

# **APPENDIX A (R1)**

# **GEOTECHNICAL REPORT**

April 15, 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 – Rev 1

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. This report has been updated to include moisture-density relationship (standard Proctor) and California Bearing Ration (CBR) testing results.

## 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.

## 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.

**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 approximately 0.3 m to 0.9 m (1 ft to 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.

Standard Proctor and CBR testing results, as well as all other laboratory testing results have been included in this updated report, attached in Appendix C.

## 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 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.

*Additional Laboratory Testing* – One (1) moisture density relationship test (standard Proctor) and one (1) CBR test were completed on a composite sample consisting of clay collected from approximately 0.3 m to 0.9 m (1 ft to 3 ft) BGS in all test holes. Results indicated a maximum dry density of 1710 kg/m<sup>3</sup>, an optimum moisture content of 18.5%, and a CBR of 2.4 remolded to 95% of the SPDD at optimum moisture content. All laboratory test reports can be found attached in Appendix C.

## **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%.

*Additional Laboratory Testing* – One (1) moisture density relationship test (standard Proctor) and one (1) CBR test were completed on a composite sample consisting of clay collected from approximately 0.3 m to 0.9 m (1 ft to 3 ft) BGS in all test holes. Results indicated a maximum dry density of 1520 kg/m<sup>3</sup>, an optimum moisture content of 21.5%, and a CBR of 2.2 remolded to 95% of the SPDD at optimum moisture content. All laboratory test reports can be found attached in Appendix C.

### **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.

### **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%.

*Additional Laboratory Testing* – One (1) moisture density relationship test (standard Proctor) and one (1) CBR test were completed on a composite sample consisting of clay collected from approximately 0.3 m to 0.9 m (1 ft to 3 ft) BGS in all test holes. Results indicated a maximum dry density of 1650 kg/m<sup>3</sup>, an optimum moisture

content of 20.0%, and a CBR of 6.1 remolded to 95% of the SPDD at optimum moisture content. All laboratory test reports can be found attached in Appendix C.

## **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.

*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%.

*Additional Laboratory Testing* – One (1) moisture density relationship test (standard Proctor) and one (1) CBR test were completed on a composite sample consisting of clay collected from approximately 0.3 m to 0.9 m (1 ft to 3 ft) BGS in all test holes. Results indicated a maximum dry density of 1470 kg/m<sup>3</sup>, an optimum moisture content of 28.0%, and a CBR of 3.4 remolded to 95% of the SPDD at optimum moisture content. All laboratory test reports can be found attached in Appendix C.

## **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.

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.

One (1) moisture content analysis was performed within the lean clay, yielding a value of 20%.

*Additional Laboratory Testing* – One (1) moisture density relationship test (standard Proctor) and one (1) CBR test were completed on a composite sample consisting of clay collected from approximately 0.3 m to 0.9 m (1 ft to 3 ft) BGS in all test holes. Results indicated a maximum dry density of 1410 kg/m<sup>3</sup>, an optimum moisture content of 25.5%, and a CBR of 2.3 remolded to 95% of the SPDD at optimum moisture content. All laboratory test reports can be found attached in Appendix C.

## 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.

### 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:



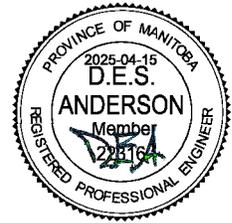
Raina Alcantara, E.I.T.  
Geotechnical Engineer in Training

RA/cs  
Attached

Approved By:



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



# FIGURES

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Test Hole Location Plans

FIGURE 1: TEST HOLE LOCATIONS ON BURNELL STREET (SITE 01)

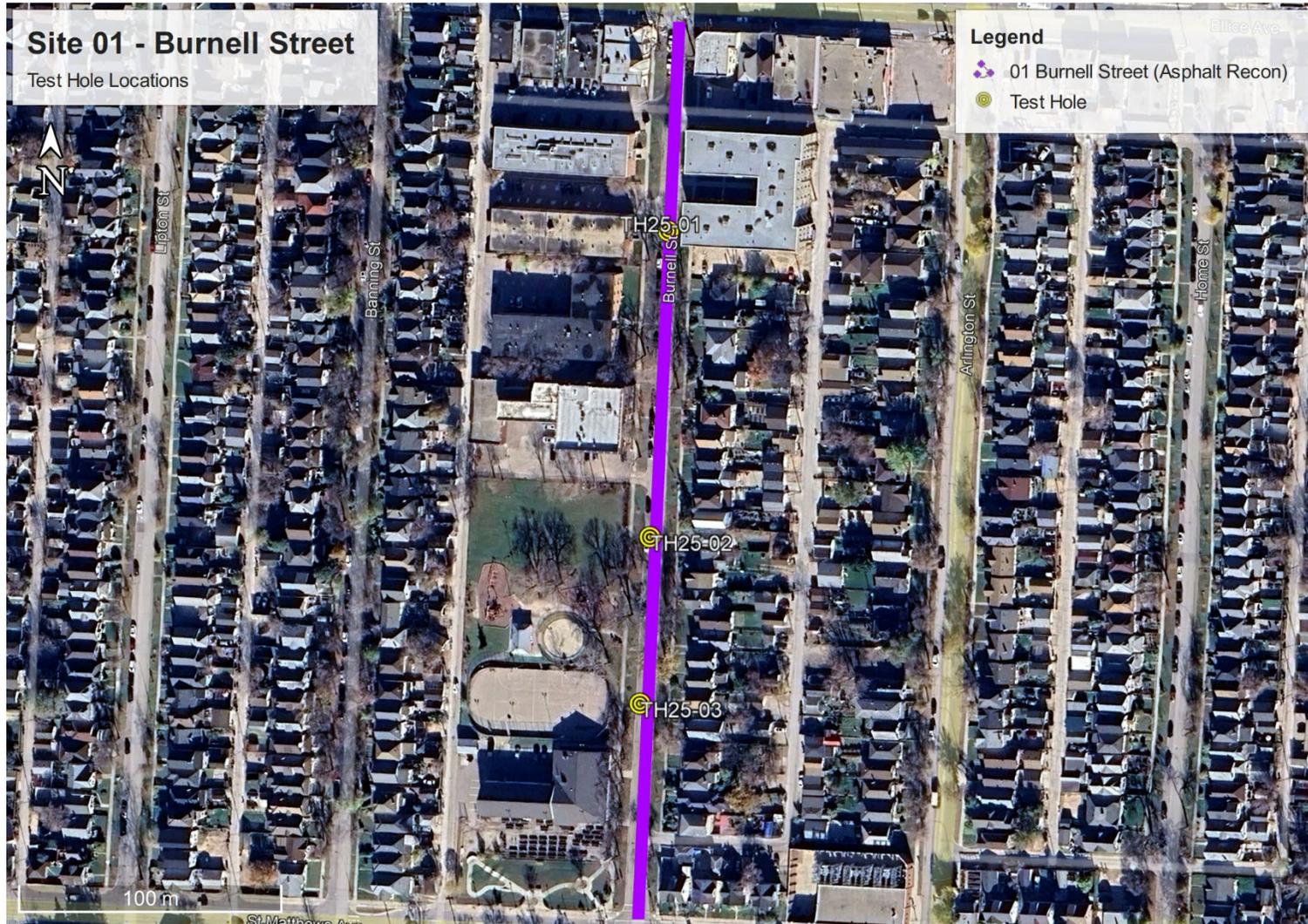


FIGURE 2: TEST HOLE LOCATIONS ON HUNTLEIGH STREET (SITE 02)



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

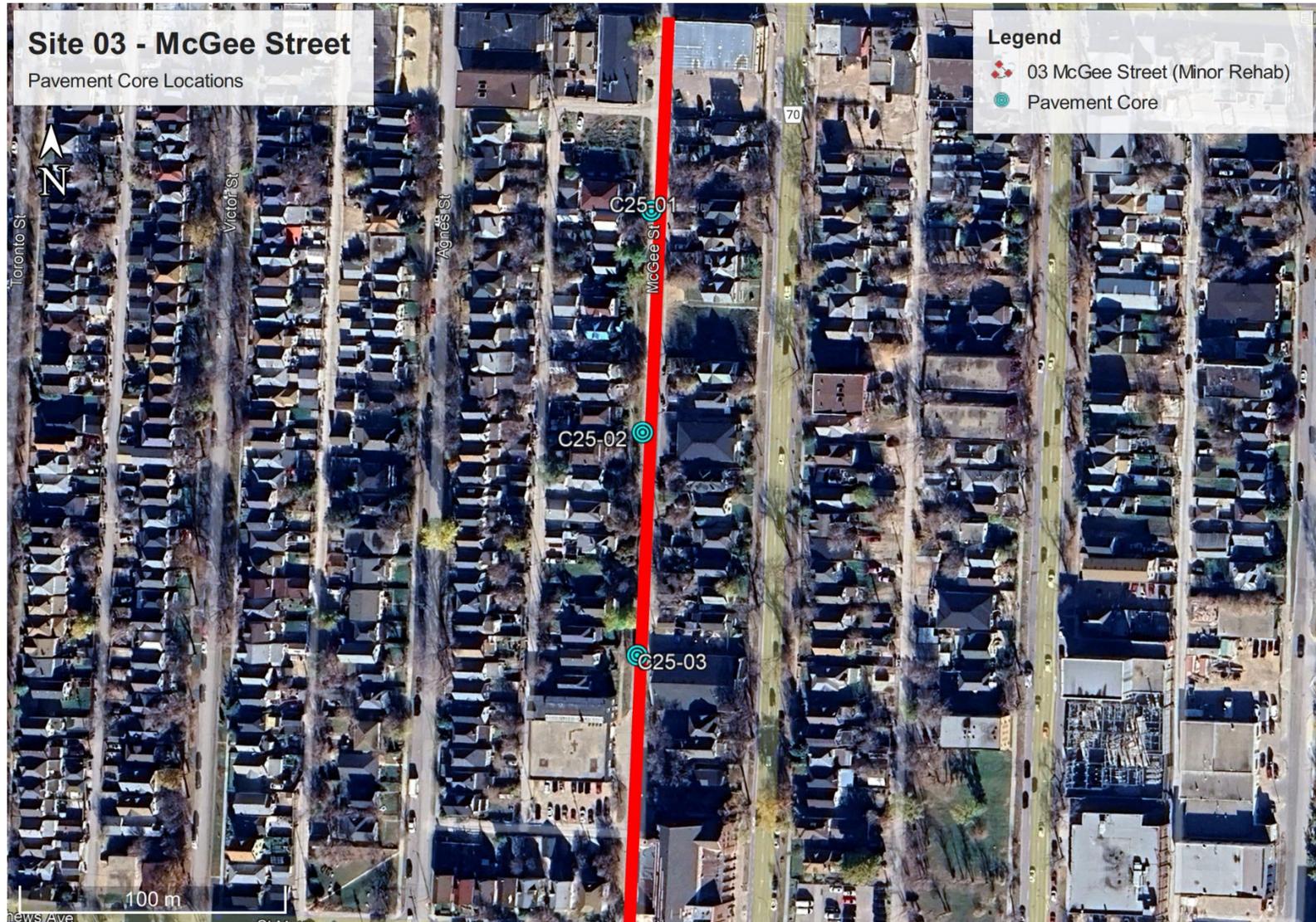


FIGURE 4: TEST HOLE LOCATIONS ON MCMICKEN STREET (SITE 04)

