conclusions in this report are subject to the constraints and limitations in the Agreement and the qualifications in this report. This report must be read as a whole, and sections or parts should not be read out of context.

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This report is based on information made available to KGS Group by KGS Group. Unless stated otherwise, KGS Group has not verified the accuracy, completeness or validity of such information, makes no representation regarding its accuracy and hereby disclaims any liability in connection therewith. KGS Group shall not be responsible for conditions/issues it was not authorized or able to investigate or which were beyond the scope of its work. The information and conclusions provided in this report apply only as they existed at the time of KGS Group's work.

Third Party Use of Report

Any use a third party makes of this report or any reliance on or decisions made based on it, are the responsibility of such third parties. KGS Group accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions undertaken based on this report.

Geotechnical Investigation Statement of Limitations

The geotechnical investigation findings and recommendations of this report were prepared in accordance with generally accepted professional engineering principles and practice. The findings and recommendations are based on the results of field and laboratory investigations, combined with an interpolation of soil and groundwater conditions found at and within the depth of the test holes drilled by KGS Group at the site at the time of drilling. If conditions encountered during construction appear to be different from those shown by the test holes drilled by KGS Group or if the assumptions stated herein are not in keeping with the design, KGS Group should be notified in order that the recommendations can be reviewed and modified if necessary.

Prepared By:

Raina Alcantara, E.I.T.
Geotechnical Engineer in Training

Approved By:

David Anderson, M.Sc., P.Eng.
Geotechnical Engineer

RA/cs
Attached

FIGURES

Test Hole Location Plans

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FIGURE 1: PAVEMENT CORE LOCATIONS ON IRYSH AVENUE (SITE 01) & BURY STREET (SITE 02)

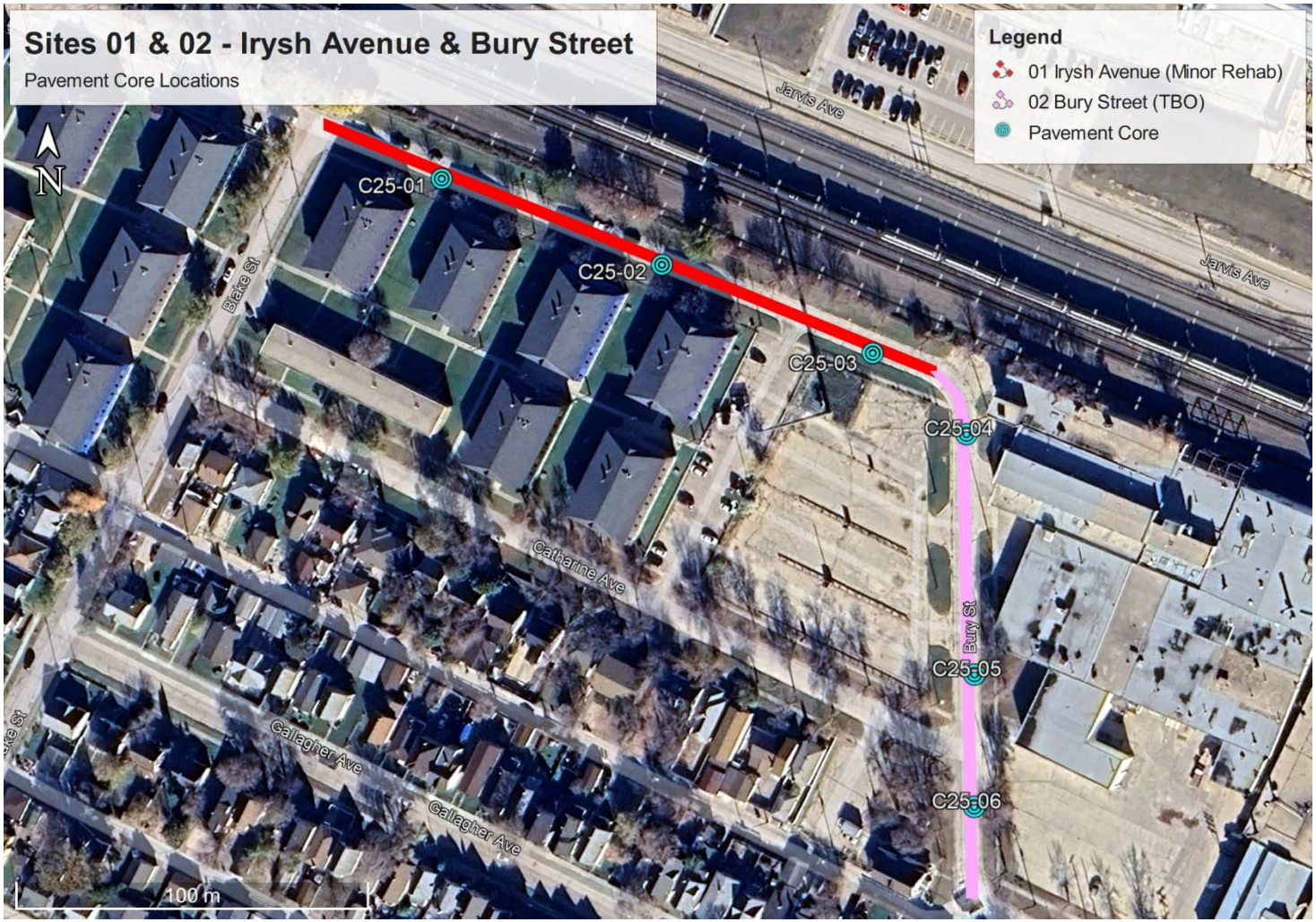

FIGURE 2: TEST HOLE LOCATIONS ON WHYTE AVENUE (SITE 03)

FIGURE 3: TEST HOLE LOCATIONS ON ELGIN AVENUE (SITE 04) & KATE STREET (SITE 05)

FIGURE 4: PAVEMENT CORE LOCATIONS ON ALEXANDER AVENUE (SITE 06)

