

APPENDIX 'G'

GEOTECHNICAL REPORT



wood.

Geotechnical Investigation

City of Winnipeg Local Street Investigation

Winnipeg, Manitoba

WX18716

26 February 2019



Environment & Infrastructure Solutions
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Geotechnical Investigation
City of Winnipeg Local Street Investigation
Wood Project Number - WX18716

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|-------------------------------------|---|--|------------------|
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| Rev. | Date | Revision Notes | |
| 0 | 26 Feb. 2019 | Issued Final to Client | |
| Permit Stamp | | Engineer Seal | |
| | | | |



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1.0 Introduction

At the authorization of Mr. Brad Cook, P. Eng., of Dillon Consulting Limited (Dillon), Wood Environment & Infrastructure Solutions, a division of Wood Canada Limited (Wood), completed a pavement coring and test hole drilling program related to the pavement evaluation and potential asphalt reconstruction and rehabilitation for nine (9) street locations in the City of Winnipeg, Manitoba. Locations and scope are itemized in Table 1-1.

Table 1-1: Street Location and Investigation Scope

| Street Name | Locations | Number of Cores | Number of Test Holes | Test Hole Numbers |
|--------------------|---|-----------------|----------------------|--------------------|
| Lyndale Drive | 400 m asphalt reconstruction from Main Street Bridge to Walmer Street | 8 | 8 | TH01 to TH08 |
| Pulberry Street | 330 m asphalt reconstruction from Parkville Drive to St. Michael Road | 7 | 7 | TH09 to TH15 |
| Flynn Street | 145 m asphalt reconstruction from Barrington Avenue to Moore Avenue | 3 | 3 | TH16 to TH18 |
| Speers Road | 800 m rehabilitation from Elizabeth Road to Winakwa Road | 8 | - | TH-S01 to TH-S08 |
| Traverse Avenue | 750 m rehabilitation from Dollard Boulevard to Marion Street | 8 | - | TH-TA01 to TH-TA08 |
| Hamel Avenue | 500 m rehabilitation from Des Meurons Street to Aulneau Street | 5 | - | TH-H01 to TH-H05 |
| Des Meurons Street | 275 m rehabilitation from Carriere Avenue to Morier Avenue | 6 | - | TH-D01 to TH-D06 |
| Hazelwood Avenue | 330 m rehabilitation from Dakota Street to Dells Crescent | 7 | - | TH-HW01 to TH-HW07 |
| Traynor Bay | 240 m rehabilitation from St Michael Road to St. Michael Road | 5 | - | TH-TB01 to TH-TB05 |
| | Total | 57 | 18 | |

The geotechnical investigation was completed in accordance with the Scope of Work and Terms and Conditions outlined in Wood Proposal No. WPG2018.683 dated 19 December 2018.

2.0 Geotechnical Investigation

Prior to initiating drilling, Wood notified public utility providers (i.e. Manitoba Hydro, MTS, Shaw, etc.) of the intent to drill in order to clear public utilities, and where required, met with said representatives on-site.

On 28th and 31st of January 2019, Wood supervised the drilling and coring of a total of eighteen test holes (TH01 through TH18) on Lyndale Drive, Pulberry Street, and Flynn Street. The test hole locations are illustrated in Figure 1. All locations were cored using a 150 mm diameter core barrel, while test hole



drilling was conducted using a truck mounted Mobile B40LX drill rig equipped with 125 mm solid stem augers, owned and operated by Maple Leaf Drilling of Springfield, Manitoba.

During coring, Wood field personnel identified pavement types and thicknesses, as well as underlying granular structure, while during drilling, Wood field personnel visually classified the soil stratigraphy within the test holes in accordance with the Modified Unified Soil Classification System (MUSCS); as well as noted observed seepage and/or sloughing conditions. Soil sampling consisted of grab samples of the auger cuttings at all test hole locations. All grab samples were retained in sealed plastic bags and shipped to Wood's Winnipeg laboratory for review and selected testing. All pavement core samples were shipped to Winnipeg laboratory to be measured and photographed; core thickness measurements were based on the average of three measurements for each core. The measured core data and underlying pavement structure information are provided in the Appendix C summary tables, while the core photo log can be found in Appendix D.