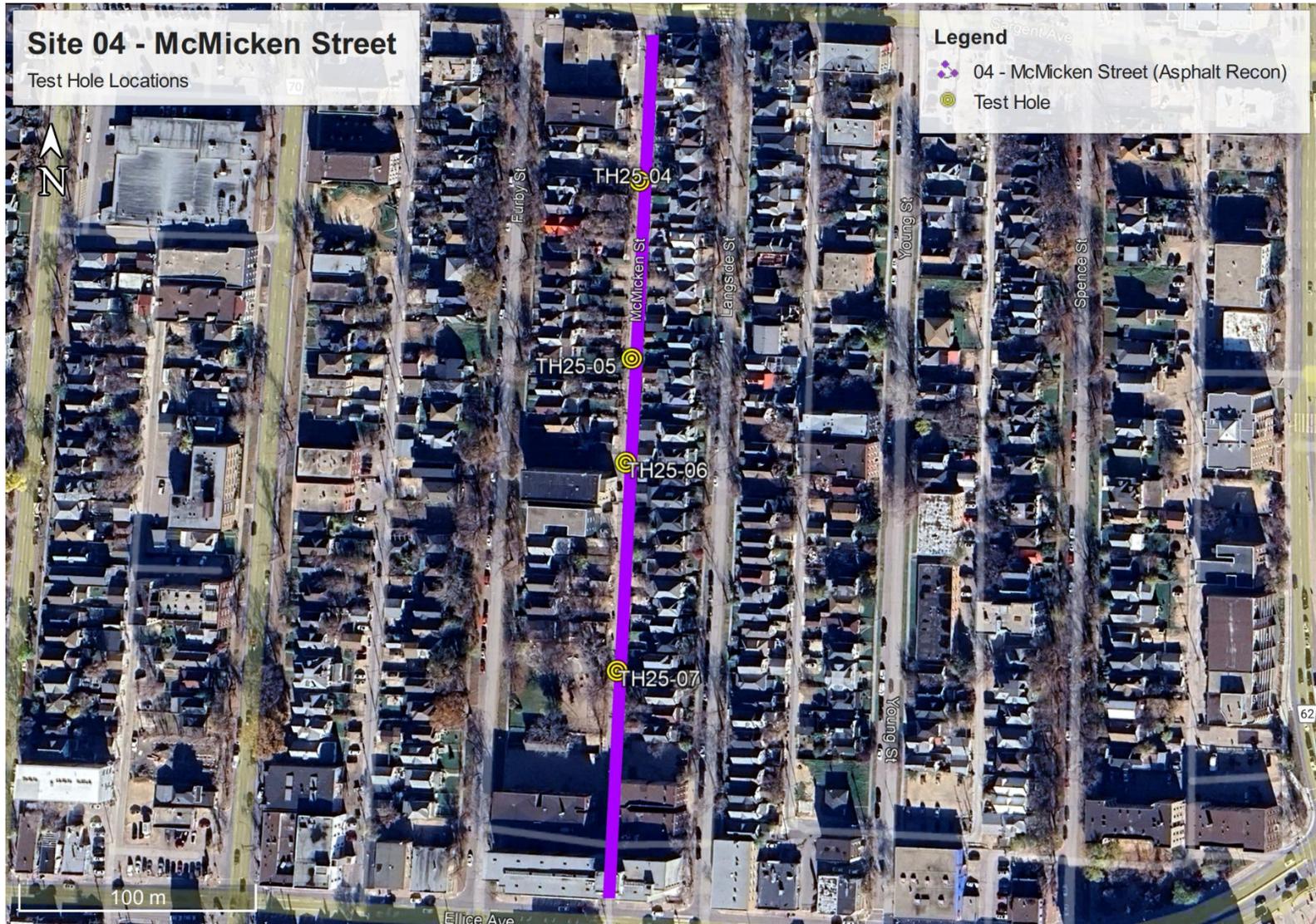
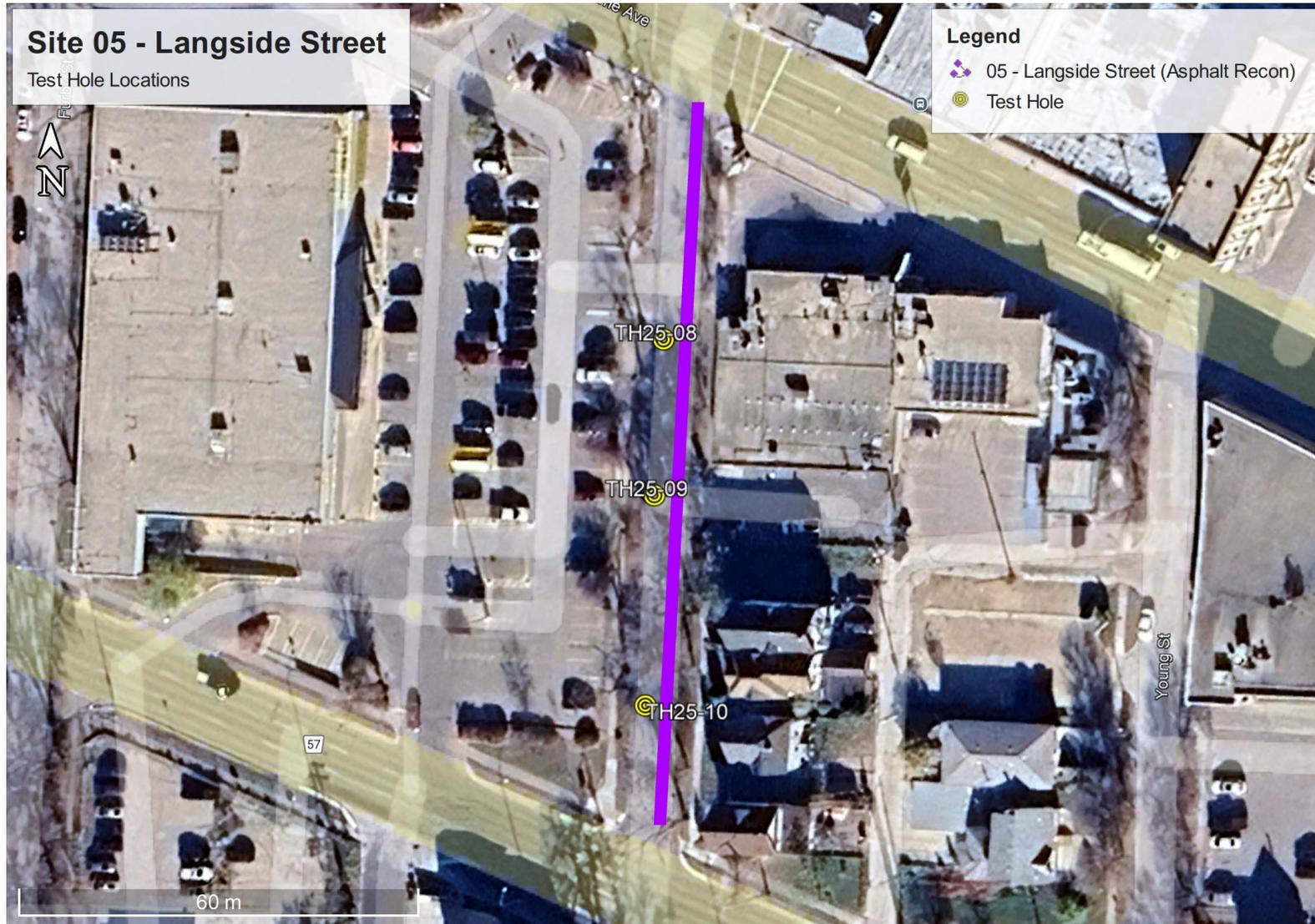
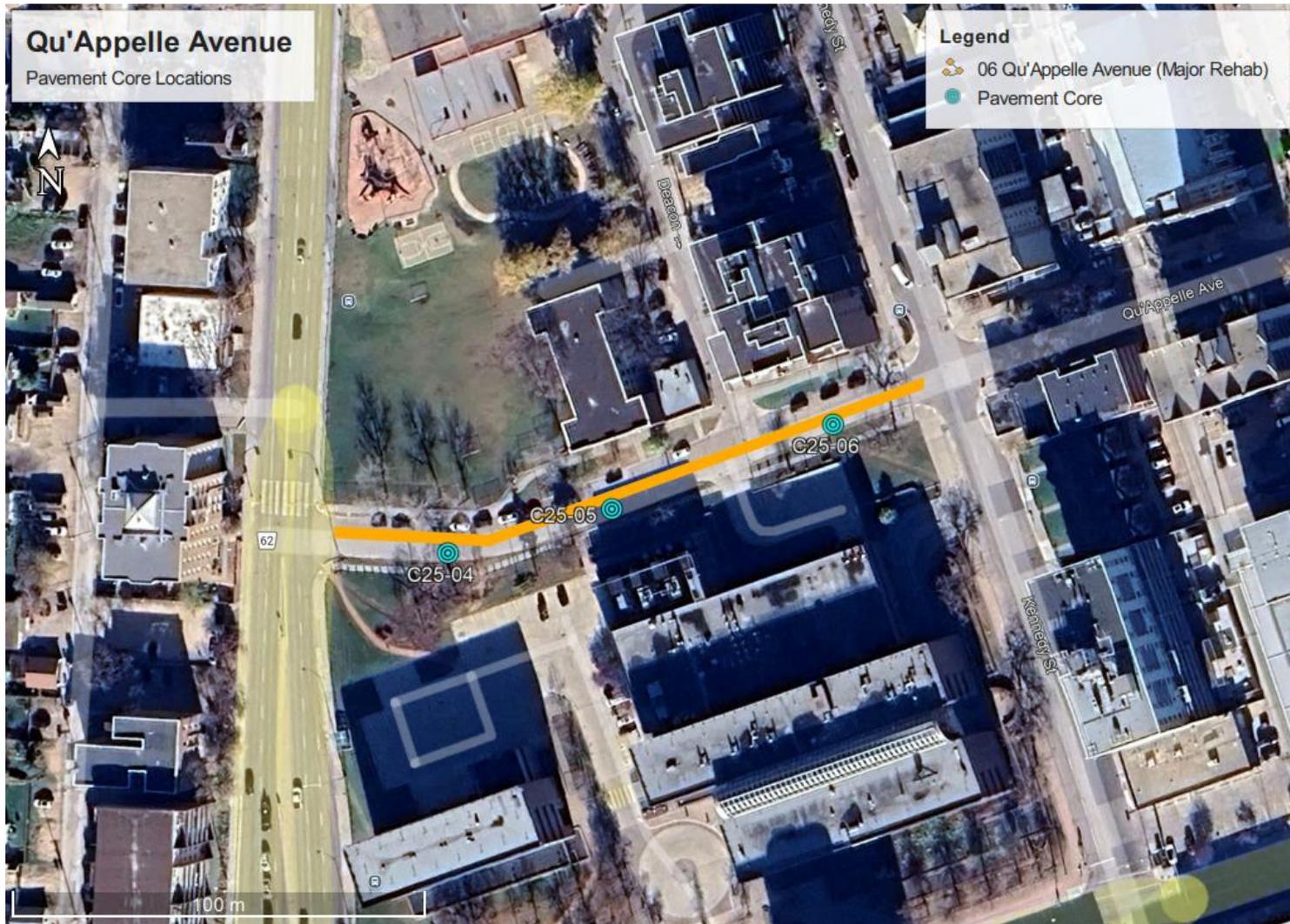


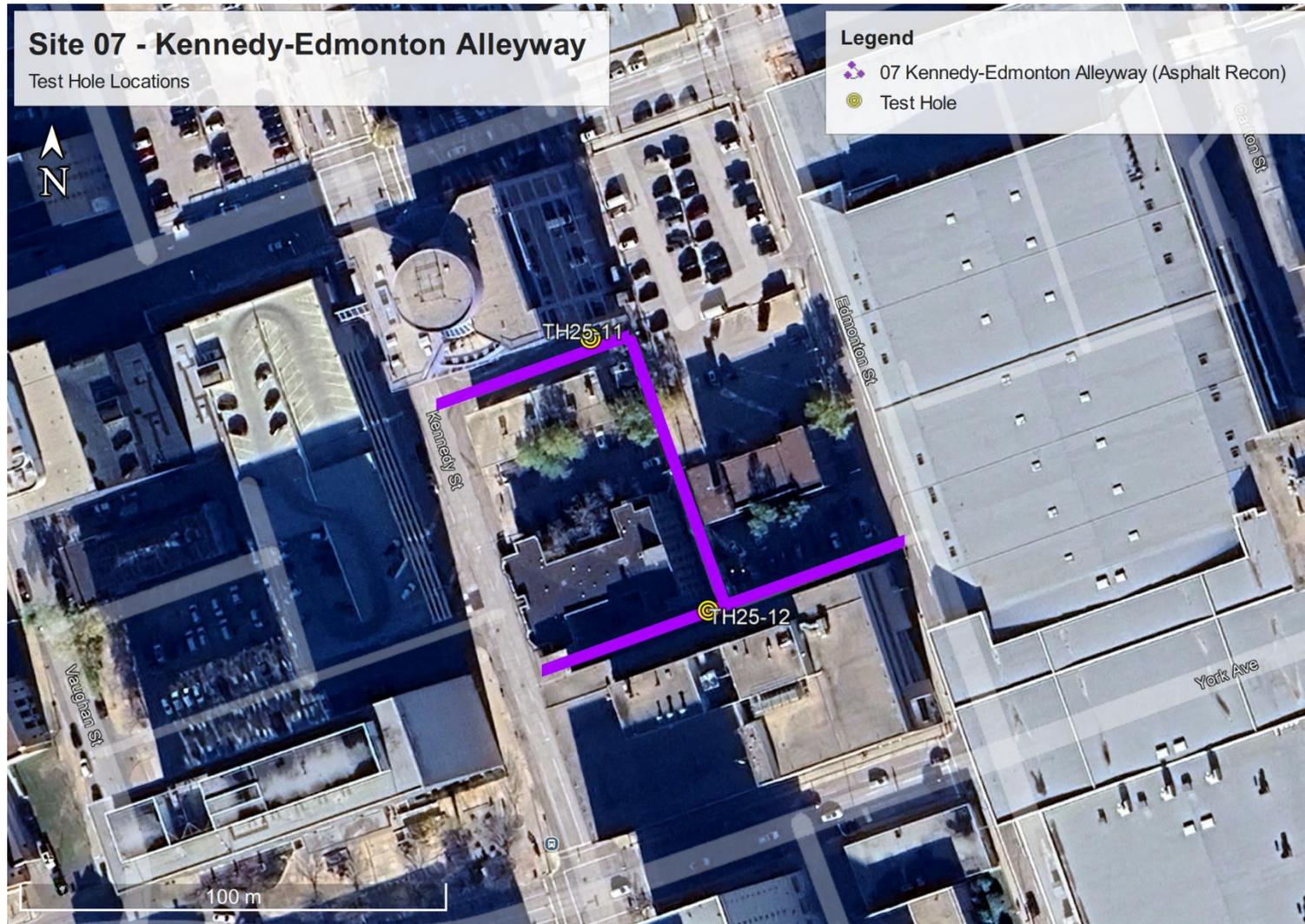
FIGURE 5: TEST HOLE LOCATIONS ON LANGSIDE STREET (SITE 05)



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



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



# **TABLES**

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Location Descriptions and Coordinates  
Summary of Core Results

**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 <sup>1</sup>	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 <sup>2</sup>	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

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## Core Photo Log



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

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Test Hole Logs

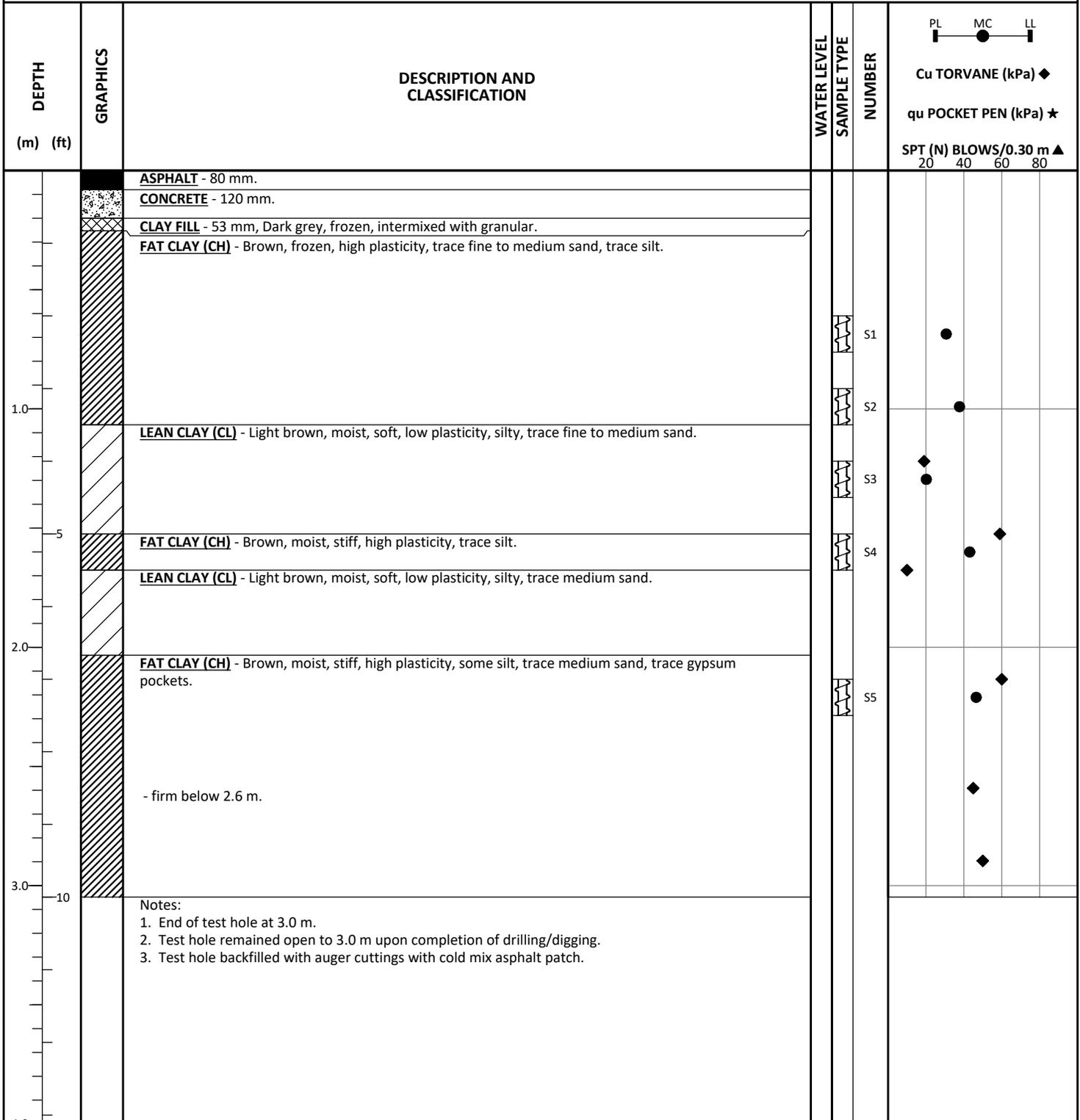
<b>CLIENT</b>	<b>KGS GROUP</b>	<b>PROJECT NO.</b>	25-0535-002
<b>PROJECT</b>	<b>City of Winnipeg 2025 Local Street Program - 25-R-02</b>	<b>START DATE</b>	2-24-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,528,285 E 631,404 Zone 14
<b>DESCRIPTION</b>	Burnell Street, southbound lane near 510 Burnell Street		
<b>DRILL RIG / HAMMER</b>	Canterra CT 250 Truck Mounted Drill Rig with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.1 m: 175 mm Core 0.1 m to 3.0 m: 150 mm $\phi$ SSA		

DEPTH (m) (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		
						20	40	60	80							
		<b>CONCRETE</b> - 108 mm.														
		<b>CLAY FILL</b> - 172 mm, Dark grey, frozen, high plasticity, intermixed with granular, trace silt.			S1											
		<b>LEAN CLAY (CL)</b> - 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											
1.0		<b>FAT CLAY (CH)</b> - Brown, frozen, high plasticity, trace medium sand, trace silt.  - moist, stiff below 1.3 m.			S3											
5		<b>FAT CLAY (CH)</b> - Brown, frozen, high plasticity, trace medium sand, trace silt.  - moist, stiff below 1.3 m.			S4											
2.0		<b>FAT CLAY (CH)</b> - Brown, frozen, high plasticity, trace medium sand, trace silt.  - trace gypsum pockets below 1.9 m.  - with silt from 2.1 m to 2.4 m.			S5											
3.0		<b>FAT CLAY (CH)</b> - Brown, frozen, high plasticity, trace medium sand, trace silt.  - moist, stiff below 1.3 m.														
		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.														