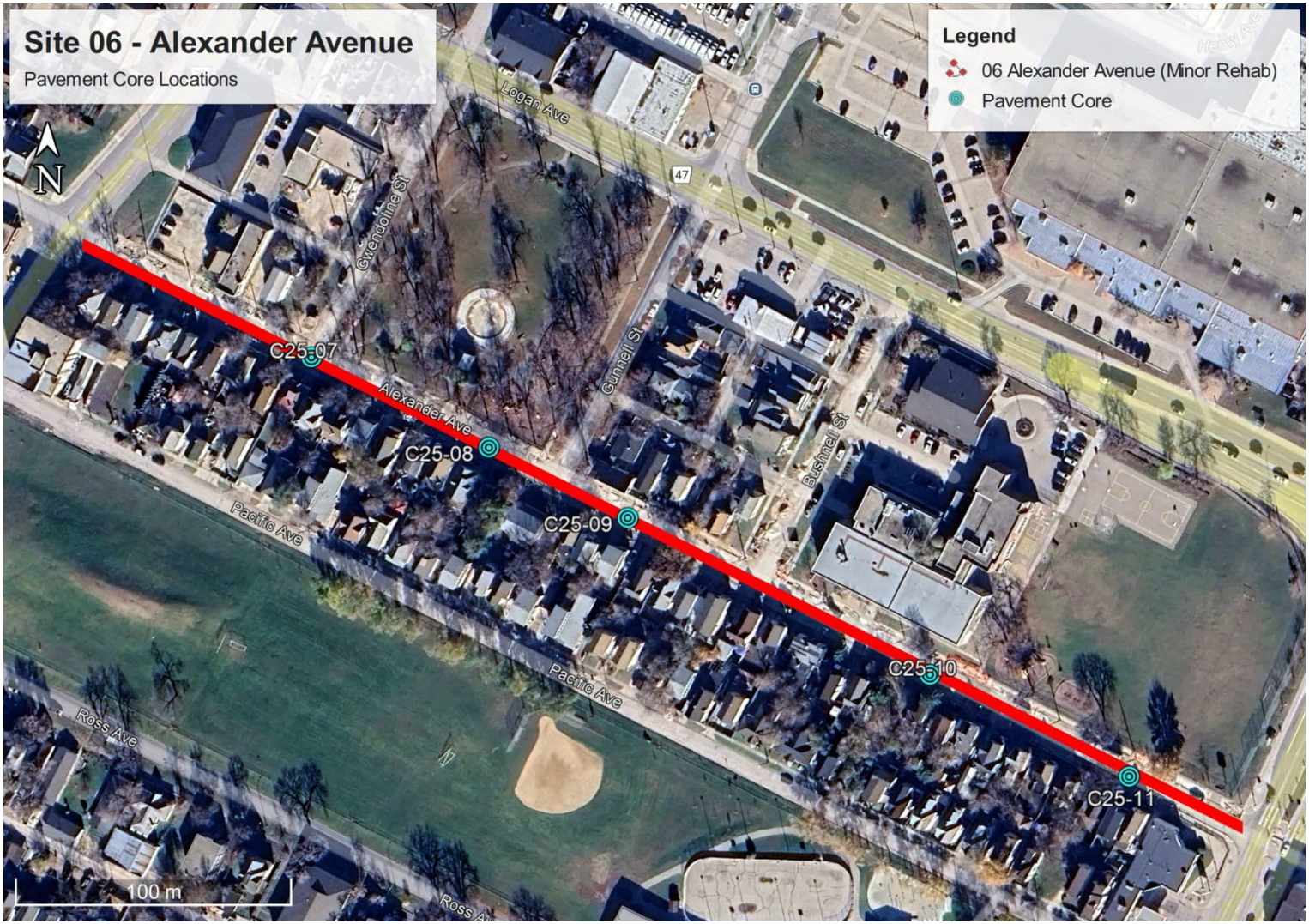

FIGURE 5: TEST HOLE LOCATIONS ON PRINCE EDWARD STREET (SITE 07)

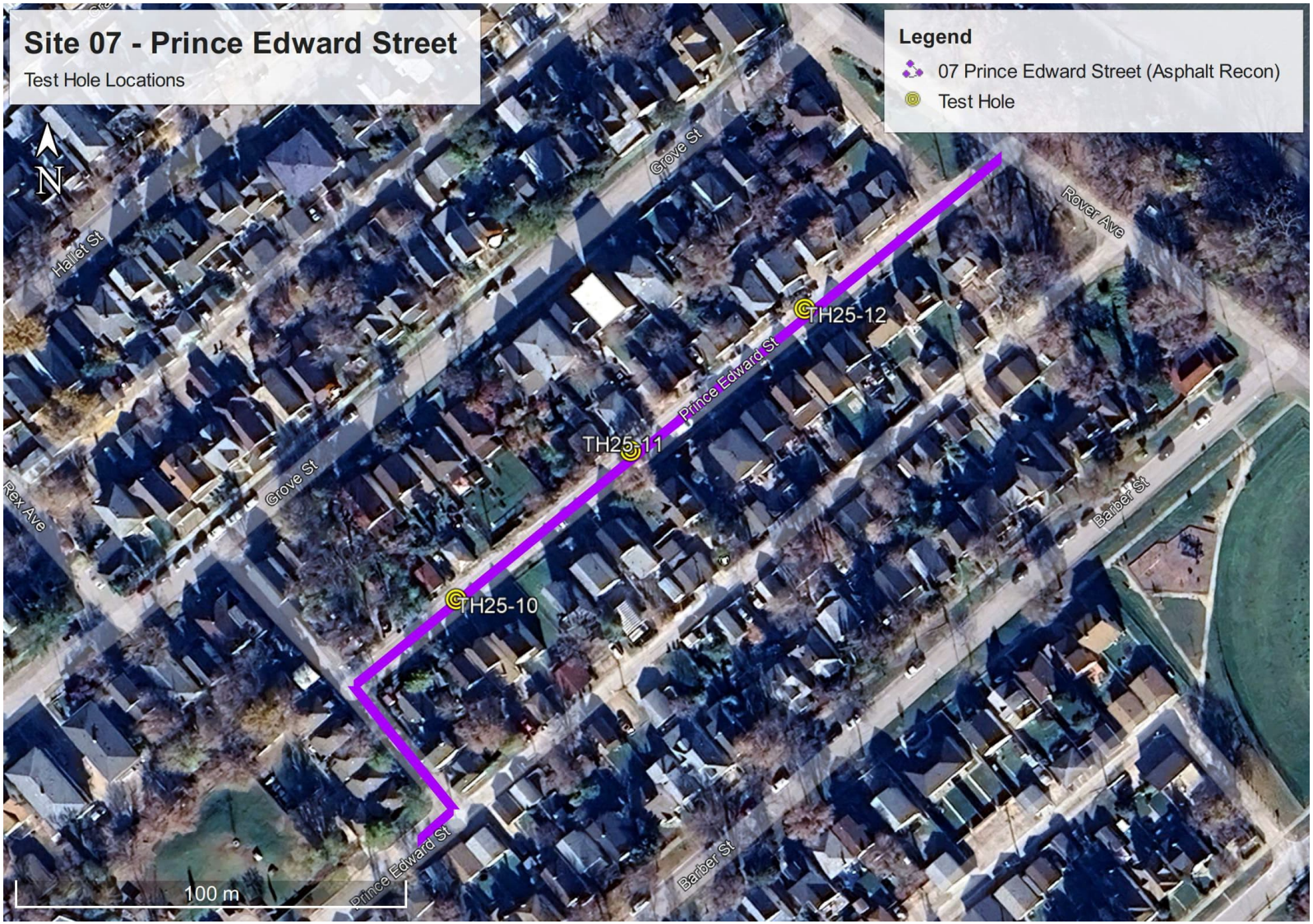

FIGURE 6: TEST HOLE LOCATIONS ON MCFARLANE STREET N (SITE 08)

TABLES

Location Descriptions and Coordinates

Summary of Core Results

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TABLE 1: PAVEMENT CORE & TEST HOLE LOCATIONS

Site	Street Name	Test Hole ID	Location Description	Northing [m]	Easting [m]
01	Irysh Avenue	C25-01	Eastbound lane approximately 38 m east of Blake St. intersection	5531434	630233
		C25-02	Eastbound lane approximately 107 m east of Blake St. intersection	5531410	630297
		C25-03	Eastbound lane approximately 23 m west of Burt St. intersection	5531386	630359
02	Bury Street	C25-04	Northbound lane approximately 14 m south of Irysh Ave. intersection	5531363	630386
		C25-05	Northbound lane approximately 63 m north of Whyte Ave. intersection	5531295	630389
		C25-06	Northbound lane approximately 25 m north of Whyte Ave. intersection	5531257	630390
03	Whyte Avenue	TH25-07	Westbound lane near backside of 2205 Gallagher Ave.	5531215	630426
		TH25-08	Westbound lane near backside of 2179 Gallagher Ave.	5531176	630507
		TH25-09	Westbound lane near backside of 2147 Gallagher Ave.	5531136	630594
04	Elgin Avenue	TH25-03	Eastbound lane near 632 Elgin Ave.	5529674	632542
		TH25-04	Eastbound lane near 590 Elgin Ave.	5529619	632662
		TH25-05	Eastbound lane near west end of Roosevelt Playground	5529560	632785
		TH25-06	Eastbound lane near east end of Roosevelt Playground	5529521	632868
05	Kate Street	TH25-01	Northbound lane near west edge of Roosevelt Playground	5529544	632744
		TH25-02	Northbound lane near west face of Best Way Food Market	5529507	632726
06	Alexander Avenue	C25-07	Eastbound lane, near intersection with Gwendoline St.	5529890	632671
		C25-08	Eastbound lane, near 602 Alexander Ave.	5529859	632737
		C25-09	Eastbound lane, near 584 Alexander Ave.	5529836	632788
		C25-10	Eastbound lane, near 542 Alexander Ave.	5529782	632900
		C25-11	Eastbound lane, near 516 Alexander Ave.	5529748	632973
07	Prince Edward Street	TH25-10	Northwestern lane near backside of 90 Grove St.	5530076	634540
		TH25-11	Northwestern lane near backside of 66 Grove St.	5530115	634584
		TH25-12	Northwestern lane near 53 Prince Edward St.	5530153	634628
08	McFarlane Street N	TH25-13	Northbound lane near 175 McFarlane Street N	5529857	635007
		TH25-14	Northbound lane near 149 McFarlane Street N	5529770	634989
		TH25-15	Northbound lane near 143 McFarlane Street N	5529732	634980