Following completion of the field drilling program, a laboratory testing program was conducted on all soil samples obtained from the test holes. The laboratory testing program consisted of moisture content determinations, Atterberg limits, and particle size distributions (hydrometer method). A summary of the Atterberg limit and particle size distribution are presented in Appendix B. Detailed test hole logs summarizing the sampling, field testing, laboratory test results, and subsurface conditions encountered at the test hole locations are presented in Appendix A. Actual depths noted on the test hole logs may vary by ± 0.3 m from those recorded due to the method by which the soil cuttings are returned to the surface. Summaries of the terms and symbols used on the test hole logs and of the Modified Unified Soil Classification System are also presented in Appendix A.

3.0 Pavement Investigation

Between the dates of 23 January 2019 and 01 February 2019, Wood cored a total of thirty-nine test holes on Speers Road, Traverse Avenue, Hamel Avenue, Des Meurons Street, Hazelwood Avenue and Traynor Bay. The coring locations are illustrated in Figures 2 and 3. All test holes were cored by Wood using a 150 mm diameter core barrel. All pavement core samples were shipped to Winnipeg laboratory and where measured and photographed; core thickness measurements were based on the average of three measurements for each core. During coring Wood identified the pavement structure materials directly below the concrete/asphalt. The measured core data, underlying pavement structure information, and a tabular summary of the testing results are provided in the Appendix C summary tables, while the core photo log can be found in Appendix D.

4.0 Closure

The findings of this report were based on the results of field and laboratory investigations at test hole locations determined based on the City of Winnipeg requirements.

The site investigation was conducted for the sole purpose of profiling the pavement and subsurface conditions. Although no environmental issues were identified during the fieldwork, this does not indicate that no such issues exist. If the owner or other parties have any concern regarding the presence of environmental issues, then an appropriate level environmental assessment should be conducted.

Soil conditions, by their nature, can be highly variable across a site. The placement of fill and prior construction activities on a site can contribute to the variability especially near surface soil conditions. A contingency should always be included in any construction budget to allow for the possibility of variation



in soil conditions, which may result in modification of any potential design and construction procedures which may arise from this factual investigative report.

Respectfully submitted,

**Wood Environment & Infrastructure Solutions,
a Division of Wood Canada Limited**

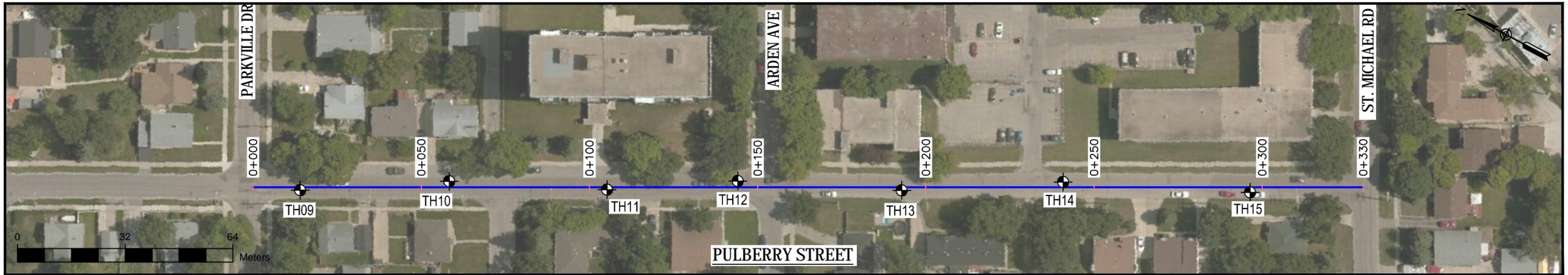
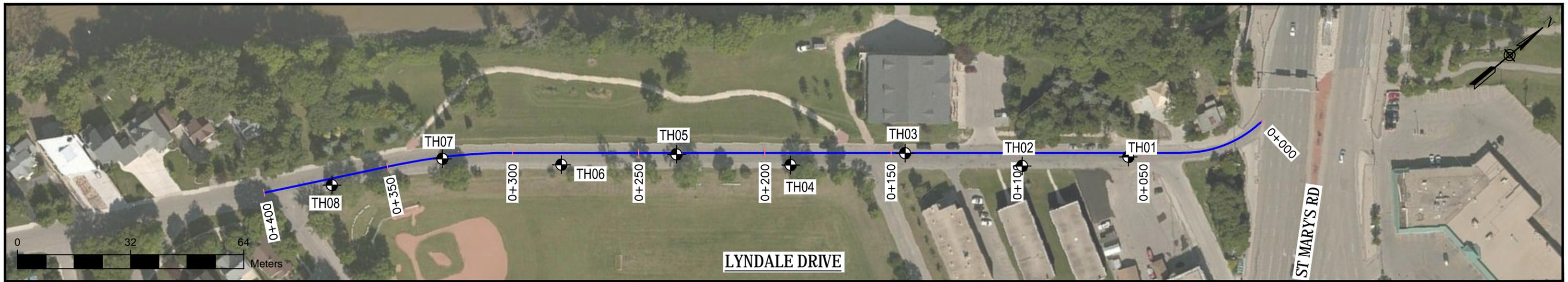