KGS\_LOG\_U:\FMS\25-0535-002\COW LOCAL STREETS 25-R-02.GPJ

<b>WATER LEVELS</b>	<input checked="" type="checkbox"/> During Drilling/Digging <input type="checkbox"/> None Encountered	<b>CONTRACTOR</b> Paddock Drilling	<b>INSPECTOR</b> R. ALCANTARA
		<b>APPROVED</b> D. ANDERSON	<b>DATE</b> 4-4-2025

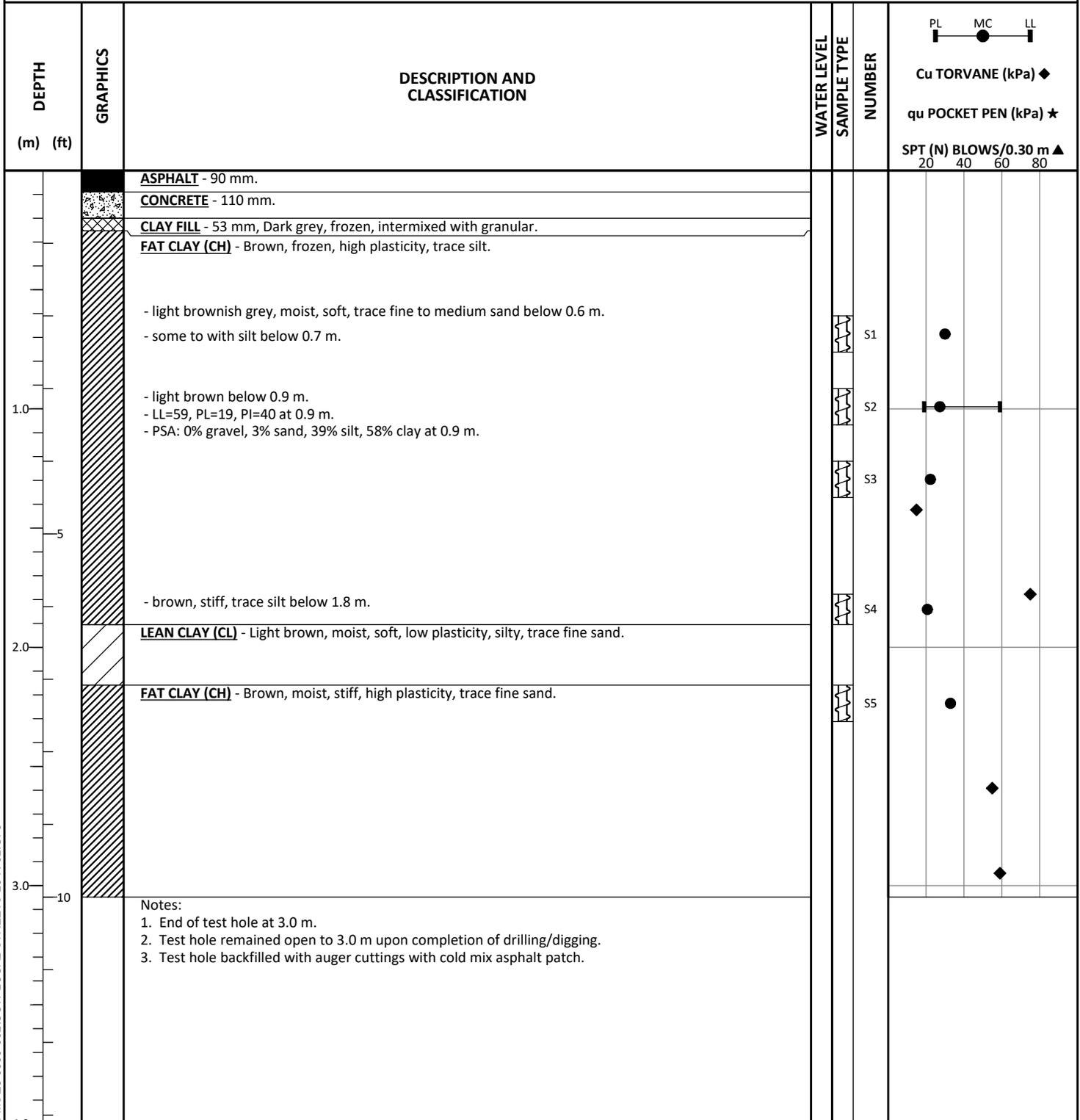
<b>CLIENT</b>	<b>KGS GROUP</b>	<b>PROJECT NO.</b>	25-0535-002
<b>PROJECT</b>	<b>City of Winnipeg 2025 Local Street Program - 25-R-02</b>	<b>START DATE</b>	2-24-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,528,169 E 631,400 Zone 14
<b>DESCRIPTION</b>	Burnell Street, southbound lane near 477 Burnell Street		
<b>DRILL RIG / HAMMER</b>	Canterra CT 250 Truck Mounted Drill Rig with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.2 m: 175 mm Core 0.2 m to 3.0 m: 150 mm $\phi$ SSA		



<b>WATER LEVELS</b>	During Drilling/Digging	None Encountered	<b>CONTRACTOR</b> Paddock Drilling	<b>INSPECTOR</b> R. ALCANTARA
			<b>APPROVED</b> D. ANDERSON	<b>DATE</b> 4-4-2025

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<b>CLIENT</b>	<b>KGS GROUP</b>	<b>PROJECT NO.</b>	25-0535-002
<b>PROJECT</b>	<b>City of Winnipeg 2025 Local Street Program - 25-R-02</b>	<b>START DATE</b>	2-24-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,528,106 E 631,398 Zone 14
<b>DESCRIPTION</b>	Burnell Street, southbound lane near 457 Burnell Street		
<b>DRILL RIG / HAMMER</b>	Canterra CT 250 Truck Mounted Drill Rig with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.2 m: 175 mm Core 0.2 m to 3.0 m: 150 mm $\phi$ SSA		

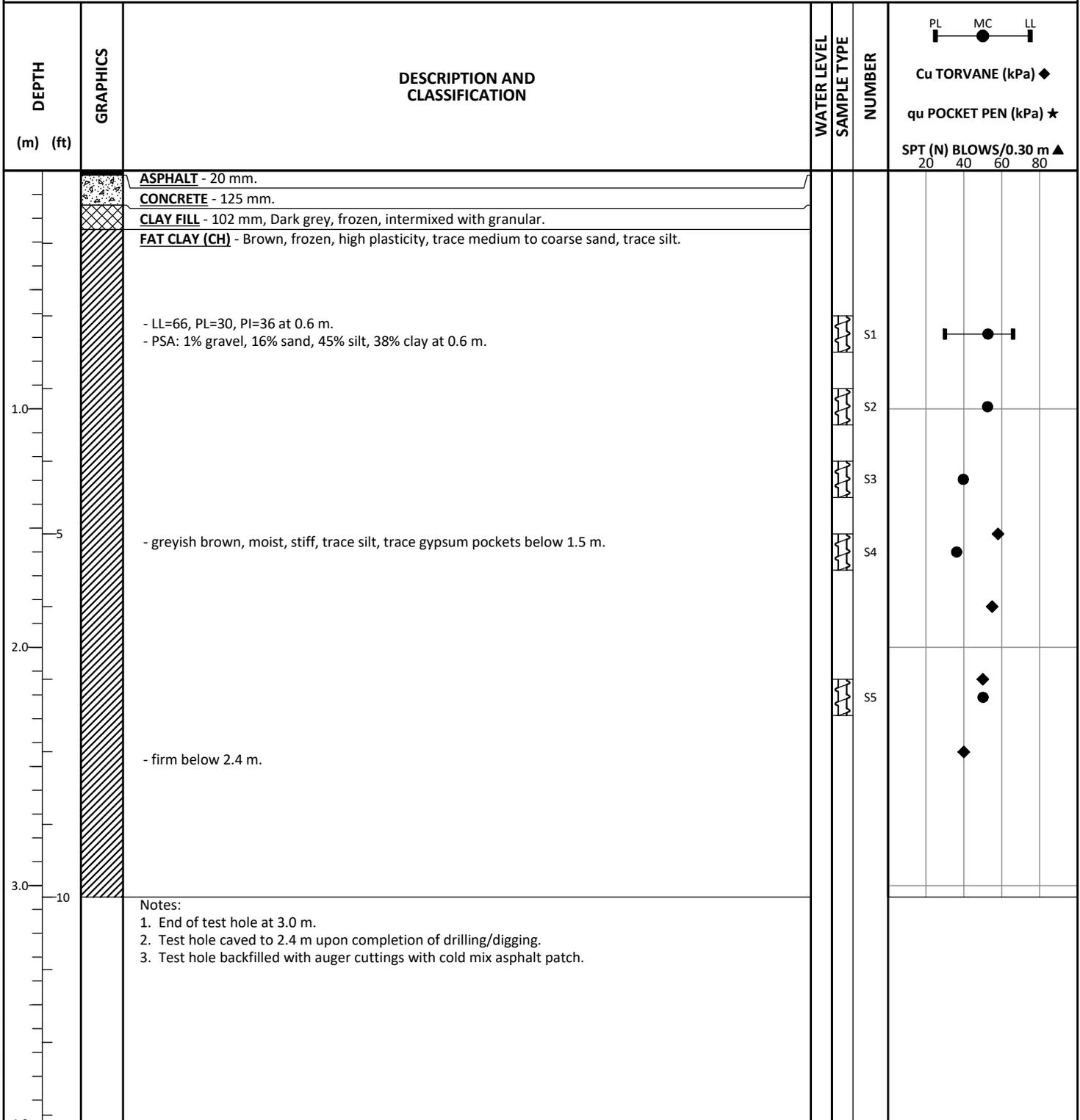


Notes:  
 1. End of test hole at 3.0 m.  
 2. Test hole remained open to 3.0 m upon completion of drilling/digging.  
 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.

<b>WATER LEVELS</b>	During Drilling/Digging	None Encountered	<b>CONTRACTOR</b> Paddock Drilling	<b>INSPECTOR</b> R. ALCANTARA
			<b>APPROVED</b> D. ANDERSON	<b>DATE</b> 4-4-2025

KGS\_LOG\_U:\FMS\25-0535-002\COW LOCAL STREETS 25-R-02.GPJ

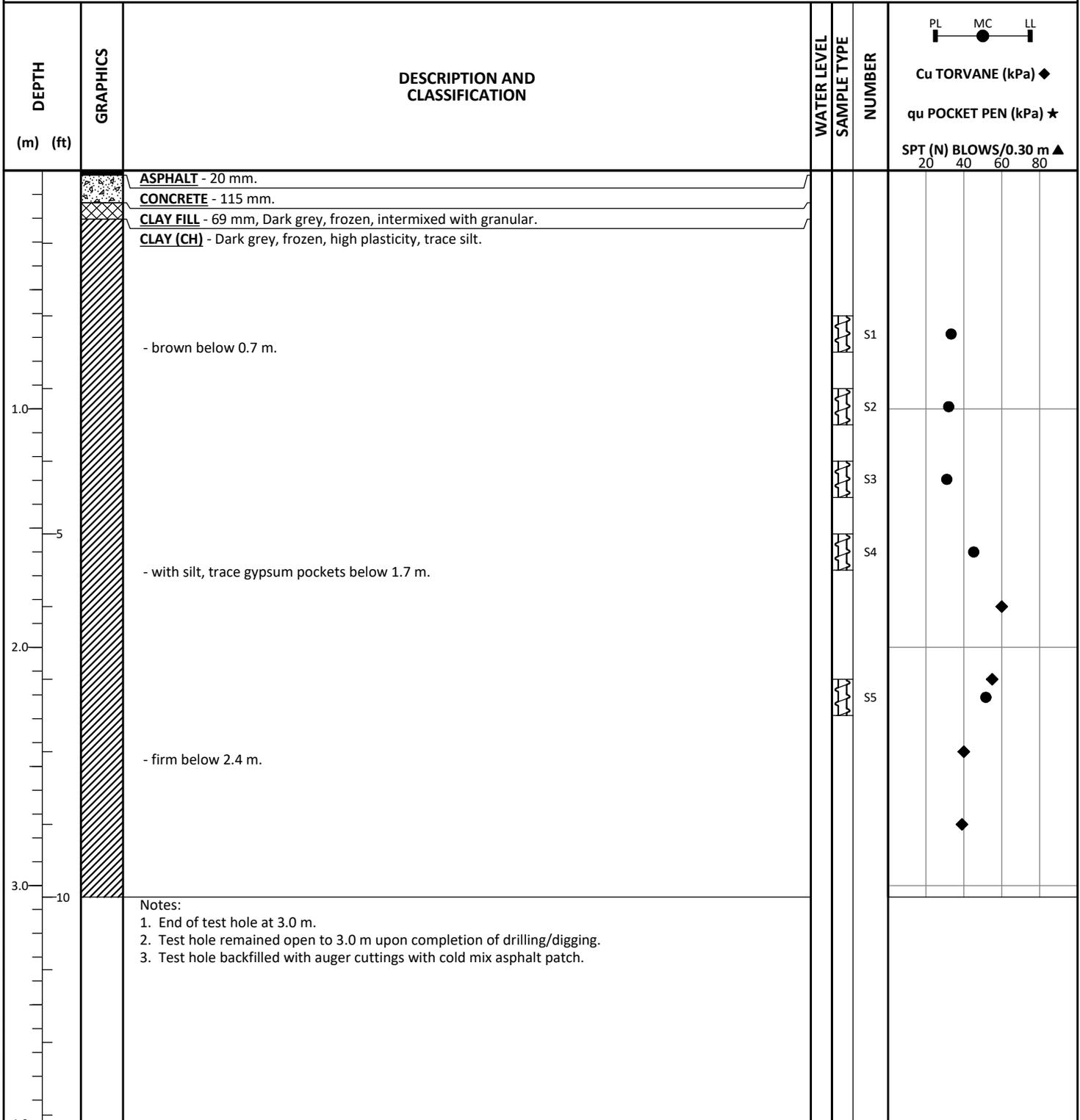
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<b>PROJECT</b>	<b>City of Winnipeg 2025 Local Street Program - 25-R-02</b>	<b>START DATE</b>	2-21-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,528,668 E 632,406 Zone 14
<b>DESCRIPTION</b>	McMicken Street, southbound lane near backside of 575 Furby Street		
<b>DRILL RIG / HAMMER</b>	Acker MP8 with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.0 m: 175 mm Core 0.0 m to 3.0 m: 150 mm $\phi$ SSA		



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<b>WATER LEVELS</b>	During Drilling/Digging None Encountered	<b>CONTRACTOR</b> Paddock Drilling	<b>INSPECTOR</b> R. ALCANTARA
		<b>APPROVED</b> D. ANDERSON	<b>DATE</b> 4-4-2025

<b>CLIENT</b>	<b>KGS GROUP</b>	<b>PROJECT NO.</b>	25-0535-002
<b>PROJECT</b>	<b>City of Winnipeg 2025 Local Street Program - 25-R-02</b>	<b>START DATE</b>	2-24-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,528,589
<b>DESCRIPTION</b>	McMicken Street, southbound lane near backside of 549 Furby Street		E 632,404 Zone 14
<b>DRILL RIG / HAMMER</b>	Acker MP8 with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.1 m: 175 mm Core 0.1 m to 3.0 m: 150 mm $\phi$ SSA		

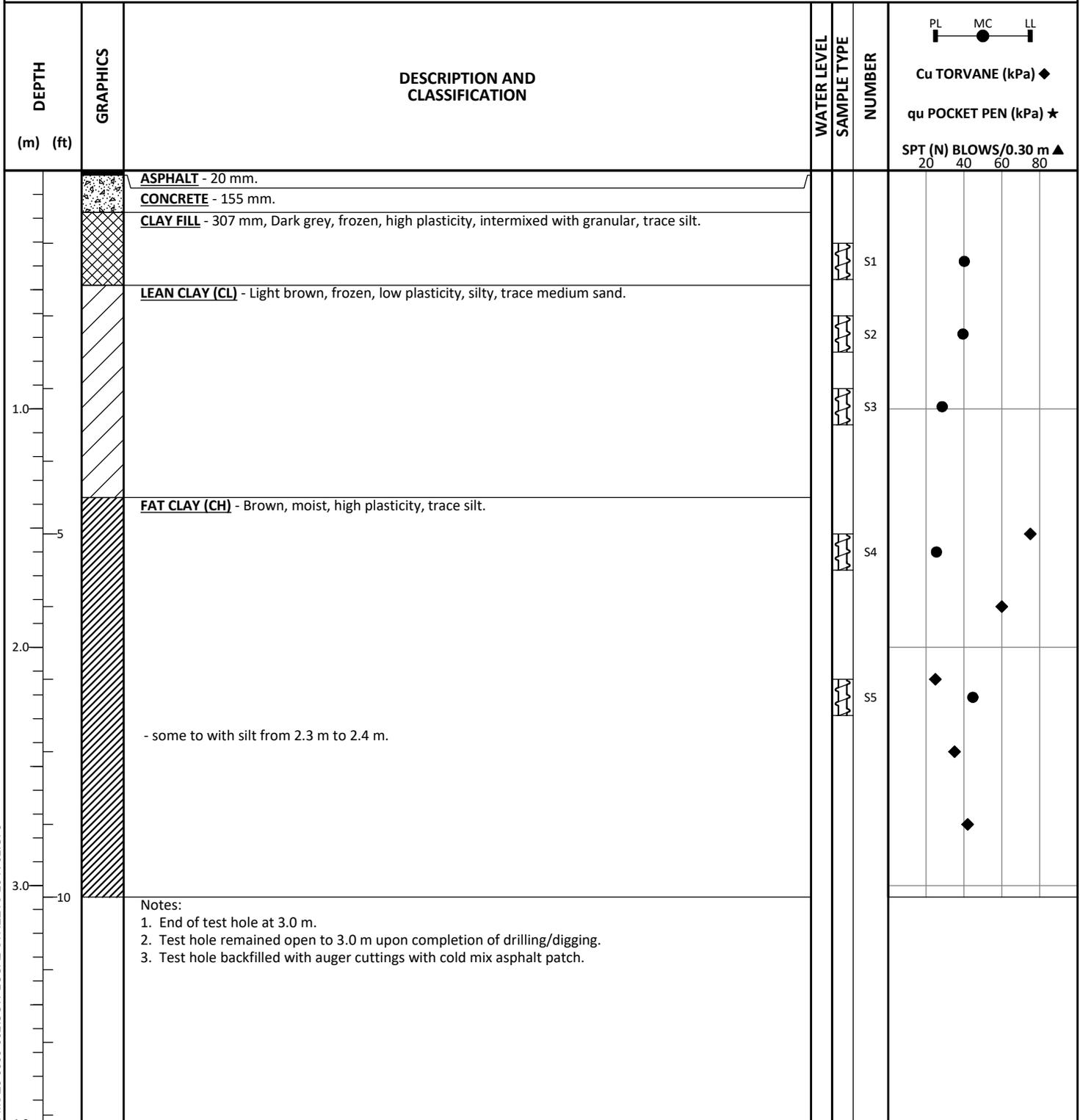


Notes:  
 1. End of test hole at 3.0 m.  
 2. Test hole remained open to 3.0 m upon completion of drilling/digging.  
 3. Test hole backfilled with auger cuttings with cold mix asphalt patch.