TABLE 02: PAVEMENT CORE & TEST HOLE RESULTS

Site	Street Name	Test Hole ID	Pavement Type	Location	Core Thickness [mm]	Base Material	Base Thickness [mm]	Depth to Sub-Grade [mm]	Subgrade Material
01	Irysh Avenue	C25-01	Concrete	Mid-slab	175	Granular	117	292	Not investigated
		C25-02	Concrete	Mid-slab	168	Granular	86	254	Not investigated
		C25-03	Concrete	Mid-slab	150	Granular	117	267	Not investigated
02	Bury Street	C25-04	Concrete	Mid-slab	175	Granular	28	203	Not investigated
		C25-05	Concrete	Mid-slab	155	Granular	36	191	Not investigated
		C25-06	Concrete	Joint	160	Granular	43	203	Not investigated
03	Whyte Avenue	TH25-07[1]	Asphalt / Concrete	Mid-slab	140 / 135	Clay mixed with granular	182	453	Lean clay & fat clay
		TH25-08[2]	Asphalt / Concrete	Mid-slab	110 / 75	Clay mixed with granular	172	357	Lean clay & fat clay
		TH25-09[2]	Asphalt / Concrete	Mid-slab	60 / 75	Granular	94	229	Fat clay
04	Elgin Avenue	TH25-03[3]	Asphalt	N/A	125	Granular	128	253	Lean clay & fat clay
		TH25-04[3]	Asphalt	N/A	80	Granular	85	165	Lean clay & fat clay
		TH25-05	Asphalt	N/A	105	Granular	276	381	Fat clay
		TH25-06	Asphalt	N/A	58	Granular	247	305	Lean clay & fat clay
05	Kate Street	TH25-01	Asphalt / Concrete	Mid-slab	40 / 70	Granular	170	280	Lean clay & fat clay
		TH25-02	Asphalt	N/A	170	Granular	71	241	Lean clay & fat clay
06	Alexander Avenue	C25-07	Concrete	Mid-slab	230	Granular	24	254	Not investigated
		C25-08	Concrete	Joint	205	Granular	74	279	Not investigated
		C25-09	Concrete	Mid-slab	230	Granular	24	254	Not investigated
		C25-10	Concrete	Mid-slab	230	Granular	49	279	Not investigated
		C25-11	Concrete	Mid-slab	235	Granular	44	279	Not investigated
07	Prince Edward Street	TH25-10[3]	Asphalt / Concrete	Mid-slab	48 / 205	Granular	52	305	Fat clay
		TH25-11	Asphalt / Concrete	Mid-slab	60 / 170	Granular	11	241	Fat clay
		TH25-12	Asphalt / Concrete	Mid-slab	45 / 155	Granular	29	229	Fat clay

Site	Street Name	Test Hole ID	Pavement Type	Location	Core Thickness [mm]	Base Material	Base Thickness [mm]	Depth to Sub-Grade [mm]	Subgrade Material
08	McFarlane Street N	TH25-13	Asphalt / Concrete	Mid-slab	25 / 165	Granular	140	330	Fat clay
		TH25-14[1]	Asphalt / Concrete	Mid-slab	40 / 203	None observed	N/A	243	Fat clay
		TH25-15[1]	Asphalt / Concrete	Mid-slab	50 / 155	None observed	N/A	205	Fat clay

1- Asphalt portion of core not recoverable; thickness measured down-hole during investigation

2- Concrete portion of core not recoverable; thickness measured down-hole during investigation

3- Core not recoverable; pavement thicknesses measured down-hole during investigation

APPENDIX A

Core Photo Log

KGS GROUP

Photo 1: Irysh Avenue, C25-01

Photo 2: Irysh Avenue, C25-02

Photo 3: Irysh Avenue, C25-03

Photo 4: Bury Street, C25-04

Photo 5: Bury Street, C25-05

Photo 6: Bury Street, C25-06

Photo 7: Whyte Avenue, TH25-07

Photo 8: Whyte Avenue, TH25-08

Photo 9: Whyte Avenue, TH25-09

Elgin Avenue TH25-03 core not recoverable.

Photo 10: Elgin Avenue, TH25-04

Photo 11: Elgin Avenue, TH25-05

Photo 12: Elgin Avenue, TH25-06

Photo 13: Kate Street, TH25-01

Photo 14: Kate Street, TH25-02

Photo 15: Alexander Avenue, C25-07

Photo 16: Alexander Avenue, C25-08

Photo 17: Alexander Avenue, C25-09

Photo 18: Alexander Avenue, C25-10

Photo 19: Alexander Avenue, C25-11

Prince Edward Street TH25-10 core not recoverable.

Photo 20: Prince Edward Street, TH25-11

Photo 21: Prince Edward Street, TH25-12

Photo 22: McFarlane Street N, TH25-13

Photo 23: McFarlane Street N, TH25-14

Photo 24: McFarlane Street N, TH25-15

APPENDIX B

Test Hole Logs

KGS GROUP

KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-01

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-26-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,529,544
DESCRIPTION	Kate Street, northbound lane near west edge of Roosevelt Playground		E 632,744 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.1 m: 175 mm Core 0.1 m to 3.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER
			ASPHALT - 40 mm.			
			CONCRETE - 70 mm.			
			GRAVEL FILL - 170 mm, frozen, fine, with fine to coarse sand.			
			CLAY FILL - 125 mm, Black, frozen, high plasticity, trace fine to medium sand.			
			LEAN CLAY (CL) - Light brown, frozen, low plasticity, silty, trace fine sand.			
			- LL=31, PL=17, PI=14 at 0.8 m. - PSA: 1% gravel, 3% sand, 78% silt, 18% clay at 0.8 m.			S1
1.0			**FAT CLAY (CH)** - Brown, frozen, high plasticity, with silt, trace fine to medium sand.			
						S2
	5		- mottled grey/brown, moist, stiff, high plasticity, trace coarse sand, trace silt, trace gypsum below 1.5 m.			S3
			- firm below 1.8 m.			S4
2.0						S5
3.0	10		Notes: 1. End of test hole at 3.0 m. 2. Test hole caved to 2.7 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.			
4.0						

PL MC LL
Cu TORVANE (kPa) ◇
qu POCKET PEN (kPa) ★
SPT (N) BLOWS/0.30 m △
20 40 60 80

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR **Paddock Drilling**	INSPECTOR **R. ALCANTARA**
APPROVED D. ANDERSON	DATE 4-7-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-02