Figures



Figure 1: Test Hole and Coring Location Plan (Lyndale Drive, Pulberry Street, and Flynn Street)





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NOTES: SITE FEATURES AND LOCATIONS ARE APPROXIMATE ONLY. IMAGES FROM GOOGLE EARTH PRO AND TOPO MAPS.

LEGEND:
CORING LOCATIONS



| REVISION | BY | DATE |
|----------|------|------|
| ---- | ---- | ---- |
| | | |
| | | |
| | | |
| | | |

CLIENT:




440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
PHONE: 204.488.2997 FAX: 204.489.8261

| | |
|-------------|---------------|
| DWN BY: | MD |
| CHK'D BY: | BW |
| DATUM: | NAD83 |
| PROJECTION: | UTM Zone 14 U |
| SCALE: | AS SHOWN |

CITY OF WINNIPEG STREET INVESTIGATION
19-R-5 LOCAL STREET PACKAGE
WINNIPEG, MANITOBA

TEST HOLE AND CORING LOCATION PLAN
(LYNDALE DRIVE, PULBERRY STREET, AND FLYNN STREET)

| | |
|--------------|---------------|
| DATE: | FEBRUARY 2019 |
| PROJECT NO.: | WX18716 |
| REV. NO.: | A |
| FIGURE NO.: | FIGURE 1 |

Figure 2: Coring Location Plan (Speers Road, Traverse Avenue, and Hamel Avenue)





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LEGEND:
CORING LOCATIONS



| REVISION | BY | DATE |
|----------|------|------|
| ---- | ---- | ---- |
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| | | |
| | | |
| | | |

CLIENT:




440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
PHONE: 204.488.2997 FAX: 204.489.8261

| | |
|-------------|---------------|
| DWN BY: | MD |
| CHK'D BY: | BW |
| DATUM: | NAD83 |
| PROJECTION: | UTM Zone 14 U |
| SCALE: | AS SHOWN |

CITY OF WINNIPEG STREET INVESTIGATION
19-R-5 LOCAL STREET PACKAGE
WINNIPEG, MANITOBA

CORING LOCATION PLAN
(SPEERS ROAD, TRAVERSE AVENUE, AND HAMEL AVENUE)

| | |
|--------------|---------------|
| DATE: | FEBRUARY 2019 |
| PROJECT NO.: | WX18716 |
| REV. NO.: | A |
| FIGURE NO.: | FIGURE 2 |

Figure 3: Coring Location Plan (Des Meurons Street, Hazelwood Avenue, and Traynor Avenue)





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NOTES: SITE FEATURES AND LOCATIONS ARE APPROXIMATE ONLY. IMAGES FROM GOOGLE EARTH PRO AND TOPO MAPS.

LEGEND:
CORING LOCATIONS



| REVISION | BY | DATE |
|----------|------|------|
| ---- | ---- | ---- |
| | | |
| | | |
| | | |
| | | |

CLIENT:



440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
PHONE: 204.488.2997 FAX:204.489.8261

DWN BY: MD
CHK'D BY: BW
DATUM: NAD83
PROJECTION: UTM Zone 14 U
SCALE: AS SHOWN

CITY OF WINNIPEG STREET INVESTIGATION
19-R-5 LOCAL STREET PACKAGE
WINNIPEG, MANITOBA

CORING LOCATION PLAN
(DES MEURONS ST, HAZELWOOD AVE, AND TRAYNOR AVE)