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<b>WATER LEVELS</b>	During Drilling/Digging	None Encountered	<b>CONTRACTOR</b> Paddock Drilling	<b>INSPECTOR</b> R. ALCANTARA
			<b>APPROVED</b> D. ANDERSON	<b>DATE</b> 4-4-2025

<b>CLIENT</b>	<b>KGS GROUP</b>	<b>PROJECT NO.</b>	25-0535-002
<b>PROJECT</b>	<b>City of Winnipeg 2025 Local Street Program - 25-R-02</b>	<b>START DATE</b>	2-24-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,528,544
<b>DESCRIPTION</b>	McMicken Street, southbound lane, near backside of 531 Furby Street		E 632,403 Zone 14
<b>DRILL RIG / HAMMER</b>	Acker MP8 with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.2 m: 175 mm Core 0.2 m to 3.0 m: 150 mm $\phi$ SSA		



- Notes:
- End of test hole at 3.0 m.
  - Test hole remained open to 3.0 m upon completion of drilling/digging.
  - Test hole backfilled with auger cuttings with cold mix asphalt patch.

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

CONTRACTOR  
**Paddock Drilling**

INSPECTOR  
**R. ALCANTARA**

APPROVED  
**D. ANDERSON**

DATE  
**4-4-2025**

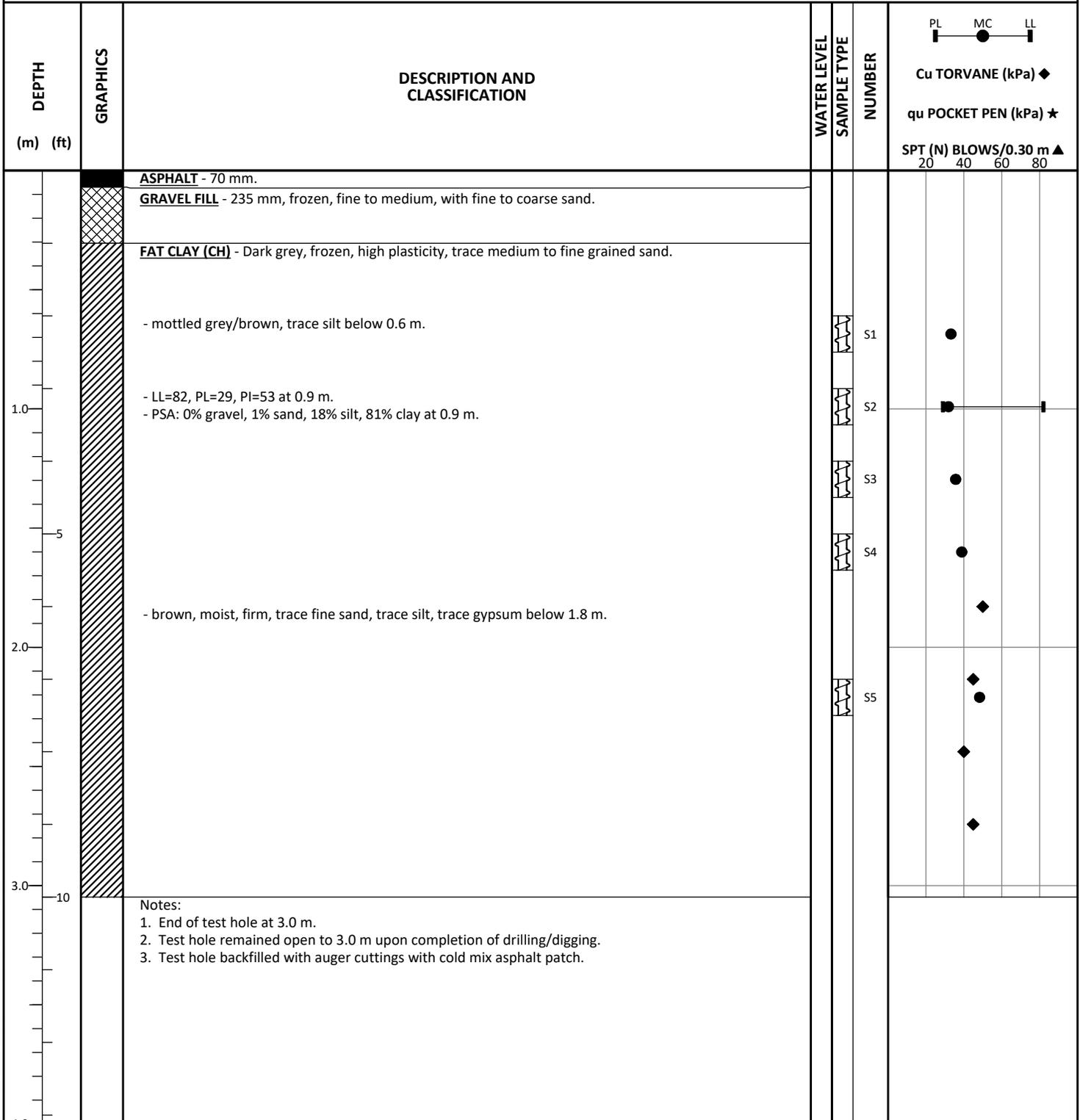
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<b>PROJECT</b>	City of Winnipeg 2025 Local Street Program - 25-R-02	<b>START DATE</b>	2-24-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,528,455
<b>DESCRIPTION</b>	McMicken Street, southbound lane, near north edge of Furby Tot Lot		E 632,402 Zone 14
<b>DRILL RIG / HAMMER</b>	Acker MP8 with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.2 m: 175 mm Core 0.2 m to 3.0 m: 150 mm $\phi$ SSA		

DEPTH (m) (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 ▲
		ASPHALT - 21 mm.						
		CONCRETE - 150 mm.						
		CLAY FILL - 305 mm, Dark grey, frozen, intermixed with granular.						
		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.			S1			
		FAT CLAY (CH) - Brown, frozen, high plasticity, with silt, trace fine sand.			S2			
1.0					S3			
5		- moist, firm, trace to some silt, trace coarse sand below 1.5 m.			S4			
2.0					S5			
		- mottled brown/light brown, with silt seams, trace medium sand below 2.1 m.						
		- soft below 2.7 m.						
3.0		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.						

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<b>WATER LEVELS</b>	▽ During Drilling/Digging	None Encountered	<b>CONTRACTOR</b> Paddock Drilling	<b>INSPECTOR</b> R. ALCANTARA
			<b>APPROVED</b> D. ANDERSON	<b>DATE</b> 4-4-2025

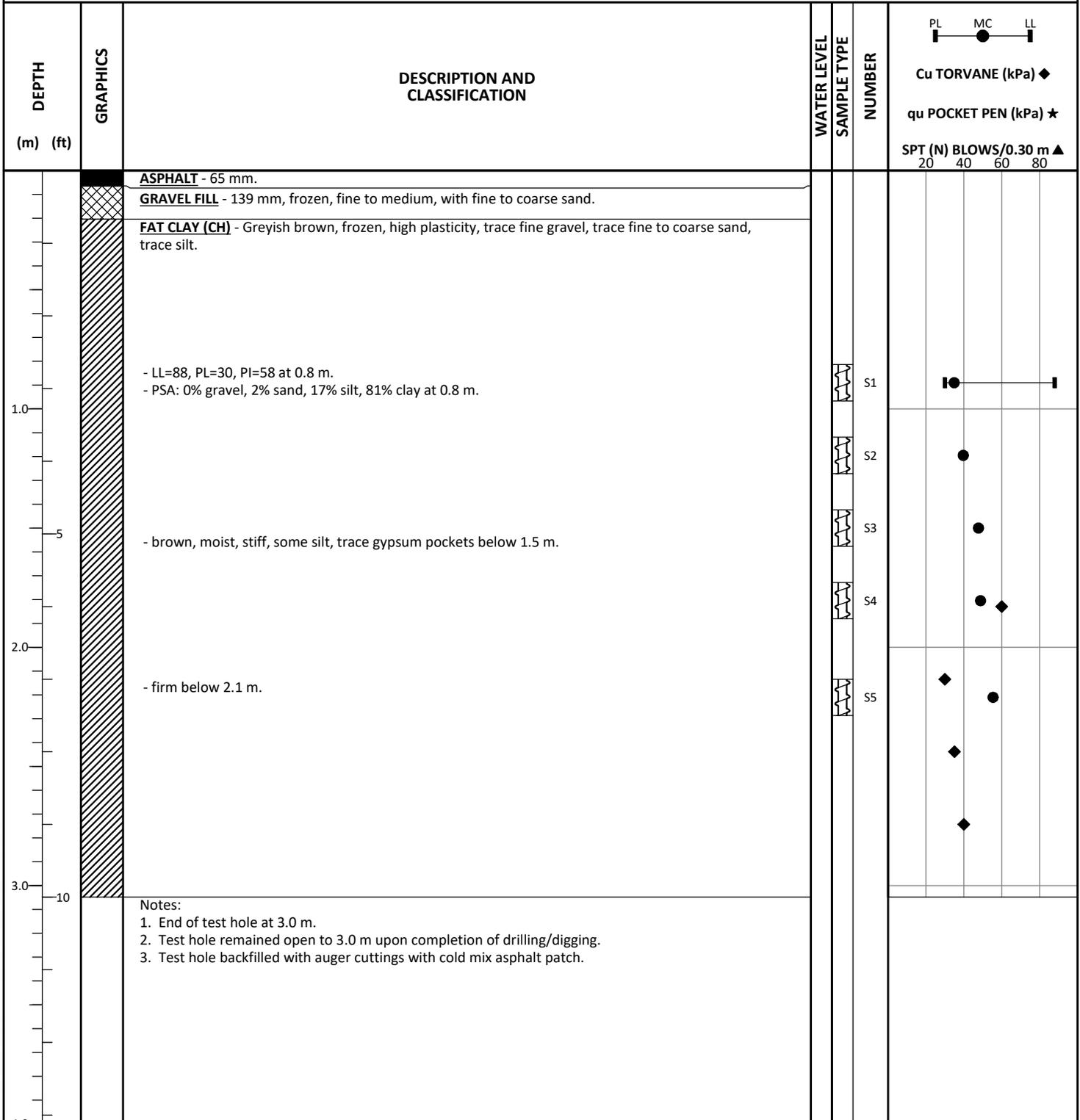
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<b>PROJECT</b>	<b>City of Winnipeg 2025 Local Street Program - 25-R-02</b>	<b>START DATE</b>	2-19-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,529,129
<b>DESCRIPTION</b>	Langside Street, southbound lane approx. 40 m south of Notre Dame Avenue intersection	E 632,455	Zone 14
<b>DRILL RIG / HAMMER</b>	Acker MP8 with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.3 m: 175 mm Core 0.3 m to 3.0 m: 150 mm $\phi$ SSA		



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<b>WATER LEVELS</b>	∇ During Drilling/Digging	None Encountered	<b>CONTRACTOR</b> Paddock Drilling	<b>INSPECTOR</b> R. ALCANTARA
			<b>APPROVED</b> D. ANDERSON	<b>DATE</b> 4-4-2025

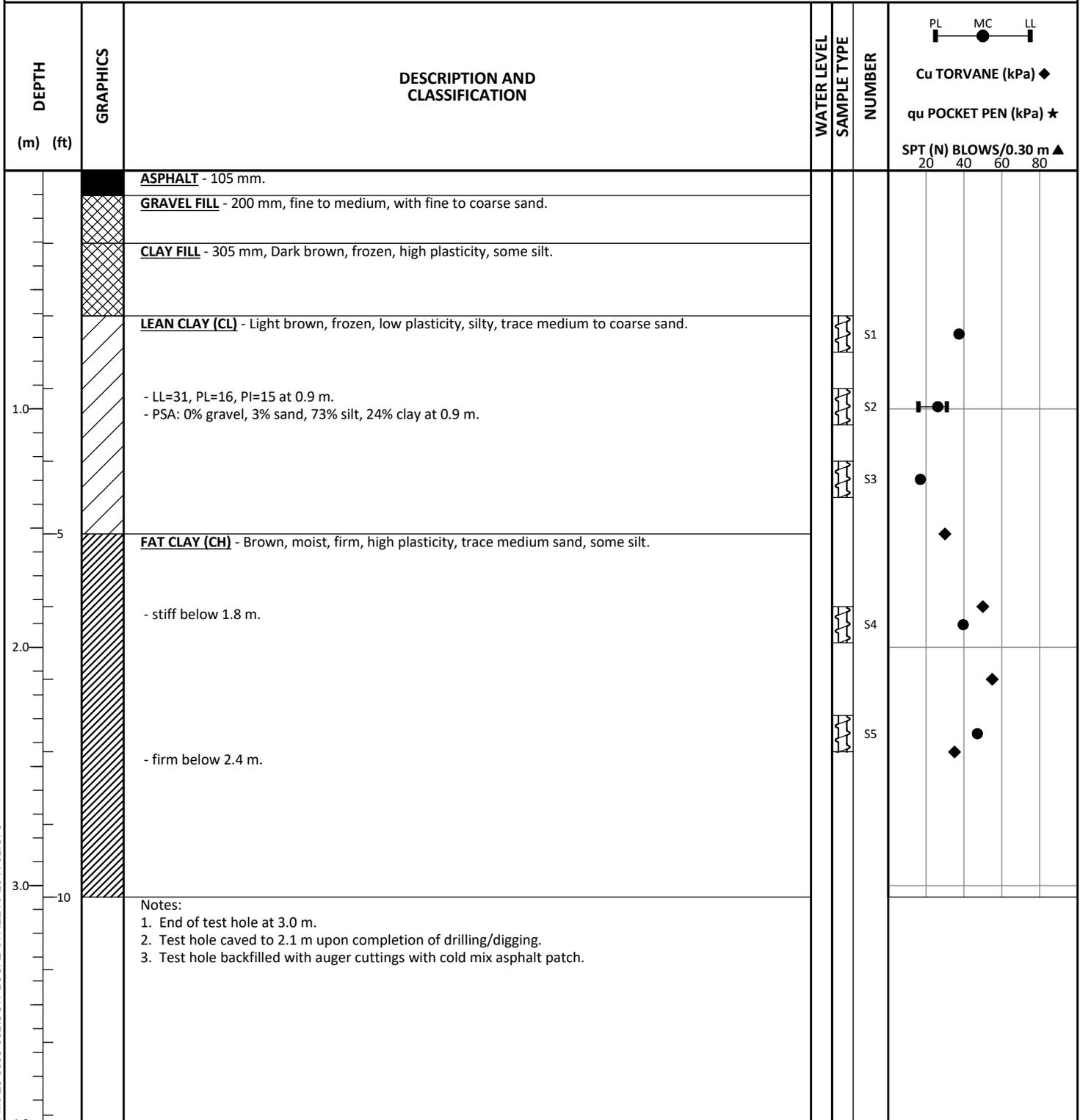
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<b>PROJECT</b>	<b>City of Winnipeg 2025 Local Street Program - 25-R-02</b>	<b>START DATE</b>	2-19-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,529,106
<b>DESCRIPTION</b>	Langside Street, southbound lane approx. 60 m south of Notre Dame Avenue intersection E 632,455 Zone 14		
<b>DRILL RIG / HAMMER</b>	Acker MP8 with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.2 m: 175 mm Core 0.2 m to 3.0 m: 150 mm $\phi$ SSA		



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<b>WATER LEVELS</b> During Drilling/Digging    None Encountered	<b>CONTRACTOR</b> Paddock Drilling	<b>INSPECTOR</b> R. ALCANTARA
	<b>APPROVED</b> D. ANDERSON	<b>DATE</b> 4-4-2025