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-26-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,529,507
DESCRIPTION	Kate Street, northbound lane near west face of Best Way Food Market		E 632,726 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.2 m: 175 mm Core 0.2 m to 3.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER
			ASPHALT - 170 mm.			
			GRAVEL FILL - 71 mm, frozen, fine, with fine to coarse sand.			
			LEAN CLAY (CL) - Light brown, frozen, low plasticity, silty, trace fine sand.			
			- decreasing silt content below 0.6 m.			
			- LL=35, PL=17, PI=18 at 0.8 m. - PSA: 0% gravel, 6% sand, 74% silt, 20% clay at 0.8 m.			S1
1.0			**FAT CLAY (CH)** - Brown, frozen, high plasticity, trace fine sand, trace silt.			S2
	5		- moist, stiff, trace gypsum, no sand below 1.5 m.			S3
						S4
2.0						S5
			- firm below 2.4 m.			
3.0	10		Notes: 1. End of test hole at 3.0 m. 2. Test hole caved to 2.7 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.			
4.0						

PL MC LL
Cu TORVANE (kPa) ◇
qu POCKET PEN (kPa) ★
SPT (N) BLOWS/0.30 m △
20 40 60 80

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR	INSPECTOR
Paddock Drilling	**R. ALCANTARA**
APPROVED	DATE
D. ANDERSON	4-7-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-03

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-20-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,529,674
DESCRIPTION	Elgin Avenue, eastbound lane near 632 Elgin Avenue		E 632,542 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.1 m: 175 mm Core 0.1 m to 2.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER
			ASPHALT - 125 mm.			
			GRAVEL FILL - 128 mm, frozen, fine, with fine to coarse sand.			
			CLAY FILL - 229 mm, Dark grey, frozen, high plasticity.			
			LEAN CLAY (CL) - Brown, frozen, low plasticity, silty, some to with fine to coarse grained sand.			S1
1.0			- LL=30, PL=16, PI=14 at 0.9 m. - PSA: 0% gravel, 4% sand, 78% silt, 18% clay at 0.9 m.			S2
			- decreasing silt content below 1.2 m.			S3
	5					
			FAT CLAY (CH) - Brown, moist, stiff, high plasticity, some silt, trace fine sand.			S4
2.0			- soft, silty below 1.9 m.			S5
			Notes: 1. End of test hole at 2.0 m. 2. Test hole caved to 1.5 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.			
3.0	10					
4.0						

PL MC LL
Cu TORVANE (kPa) ◇
qu POCKET PEN (kPa) ★
SPT (N) BLOWS/0.30 m △
20 40 60 80

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR **Paddock Drilling**	INSPECTOR **R. ALCANTARA**
APPROVED D. ANDERSON	DATE 4-7-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-04

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-20-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,529,619
DESCRIPTION	Elgin Avenue, eastbound lane near 590 Elgin Avenue		E 632,662 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.1 m: 175 mm Core 0.1 m to 2.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER
			ASPHALT - 80 mm.			
			GRAVEL FILL - 85 mm, frozen, fine, with fine to coarse sand.			
			CLAY FILL - 292 mm, Mottled grey/brown, frozen, high plasticity, intermixed with granular, some silt.			
						S1
			LEAN CLAY (CL) - Light brown, frozen, low plasticity, silty, trace medium sand.			
						S2
1.0						S3
			- soft, moist below 1.4 m.			
	5		**FAT CLAY (CH)** - Grey, moist, stiff, high plasticity, some to with silt, trace fine sand.			S4
			- trace to some silt below 1.8 m.			S5
2.0			Notes: 1. End of test hole at 2.0 m. 2. Test hole remained open to 2.0 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.			
3.0	10					
4.0						

PL MC LL
Cu TORVANE (kPa) ◇
qu POCKET PEN (kPa) ★
SPT (N) BLOWS/0.30 m △
20 40 60 80

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR **Paddock Drilling**	INSPECTOR **R. ALCANTARA**
APPROVED D. ANDERSON	DATE 4-7-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-05

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-20-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,529,560
DESCRIPTION	Elgin Avenue, eastbound lane near west end of Roosevelt Playground		E 632,785 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.1 m: 175 mm Core 0.1 m to 3.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER
			ASPHALT - 105 mm.			
			GRAVEL FILL - 276 mm, frozen, fine, with fine to coarse sand.			
			FAT CLAY (CH) - Greyish brown, frozen, high plasticity, trace fine sand, trace silt.			
			- brown below 0.8 m.			S1
1.0			- LL=80, PL=25, PI=55 at 0.9 m. - PSA: 0% gravel, 2% sand, 26% silt, 72% clay at 0.9 m.			S2
			- moist, stiff below 1.3 m.			S3
	5					S4
			- mottled light brown/brown, increased silt content below 1.8 m.			
2.0						
			- firm below 2.1 m.			S5
3.0	10		Notes: 1. End of test hole at 3.0 m. 2. Test hole caved to 2.4 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.			
4.0						

PL MC LL
Cu TORVANE (kPa) ◇
qu POCKET PEN (kPa) ★
SPT (N) BLOWS/0.30 m △
20 40 60 80

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR **Paddock Drilling**	INSPECTOR **R. ALCANTARA**
APPROVED D. ANDERSON	DATE 4-7-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-06

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-20-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,529,521
DESCRIPTION	Elgin Avenue, eastbound lane near east end of Roosevelt Playground		E 632,868 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.1 m: 175 mm Core 0.1 m to 3.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER
			ASPHALT - 58 mm.			
			GRAVEL FILL - 247 mm, frozen, fine, with fine to coarse sand.			
			CLAY FILL - 305 mm, Brown, frozen, high plasticity, some to with silt, trace fine sand.			
			LEAN CLAY (CL) - Light brown, frozen, low plasticity, silty, trace fine sand.			S1
			- LL=33, PL=17, PI=16 at 0.8 m. - PSA: 0% gravel, 4% sand, 75% silt, 21% clay at 0.8 m.			S2
1.0						S3
			- moist, soft below 1.3 m.			
	5					
			FAT CLAY (CH) - Brown, moist, stiff, high plasticity, with silt, trace medium to coarse sand.			S4
2.0			- some silt below 1.8 m.			
						S5
3.0	10					
4.0			Notes: 1. End of test hole at 3.0 m. 2. Test hole caved to 2.9 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.			

PL MC LL
Cu TORVANE (kPa) ◇
qu POCKET PEN (kPa) ★
SPT (N) BLOWS/0.30 m △
20 40 60 80

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR **Paddock Drilling**	INSPECTOR **R. ALCANTARA**
APPROVED D. ANDERSON	DATE 4-7-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-07

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-20-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,531,215
DESCRIPTION	Whyte Avenue, westbound lane near backside of 2205 Gallagher Avenue		E 630,426 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.3 m: 175 mm Core 0.3 m to 3.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER
			ASPHALT - 140 mm.			
			CONCRETE - 135 mm.			
			CLAY FILL - 182 mm, Dark grey, frozen, high plasticity, intermixed with granular.			S1
			LEAN CLAY (CL) - Light brown, frozen, low plasticity, silty, trace fine sand.			S2
			- LL=28, PL=17, PI=11 at 0.9 m. - PSA: 0% gravel, 9% sand, 75% silt, 16% clay at 0.9 m.			S3
1.0	5		**FAT CLAY (CH)** - Brown, moist, stiff, high plasticity, trace fine sand, trace silt.			S4
			- firm below 1.8 m.			
2.0						S5
			- stiff below 2.7 m.			
3.0	10		Notes: 1. End of test hole at 3.0 m. 2. Test hole remained open to 3.0 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.			
4.0						

PL MC LL
Cu TORVANE (kPa) ◇
qu POCKET PEN (kPa) ★
SPT (N) BLOWS/0.30 m △
20 40 60 80

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR **Paddock Drilling**	INSPECTOR **R. ALCANTARA**
APPROVED D. ANDERSON	DATE 4-7-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-08

