APPENDIX A

GEOTECHNICAL REPORT

Kontzamanis Graumann
Smith MacMillan Inc.
3rd Floor - 865 Waverley St
Winnipeg, MB R3T 5P4

P 204-896-1209
F 204-896-0754
kgsgroup.com

April 4, 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-02
Report of Geotechnical Investigations and Test Results – Final Rev 0

Dear Mr. Rowbotham

This letter summarizes KGS Group's geotechnical investigation results for the 2025 City of Winnipeg (COW) Local Street Program – 25-R-02 in Winnipeg, Manitoba. KGS Group's scope of service for this project was outlined in our proposal no. 25-000-0103 titled "City of Winnipeg 2025 Local Street Program 25-R-02 – Geotechnical Services" dated January 23, 2025.

Kontzamanis Graumann Smith MacMillan Inc. (KGS Group) was retained to complete pavement and subsurface investigations for approximately 1.7 km of local and industrial streets and an alleyway at seven (7) sites included in the 2025 project scope. Of the seven (7) sites, one (1) was identified as a minor rehabilitation, one (1) was identified as a major rehabilitation, and five (5) were identified as reconstructions. Pavement coring and granular base investigations were completed for all seven (7) 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 seven (7) sites, with subgrade drilling and soil sampling completed at Burnell Street, Huntleigh Street, McMicken Street, Langside Street, and Kennedy-Edmonton Alleyway (sites 01, 02, 04, 05, and 07, respectively). Only pavement coring was conducted at McGee Street and Qu'Appelle Avenue (sites 03 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 core and test hole 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 7, 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 Burnell Street, Huntleigh Street, McMicken Street, Langside Street, and the Kennedy-Edmonton Alley (sites 01, 02, 04, 05, and 07, respectively). Fifteen (15) test holes were advanced between the five (5) reconstruction project sites, as follows:

- Burnell Street: three (3) test holes
- Huntleigh Street: three (3) test holes
- McMicken Street: four (4) test holes
- Langside Street: three (3) test holes
- Kennedy-Edmonton Alley: two (2) 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, three (3) test holes which were located in areas with a high number of service lines were advanced to depths of 2.0 m (6.5 ft) below ground surface (BGS), and the remaining 12 test holes were advanced to depths 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 for during drilling for sloughing and caving conditions in each test hole and are summarized within 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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kgsgroup.com

TABLE 3: OBSERVED TEST HOLE CONDITIONS

Site No, Name	Test Hole ID	Depth of Drilling (m)	Depth of Hole Upon Completion (m)
01, Burnell Street	TH25-01	3.0	3.0
	TH25-02	3.0	3.0
	TH25-03	3.0	3.0
02, Huntleigh Street	TH25-13	3.0	2.4
	TH25-14	2.0	1.8
	TH25-15	2.0	2.0
04, McMicken Street	TH25-04	3.0	2.4
	TH25-05	3.0	3.0
	TH25-06	3.0	3.0
	TH25-07	3.0	3.0
05, Langside Street	TH25-08	3.0	3.0
	TH25-09	3.0	3.0
	TH25-10	3.0	2.1
07, Kennedy-Edmonton Alley	TH25-11	3.0	2.4
	TH25-12	2.0	2.0

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

Detailed test hole 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 if issuing this report, the CBR testing is currently underway, and results are yet to be received. The updated and final report will be issued upon receipt of testing results.

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: BURNELL STREET

A core investigation was conducted along Burnell Street, 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 3.0 m (10 ft) below pavement surface. The general stratigraphy encountered within the test holes consisted of asphalt pavement overlying concrete, with clay 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 1.

Asphalt – The pavement surface consisted of asphalt with varying thicknesses of 80 to 90 mm. No asphalt was present at the ground surface in TH25-01 location.

Concrete – Concrete was encountered at the ground surface in TH25-01 and underlying the asphalt in TH25-02 and TH25-03. The thickness of the concrete varied from 105 to 120 mm.

Clay Fill – Clay fill material was encountered directly below the concrete in all test holes and varied in thickness between 50 to 170 mm. The fill was dark grey, frozen, and intermixed with granular.

Fat Clay (CH) – Fat clay was generally encountered below the clay fill and though the depth of exploration in all test holes. The fat clay was generally brown to light grey, frozen, 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 15 kPa to 75 kPa, classifying the clay as soft to stiff in consistency, generally increasing with depth. One (1) Atterberg limits test was completed on the fat clay with results indicating a liquid limit of 59, plastic limit of 19, and plasticity index of 40, classifying the material as high plasticity. One (1) particle size analysis test was completed and indicated 0% gravel, 3% sand, 39% silt, and 58% clay. Moisture contents within the clay ranged from 21 to 54% and generally increased with depth.

Lean Clay (CL) – Lean clay was encountered at varying depths within the fat clay in each test hole and varied in thickness from 300 to 600 mm. The lean clay was light brown, moist, silty, trace fine to medium sand.

One (1) Atterberg limits test was completed on the lean clay with results indicating a liquid limit of 28, plastic limit of 18, and plasticity index of 10, classifying the material as low plasticity. One (1) particle size analysis test

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was completed and indicated 0% gravel, 8% sand, 77% silt, and 15% clay. Moisture contents within the clay ranged from 20 to 30% and generally increased with depth.

SITE 02: HUNTLEIGH STREET

A core investigation was conducted along Huntleigh Street, involving the extraction of three (3) cores from mid-slab locations. 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 asphalt pavement overlying concrete with 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 2.

Asphalt – The pavement surface consisted of asphalt with varying thicknesses of 18 to 25 mm.

Concrete – Concrete was encountered underlying the asphalt with varying thicknesses of 127 to 160 mm.

Gravel Fill – Gravel fill was encountered directly below the concrete in all test holes and varied in thickness between 45 to 50 mm. The gravel fill material was frozen, fine gravel, with fine to coarse sand.

Fat Clay (CH) – Fat clay was encountered below the gravel fill in all test holes except TH25-15. The fat clay was generally brown to grey, frozen, trace fine sand, trace silt, and damp to wet below frozen material.

One (1) Atterberg limits test was completed on the clay with results indicating liquid limit of 74, plastic limit of 30, and plasticity index of 44, classifying the material as of high plasticity. One (1) particle size analysis test was completed and indicated 0% gravel, 1% sand, 32% silt, and 67% clay. Moisture contents within the clay ranged from 20 to 35%.

Lean Clay (CL) – Lean clay was encountered directly within the fat clay in TH25-13 and TH25-14 and beneath the gravel fill in TH25-15 where it extended to the depth of exploration. The lean clay was light brown to brown, moist to wet, silty, trace fine to medium sand.

Undrained shear strengths of the lean clay were estimated during drilling using a handheld Torvane and ranged from 18 kPa to 30 kPa, classifying the clay as soft to firm in consistency. One (1) Atterberg limits test was completed on the lean clay with results indicating liquid limit of 32, plastic limit of 16, and plasticity index of 16, classifying the material as of low plasticity. One (1) Particle size analysis test completed and indicated 0% gravel, 5% sand, 76% silt, and 19% clay. Moisture contents within the lean clay ranged from 23 to 43%.

SITE 03: MCGEE STREET

A core investigation was conducted along McGee 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 185 to 190 mm. Granular base was observed below the pavement structure at all core locations with thicknesses varying between 39 and 221 mm, generally increasing in thickness in the northbound direction. Dense, frozen conditions of the gravel base prevented observation of the underlying subgrade. Detailed core locations are illustrated in Figure 3.

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F 204-896-0754
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SITE 04: MCMICKEN STREET

A core investigation was conducted along McMicken Street, involving the extraction of four (4) 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 with clay 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 4.

Asphalt – The pavement surface consisted of asphalt with a thickness of approximately 20 mm.

Concrete – Concrete was encountered underlying the asphalt with varying thicknesses of 115 to 155 mm.

Clay Fill – Clay fill was encountered directly below the concrete in all test holes and varied in thickness between 70 to 310 mm. The clay fill was dark grey, frozen, intermixed with granular.

Fat Clay (CH) – Fat clay was encountered below the clay fill and extended for the depth of exploration, except TH25-06 and TH25-07 where a layer of lean clay beneath the clay fill and over the fat clay. The fat clay was generally brown to grey, frozen, trace to with silt, trace sand, and moist below frozen material.

Undrained shear strengths of the fat clay were estimated during drilling using a handheld Torvane and ranged from 20 kPa to 70 kPa, classifying the clay as soft to stiff in consistency. One (1) Atterberg limits test was completed on the fat clay with results indicating liquid limit of 66, plastic limit of 30, and plasticity index of 36, classifying the material as of high plasticity. One (1) particle size analysis test was completed and indicated 1% gravel, 16% sand, 45% silt, and 38% clay. Moisture contents within the clay ranged from 25 to 55%, with the exception of sample TH25-07 S5 at 7ft depth with 90%.

Lean Clay (CL) – Lean clay was encountered directly beneath the clay fill and above the fat clay in TH25-06 and TH25-07. The lean clay was light brown, frozen, silty, trace fine to medium sand.