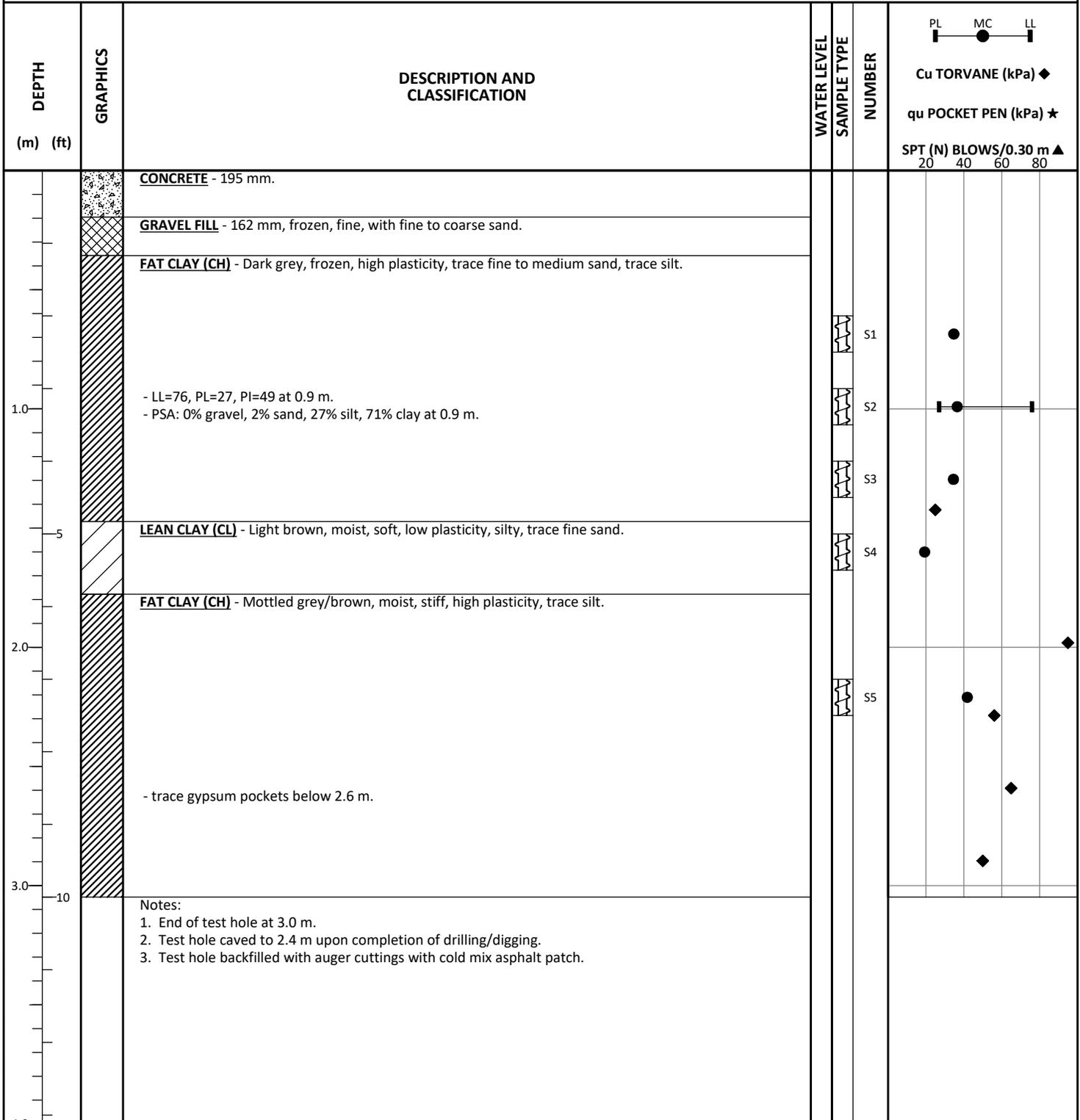
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<b>PROJECT</b>	<b>City of Winnipeg 2025 Local Street Program - 25-R-02</b>	<b>START DATE</b>	2-19-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,529,075
<b>DESCRIPTION</b>	Langside Street, southbound lane approx. 19 m north of Cumberland Avenue intersection E 632,454 Zone 14		
<b>DRILL RIG / HAMMER</b>	Acker MP8 with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.3 m: 175 mm Core 0.3 m to 3.0 m: 150 mm $\phi$ SSA		



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<b>WATER LEVELS</b>	∇ During Drilling/Digging	None Encountered	<b>CONTRACTOR</b> Paddock Drilling	<b>INSPECTOR</b> R. ALCANTARA
			<b>APPROVED</b> D. ANDERSON	<b>DATE</b> 4-4-2025

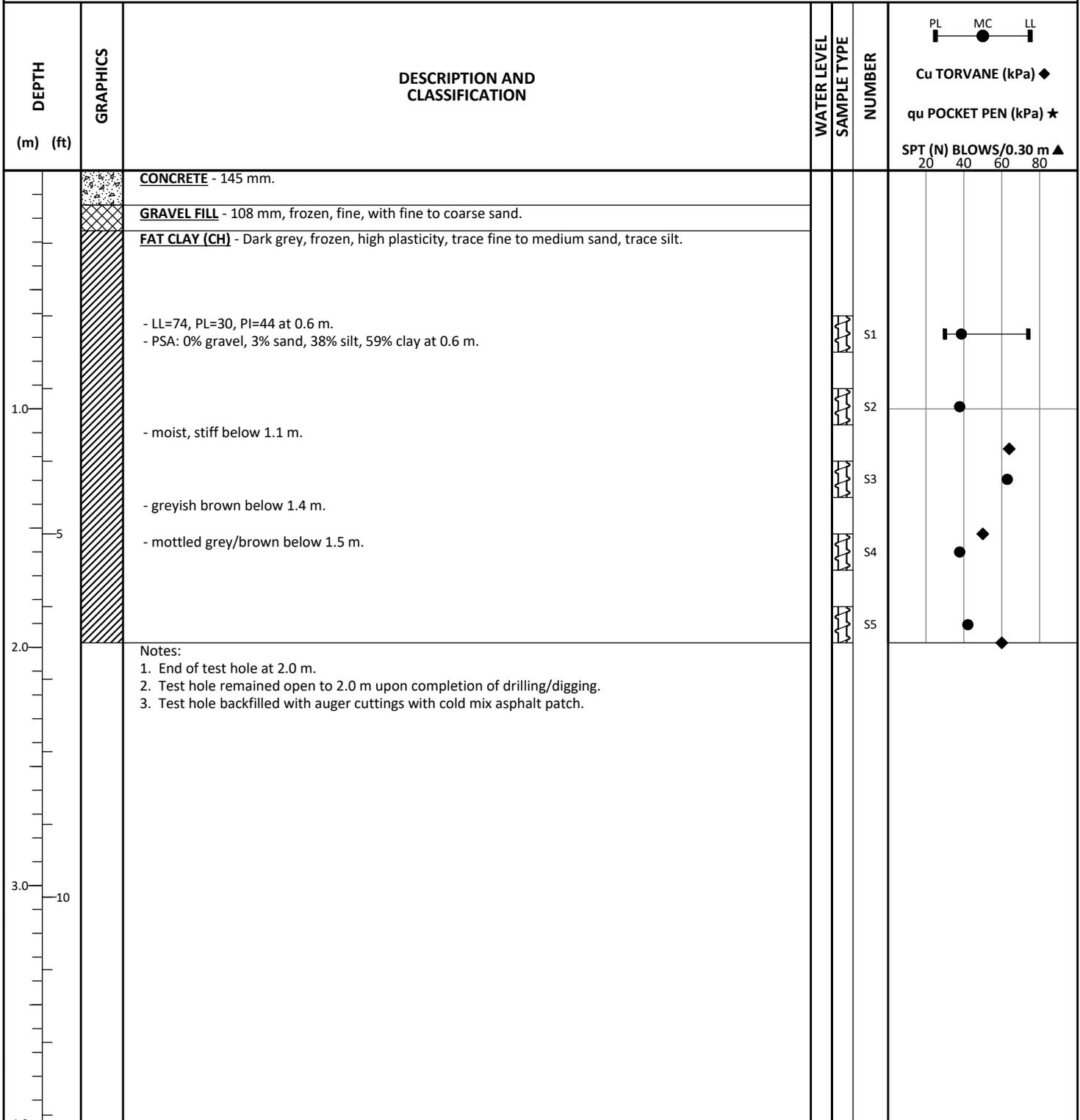
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<b>PROJECT</b>	<b>City of Winnipeg 2025 Local Street Program - 25-R-02</b>	<b>START DATE</b>	2-26-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,527,953
<b>DESCRIPTION</b>	Kennedy-Edmonton Alleyway, near parking garage exit of 400 St. Mary Avenue		E 633,147 Zone 14
<b>DRILL RIG / HAMMER</b>	Acker MP8 with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.2 m: 175 mm Core 0.2 m to 3.0 m: 150 mm $\phi$ SSA		



KGS\_LOG\_U:\FMS\25-0535-002\COW LOCAL STREETS 25-R-02.GPJ

<b>WATER LEVELS</b>	During Drilling/Digging	None Encountered	<b>CONTRACTOR</b> Paddock Drilling	<b>INSPECTOR</b> R. ALCANTARA
			<b>APPROVED</b> D. ANDERSON	<b>DATE</b> 4-4-2025

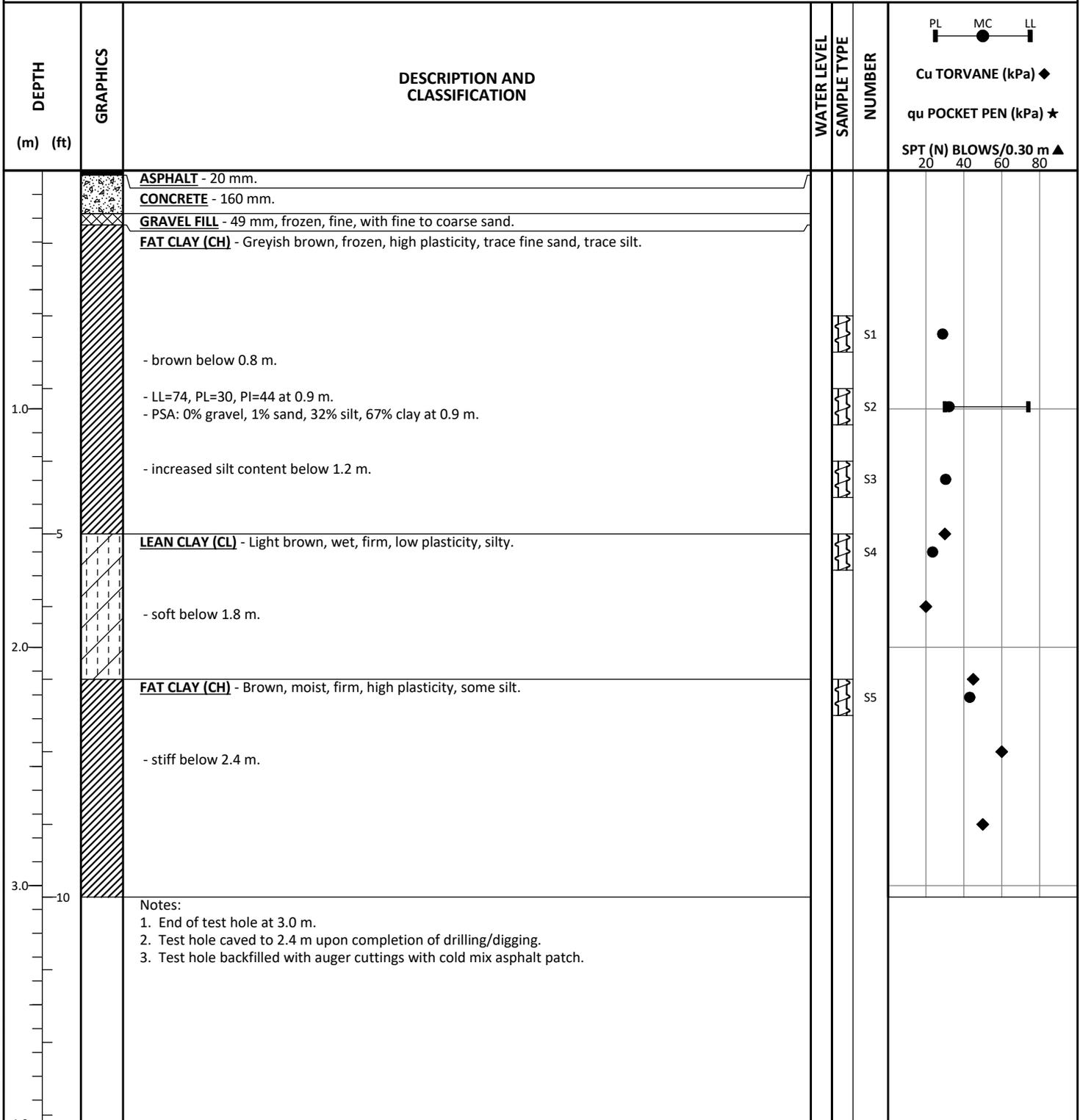
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<b>PROJECT</b>	<b>City of Winnipeg 2025 Local Street Program - 25-R-02</b>	<b>START DATE</b>	2-26-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,527,891
<b>DESCRIPTION</b>	Kennedy-Edmonton Alleyway, near eastern face of 165 Kennedy Street		E 633,176 Zone 14
<b>DRILL RIG / HAMMER</b>	Acker MP8 with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.1 m: 175 mm Core 0.1 m to 3.0 m: 150 mm $\phi$ SSA		



<b>WATER LEVELS</b>	∇ During Drilling/Digging	None Encountered	<b>CONTRACTOR</b> Paddock Drilling	<b>INSPECTOR</b> R. ALCANTARA
			<b>APPROVED</b> D. ANDERSON	<b>DATE</b> 4-4-2025

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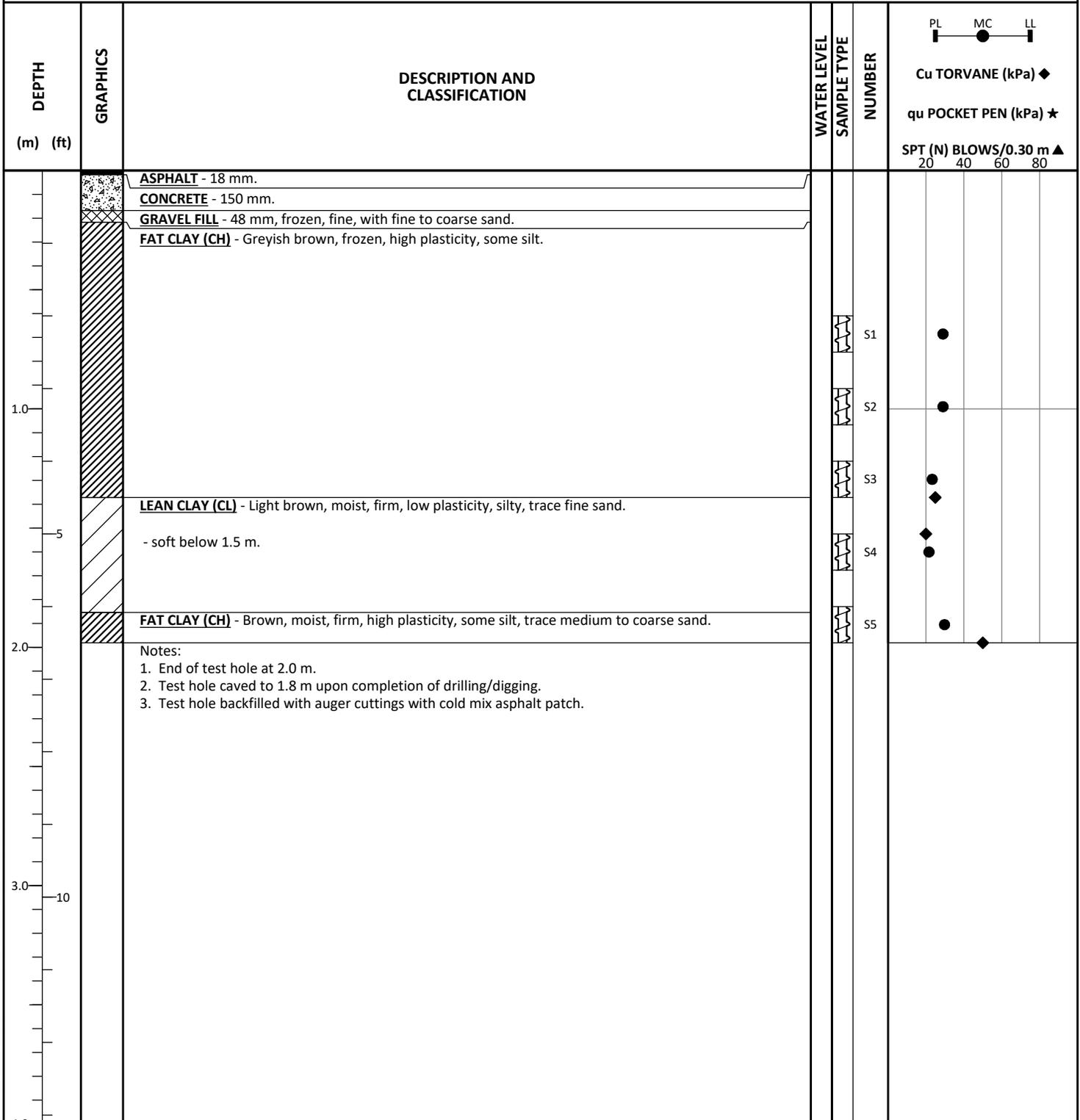
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<b>PROJECT</b>	<b>City of Winnipeg 2025 Local Street Program - 25-R-02</b>	<b>START DATE</b>	2-27-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,527,850
<b>DESCRIPTION</b>	Huntleigh Street, southbound lane near northern face of 301 Victor Street		E 631,965 Zone 14
<b>DRILL RIG / HAMMER</b>	Acker MP8 with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.2 m: 175 mm Core 0.2 m to 2.0 m: 150 mm $\phi$ SSA		