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-20-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,531,176
DESCRIPTION	Whyte Avenue, westbound lane near backside of 2179 Gallagher Avenue		E 630,507 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.2 m: 175 mm Core 0.2 m to 2.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER
			ASPHALT - 110 mm.			
			CONCRETE - 75 mm.			
			CLAY FILL - 172 mm, Dark grey, frozen, intermediate plasticity, intermixed with fine to coarse sand.			
			LEAN CLAY (CL) - Light brown, frozen, low plasticity, silty, trace fine sand.			S1
						S2
1.0			**FAT CLAY (CH)** - Brown, frozen, high plasticity, some to with silt, trace coarse sand.			S3
	5					S4
			- moist, stiff below 1.7 m.			
			- trace silt below 1.8 m.			S5
2.0			Notes: 1. End of test hole at 2.0 m. 2. Test hole remained open to 2.0 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.			
3.0	10					
4.0						

PL MC LL
Cu TORVANE (kPa) ◇
qu POCKET PEN (kPa) ★
SPT (N) BLOWS/0.30 m △
20 40 60 80

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR **Paddock Drilling**	INSPECTOR **R. ALCANTARA**
APPROVED D. ANDERSON	DATE 4-7-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-09

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-21-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,531,136
DESCRIPTION	Whyte Avenue, westbound lane near backside of 2147 Gallagher Avenue		E 630,594 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.1 m: 175 mm Core 0.1 m to 2.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER
			ASPHALT - 60 mm.			
			CONCRETE - 75 mm.			
			GRAVEL FILL - 94 mm, frozen, fine, with fine to coarse sand.			
			CLAY FILL - 152 mm, Dark grey, frozen, high plasticity, trace medium to coarse sand, trace silt.			
			FAT CLAY (CH) - Light brown, frozen, high plasticity, some silt, trace fine sand.			
			- LL=67, PL=24, PI=43 at 0.6 m. - PSA: 1% gravel, 7% sand, 74% silt, 18% clay at 0.6 m.			S1
1.0			- moist, soft below 0.9 m.			S2
						S3
	5		- brown, stiff, trace to some silt below 1.5 m.			S4
						S5
2.0			Notes: 1. End of test hole at 2.0 m. 2. Test hole caved to 1.5 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.			
3.0	10					
4.0						

PL MC LL
Cu TORVANE (kPa) ◇
qu POCKET PEN (kPa) ★
SPT (N) BLOWS/0.30 m △
20 40 60 80

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR **Paddock Drilling**	INSPECTOR **R. ALCANTARA**
APPROVED D. ANDERSON	DATE 4-7-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-10

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-27-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,530,076
DESCRIPTION	Prince Edward Street, northwestern lane near backside of 90 Grove Street		E 634,540 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.3 m: 175 mm Core 0.3 m to 3.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER	PL MC LL / Cu TORVANE (kPa) ◇ / qu POCKET PEN (kPa) ★ / SPT (N) BLOWS/0.30 m △ (20 40 60 80)
			ASPHALT - 48 mm.				
			CONCRETE - 205 mm.				
			GRAVEL FILL - 52 mm, frozen, fine, with fine to coarse sand.				
			FAT CLAY (CH) - Greyish brown, frozen, high plasticity, trace fine sand, trace silt.				
			- brown below 0.6 m.				
1.0			- LL=80, PL=34, PI=46 at 0.9 m. - PSA: 0% gravel, 1% sand, 40% silt, 59% clay at 0.9 m.			S1	
						S2	
	5		- moist, stiff, trace to some silt below 1.5 m.			S3	
						S4	
2.0						S5	
3.0	10		Notes: 1. End of test hole at 3.0 m. 2. Test hole caved to 2.7 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.				
4.0							

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR **Paddock Drilling**	INSPECTOR **R. ALCANTARA**
APPROVED D. ANDERSON	DATE 4-7-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-11

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-27-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,530,115
DESCRIPTION	Prince Edward Street, northwestern lane near backside of 66 Grove Street		E 634,584 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.2 m: 175 mm Core 0.2 m to 3.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER	PL MC LL Cu TORVANE (kPa) ◇ qu POCKET PEN (kPa) ★ SPT (N) BLOWS/0.30 m △ 20 40 60 80
			ASPHALT - 60 mm.				
			CONCRETE - 170 mm.				
			GRAVEL FILL - 25 mm, frozen, fine, with fine to coarse sand.				
			FAT CLAY (CH) - Dark grey, frozen, high plasticity, trace fine sand, trace silt.				
			- brown below 0.6 m.			S1	
1.0			- some silt below 1.0 m.			S2	
	5		- moist, stiff below 1.5 m.			S3	
						S4	
2.0						S5	
3.0	10		Notes: 1. End of test hole at 3.0 m. 2. Test hole remained open to 3.0 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.				
4.0							

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR **Paddock Drilling**	INSPECTOR **R. ALCANTARA**
APPROVED D. ANDERSON	DATE 4-7-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-12

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-27-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,530,153
DESCRIPTION	Prince Edward Street, northwestern lane near 53 Prince Edward Street		E 634,628 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.2 m: 175 mm Core 0.2 m to 2.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER
			ASPHALT - 45 mm.			
			CONCRETE - 155 mm.			
			GRAVEL FILL - 29 mm, frozen, fine, with fine to coarse sand.			
			FAT CLAY (CH) - Greyish brown, frozen, high plasticity, trace fine sand, trace silt.			
			- moist, stiff below 0.8 m. - LL=81, PL=29, PI=52 at 0.8 m. - PSA: 0% gravel, 1% sand, 45% silt, 54% clay at 0.8 m.			S1
1.0			- trace to some silt below 1.1 m.			S2
	5		- trace silt below 1.5 m.			S3 S4
2.0						S5
			Notes: 1. End of test hole at 2.0 m. 2. Test hole remained open to 2.0 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.			
3.0	10					
4.0						

PL MC LL
Cu TORVANE (kPa) ◇
qu POCKET PEN (kPa) ★
SPT (N) BLOWS/0.30 m △
20 40 60 80

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR **Paddock Drilling**	INSPECTOR **R. ALCANTARA**
APPROVED D. ANDERSON	DATE 4-7-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-13

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-21-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,529,857
DESCRIPTION	McFarlane Street N, northbound lane near 175 McFarlane Street N		E 635,007 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.2 m: 175 mm Core 0.2 m to 2.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER
			ASPHALT - 25 mm.			
			CONCRETE - 165 mm.			
			GRAVEL FILL - 140 mm, frozen, fine, with fine to coarse sand.			
			FAT CLAY (CH) - Dark grey, frozen, high plasticity, trace fine gravel, some medium to coarse sand.			
			- greyish brown, trace silt, no gravel below 0.6 m.			S1
			- LL=75, PL=29, PI=46 at 0.8 m. - PSA: 0% gravel, 0% sand, 45% silt, 55% clay at 0.8 m.			S2
1.0						S3
			- moist, firm below 1.2 m.			
	5		- stiff, some to with silt below 1.5 m.			S4
			- firm below 1.8 m.			S5
2.0			Notes: 1. End of test hole at 2.0 m. 2. Test hole caved to 1.8 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.			
3.0	10					
4.0						

PL MC LL
Cu TORVANE (kPa) ◇
qu POCKET PEN (kPa) ★
SPT (N) BLOWS/0.30 m △
20 40 60 80

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR **Paddock Drilling**	INSPECTOR **R. ALCANTARA**
APPROVED D. ANDERSON	DATE 4-7-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-14