One (1) Atterberg limits test was completed on the lean clay with results indicating liquid limit of 31, plastic limit of 17, and plasticity index of 14, classifying the material as of low plasticity. One (1) Particle size analysis test completed and indicated 0% gravel, 7% sand, 75% silt, and 18% clay. Moisture contents within the lean clay ranged from 30 to 40%.

SITE 05: LANGSIDE STREET

A core investigation was conducted along Langside Street, involving the extraction of three (3) cores. 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 with 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 65 to 105 mm.

Gravel Fill – Gravel fill was encountered directly below the asphalt in all test holes and varied in thickness between 140 to 235 mm. The gravel fill was frozen, fine to medium, with fine to coarse sand.

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P 204-896-1209
F 204-896-0754
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Fat Clay (CH) – Fat clay was encountered below the gravel fill for the depth of exploration, except in TH25-10 where a 900 mm thick layer of lean clay was encountered within the fat clay. The fat clay was generally grey to brown, frozen, trace to some silt, trace fine gravel, trace sand, and moist below frozen material.

Undrained shear strengths of the fat clay were estimated during drilling using a handheld Torvane and ranged from 30 kPa to 60 kPa, classifying the clay as firm to stiff in consistency. Two (2) Atterberg limits tests were completed on the fat clay with results indicating liquid limits of 82 to 88, plastic limits of 29 to 30, and plasticity indices of 53 to 58, classifying the material as of high plasticity. Two (2) particle size analysis tests were completed and indicated 0% gravel, 1 to 2% sand, 17 to 18% silt, and 81% clay. Moisture contents within the clay ranged from 30 to 50%.

Lean Clay (CL) – Lean clay was encountered within the fat clay layer with a thickness of 900 mm in TH25-10 at a depth of 0.6 m below grade. The lean clay was light brown, frozen, silty, trace medium to coarse sand.

One (1) Atterberg limits test was completed on the lean clay with results indicating liquid limit of 31, plastic limit of 16, and plasticity index of 15, classifying the material as of low plasticity. One (1) Particle size analysis test completed and indicated 0% gravel, 3% sand, 73% silt, and 24% clay. Moisture contents within the lean clay ranged from 18 to 38%.

SITE 06: QU'APPELLE AVENUE

A core investigation was conducted along Qu'Appelle 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 200 to 220 mm. Granular base was observed below the pavement structure at C25-04 and C25-05, with observed thicknesses of 59 and 204 mm. Clay with some intermixed sand was observed below the pavement structure at C25-06. Dense, frozen conditions of the gravel base prevented observation of the underlying subgrade in C24-04 and C25-05. Detailed core locations are illustrated in Figure 6.

SITE 07: KENNEDY-EDMONTON ALLEY

A core investigation was conducted along the Kennedy-Edmonton Alleyway, involving the extraction of two (2) cores from mid-slab locations. 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 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 concrete pavement with 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 7.

Concrete – The pavement surface consisted of concrete with thicknesses of 145 and 195 mm.

Gravel Fill – Gravel fill was encountered directly below the concrete in all test holes and varied in thickness between 110 to 160 mm. The gravel fill was frozen, fine, with fine to coarse sand.

Fat Clay (CH) – Fat clay was encountered below the gravel fill for the depth of exploration, except in TH25-11 where a 250 mm thick layer of lean clay was encountered within the fat clay. The fat clay was generally grey to brown, frozen, trace silt, trace fine to medium sand, and moist below frozen material.

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P 204-896-1209
F 204-896-0754
kgsgroup.com

Undrained shear strengths of the fat clay were estimated during drilling using a handheld Torvane and ranged from 25 kPa to 65 kPa, classifying the clay as firm to stiff in consistency. Two (2) Atterberg limits tests were completed on the fat clay with results indicating liquid limits of 74 to 76, plastic limits of 27 to 30, and plasticity indices of 44 to 49, classifying the material as of high plasticity. Two (2) particle size analysis tests were completed and indicated 0% gravel, 2 to 3% sand, 27 to 38% silt, and 59 to 71% clay. Moisture contents within the clay ranged from 35 to 62%.

Lean Clay (CL) – Lean clay was encountered within the fat clay layer with a thickness of 250 mm in TH25-11 at a depth of 1.5 m below grade. The lean clay was light brown, moist, soft, silty, and trace fine sand.

Moisture content within the lean clay was from 20%.

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.

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.

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Kontzamanis Graumann Smith MacMillan Inc.
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F 204-896-0754
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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: TEST HOLE LOCATIONS ON BURNELL STREET (SITE 01)

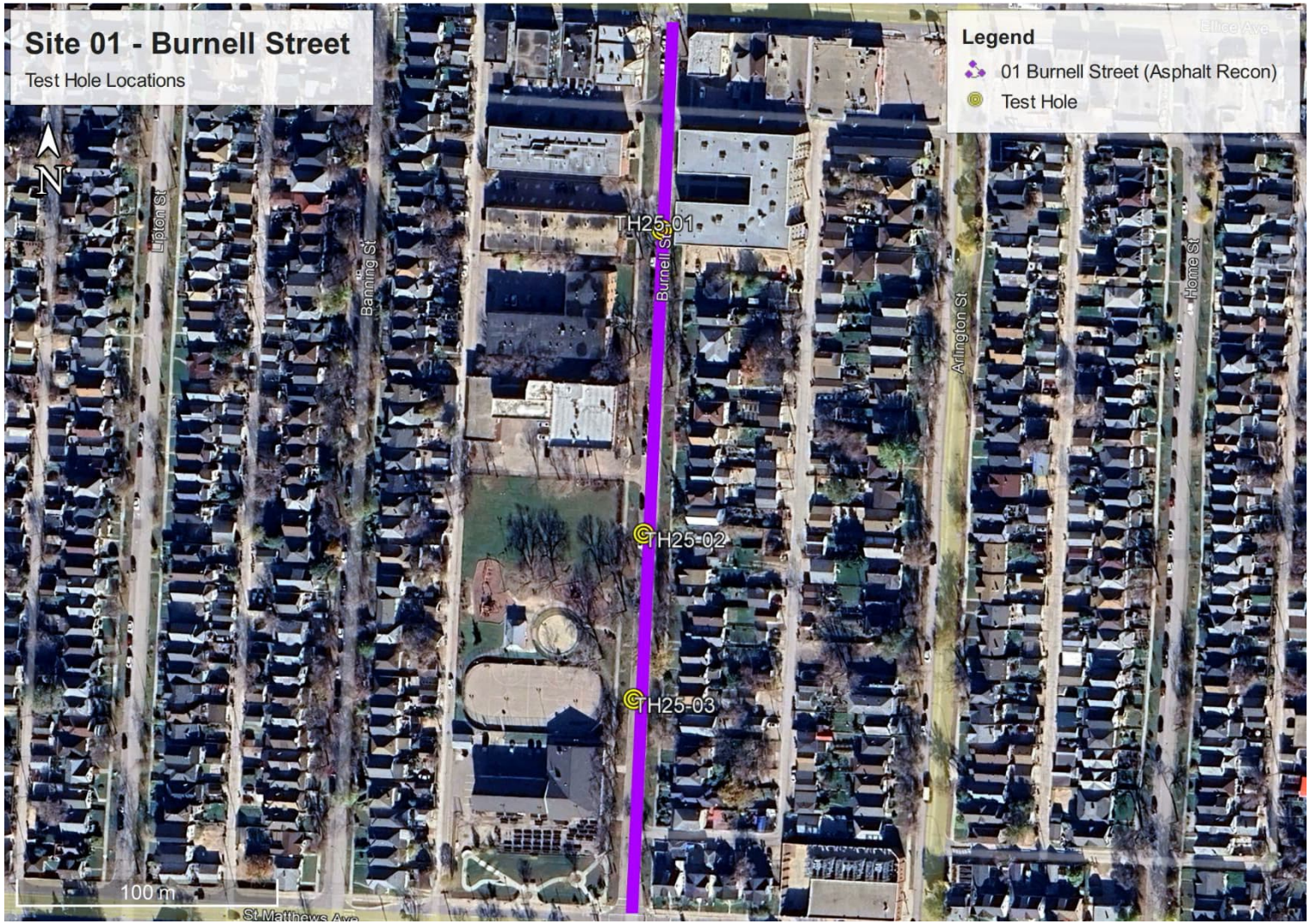


FIGURE 2: TEST HOLE LOCATIONS ON HUNTLEIGH STREET (SITE 02)

FIGURE 3: PAVEMENT CORE LOCATIONS ON MCGEE STREET (SITE 03)