DATE: FEBRUARY 2019
PROJECT NO: WX18716
REV. NO.: A
FIGURE NO: FIGURE 3

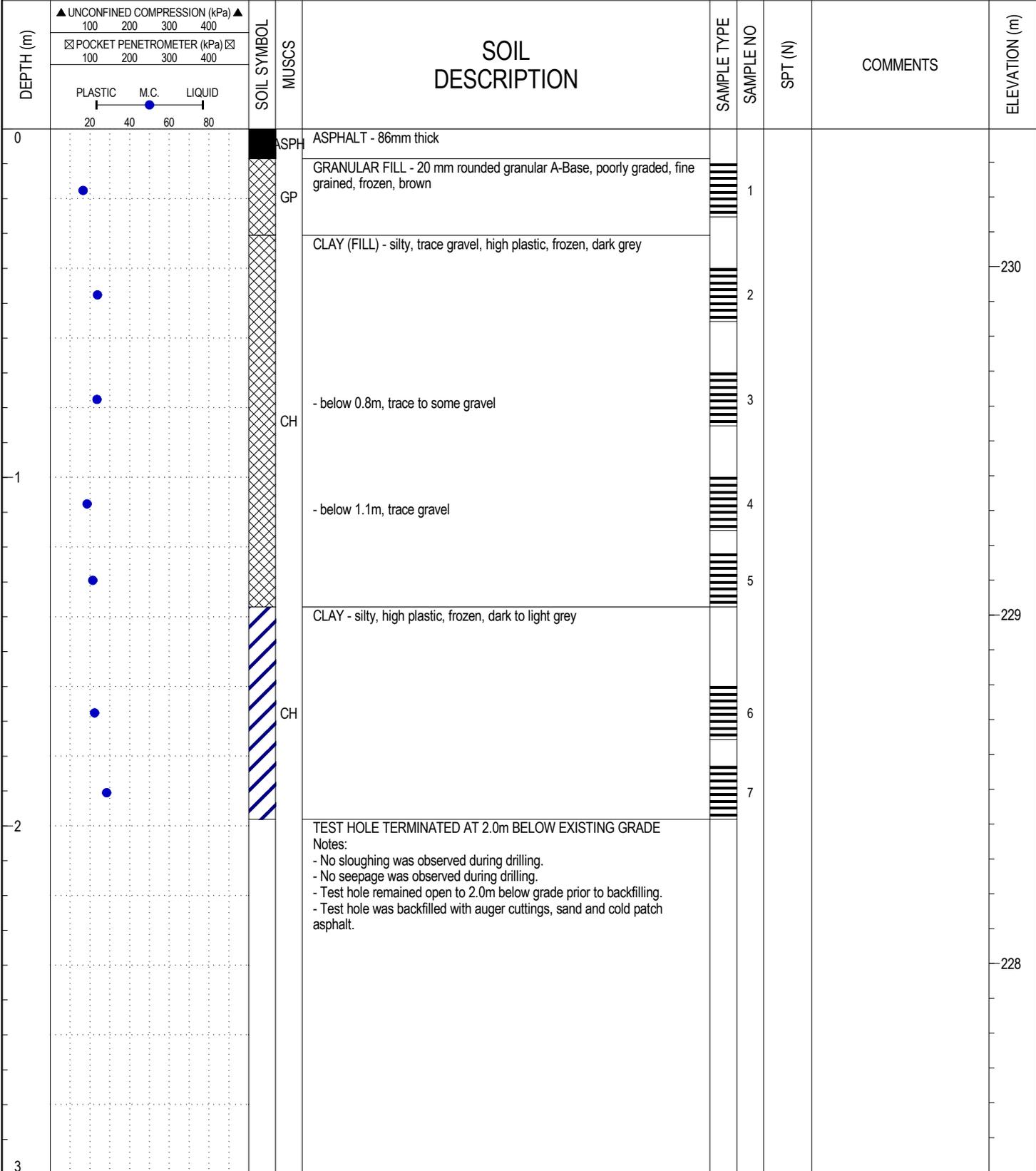
Appendix A

Test Hole Logs



| | | |
|--|---------------------------------------|------------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH01 (LYNDALE) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5527117.2 E634374.4 | DRILL METHOD: 125mm SSA | ELEVATION: 230.4 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
| SAMPLE TYPE | <input checked="" type="checkbox"/> Shelby Tube | <input type="checkbox"/> No Recovery | <input checked="" type="checkbox"/> SPT (N) | <input checked="" type="checkbox"/> Grab Sample | <input type="checkbox"/> Split-Pen | <input type="checkbox"/> Core |
| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