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-21-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,529,770
DESCRIPTION	McFarlane Street N, northbound lane near 149 McFarlane Street N		E 634,989 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.2 m: 175 mm Core 0.2 m to 2.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER	PL MC LL; Cu TORVANE (kPa) ◇; qu POCKET PEN (kPa) ★; SPT (N) BLOWS/0.30 m △ (20 40 60 80)
			ASPHALT - 40 mm.				
			CONCRETE - 203 mm.				
			FAT CLAY (CH) - Greyish brown, frozen, high plasticity, trace fine sand, trace silt.				
						S1	⊖
1.0						S2	⊖
						S3	⊖ ◇
	5		- moist, stiff below 1.4 m.			S4	⊖ ◇
						S5	⊖ ◇
2.0			Notes: 1. End of test hole at 2.0 m. 2. Test hole remained open to 2.0 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.				
3.0	10						
4.0							

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR **Paddock Drilling**	INSPECTOR **R. ALCANTARA**
APPROVED D. ANDERSON	DATE 4-7-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-15

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT	**City of Winnipeg 2025 Local Street Program 25-R-05**	**START DATE**	2-21-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,529,732
DESCRIPTION	McFarlane Street N, northbound lane near 143 McFarlane Street N		E 634,980 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.2 m: 175 mm Core 0.2 m to 2.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER
			ASPHALT - 50 mm.			
			CONCRETE - 155 mm.			
			FAT CLAY (CH) - Greyish brown, frozen, high plasticity, some fine sand, some silt.			
			- LL=70, PL=27, PI=43 at 0.6 m. - PSA: 0% gravel, 1% sand, 52% silt, 47% clay at 0.6 m.			S1
1.0						S2
			- moist, stiff below 1.3 m.			S3
	5		- trace coarse sand, trace gypsum pockets below 1.5 m.			S4
						S5
2.0			Notes: 1. End of test hole at 2.0 m. 2. Test hole caved to 1.8 m upon completion of drilling/digging. 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.			
3.0	10					
4.0						

PL MC LL
Cu TORVANE (kPa) ◇
qu POCKET PEN (kPa) ★
SPT (N) BLOWS/0.30 m △
20 40 60 80

WATER LEVELS ▽ **During Drilling/Digging** None Encountered

CONTRACTOR **Paddock Drilling**	INSPECTOR **R. ALCANTARA**
APPROVED D. ANDERSON	DATE 4-7-2025

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KEY TO SYMBOLS

LITHOLOGIC SYMBOLS


Asphalt


Clay (CH, high plasticity)


Clay (CL, low plasticity)


Concrete


Fill

SAMPLER SYMBOLS


Auger Grab

WELL CONSTRUCTION SYMBOLS

ABBREVIATIONS

LL - Liquid Limit
PL - Plastic Limit
PI - Plastic Index
MC - Moisture Content
DD - Dry Density
NP - Non-Plastic
-200 - Percent Passing No. 200 Sieve
TV - Torvane (kPa)
PP - Pocket Penetrometer (kPa)
PSA - Particle Size Analysis
TOC - Top Of Casing

PN - Pneumatic Piezometer
VW - Vibrating Wire Piezometer
PID - Photoionization Detector
ppm - Parts Per Million
▽ Water Level During Drilling
▽ Water Level Upon Completion of Drilling
▼ Water Level Remeasured/Static

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-001
PROJECT NAME	City of Winnipeg 2025 Local Street Program 25-R-05	**LOCATION**	Winnipeg, Manitoba

APPENDIX C

Laboratory Testing

KGS GROUP

SUMMARY OF INDEX TESTS

Test Hole ID	Smpl No.	Depth From (m)	Depth To (m)	Class-ification	Gravel (%)	Sand (%)	Silt/ Clay (%)	LL	PL	PI	MC (%)	Dry Dens (kN /m3)	Spec Gvty	Satur-ation (%)	Proctor Max DD (kg/m3)	Proct Opt MC (%)	CBR Initial DD (kg/m3)	CBR Initial MC (%)	CBR % of Max DD	CBR % of Opt MC	CBR @2.54 mm	CBR % Swell
TH25-01	S1	0.8	1.0	CL	1	3	96	31	17	14	24											
TH25-01	S2	1.1	1.3								25											
TH25-01	S3	1.4	1.5								23											
TH25-01	S4	1.8	1.9								47											
TH25-01	S5	2.1	2.3								51											
TH25-02	S1	0.8	1.0	CL	0	5	95	35	17	18	39											
TH25-02	S2	1.1	1.3								38											
TH25-02	S3	1.4	1.5								31											
TH25-02	S4	1.7	1.9								48											
TH25-02	S5	2.0	2.1								53											
TH25-03	S1	0.6	0.8								25											
TH25-03	S2	0.9	1.1	CL	0	4	96	30	16	14	26											
TH25-03	S3	1.2	1.4								23											
TH25-03	S4	1.7	1.8								35											
TH25-03	S5	1.9	2.0								22											
TH25-04	S1	0.3	0.5								32											
TH25-04	S2	0.6	0.8								27											
TH25-04	S3	0.9	1.1								26											
TH25-04	S4	1.5	1.7								42											
TH25-04	S5	1.8	2.0								45											
TH25-05	S1	0.6	0.8								32											
TH25-05	S2	0.9	1.1	CH	0	2	98	80	25	55	32											
TH25-05	S3	1.2	1.4								48											
TH25-05	S4	1.5	1.7								52											
TH25-05	S5	2.1	2.3								54											
TH25-06	S1	0.5	0.6								36											
TH25-06	S2	0.8	0.9	CL	0	4	96	33	17	16	27											
TH25-06	S3	1.1	1.2								22											
TH25-06	S4	1.7	1.8								41											
TH25-06	S5	2.1	2.3								44											
TH25-07	S1	0.3	0.5								23											
TH25-07	S2	0.6	0.8								19											
TH25-07	S3	0.9	1.1	CL	0	9	91	28	17	11	20											
TH25-07	S4	1.5	1.7								41											
TH25-07	S5	2.1	2.3								54											
TH25-08	S1	0.4	0.6								21											
TH25-08	S2	0.8	0.9								22											
TH25-08	S3	1.2	1.4								26											
TH25-08	S4	1.5	1.7								31											
TH25-08	S5	1.8	2.0								40											
TH25-09	S1	0.6	0.8	CH	1	7	92	67	24	43	40											
TH25-09	S2	0.9	1.1								33											
TH25-09	S3	1.2	1.4								30											
TH25-09	S4	1.5	1.7								41											

* Moisture conditioned and remolded sample.
** Assumed specific gravity.