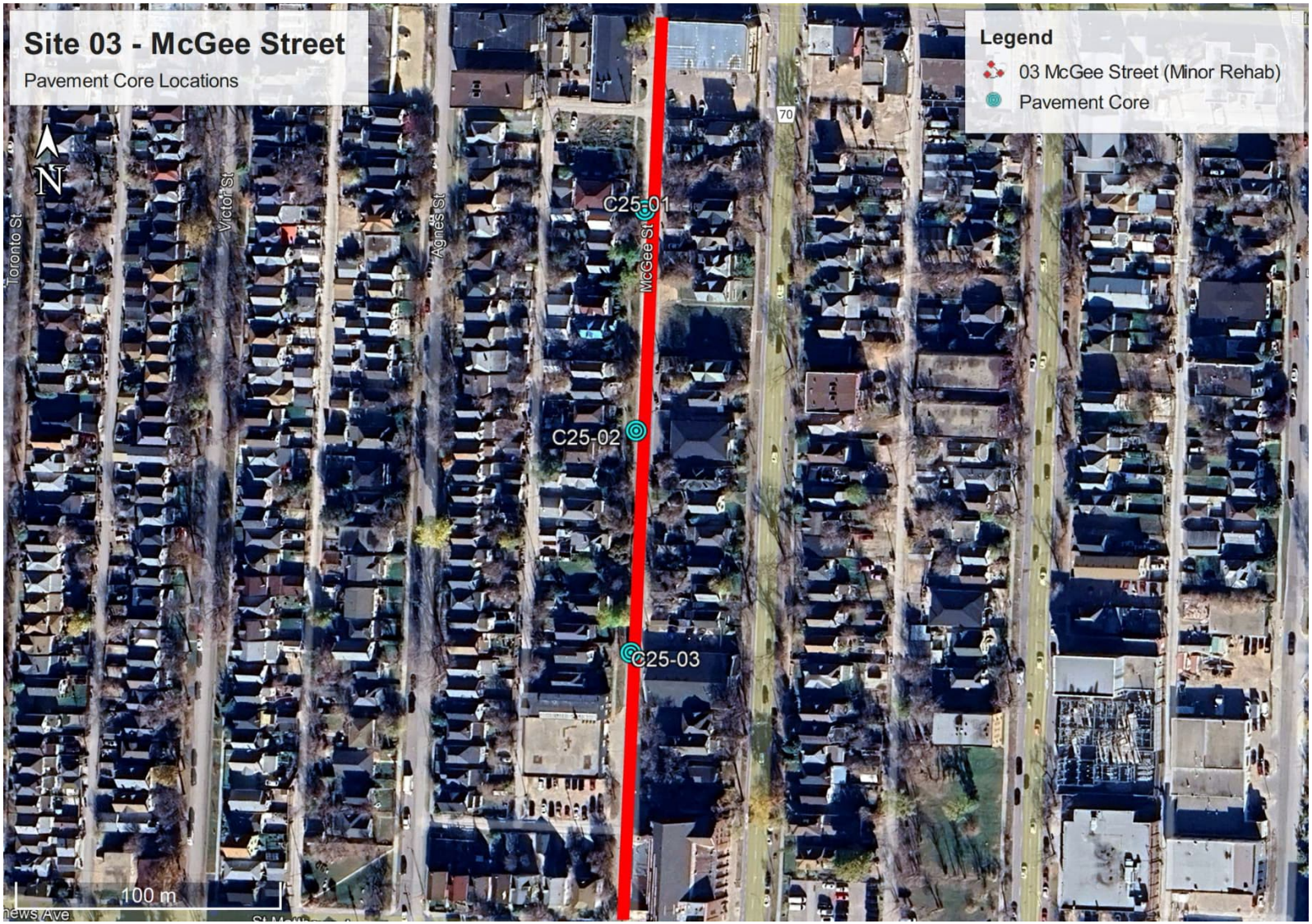


FIGURE 4: TEST HOLE LOCATIONS ON MCMICKEN STREET (SITE 04)

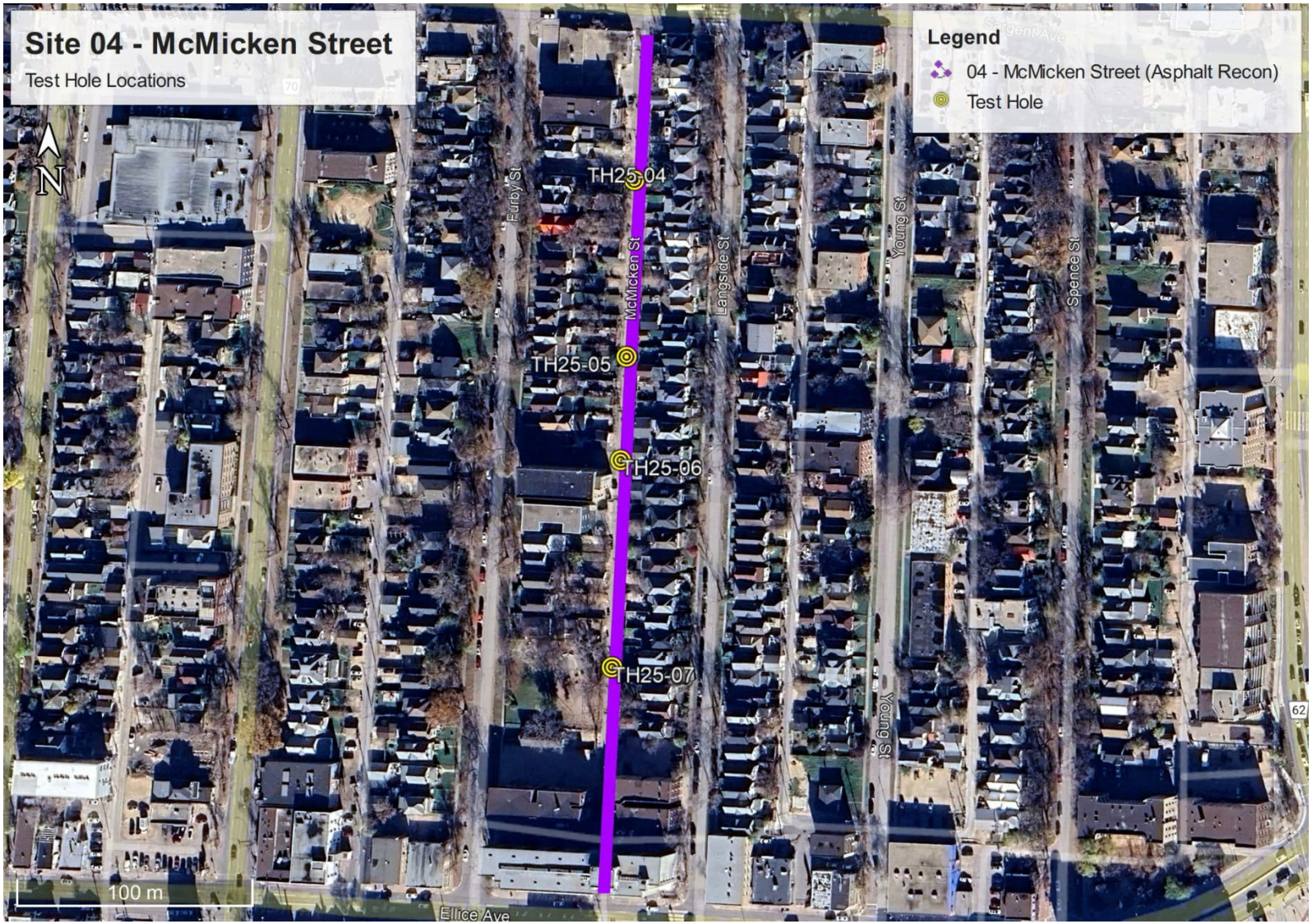


FIGURE 5: TEST HOLE LOCATIONS ON LANGSIDE STREET (SITE 05)