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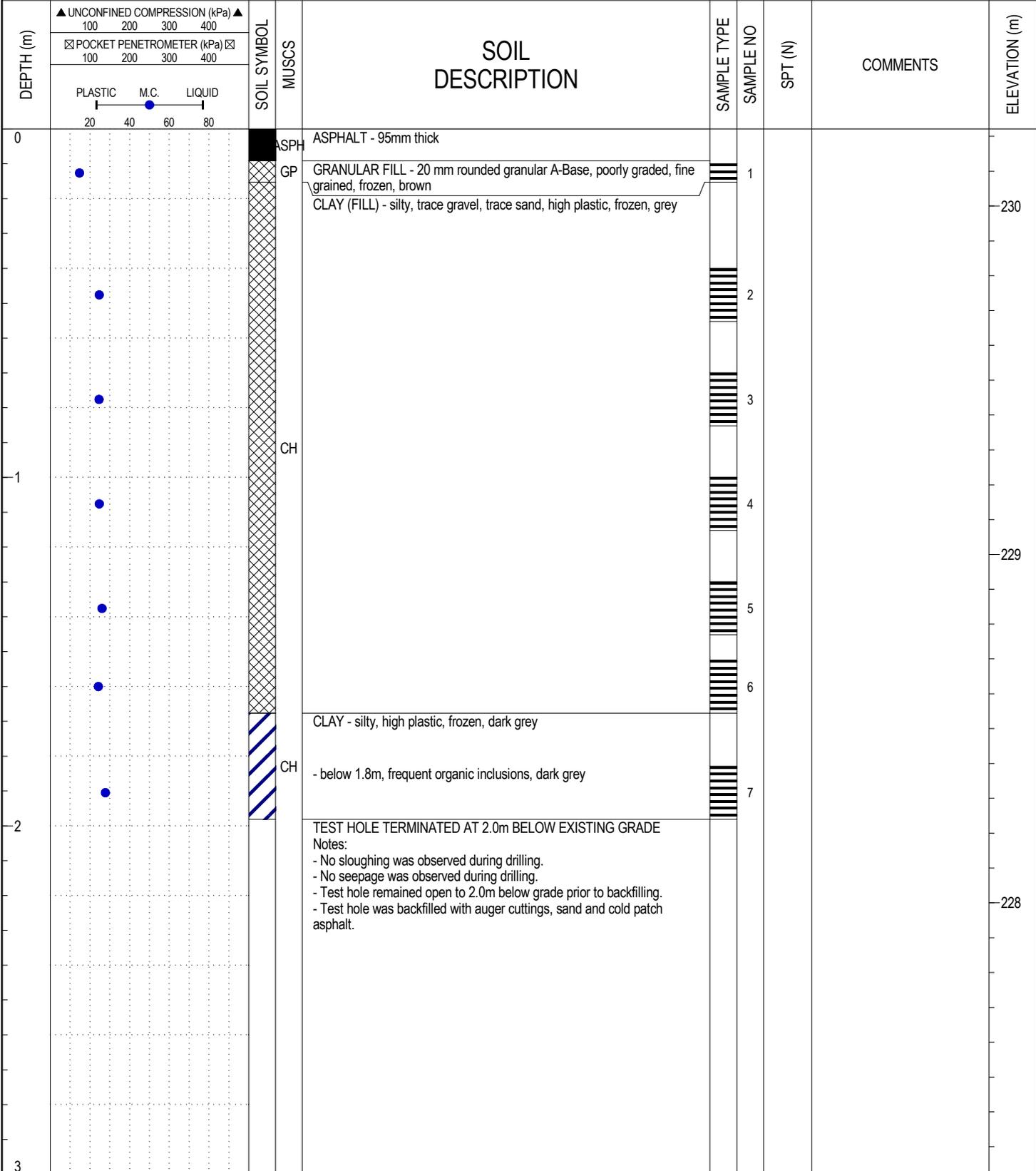


Wood Environment & Infrastructure Solutions
a division of Wood Canada Limited

| | |
|-----------------|----------------------------------|
| LOGGED BY: CM | COMPLETION DEPTH: 2 m |
| REVIEWED BY: BW | COMPLETION DATE: 28 January 2019 |
| Figure No. A1 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|------------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH02 (LYNDALE) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5527082 E634351 | DRILL METHOD: 125mm SSA | ELEVATION: 230.22 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
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| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