KGS GROUP

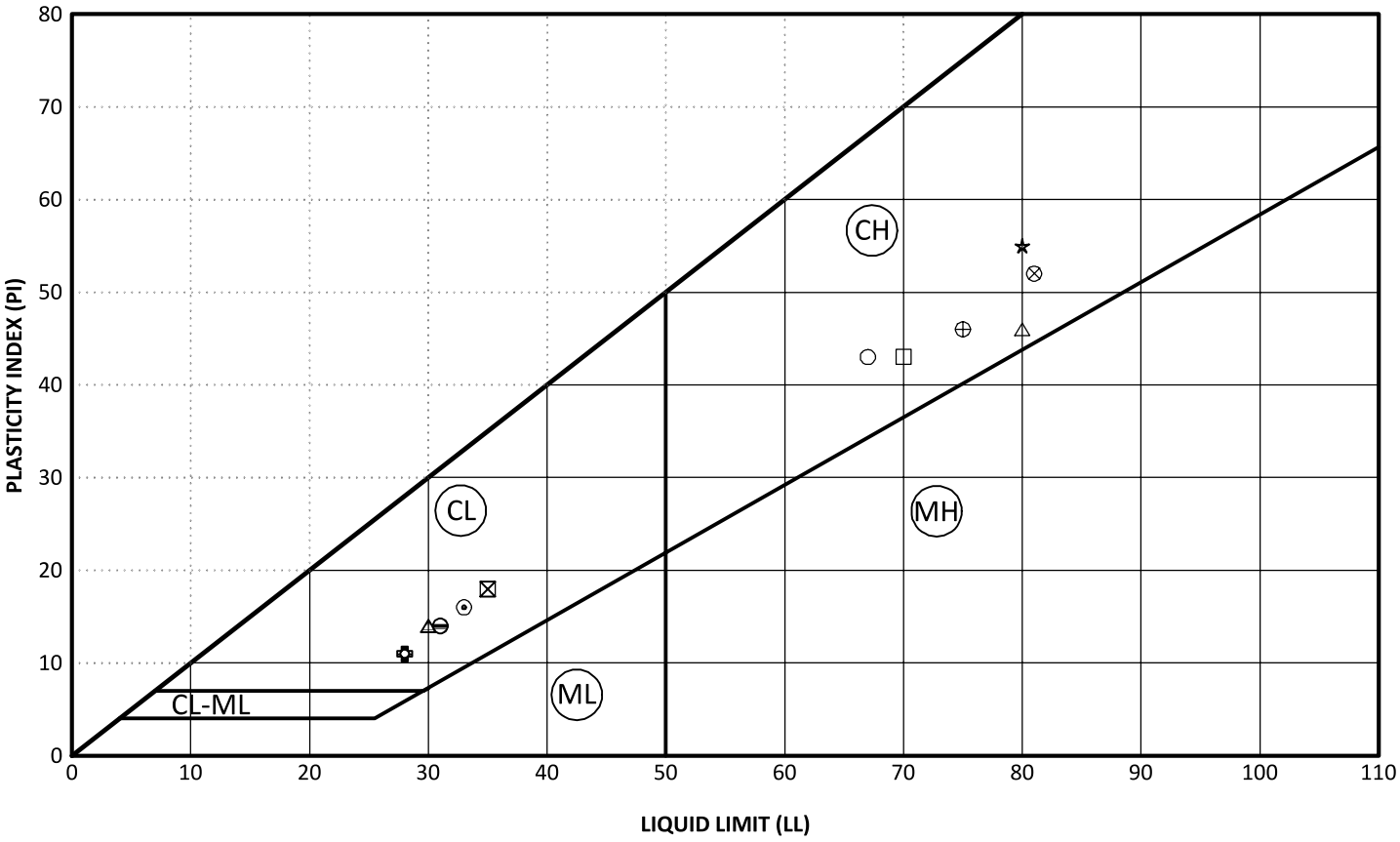
CLIENT **KGS GROUP** **PROJECT NO.** 25-0535-001
PROJECT NAME City of Winnipeg 2025 Local Street Program 25-R-05 **LOCATION** Winnipeg, Manitoba

SUMMARY OF INDEX TESTS

Test Hole ID	Smpl No.	Depth From (m)	Depth To (m)	Class-ification	Gravel (%)	Sand (%)	Silt/ Clay (%)	LL	PL	PI	MC (%)	Dry Dens (kN /m3)	Spec Gvty	Satur-ation (%)	Proctor Max DD (kg/m3)	Proct Opt MC (%)	CBR Initial DD (kg/m3)	CBR Initial MC (%)	CBR % of Max DD	CBR % of Opt MC	CBR @2.54 mm	CBR % Swell
TH25-09	S5	1.8	2.0								47											
TH25-10	S1	0.9	1.0	CH	0	1	99	80	34	46	36											
TH25-10	S2	1.2	1.3								35											
TH25-10	S3	1.4	1.5								30											
TH25-10	S4	1.7	1.8								30											
TH25-10	S5	2.0	2.1								30											
TH25-11	S1	0.8	1.0								38											
TH25-11	S2	1.1	1.3								34											
TH25-11	S3	1.4	1.5								34											
TH25-11	S4	1.8	1.9								32											
TH25-11	S5	2.1	2.3								32											
TH25-12	S1	0.8	1.0	CH	0	1	99	81	29	52	39											
TH25-12	S2	1.1	1.3								37											
TH25-12	S3	1.4	1.5								32											
TH25-12	S4	1.5	1.7								30											
TH25-12	S5	1.8	2.0								35											
TH25-13	S1	0.5	0.6								32											
TH25-13	S2	0.8	0.9	CH	0	1	99	75	29	46	33											
TH25-13	S3	1.1	1.2								30											
TH25-13	S4	1.5	1.7								29											
TH25-13	S5	1.8	2.0								25											
TH25-14	S1	0.6	0.8								30											
TH25-14	S2	0.9	1.1								31											
TH25-14	S3	1.2	1.4								29											
TH25-14	S4	1.5	1.7								28											
TH25-14	S5	1.8	2.0								31											
TH25-15	S1	0.6	0.8	CH	0	1	99	70	27	43	35											
TH25-15	S2	0.9	1.1								36											
TH25-15	S3	1.2	1.4								32											
TH25-15	S4	1.5	1.7								30											
TH25-15	S5	1.8	2.0								33											

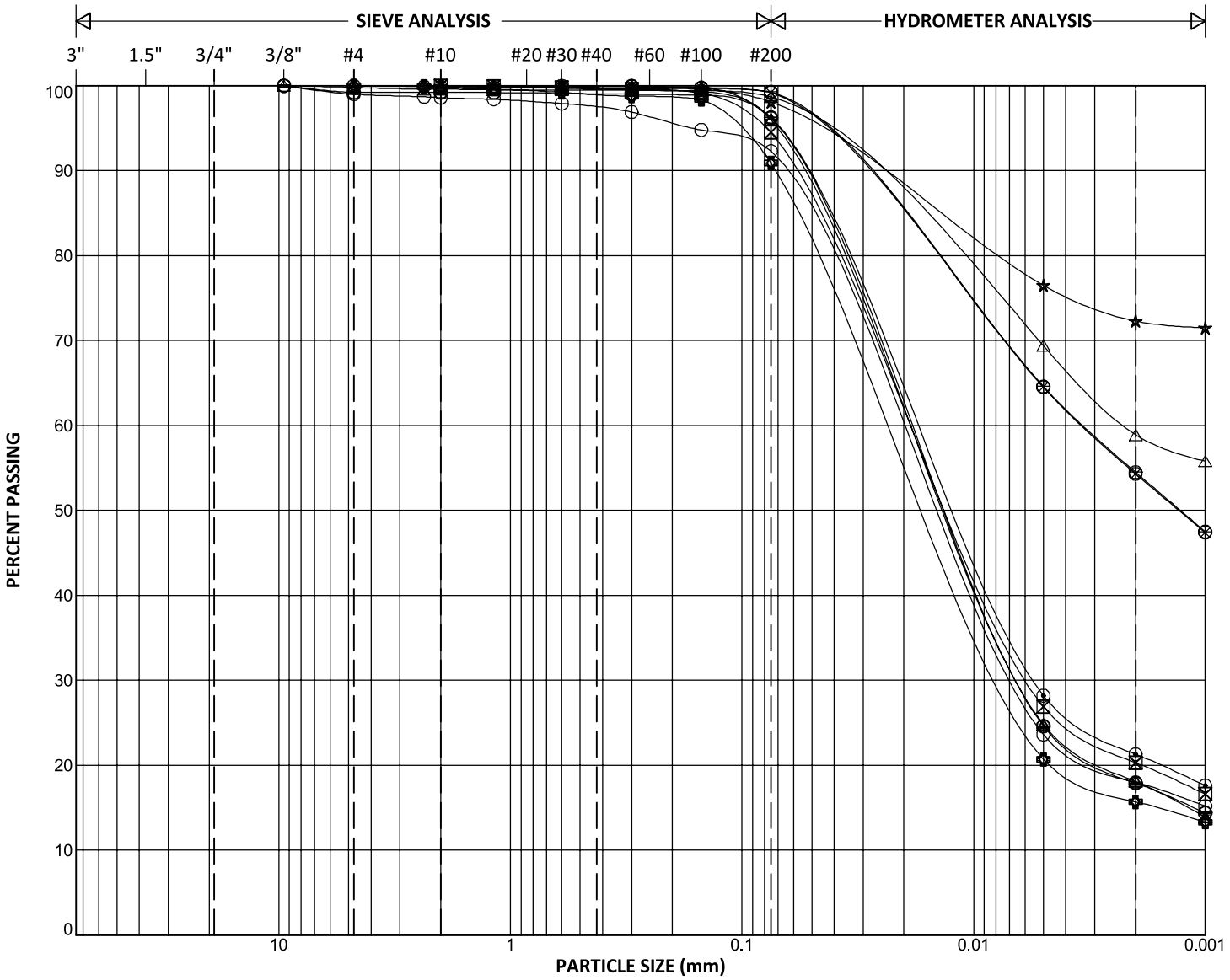
* Moisture conditioned and remolded sample.
** Assumed specific gravity.