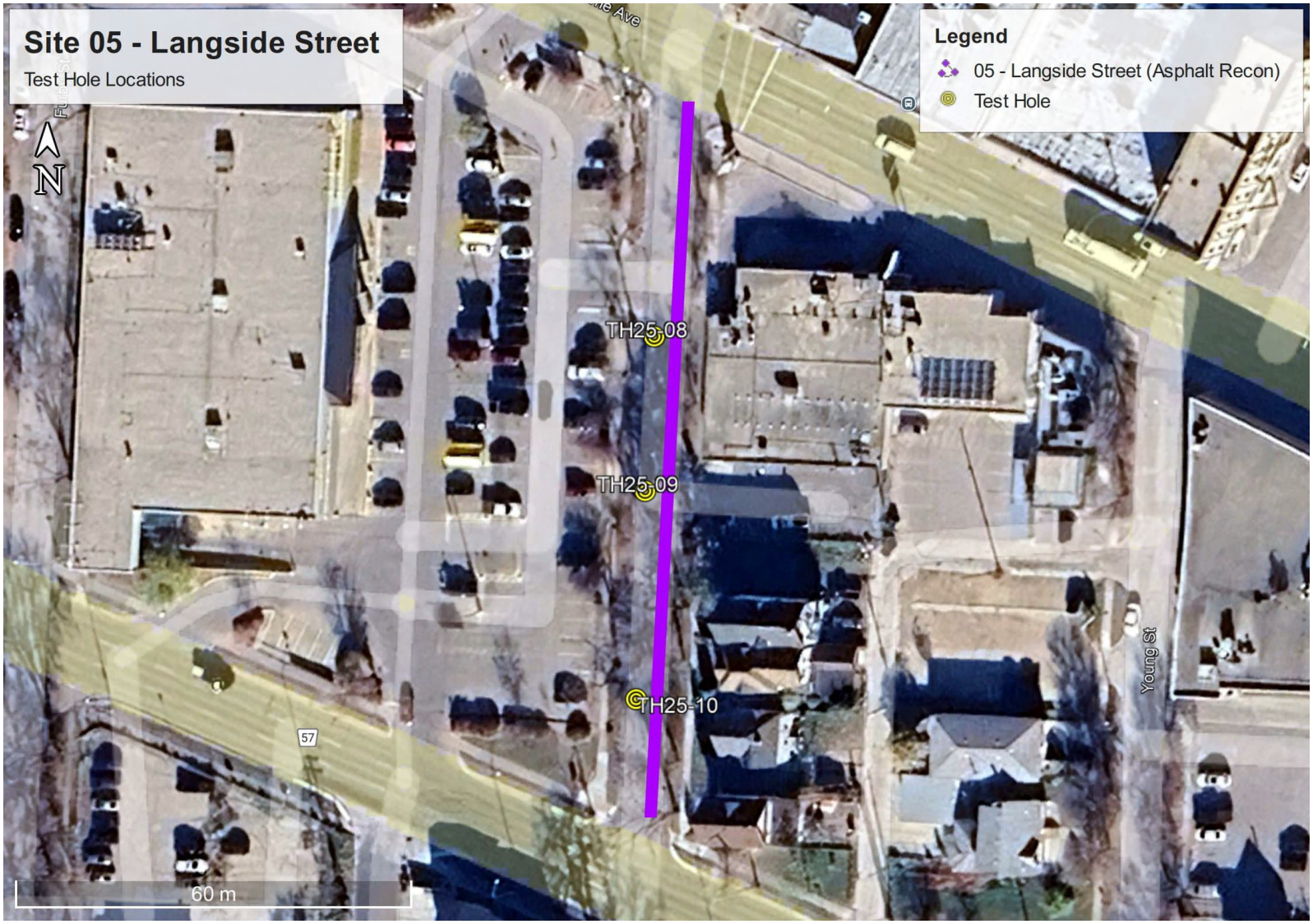
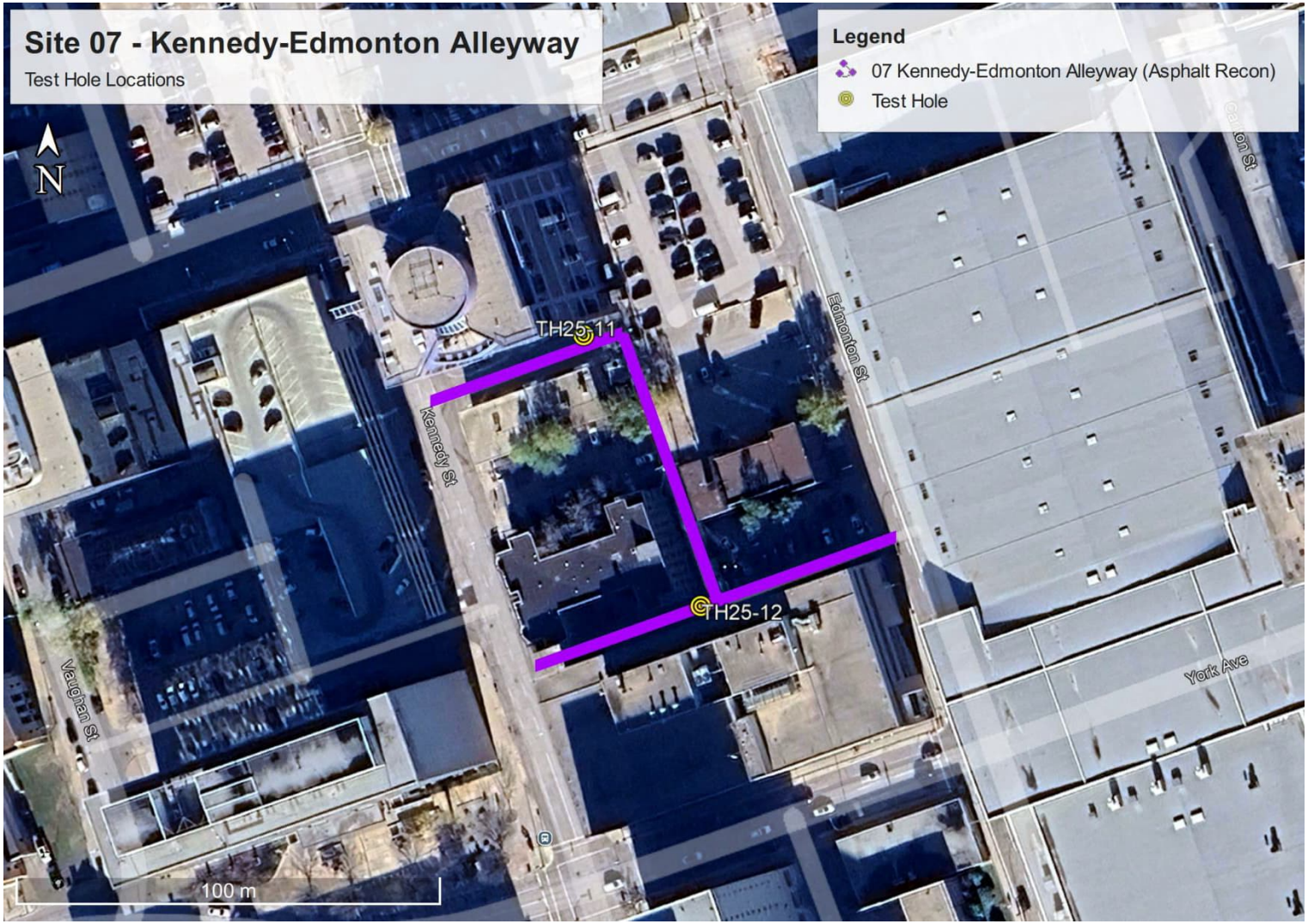


FIGURE 6: PAVEMENT CORE LOCATIONS ON QU'APPELLE AVENUE (SITE 06)

FIGURE 7: TEST HOLE LOCATIONS ON KENNEDY-EDMONTON ALLEYWAY (SITE 07)



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	Burnell Street	TH25-01	Southbound lane near 510 Burnell St.	5528285	631404
		TH25-02	Southbound lane near 477 Burnell St.	5528169	631400
		TH25-03	Southbound lane near 457 Burnell St.	5528106	631398
02	Huntleigh Street	TH25-13	Southbound lane near northern face of 301 Victor St.	5527850	631965
		TH25-14	Southbound lane near backside of 331 Victor St.	5527907	631966
		TH25-15	Southbound lane near 339 Victor St.	5527940	631966
03	McGee Street	C25-01	Southbound lane near 446 McGee St.	5528273	632089
		C25-02	Southbound lane near 416 McGee St.	5528189	632088
		C25-03	Southbound lane near 388 McGee St.	5528106	632087
04	McMicken Street	TH25-04	Southbound lane near backside of 575 Furby St.	5528668	632406
		TH25-05	Southbound lane near backside of 549 Furby St.	5528589	632404
		TH25-06	Southbound lane near backside of 531 Furby St.	5528544	632403
		TH25-07	Southbound lane near north edge of Furby Tot Lot	5528455	632402
05	Langside Street	TH25-08	Southbound lane approximately 40 m south of Notre Dame Ave. intersection	5529129	632455
		TH25-09	Southbound lane approximately 60 m south of Notre Dame Ave. intersection	5529106	632455
		TH25-10	Southbound lane approximately 19 m north of Cumberland Ave. intersection	5529075	632454
06	Qu'Appelle Avenue	C25-04	Eastbound lane approximately 34 m east of Balmoral St. intersection	5528557	632738
		C25-05	Eastbound lane approximately 87 m west of Kennedy St. intersection	5528568	632777
		C25-06	Eastbound lane approximately 30 m west of Kennedy St. intersection	5528590	632830
07	Kennedy-Edmonton Alleyway	TH25-11	Near parking garage exit of 400 St. Mary Ave.	5527953	633147
		TH25-12	Near eastern face of 165 Kennedy St.	5527891	633176