<b>WATER LEVELS</b>	∇ During Drilling/Digging	None Encountered	<b>CONTRACTOR</b> Paddock Drilling	<b>INSPECTOR</b> R. ALCANTARA
			<b>APPROVED</b> D. ANDERSON	<b>DATE</b> 4-4-2025

KGS\_LOG\_U:\FMS\25-0535-002\COW LOCAL STREETS 25-R-02.GPJ

<b>CLIENT</b>	<b>KGS GROUP</b>	<b>PROJECT NO.</b>	25-0535-002
<b>PROJECT</b>	<b>City of Winnipeg 2025 Local Street Program - 25-R-02</b>	<b>START DATE</b>	2-27-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,527,907
<b>DESCRIPTION</b>	Huntleigh Street, southbound lane near backside of 331 Victor Street		E 631,966 Zone 14
<b>DRILL RIG / HAMMER</b>	Acker MP8 with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.2 m: 175 mm Core 0.2 m to 2.0 m: 150 mm $\phi$ SSA		



PL MC LL

Cu TORVANE (kPa) ◆

qu POCKET PEN (kPa) ★

SPT (N) BLOWS/0.30 m ▲

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

CONTRACTOR **Paddock Drilling** INSPECTOR **R. ALCANTARA**

APPROVED **D. ANDERSON** DATE **4-4-2025**

KGS\_LOG\_U:\FMS\25-0535-002\COW LOCAL STREETS 25-R-02.GPJ

<b>CLIENT</b>	<b>KGS GROUP</b>	<b>PROJECT NO.</b>	25-0535-002
<b>PROJECT</b>	<b>City of Winnipeg 2025 Local Street Program - 25-R-02</b>	<b>START DATE</b>	2-27-2025
<b>LOCATION</b>	Winnipeg, Manitoba	<b>UTM (m)</b>	N 5,527,940 E 631,966 Zone 14
<b>DESCRIPTION</b>	Huntleigh Street, southbound lane near 339 Victor Street		
<b>DRILL RIG / HAMMER</b>	Acker MP8 with Auto-Hammer		
<b>METHOD(S)</b>	0.0 m to 0.0 m: 175 mm Core 0.0 m to 2.0 m: 150 mm $\phi$ SSA		

DEPTH (m) (ft)	GRAPHICS	DESCRIPTION AND CLASSIFICATION	WATER LEVEL	SAMPLE NUMBER	TEST RESULTS			
					PL	MC	LL	SPT (N) BLOWS/0.30 m ▲
		<b>ASPHALT</b> - 25 mm.						
		<b>CONCRETE</b> - 127 mm.						
		<b>GRAVEL FILL</b> - 52 mm, frozen, fine, with fine to coarse sand.						
		<b>LEAN CLAY (CL)</b> - 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		- light brown, silty, trace fine to medium sand below 1.1 m.		S3				
		- 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.						

<b>WATER LEVELS</b>	During Drilling/Digging	None Encountered	<b>CONTRACTOR</b> Paddock Drilling	<b>INSPECTOR</b> R. ALCANTARA
			<b>APPROVED</b> D. ANDERSON	<b>DATE</b> 4-4-2025

KGS\_LOG\_U:\FMS\25-0535-002\COW LOCAL STREETS 25-R-02.GPJ

# 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

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>LL - Liquid Limit</li> <li>PL - Plastic Limit</li> <li>PI - Plastic Index</li> <li>MC - Moisture Content</li> <li>DD - Dry Density</li> <li>NP - Non-Plastic</li> <li>-200 - Percent Passing No. 200 Sieve</li> <li>TV - Torvane (kPa)</li> <li>PP - Pocket Penetrometer (kPa)</li> <li>PSA - Particle Size Analysis</li> <li>TOC - Top Of Casing</li> </ul> | <ul style="list-style-type: none"> <li>PN - Pneumatic Piezometer</li> <li>VW - Vibrating Wire Piezometer</li> <li>PID - Photoionization Detector</li> <li>ppm - Parts Per Million</li> <li>∇ - Water Level During Drilling</li> <li>▼ - Water Level Upon Completion of Drilling</li> <li>◄ - Water Level Remeasured/Static</li> </ul> |
|---|---|

# APPENDIX C

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## Laboratory Testing

# SUMMARY OF INDEX TESTS

Test Hole ID	Smpl No.	Depth From (m)	Depth To (m)	Classification	Gravel (%)	Sand (%)	Silt/Clay (%)	LL	PL	PI	MC (%)	Dry Dens (kN/m <sup>3</sup> )	Spec Gvty	Saturation (%)	Proctor Max DD (kg/m <sup>3</sup> )	Proct Opt MC (%)	CBR Initial DD (kg/m <sup>3</sup> )	CBR Initial MC (%)	CBR % of Max DD	CBR % of Opt MC	CBR @2.54 mm	CBR % Swell
1. Burnell St.	Comb.	0.3	0.9	CH/CL							27				1710	18.5	1625	18.4	95.0	-0.1	2.4	4.5
2. McMicken St.	Comb.	0.3	0.9	CH/CL							36				1650	20.0	1567	20.1	95.0	0.1	6.1	1.8
3. Langside St.	Comb.	0.3	0.9	CH/CL							33				1470	28.0	1396	28.0	95.0	0.0	3.4	3.4
4. Kennedy	Comb.	0.3	0.9	CH							34				1410	25.5	1340	25.5	95.0	0.0	2.3	4.8
5. Huntleigh St.	Comb.	0.3	0.9	CH/CL							29				1520	21.5	1443	21.6	94.9	0.1	2.2	5.7
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											

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



**CLIENT** KGS GROUP  
**PROJECT NAME** City of Winnipeg 2025 Local Street Program - 25-R-02  
**TESTED BY** Stantec

**PROJECT NO.** 25-0535-002  
**LOCATION** Winnipeg, Manitoba  
**DATE TESTED** 03-28-2025

# SUMMARY OF INDEX TESTS

Test Hole ID	Smpl No.	Depth From (m)	Depth To (m)	Classification	Gravel (%)	Sand (%)	Silt/Clay (%)	LL	PL	PI	MC (%)	Dry Dens (kN/m <sup>3</sup> )	Spec Gvty	Saturation (%)	Proctor Max DD (kg/m <sup>3</sup> )	Proct Opt MC (%)	CBR Initial DD (kg/m <sup>3</sup> )	CBR Initial MC (%)	CBR % of Max DD	CBR % of Opt MC	CBR @2.54 mm	CBR % Swell
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											
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											

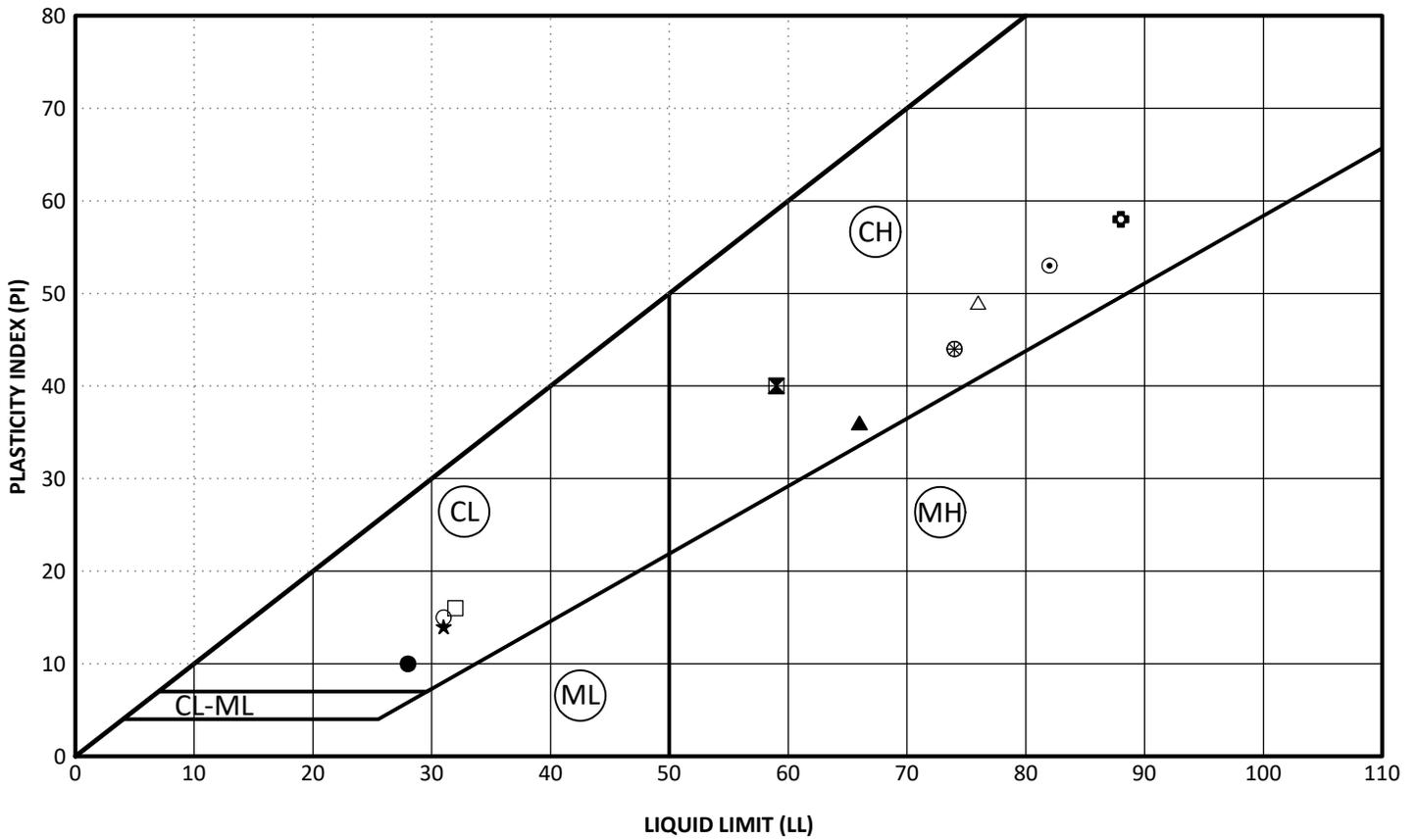
\* Moisture conditioned and remolded sample.  
 \*\* Assumed specific gravity.



**CLIENT** KGS GROUP  
**PROJECT NAME** City of Winnipeg 2025 Local Street Program - 25-R-02  
**TESTED BY** Stantec

**PROJECT NO.** 25-0535-002  
**LOCATION** Winnipeg, Manitoba  
**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

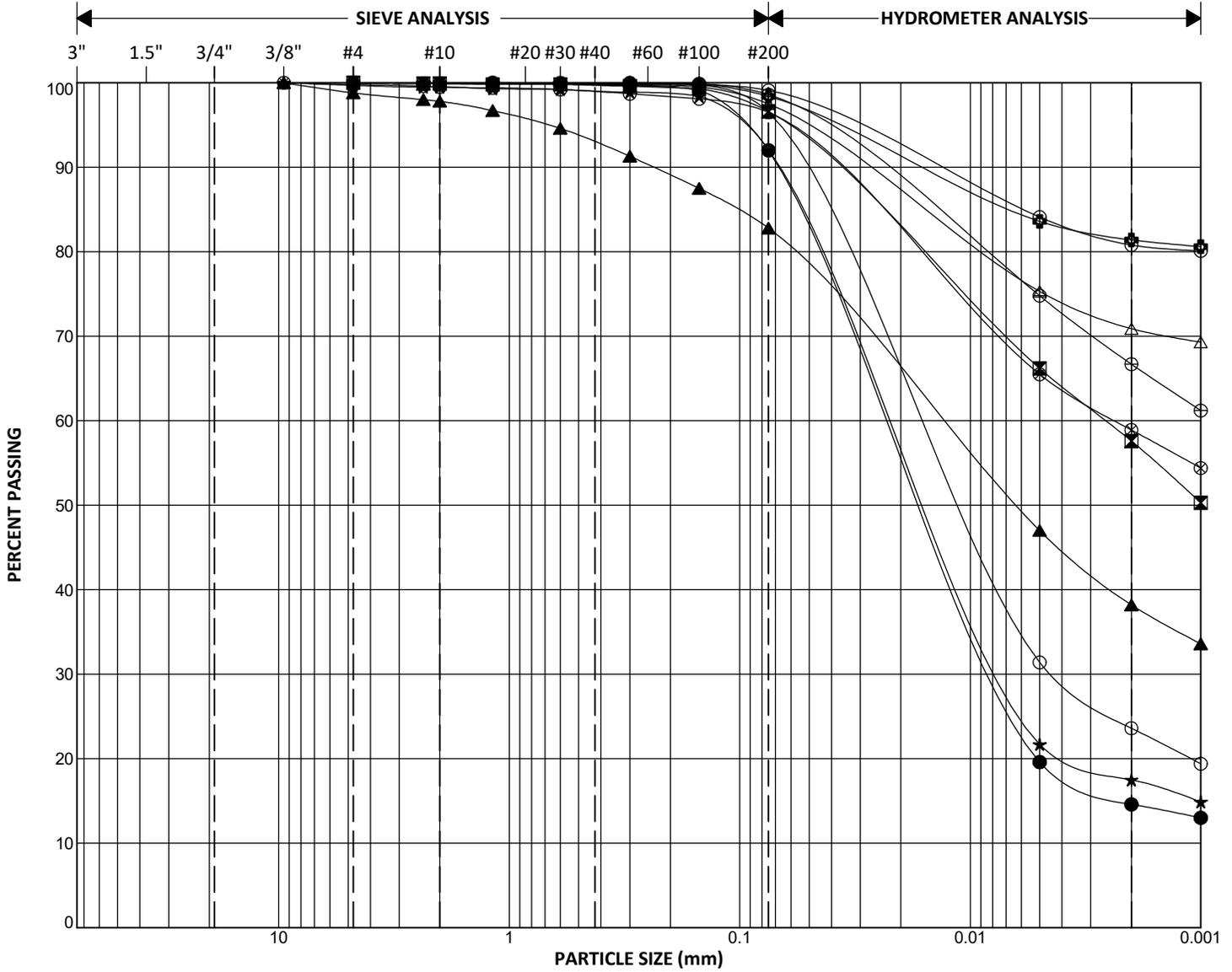
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**CLIENT** KGS GROUP  
**PROJECT NAME** City of Winnipeg 2025 Local Street Program - 25-R-02  
**TESTED BY** Stantec