ATTERBERG LIMITS



	HOLE	DEPTH (m)	SAMPLE #	LL	PL	PI	SAND (%)	SILT (%)	CLAY (%)	SILT & CLAY (%)	MC (%)	CLASSIFICATION
⊖	TH25-01	0.8	S1	31	17	14	3	78	18	96	24	CL
⊠	TH25-02	0.8	S1	35	17	18	5	74	20	95	39	CL
△	TH25-03	0.9	S2	30	16	14	4	78	18	96	26	CL
★	TH25-05	0.9	S2	80	25	55	2	26	72	98	32	CH
⊙	TH25-06	0.8	S2	33	17	16	4	75	21	96	27	CL
✿	TH25-07	0.9	S3	28	17	11	9	75	16	91	20	CL
○	TH25-09	0.6	S1	67	24	43	7	74	18	92	40	CH
△	TH25-10	0.9	S1	80	34	46	1	40	59	99	36	CH
⊗	TH25-12	0.8	S1	81	29	52	1	45	54	99	39	CH
⊕	TH25-13	0.8	S2	75	29	46	1	45	55	99	33	CH
□	TH25-15	0.6	S1	70	27	43	1	52	47	99	35	CH

GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

	HOLE	DEPTH (m)	SAMPLE #	GRAVEL (%)	SAND (%)	SILT (%)	CLAY (%)	SILT & CLAY (%)	Cu	Cc	CLASSIFICATION
⊖	TH25-01	0.8	S1	1	3	78	18	96			CL
⊠	TH25-02	0.8	S1	0	5	74	20	95			CL
△	TH25-03	0.9	S2	0	4	78	18	96			CL
☆	TH25-05	0.9	S2	0	2	26	72	98			CH
⊙	TH25-06	0.8	S2	0	4	75	21	96			CL
✿	TH25-07	0.9	S3	0	9	75	16	91			CL
○	TH25-09	0.6	S1	1	7	74	18	92			CH
△	TH25-10	0.9	S1	0	1	40	59	99			CH
⊗	TH25-12	0.8	S1	0	1	45	54	99			CH
⊕	TH25-13	0.8	S2	0	1	45	55	99			CH

KGS GROUP

CLIENT **KGS GROUP**
PROJECT NAME City of Winnipeg 2025 Local Street Program 25-R-05
PROJECT NO. 25-0535-001
LOCATION Winnipeg, Manitoba

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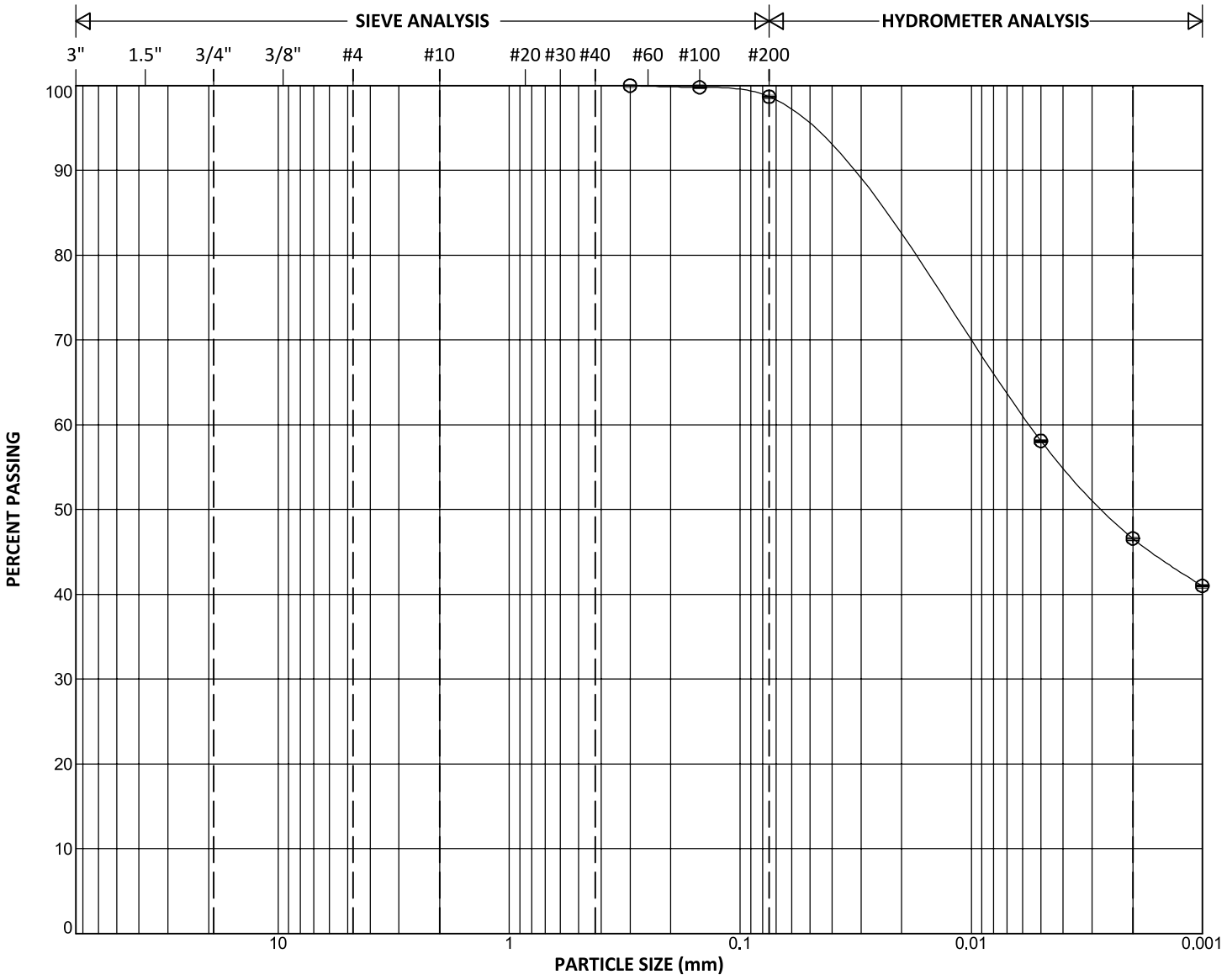
GRAIN SIZE DISTRIBUTION



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

	HOLE	DEPTH (m)	SAMPLE #	GRAVEL (%)	SAND (%)	SILT (%)	CLAY (%)	SILT & CLAY (%)	Cu	Cc	CLASSIFICATION
⊖	TH25-15	0.6	S1	0	1	52	47	99			CH

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KGS GROUP

CLIENT KGS GROUP
PROJECT NAME City of Winnipeg 2025 Local Street Program 25-R-05
PROJECT NO. 25-0535-001
LOCATION Winnipeg, Manitoba