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	Burnell Street	TH25-01	Concrete	Mid-slab	108	Clay mixed with granular	172	280	Lean clay & fat clay
		TH25-02	Asphalt / Concrete	Mid-slab	80 / 120	Clay mixed with granular	53	253	Fat clay & lean clay
		TH25-03	Asphalt / Concrete	Mid-slab	90 / 110	Clay mixed with granular	53	253	Fat clay & lean clay
02	Huntleigh Street	TH25-13	Asphalt / Concrete	Mid-slab	20 / 160	Granular	49	229	Fat clay & lean clay
		TH25-14	Asphalt / Concrete	Mid-slab	18 / 150	Granular	48	216	Fat clay & lean clay
		TH25-15[1]	Asphalt / Concrete	Mid-slab	25 / 127	Granular	52	204	Lean clay
03	McGee Street	C25-01	Concrete	Joint	185	Granular	221	406	Not investigated
		C25-02	Concrete	Mid-slab	185	Granular	120	305	Not investigated
		C25-03	Concrete	Mid-slab	190	Granular	39	229	Not investigated
04	McMicken Street	TH25-04[2]	Asphalt / Concrete	Mid-slab	20 / 125	Clay mixed with granular	102	247	Fat clay
		TH25-05	Asphalt / Concrete	Mid-slab	20 / 115	Clay mixed with granular	69	204	Fat clay
		TH25-06	Asphalt / Concrete	Mid-slab	20 / 155	Clay mixed with granular	307	482	Lean clay & fat clay
		TH25-07	Asphalt / Concrete	Mid-slab	21 / 150	Clay mixed with granular	305	476	Lean clay & fat clay
05	Langside Street	TH25-08	Asphalt	N/A	70	Granular	235	305	Fat clay
		TH25-09	Asphalt	N/A	65	Granular	139	204	Fat clay
		TH25-10	Asphalt	N/A	105	Granular	200	305	Lean clay & fat clay
06	Qu'Appelle Avenue	C25-04	Concrete	Mid-slab	220	Granular	59	279	Not investigated
		C25-05	Concrete	Mid-slab	202	Granular	204	406	Not investigated
		C25-06	Concrete	Mid-slab	200	Clay mixed with granular	Unknown	Unknown	Not investigated
07	Kennedy-Edmonton Alleyway	TH25-11	Concrete	Mid-slab	195	Granular	162	357	Fat clay & lean clay
		TH25-12	Concrete	Mid-slab	145	Granular	108	253	Fat clay

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

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

APPENDIX A

Core Photo Log

KGS GROUP

Photo 1: Burnell Street, TH25-01

Photo 2: Burnell Street, TH25-02

Photo 3: Burnell Street, TH25-03

Photo 4: Huntleigh Street, TH25-13

Photo 5: Huntleigh Street, TH25-14

Huntleigh Street TH25-15 core not recoverable.

Photo 6: McGee Street, C25-01

Photo 7: McGee Street, C25-02

Photo 8: McGee Street, C25-03

Photo 9: McMicken Street, TH25-04

Photo 10: McMicken Street, TH25-05

Photo 11: McMicken Street, TH25-06

Photo 12: McMicken Street, TH25-07

Photo 13: Langside Street, TH25-08

Photo 14: Langside Street, TH25-09

Photo 15: Langside Street, TH25-10

Photo 16: Qu'Appelle Avenue, C25-04

Photo 17: Qu'Appelle Avenue, C25-05

Photo 18: Qu'Appelle Avenue, C25-06

Photo 19: Kennedy-Edmonton Alleyway, TH25-11

Photo 20: Kennedy-Edmonton Alleyway, TH25-12

APPENDIX B

Test Hole Logs

KGS GROUP

KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-01

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-24-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,528,285
DESCRIPTION	Burnell Street, southbound lane near 510 Burnell Street		E 631,404 Zone 14
DRILL RIG / HAMMER	Canterra CT 250 Truck Mounted Drill Rig 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
			CONCRETE - 108 mm.			
			CLAY FILL - 172 mm, Dark grey, frozen, high plasticity, intermixed with granular, trace silt.			S1
			LEAN CLAY (CL) - Light brown, frozen, low plasticity, silty, trace fine to medium sand.			
			- LL=28, PL=18, PI=10 at 0.6 m. - PSA: 0% gravel, 8% sand, 77% silt, 15% clay at 0.6 m.			S2
						S3
1.0			**FAT CLAY (CH)** - Brown, frozen, high plasticity, trace medium sand, trace silt.			
			- moist, stiff below 1.3 m.			
	5					S4
2.0			- trace gypsum pockets below 1.9 m.			
			- with silt from 2.1 m to 2.4 m.			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						

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 4-4-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-02

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-24-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,528,169
DESCRIPTION	Burnell Street, southbound lane near 477 Burnell Street		E 631,400 Zone 14
DRILL RIG / HAMMER	Canterra CT 250 Truck Mounted Drill Rig 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)	DESCRIPTION AND CLASSIFICATION
		ASPHALT - 80 mm.
		CONCRETE - 120 mm.
		CLAY FILL - 53 mm, Dark grey, frozen, intermixed with granular.
		FAT CLAY (CH) - Brown, frozen, high plasticity, trace fine to medium sand, trace silt.
1.0		**LEAN CLAY (CL)** - Light brown, moist, soft, low plasticity, silty, trace fine to medium sand.
	5	**FAT CLAY (CH)** - Brown, moist, stiff, high plasticity, trace silt.
		LEAN CLAY (CL) - Light brown, moist, soft, low plasticity, silty, trace medium sand.
2.0		**FAT CLAY (CH)** - Brown, moist, stiff, high plasticity, some silt, trace medium sand, trace gypsum pockets.
		- firm below 2.6 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		

WATER LEVEL | SAMPLE TYPE | NUMBER

S1 | S2 | S3 | S4 | S5

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 4-4-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-03

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-24-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,528,106
DESCRIPTION	Burnell Street, southbound lane near 457 Burnell Street		E 631,398 Zone 14
DRILL RIG / HAMMER	Canterra CT 250 Truck Mounted Drill Rig 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 - 90 mm.			
			CONCRETE - 110 mm.			
			CLAY FILL - 53 mm, Dark grey, frozen, intermixed with granular.			
			FAT CLAY (CH) - Brown, frozen, high plasticity, trace silt.			
			- light brownish grey, moist, soft, trace fine to medium sand below 0.6 m.			
			- some to with silt below 0.7 m.			S1
1.0			- light brown below 0.9 m. - LL=59, PL=19, PI=40 at 0.9 m. - PSA: 0% gravel, 3% sand, 39% silt, 58% clay at 0.9 m.			S2
						S3
	5					
			- brown, stiff, trace silt below 1.8 m.			S4
2.0			**LEAN CLAY (CL)** - Light brown, moist, soft, low plasticity, silty, trace fine sand.			
			FAT CLAY (CH) - Brown, moist, stiff, high plasticity, trace fine sand.			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						

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 4-4-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-04

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-21-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,528,668
DESCRIPTION	McMicken Street, southbound lane near backside of 575 Furby Street		E 632,406 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.0 m: 175 mm Core 0.0 m to 3.0 m: 150 mm ø SSA		

DEPTH (m)	DEPTH (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE TYPE	NUMBER
			ASPHALT - 20 mm.			
			CONCRETE - 125 mm.			
			CLAY FILL - 102 mm, Dark grey, frozen, intermixed with granular.			
			FAT CLAY (CH) - Brown, frozen, high plasticity, trace medium to coarse sand, trace silt.			
			- LL=66, PL=30, PI=36 at 0.6 m. - PSA: 1% gravel, 16% sand, 45% silt, 38% clay at 0.6 m.			S1
1.0						S2
						S3
	5		- greyish brown, moist, stiff, trace silt, trace gypsum pockets below 1.5 m.			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 2.4 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 4-4-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-05

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-24-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,528,589
DESCRIPTION	McMicken Street, southbound lane near backside of 549 Furby Street		E 632,404 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 - 20 mm.			
			CONCRETE - 115 mm.			
			CLAY FILL - 69 mm, Dark grey, frozen, intermixed with granular.			
			CLAY (CH) - Dark grey, frozen, high plasticity, trace silt.			
			- brown below 0.7 m.			S1
1.0						S2
						S3
	5					S4
			- with silt, trace gypsum pockets below 1.7 m.			
2.0						S5
			- firm below 2.4 m.			
3.0	10					
4.0			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.			