**PROJECT NO.** 25-0535-002  
**LOCATION** Winnipeg, Manitoba  
**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

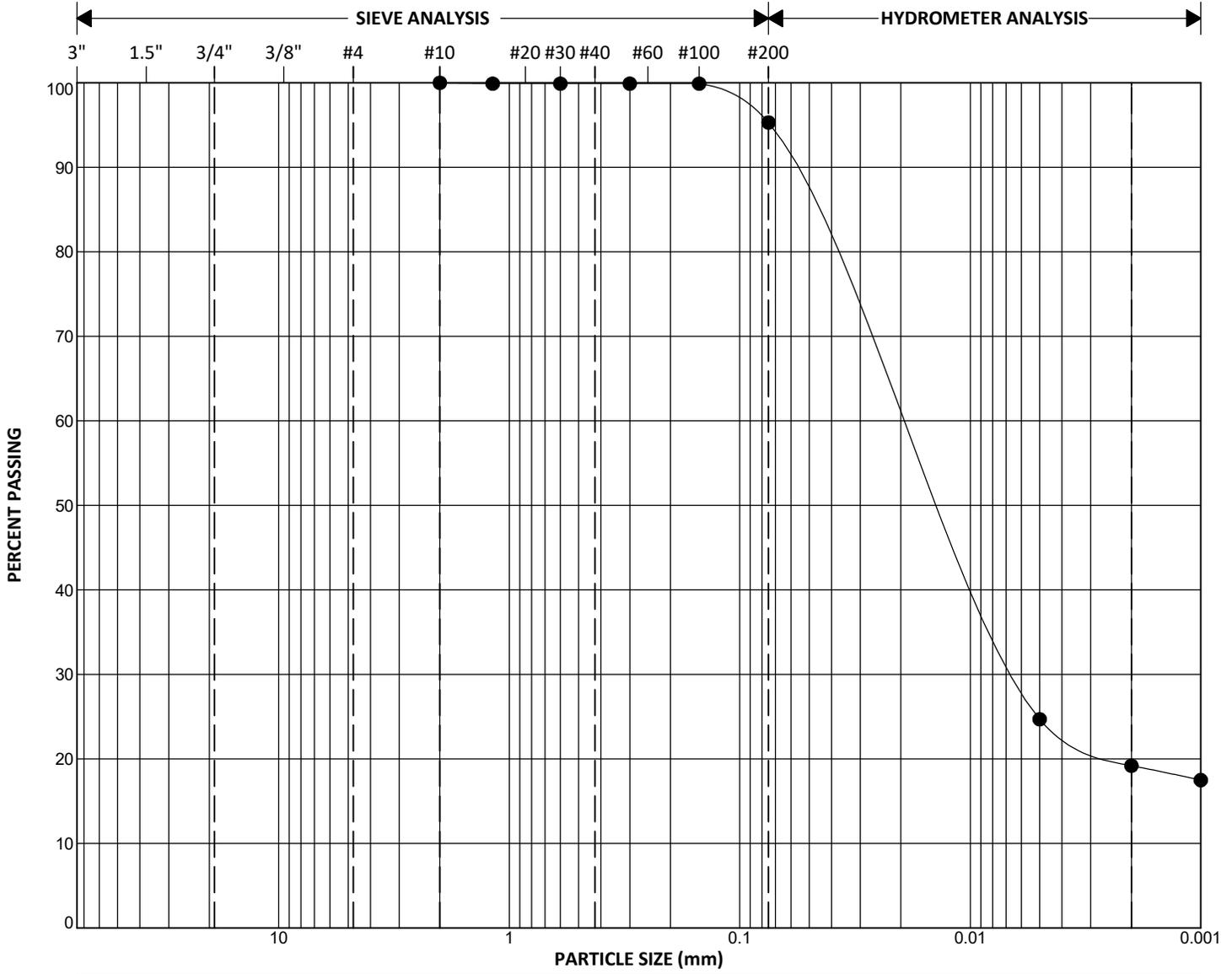
SIEVE ANALYSIS U:\IFMS\25-0535-002\LOCAL STREETS 25-R-02.GPJ



**CLIENT** KGS GROUP  
**PROJECT NAME** City of Winnipeg 2025 Local Street Program - 25-R-02  
**TESTED BY** Stantec

**PROJECT NO.** 25-0535-002  
**LOCATION** Winnipeg, Manitoba  
**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
● TH25-15	0.6	S2	0	5	76	19	95			CL

SIEVE ANALYSIS U:\IFMS\25-0535-002\ICOW LOCAL STREETS 25-R-02.GPJ

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

TO KGS Group Inc.  
 3rd Floor - 865 Waverley St.  
 Winnipeg, MB  
 R3T 5P4

PROJECT 2025 Local Street Program - 25-R-02  
 City of Winnipeg

PROJECT NO. 123317565

ATTN David Anderson

REPORT NO. 1

DATE SAMPLED: Not Provided  
 SAMPLED BY: KGS Group Inc.

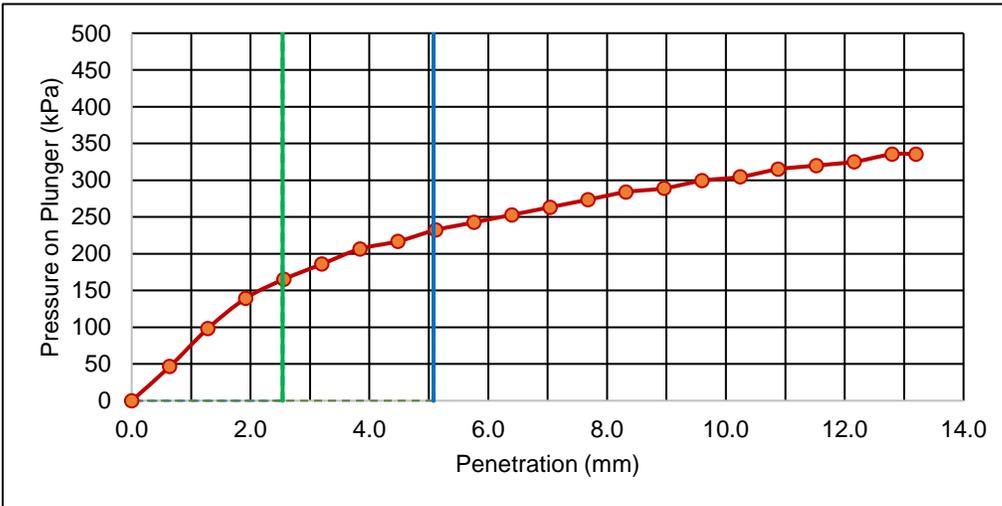
DATE RECEIVED: 2025.Mar.12  
 SUBMITTED BY: KGS Group Inc.

DATE TESTED: 2025.Mar.29  
 TESTED BY: Donald Eliazar

**MATERIAL IDENTIFICATION**

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	Burnell Street
MATERIAL TYPE	Clay	SAMPLE LOCATION	TH25-01/02/03, 1'-3'
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	5442

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1710 kg/m <sup>3</sup>
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	18.5 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1625 kg/m <sup>3</sup>
SWELL OF SAMPLE	4.47 %	AS-COMPACTED MOISTURE	18.4 %
POST-TEST MOISTURE	28.1 %	AS-COMPACTED % COMPACTION	95 %



**CBR VALUE AT 2.54 mm  
PENETRATION**  
2.4

**CBR VALUE AT 5.08 mm  
PENETRATION**  
2.3

**COMMENTS**

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

REPORT DATE 2025.Apr.03

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

# PROCTOR TEST REPORT

TO KGS Group Inc.  
 3rd Floor - 865 Waverley St.  
 Winnipeg, MB  
 R3T 5P4

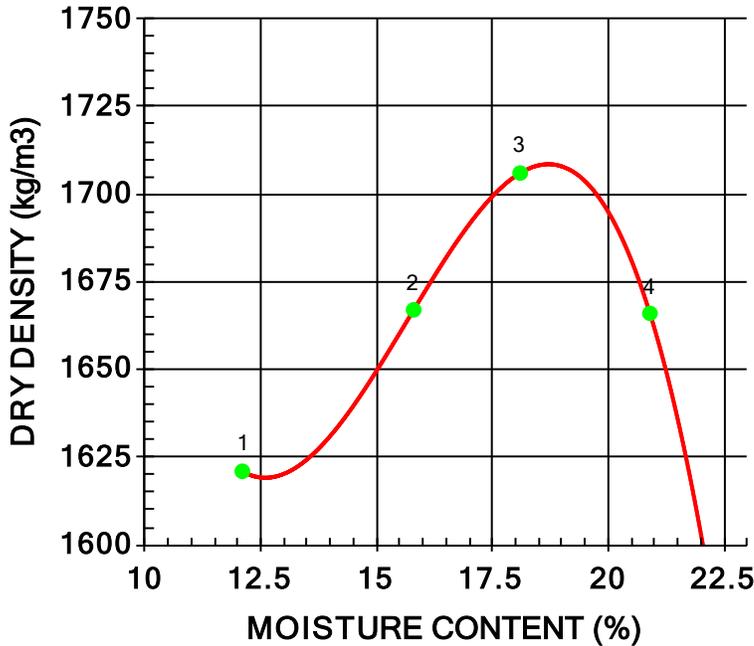
CLIENT KGS Group Inc.  
 C.C. KGS Group Inc.

ATTN: Raina Alcantara

PROJECT 2025 Local Street Program - 25-R-02  
 City of Winnipeg

PROJECT NO. 123317565  
 PROCTOR NO. 1 DATE SAMPLED 2025.Mar.12 DATE RECEIVED 2025.Mar.12 DATE TESTED 2025.Mar.27

INSITU MOISTURE	26.9 %	COMPACTION STANDARD	Standard Proctor, ASTM
TESTED BY	Donald Eliazar		D698
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Subgrade	RAMMER TYPE	Manual
SIZE	Clay	PREPARATION	Moist
DESCRIPTION		OVERSIZE CORRECTION METHOD	None
SUPPLIER	Existing Materials	RETAINED 4.75mm SCREEN	N/A %
SOURCE	TH 25-1,2 & 3 - Burnell Street		



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1817	1621	12.1
2	1930	1667	15.8
3	2015	1706	18.1
4	2014	1666	20.9

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1710	18.5
OVERSIZE CORRECTED		

**COMMENTS**

Stantec Sample No. 5442.

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

TO KGS Group Inc.  
 3rd Floor - 865 Waverley St.  
 Winnipeg, MB  
 R3T 5P4

PROJECT 2025 Local Street Program - 25-R-02  
 City of Winnipeg

PROJECT NO. 123317565

ATTN David Anderson

REPORT NO. 2

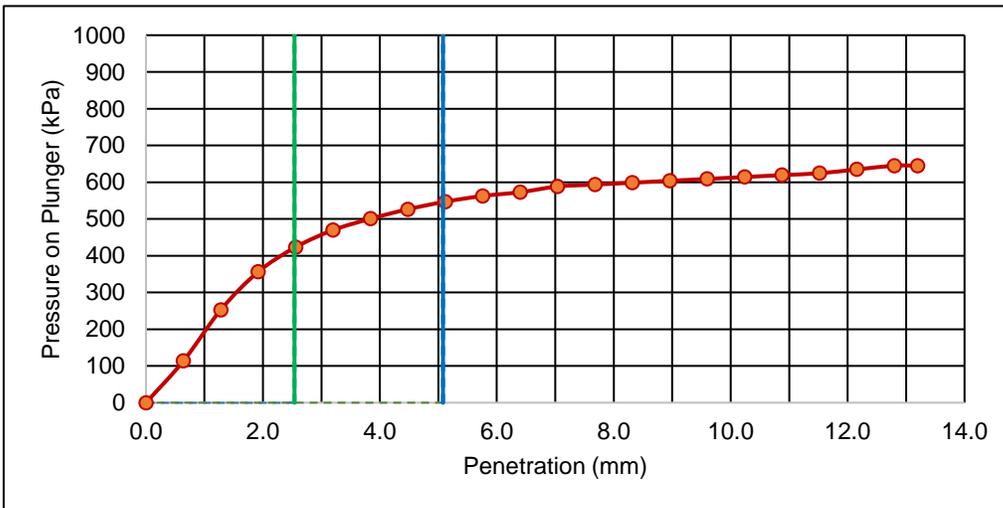
DATE SAMPLED: Not Provided  
 SAMPLED BY: KGS Group Inc.

DATE RECEIVED: 2025.Mar.12  
 SUBMITTED BY: KGS Group Inc.

DATE TESTED: 2025.Mar.29  
 TESTED BY: Donald Eliazar

**MATERIAL IDENTIFICATION**

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	McMicken Street
MATERIAL TYPE	Clay	SAMPLE LOCATION	TH25-04/05/06/07, 1'-3'
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	5445
IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1650 kg/m <sup>3</sup>
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	20.0 %
SURCHARGE MASS	4.54 kg	AS-COMPACTED DRY DENSITY	1567 kg/m <sup>3</sup>
+19 mm OVERSIZE	0 %	AS-COMPACTED MOISTURE	20.1 %
SWELL OF SAMPLE	1.78 %	AS-COMPACTED % COMPACTION	95 %
POST-TEST MOISTURE	23.2 %		



**CBR VALUE AT 2.54 mm PENETRATION**  
6.1

**CBR VALUE AT 5.08 mm PENETRATION**  
5.5

**COMMENTS**

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

REPORT DATE 2025.Apr.03

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

# PROCTOR TEST REPORT

TO KGS Group Inc.  
 3rd Floor - 865 Waverley St.  
 Winnipeg, MB  
 R3T 5P4

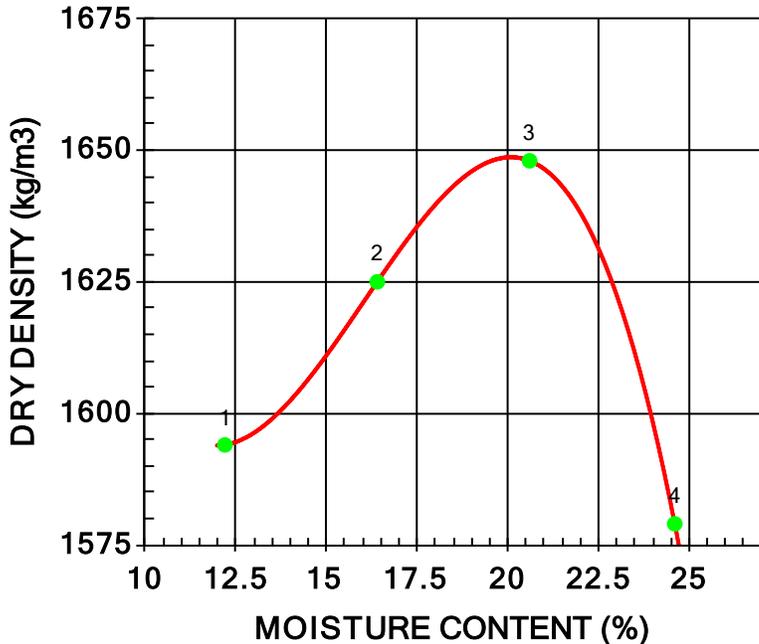
CLIENT KGS Group Inc.  
 C.C. KGS Group Inc.

ATTN: Raina Alcantara

PROJECT 2025 Local Street Program - 25-R-02  
 City of Winnipeg

PROJECT NO. 123317565  
 PROCTOR NO. 2 DATE SAMPLED 2025.Mar.12 DATE RECEIVED 2025.Mar.12 DATE TESTED 2025.Mar.27

INSITU MOISTURE	36.0 %	COMPACTION STANDARD	Standard Proctor, ASTM
TESTED BY	Donald Eliazar		D698
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Subgrade	RAMMER TYPE	Manual
SIZE	Clay	PREPARATION	Moist
DESCRIPTION		OVERSIZE CORRECTION METHOD	None
SUPPLIER	Existing Materials	RETAINED 4.75mm SCREEN	N/A %
SOURCE	TH 24-04 4,5,6 & 7 McMicken St		



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1789	1594	12.2
2	1891	1625	16.4
3	1987	1648	20.6
4	1968	1579	24.6

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1650	20.0
OVERSIZE CORRECTED		

**COMMENTS**

Stantec Sample No. 5445.

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

TO KGS Group Inc.  
 3rd Floor - 865 Waverley St.  
 Winnipeg, MB  
 R3T 5P4

PROJECT 2025 Local Street Program - 25-R-02  
 City of Winnipeg

PROJECT NO. 123317565

ATTN David Anderson

REPORT NO. 3

DATE SAMPLED: Not Provided  
 SAMPLED BY: KGS Group Inc.

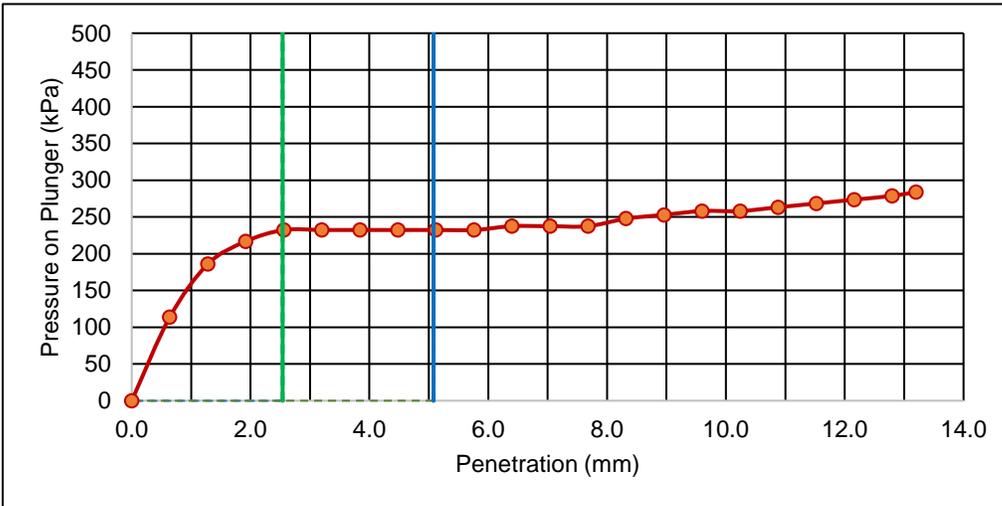
DATE RECEIVED: 2025.Mar.12  
 SUBMITTED BY: KGS Group Inc.