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 4-4-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-06

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-24-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,528,544
DESCRIPTION	McMicken Street, southbound lane, near backside of 531 Furby Street		E 632,403 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 - 20 mm.			
			CONCRETE - 155 mm.			
			CLAY FILL - 307 mm, Dark grey, frozen, high plasticity, intermixed with granular, trace silt.			S1
			LEAN CLAY (CL) - Light brown, frozen, low plasticity, silty, trace medium sand.			S2
1.0						S3
	5		**FAT CLAY (CH)** - Brown, moist, high plasticity, trace silt.			S4
2.0			- some to with silt from 2.3 m to 2.4 m.			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						

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 4-4-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-07

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-24-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,528,455
DESCRIPTION	McMicken Street, southbound lane, near north edge of Furby Tot Lot		E 632,402 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 - 21 mm.			
			CONCRETE - 150 mm.			
			CLAY FILL - 305 mm, Dark grey, frozen, intermixed with granular.			S1
			LEAN CLAY (CL) - Light brown, frozen, low plasticity, silty, trace fine sand. - LL=31, PL=17, PI=14 at 0.6 m. - PSA: 0% gravel, 7% sand, 75% silt, 18% clay at 0.6 m.			S2
			FAT CLAY (CH) - Brown, frozen, high plasticity, with silt, trace fine sand.			S3
1.0						
	5		- moist, firm, trace to some silt, trace coarse sand below 1.5 m.			S4
2.0						
			- mottled brown/light brown, with silt seams, trace medium sand below 2.1 m.			S5
			- soft 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 4-4-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-08

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-19-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,529,129
DESCRIPTION	Langside Street, southbound lane approx. 40 m south of Notre Dame Avenue intersection		E 632,455 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 - 70 mm.			
			GRAVEL FILL - 235 mm, frozen, fine to medium, with fine to coarse sand.			
			FAT CLAY (CH) - Dark grey, frozen, high plasticity, trace medium to fine grained sand.			
			- mottled grey/brown, trace silt below 0.6 m.			S1
1.0			- LL=82, PL=29, PI=53 at 0.9 m. - PSA: 0% gravel, 1% sand, 18% silt, 81% clay at 0.9 m.			S2
						S3
	5					S4
			- brown, moist, firm, trace fine sand, trace silt, trace gypsum below 1.8 m.			
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						

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 4-4-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-09

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-19-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,529,106
DESCRIPTION	Langside Street, southbound lane approx. 60 m south of Notre Dame Avenue intersection		E 632,455 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 - 65 mm.				
			GRAVEL FILL - 139 mm, frozen, fine to medium, with fine to coarse sand.				
			FAT CLAY (CH) - Greyish brown, frozen, high plasticity, trace fine gravel, trace fine to coarse sand, trace silt.				
			- LL=88, PL=30, PI=58 at 0.8 m. - PSA: 0% gravel, 2% sand, 17% silt, 81% clay at 0.8 m.			S1	
1.0						S2	
	5		- brown, moist, stiff, some silt, trace gypsum pockets below 1.5 m.			S3	
						S4	
2.0			- firm below 2.1 m.			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 4-4-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-10

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-19-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,529,075
DESCRIPTION	Langside Street, southbound lane approx. 19 m north of Cumberland Avenue intersection		E 632,454 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 - 105 mm.			
			GRAVEL FILL - 200 mm, fine to medium, with fine to coarse sand.			
			CLAY FILL - 305 mm, Dark brown, frozen, high plasticity, some silt.			
			LEAN CLAY (CL) - Light brown, frozen, low plasticity, silty, trace medium to coarse sand.			
			- LL=31, PL=16, PI=15 at 0.9 m. - PSA: 0% gravel, 3% sand, 73% silt, 24% clay at 0.9 m.			
1.0						S1
						S2
						S3
	5		**FAT CLAY (CH)** - Brown, moist, firm, high plasticity, trace medium sand, some silt.			
			- stiff below 1.8 m.			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 2.1 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 4-4-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-11

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-26-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,527,953
DESCRIPTION	Kennedy-Edmonton Alleyway, near parking garage exit of 400 St. Mary Avenue		E 633,147 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
			CONCRETE - 195 mm.			
			GRAVEL FILL - 162 mm, frozen, fine, with fine to coarse sand.			
			FAT CLAY (CH) - Dark grey, frozen, high plasticity, trace fine to medium sand, trace silt.			
						S1
			- LL=76, PL=27, PI=49 at 0.9 m. - PSA: 0% gravel, 2% sand, 27% silt, 71% clay at 0.9 m.			S2
1.0						S3
	5		**LEAN CLAY (CL)** - Light brown, moist, soft, low plasticity, silty, trace fine sand.			S4
			FAT CLAY (CH) - Mottled grey/brown, moist, stiff, high plasticity, trace silt.			
2.0						S5
			- trace gypsum pockets below 2.6 m.			
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 4-4-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-12

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-26-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,527,891
DESCRIPTION	Kennedy-Edmonton Alleyway, near eastern face of 165 Kennedy Street		E 633,176 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
			CONCRETE - 145 mm.			
			GRAVEL FILL - 108 mm, frozen, fine, with fine to coarse sand.			
			FAT CLAY (CH) - Dark grey, frozen, high plasticity, trace fine to medium sand, trace silt.			
			- LL=74, PL=30, PI=44 at 0.6 m. - PSA: 0% gravel, 3% sand, 38% silt, 59% clay at 0.6 m.			S1
1.0			- moist, stiff below 1.1 m.			S2
			- greyish brown below 1.4 m.			S3
	5		- mottled grey/brown below 1.5 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						

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 4-4-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-13

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-27-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,527,850
DESCRIPTION	Huntleigh Street, southbound lane near northern face of 301 Victor Street		E 631,965 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)	DESCRIPTION AND CLASSIFICATION	SAMPLE TYPE	NUMBER
		ASPHALT - 20 mm.		
		CONCRETE - 160 mm.		
		GRAVEL FILL - 49 mm, frozen, fine, with fine to coarse sand.		
		FAT CLAY (CH) - Greyish brown, frozen, high plasticity, trace fine sand, trace silt.		
				S1
		- brown below 0.8 m.		
		- LL=74, PL=30, PI=44 at 0.9 m. - PSA: 0% gravel, 1% sand, 32% silt, 67% clay at 0.9 m.		S2
1.0		- increased silt content below 1.2 m.		S3
	5	**LEAN CLAY (CL)** - Light brown, wet, firm, low plasticity, silty.		S4
		- soft below 1.8 m.		
2.0		**FAT CLAY (CH)** - Brown, moist, firm, high plasticity, some silt.		S5
		- stiff below 2.4 m.		
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 4-4-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-14

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-27-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,527,907
DESCRIPTION	Huntleigh Street, southbound lane near backside of 331 Victor Street		E 631,966 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 - 18 mm.			
			CONCRETE - 150 mm.			
			GRAVEL FILL - 48 mm, frozen, fine, with fine to coarse sand.			
			FAT CLAY (CH) - Greyish brown, frozen, high plasticity, some silt.			
						S1
1.0						S2
						S3
			LEAN CLAY (CL) - Light brown, moist, firm, low plasticity, silty, trace fine sand.			
	5		- soft below 1.5 m.			S4
			FAT CLAY (CH) - Brown, moist, firm, high plasticity, some silt, trace medium to coarse sand.			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 4-4-2025

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KGS GROUP

TEST HOLE LOG

HOLE NO.
TH25-15

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT	**City of Winnipeg 2025 Local Street Program - 25-R-02**	**START DATE**	2-27-2025
LOCATION	Winnipeg, Manitoba	**UTM (m)**	N 5,527,940
DESCRIPTION	Huntleigh Street, southbound lane near 339 Victor Street		E 631,966 Zone 14
DRILL RIG / HAMMER	Acker MP8 with Auto-Hammer		
METHOD(S)	0.0 m to 0.0 m: 175 mm Core 0.0 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 - 127 mm.			
			GRAVEL FILL - 52 mm, frozen, fine, with fine to coarse sand.			
			LEAN CLAY (CL) - Greyish brown, frozen, low plasticity, trace silt.			
			- mottled grey/light brown below 0.3 m.			
			- with silt below 0.3 m.			S1
			- LL=32, PL=16, PI=16 at 0.6 m.			
			- PSA: 0% gravel, 5% sand, 76% silt, 19% clay at 0.6 m.			S2
1.0						S3
			- light brown, silty, trace fine to medium sand below 1.1 m.			
			- moist, firm below 1.4 m.			
	5		- wet below 1.5 m.			S4
			- soft 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 4-4-2025

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KEY TO SYMBOLS

LITHOLOGIC SYMBOLS


Asphalt


Clay (CH, high plasticity)


Clay (CL, low plasticity)


Silty Clay (CL-ML)


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.**	25-0535-002
PROJECT NAME	City of Winnipeg 2025 Local Street Program - 25-R-02	**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	0.2	0.3								26											
TH25-01	S2	0.6	0.8	CL	0	8	92	28	18	10	25											
TH25-01	S3	0.9	1.0								29											
TH25-01	S4	1.5	1.7								44											
TH25-01	S5	2.1	2.3								54											
TH25-02	S1	0.6	0.8								31											
TH25-02	S2	0.9	1.1								38											
TH25-02	S3	1.2	1.4								20											
TH25-02	S4	1.5	1.7								43											
TH25-02	S5	2.1	2.3								47											
TH25-03	S1	0.6	0.8								30											
TH25-03	S2	0.9	1.1	CH	0	3	97	59	19	40	27											
TH25-03	S3	1.2	1.4								22											
TH25-03	S4	1.8	1.9								21											
TH25-03	S5	2.2	2.3								33											
TH25-04	S1	0.6	0.8	CH	1	16	83	66	30	36	53											
TH25-04	S2	0.9	1.1								53											
TH25-04	S3	1.2	1.4								40											
TH25-04	S4	1.5	1.7								36											
TH25-04	S5	2.1	2.3								50											
TH25-05	S1	0.6	0.8								33											
TH25-05	S2	0.9	1.1								32											
TH25-05	S3	1.2	1.4								31											
TH25-05	S4	1.5	1.7								45											
TH25-05	S5	2.1	2.3								52											
TH25-06	S1	0.3	0.5								40											
TH25-06	S2	0.6	0.8								40											
TH25-06	S3	0.9	1.1								29											
TH25-06	S4	1.5	1.7								26											
TH25-06	S5	2.1	2.3								45											
TH25-07	S1	0.3	0.5								31											
TH25-07	S2	0.6	0.8	CL	0	8	92	31	17	14	25											
TH25-07	S3	0.9	1.1								22											
TH25-07	S4	1.5	1.7								43											
TH25-07	S5	2.1	2.3								91											
TH25-08	S1	0.6	0.8								33											
TH25-08	S2	0.9	1.1	CH	0	1	99	82	29	53	32											
TH25-08	S3	1.2	1.4								36											
TH25-08	S4	1.5	1.7								39											
TH25-08	S5	2.1	2.3								48											
TH25-09	S1	0.8	1.0	CH	0	2	98	88	30	58	35											
TH25-09	S2	1.1	1.3								40											
TH25-09	S3	1.4	1.6								48											
TH25-09	S4	1.7	1.9								49											

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

KGS GROUP

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT NAME	City of Winnipeg 2025 Local Street Program - 25-R-02	**LOCATION**	Winnipeg, Manitoba
TESTED BY	Stantec	**DATE TESTED**	03-28-2025

SUMMARY OF INDEX TESTS

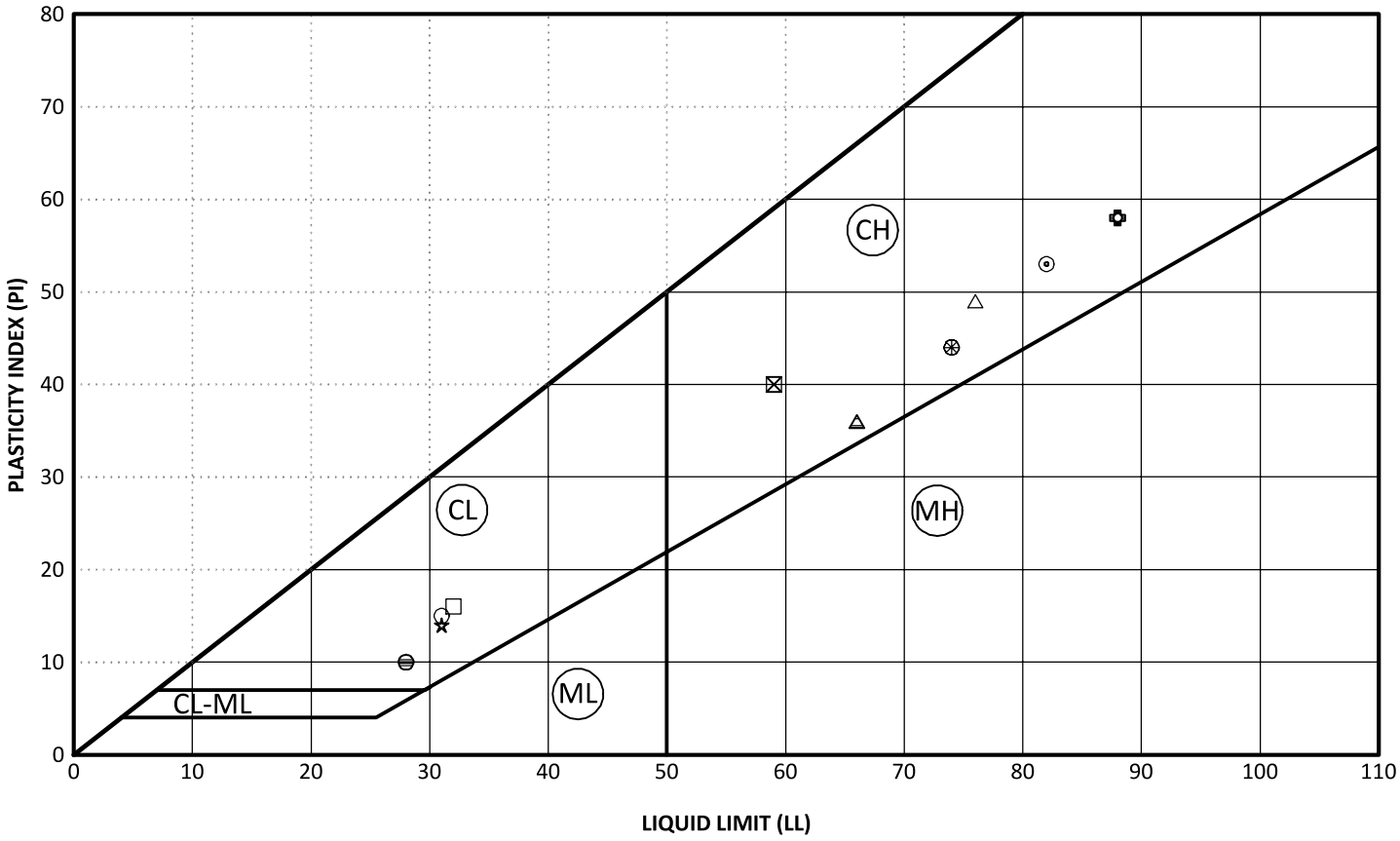
Test Hole ID	Smpl No.	Depth From (m)	Depth To (m)	Class-ification	Gravel (%)	Sand (%)	Silt/ Clay (%)	LL	PL	PI	MC (%)	Dry Dens (kN /m3)	Spec Gvty	Satur-ation (%)	Proctor Max DD (kg/m3)	Proct Opt MC (%)	CBR Initial DD (kg/m3)	CBR Initial MC (%)	CBR % of Max DD	CBR % of Opt MC	CBR @2.54 mm	CBR % Swell
TH25-09	S5	2.1	2.3								55											
TH25-10	S1	0.6	0.8								37											
TH25-10	S2	0.9	1.1	CL	0	3	97	31	16	15	26											
TH25-10	S3	1.2	1.4								17											
TH25-10	S4	1.8	2.0								40											
TH25-10	S5	2.3	2.4								47											
TH25-11	S1	0.6	0.8								35											
TH25-11	S2	0.9	1.1	CH	0	2	98	76	27	49	37											
TH25-11	S3	1.2	1.4								35											
TH25-11	S4	1.5	1.7								19											
TH25-11	S5	2.1	2.3								42											
TH25-12	S1	0.6	0.8	CH	0	3	97	74	30	44	39											
TH25-12	S2	0.9	1.1								38											
TH25-12	S3	1.2	1.4								63											
TH25-12	S4	1.5	1.7								38											
TH25-12	S5	1.8	2.0								42											
TH25-13	S1	0.6	0.8								29											
TH25-13	S2	0.9	1.1	CH	0	1	99	74	30	44	32											
TH25-13	S3	1.2	1.4								30											
TH25-13	S4	1.5	1.7								24											
TH25-13	S5	2.1	2.3								43											
TH25-14	S1	0.6	0.8								29											
TH25-14	S2	0.9	1.1								29											
TH25-14	S3	1.2	1.4								23											
TH25-14	S4	1.5	1.7								22											
TH25-14	S5	1.8	2.0								30											
TH25-15	S1	0.3	0.5								30											
TH25-15	S2	0.6	0.8	CL	0	5	95	32	16	16	30											
TH25-15	S3	0.9	1.1								26											
TH25-15	S4	1.5	1.7								24											
TH25-15	S5	1.8	2.0								22											

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

KGS GROUP

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT NAME	City of Winnipeg 2025 Local Street Program - 25-R-02	**LOCATION**	Winnipeg, Manitoba
TESTED BY	Stantec	**DATE TESTED**	03-28-2025

ATTERBERG LIMITS



	HOLE	DEPTH (m)	SAMPLE #	LL	PL	PI	SAND (%)	SILT (%)	CLAY (%)	SILT & CLAY (%)	MC (%)	CLASSIFICATION
⊖	TH25-01	0.6	S2	28	18	10	8	77	15	92	25	CL
⊠	TH25-03	0.9	S2	59	19	40	3	39	58	97	27	CH
△	TH25-04	0.6	S1	66	30	36	16	45	38	83	53	CH
★	TH25-07	0.6	S2	31	17	14	8	75	18	92	25	CL
⊙	TH25-08	0.9	S2	82	29	53	1	18	81	99	32	CH
✿	TH25-09	0.8	S1	88	30	58	2	17	81	98	35	CH
○	TH25-10	0.9	S2	31	16	15	3	73	24	97	26	CL
△	TH25-11	0.9	S2	76	27	49	2	27	71	98	37	CH
⊗	TH25-12	0.6	S1	74	30	44	3	38	59	97	39	CH
⊕	TH25-13	0.9	S2	74	30	44	1	32	67	99	32	CH
□	TH25-15	0.6	S2	32	16	16	5	76	19	95	30	CL