DATE TESTED: 2025.Mar.29  
 TESTED BY: Donald Eliazar

**MATERIAL IDENTIFICATION**

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	Langside Street
MATERIAL TYPE	Clay	SAMPLE LOCATION	TH25-08/09/10, 1'-3'
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	5449

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1470 kg/m <sup>3</sup>
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	28.0 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1396 kg/m <sup>3</sup>
SWELL OF SAMPLE	3.36 %	AS-COMPACTED MOISTURE	28.0 %
POST-TEST MOISTURE	34.7 %	AS-COMPACTED % COMPACTION	95 %



**CBR VALUE AT 2.54 mm PENETRATION**  
3.4

**CBR VALUE AT 5.08 mm PENETRATION**  
2.3

**COMMENTS**

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

REPORT DATE 2025.Apr.03

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

# PROCTOR TEST REPORT

TO KGS Group Inc.  
 3rd Floor - 865 Waverley St.  
 Winnipeg, MB  
 R3T 5P4

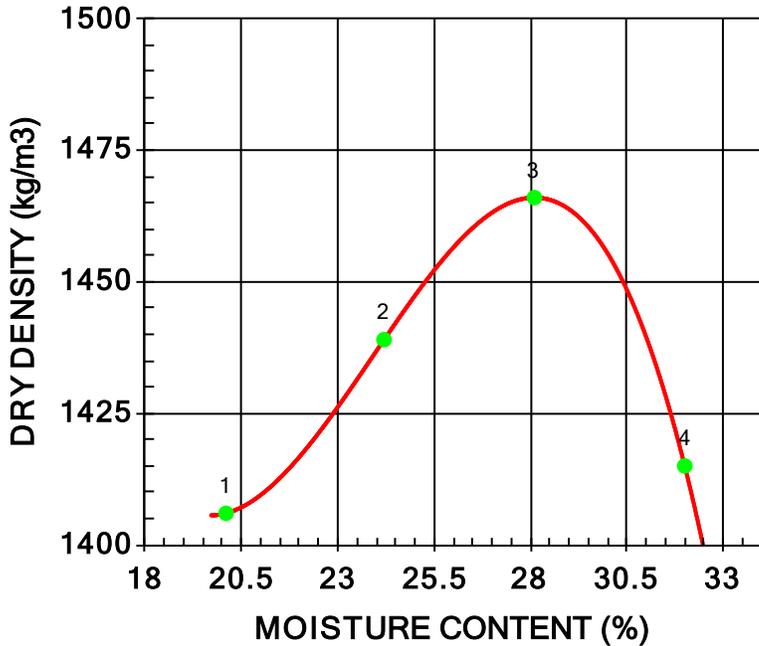
CLIENT KGS Group Inc.  
 C.C. KGS Group Inc.

ATTN: Raina Alcantara

PROJECT 2025 Local Street Program - 25-R-02  
 City of Winnipeg

PROJECT NO. 123317565  
 PROCTOR NO. 3 DATE SAMPLED 2025.Mar.12 DATE RECEIVED 2025.Mar.12 DATE TESTED 2025.Mar.28

INSITU MOISTURE	32.5 %	COMPACTION STANDARD	Standard Proctor, ASTM
TESTED BY	Donald Eliazar		D698
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Subgrade	RAMMER TYPE	Manual
SIZE	Clay	PREPARATION	Moist
DESCRIPTION		OVERSIZE CORRECTION METHOD	None
SUPPLIER	Existing Materials	RETAINED 4.75mm SCREEN	N/A %
SOURCE	BH 25 08 - 8,9&10 Langside St		



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1689	1406	20.1
2	1787	1439	24.2
3	1878	1466	28.1
4	1868	1415	32.0

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1470	28.0
OVERSIZE CORRECTED		

**COMMENTS**

Stantec Sample No. 5449.



Jason Thompson, C.E.T.

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

TO KGS Group Inc.  
 3rd Floor - 865 Waverley St.  
 Winnipeg, MB  
 R3T 5P4

PROJECT 2025 Local Street Program - 25-R-02  
 City of Winnipeg

PROJECT NO. 123317565

ATTN David Anderson

REPORT NO. 4

DATE SAMPLED: Not Provided  
 SAMPLED BY: KGS Group Inc.

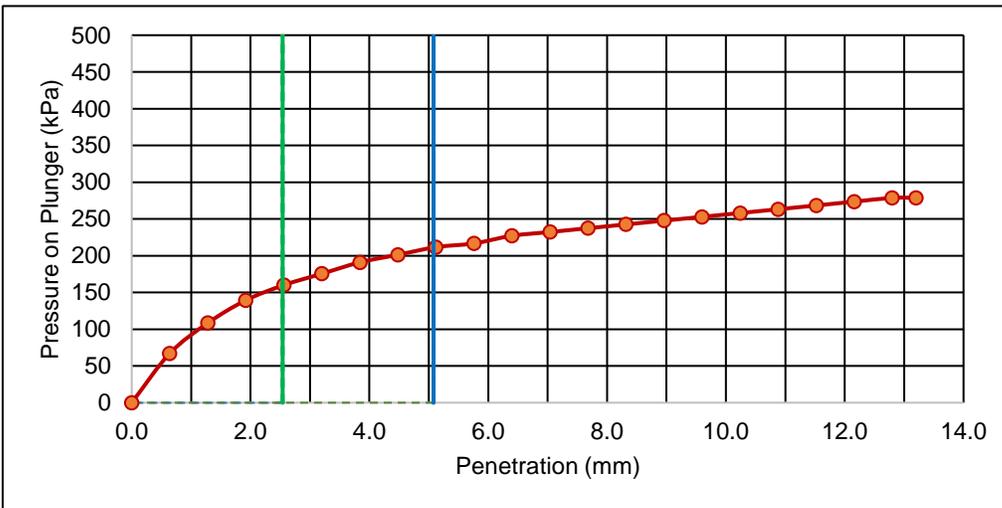
DATE RECEIVED: 2025.Mar.12  
 SUBMITTED BY: KGS Group Inc.

DATE TESTED: 2025.Mar.29  
 TESTED BY: Donald Eliazar

**MATERIAL IDENTIFICATION**

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	Kennedy Street - Edmonton Street
MATERIAL TYPE	Clay	SAMPLE LOCATION	TH25-11/12, 1'-3'
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	5452

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1410 kg/m <sup>3</sup>
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	25.5 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1340 kg/m <sup>3</sup>
SWELL OF SAMPLE	4.75 %	AS-COMPACTED MOISTURE	25.5 %
POST-TEST MOISTURE	41.5 %	AS-COMPACTED % COMPACTION	95 %



**CBR VALUE AT 2.54 mm  
PENETRATION**  
2.3

**CBR VALUE AT 5.08 mm  
PENETRATION**  
2.1

**COMMENTS**

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

REPORT DATE 2025.Apr.07

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

# PROCTOR TEST REPORT

TO KGS Group Inc.  
 3rd Floor - 865 Waverley St.  
 Winnipeg, MB  
 R3T 5P4

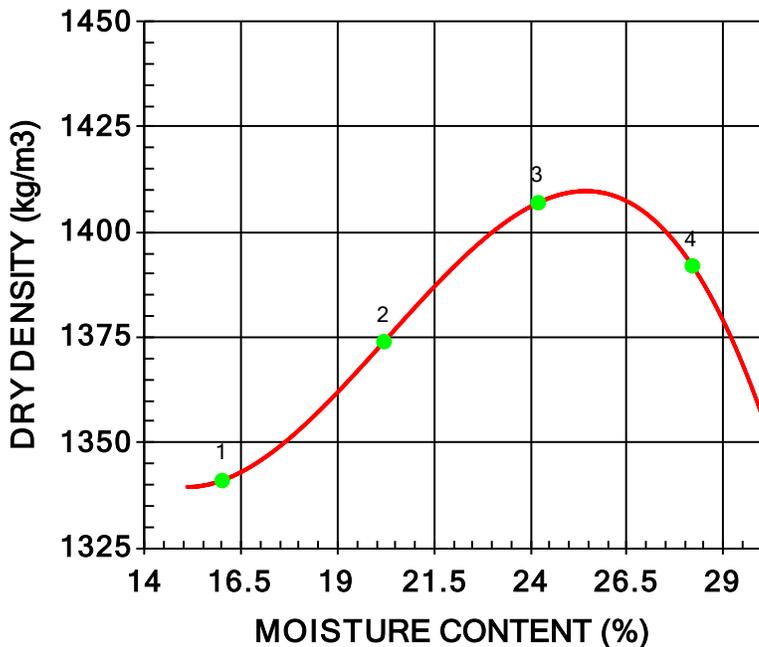
CLIENT KGS Group Inc.  
 C.C. KGS Group Inc.

ATTN: Raina Alcantara

PROJECT 2025 Local Street Program - 25-R-02  
 City of Winnipeg

PROJECT NO. 123317565  
 PROCTOR NO. 4 DATE SAMPLED 2025.Mar.12 DATE RECEIVED 2025.Mar.12 DATE TESTED 2025.Mar.28

INSITU MOISTURE	33.7 %	COMPACTION STANDARD	Standard Proctor, ASTM
TESTED BY	Donald Eliazar		D698
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Subgrade	RAMMER TYPE	Manual
SIZE	Clay	PREPARATION	Moist
DESCRIPTION		OVERSIZE CORRECTION METHOD	None
SUPPLIER	Existing Materials	RETAINED 4.75mm SCREEN	N/A %
SOURCE	BH 25-11 & 12 Kennedy/Edmonton		



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1555	1341	16.0
2	1652	1374	20.2
3	1748	1407	24.2
4	1785	1392	28.2

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

COMMENTS  
 Stantec Sample No. 5452.

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

TO KGS Group Inc.  
 3rd Floor - 865 Waverley St.  
 Winnipeg, MB  
 R3T 5P4

PROJECT 2025 Local Street Program - 25-R-02  
 City of Winnipeg

PROJECT NO. 123317565

ATTN David Anderson

REPORT NO. 5

DATE SAMPLED: Not Provided  
 SAMPLED BY: KGS Group Inc.

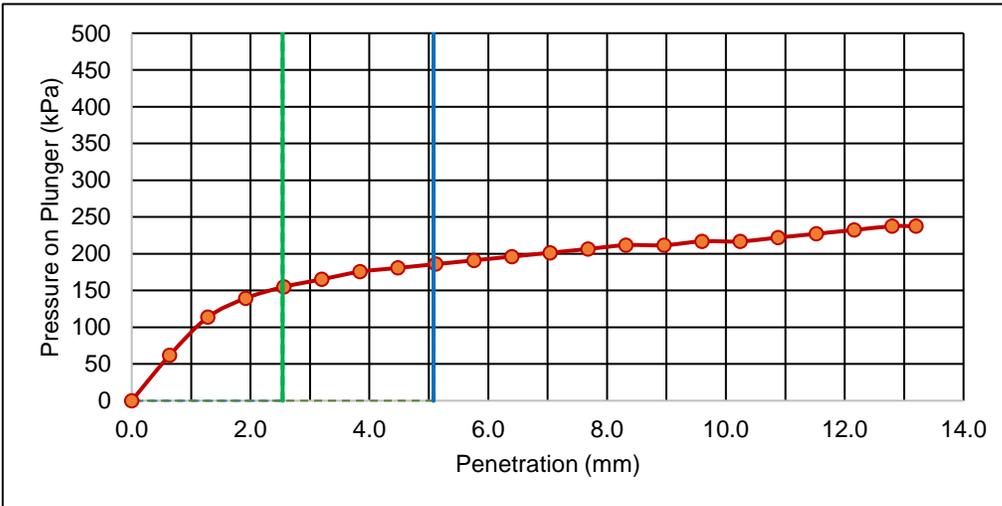
DATE RECEIVED: 2025.Mar.12  
 SUBMITTED BY: KGS Group Inc.

DATE TESTED: 2025.Mar.31  
 TESTED BY: Donald Eliazar

**MATERIAL IDENTIFICATION**

MATERIAL USE	Subgrade	SUPPLIER	Existing Material
MAX. NOMINAL SIZE	< 4.75 mm	SOURCE	Huntleigh Street
MATERIAL TYPE	Clay	SAMPLE LOCATION	TH25-13/14/15, 1'-3'
SPECIFICATION ID	Not Applicable	STANTEC SAMPLE NO.	5455

IMMERSION PERIOD	96 ± 2 hr	TARGET MAX. DRY DENSITY	1520 kg/m <sup>3</sup>
CONDITION OF SAMPLE	Soaked	TARGET OPTIMUM MOISTURE	21.5 %
SURCHARGE MASS	4.54 kg		
+19 mm OVERSIZE	0 %	AS-COMPACTED DRY DENSITY	1443 kg/m <sup>3</sup>
SWELL OF SAMPLE	5.74 %	AS-COMPACTED MOISTURE	21.6 %
POST-TEST MOISTURE	39.6 %	AS-COMPACTED % COMPACTION	95 %



**CBR VALUE AT 2.54 mm  
PENETRATION**  
2.2

**CBR VALUE AT 5.08 mm  
PENETRATION**  
1.9

**COMMENTS**

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

REPORT DATE 2025.Apr.07

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

# PROCTOR TEST REPORT

TO KGS Group Inc.  
 3rd Floor - 865 Waverley St.  
 Winnipeg, MB  
 R3T 5P4

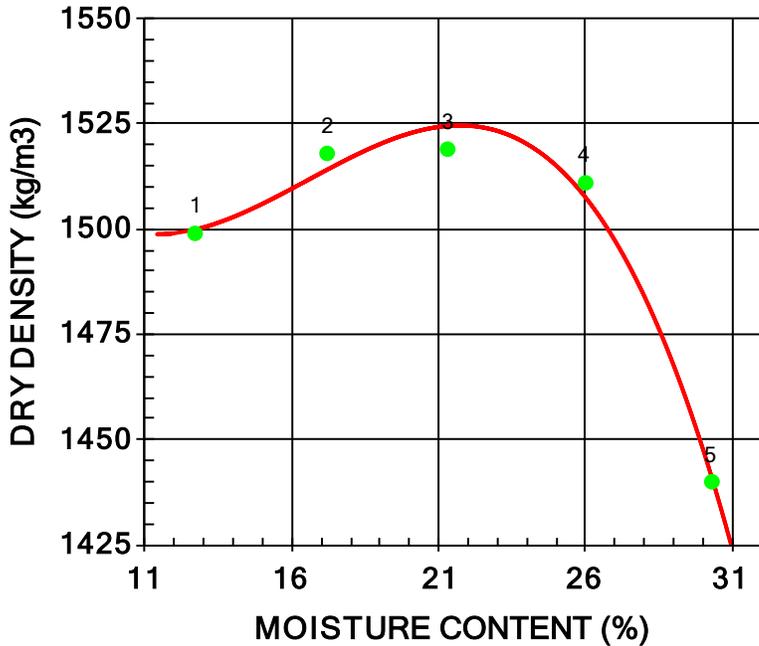
CLIENT KGS Group Inc.  
 C.C. KGS Group Inc.

ATTN: Raina Alcantara

PROJECT 2025 Local Street Program - 25-R-02  
 City of Winnipeg

PROJECT NO. 123317565  
 PROCTOR NO. 5 DATE SAMPLED 2025.Mar.12 DATE RECEIVED 2025.Mar.12 DATE TESTED 2025.Mar.27

INSITU MOISTURE	29.1 %	COMPACTION STANDARD	Standard Proctor, ASTM
TESTED BY	Donald Eliazar		D698
MATERIAL IDENTIFICATION		COMPACTION PROCEDURE	A: 101.6mm Mold, Passing 4.75mm
MAJOR COMPONENT	Subgrade	RAMMER TYPE	Manual
SIZE	Clay	PREPARATION	Moist
DESCRIPTION		OVERSIZE CORRECTION METHOD	None
SUPPLIER	Existing Materials	RETAINED 4.75mm SCREEN	N/A %
SOURCE	TH 25-13,14&15 Huntleigh St		



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1689	1499	12.7
2	1779	1518	17.2
3	1843	1519	21.3
4	1904	1511	26.0
5	1876	1440	30.3

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1520	21.5
OVERSIZE CORRECTED		

COMMENTS  
 Stantec Sample No. 5455.

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