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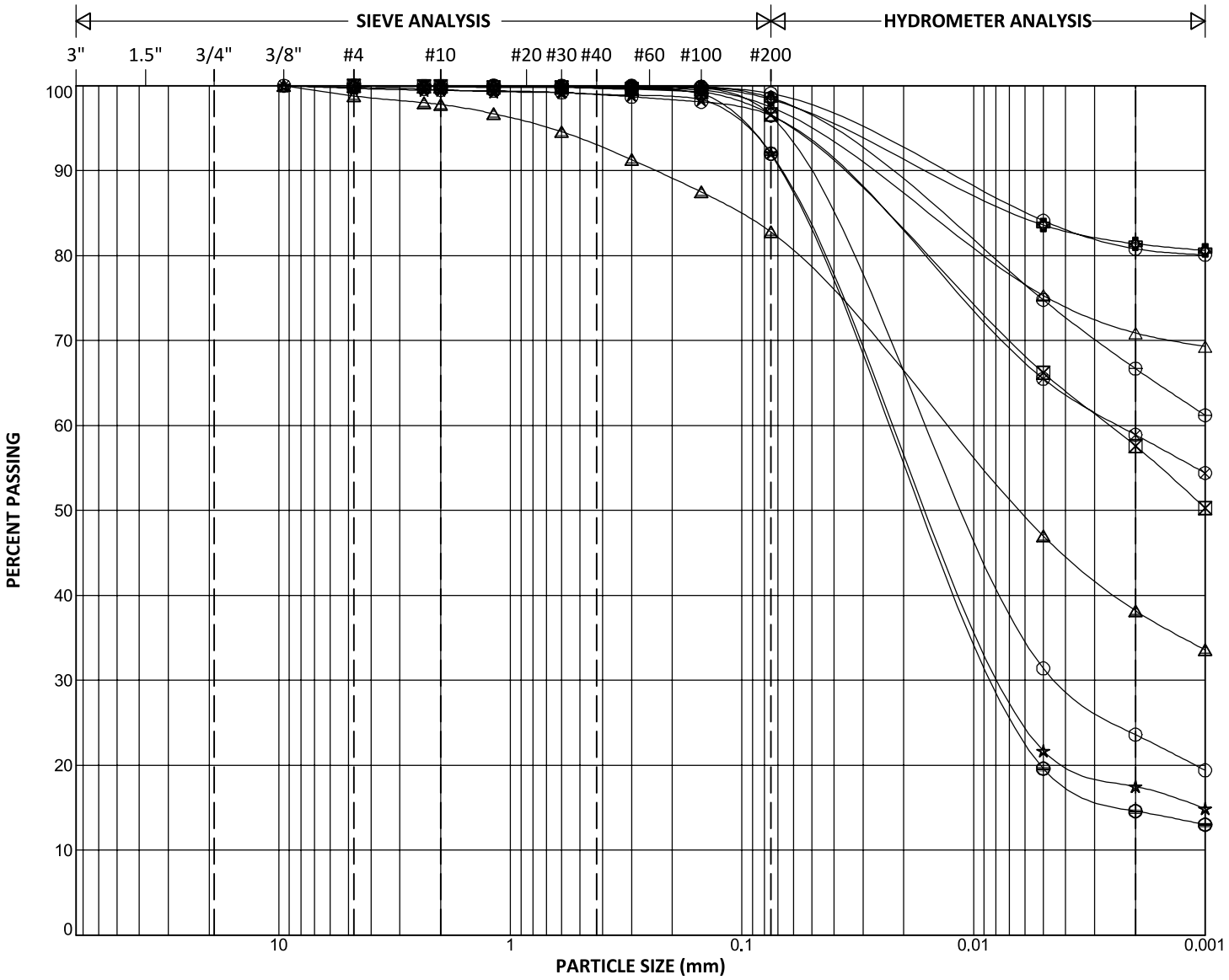
KGS GROUP

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT NAME	City of Winnipeg 2025 Local Street Program - 25-R-02	**LOCATION**	Winnipeg, Manitoba
TESTED BY	Stantec	**DATE TESTED**	03-28-2025

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	0.6	S2	0	8	77	15	92			CL
⊠	TH25-03	0.9	S2	0	3	39	58	97			CH
△	TH25-04	0.6	S1	1	16	45	38	83			CH
☆	TH25-07	0.6	S2	0	8	75	18	92			CL
⊙	TH25-08	0.9	S2	0	1	18	81	99			CH
✿	TH25-09	0.8	S1	0	2	17	81	98			CH
○	TH25-10	0.9	S2	0	3	73	24	97			CL
△	TH25-11	0.9	S2	0	2	27	71	98			CH
⊗	TH25-12	0.6	S1	0	3	38	59	97			CH
⊕	TH25-13	0.9	S2	0	1	32	67	99			CH

KGS GROUP

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT NAME	City of Winnipeg 2025 Local Street Program - 25-R-02	**LOCATION**	Winnipeg, Manitoba
TESTED BY	Stantec	**DATE TESTED**	03-28-2025

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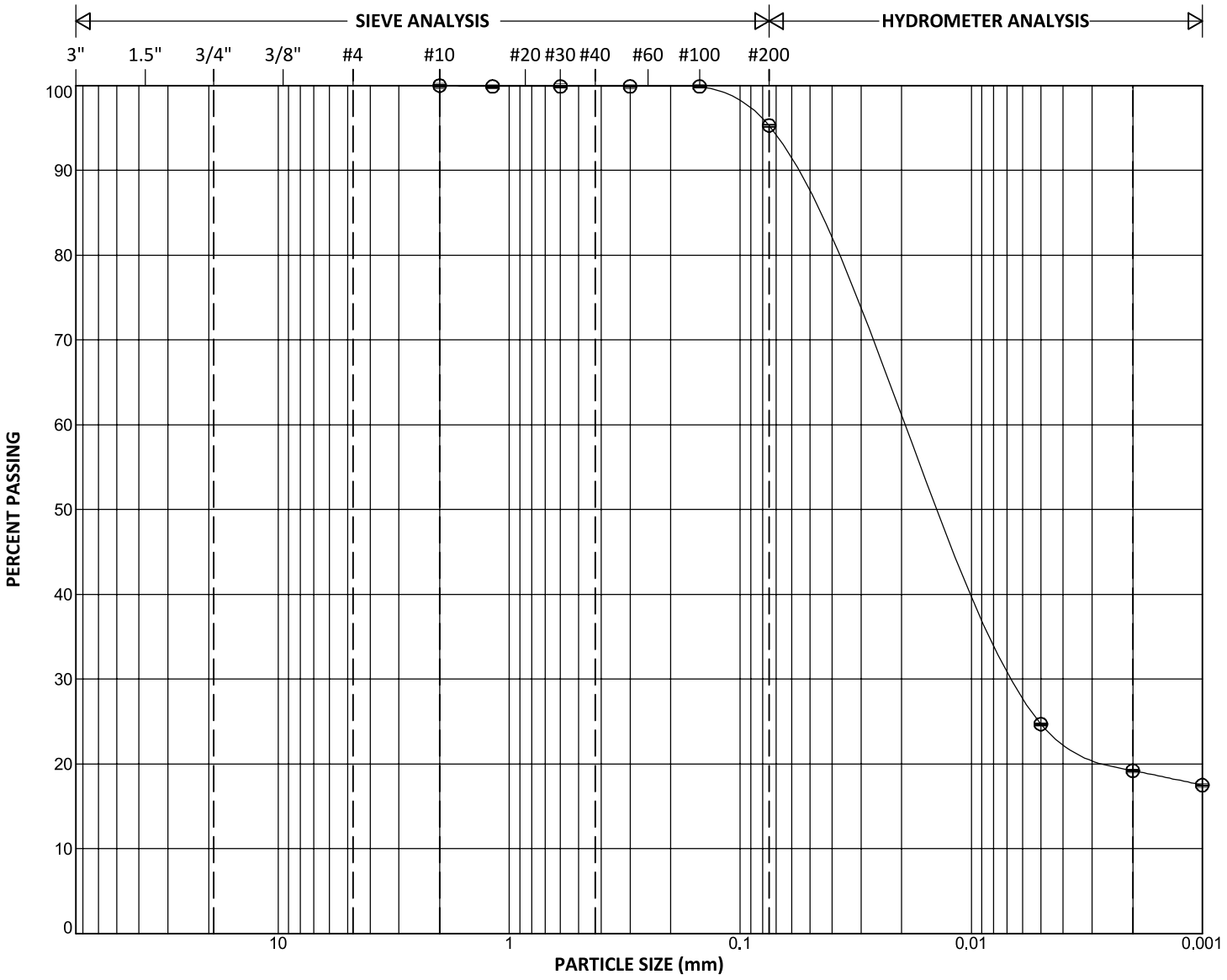
GRAIN SIZE DISTRIBUTION



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	S2	0	5	76	19	95			CL

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KGS GROUP

CLIENT	**KGS GROUP**	**PROJECT NO.**	25-0535-002
PROJECT NAME	City of Winnipeg 2025 Local Street Program - 25-R-02	**LOCATION**	Winnipeg, Manitoba
TESTED BY	Stantec	**DATE TESTED**	03-28-2025