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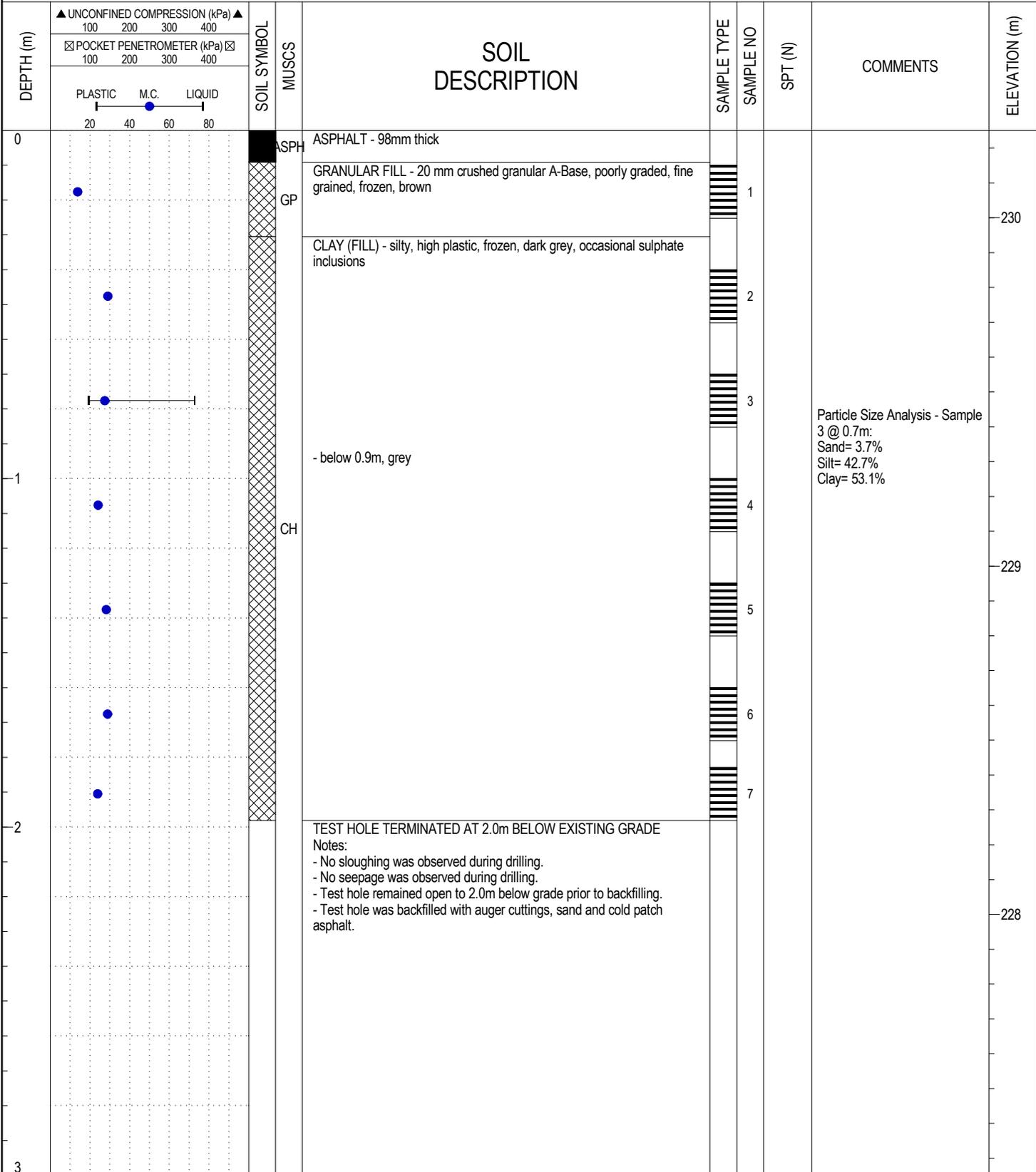


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| REVIEWED BY: BW | COMPLETION DATE: 28 January 2019 |
| Figure No. A2 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|------------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH03 (LYNDALE) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5527048.8 E634318.3 | DRILL METHOD: 125mm SSA | ELEVATION: 230.25 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
| SAMPLE TYPE | <input checked="" type="checkbox"/> Shelby Tube | <input type="checkbox"/> No Recovery | <input checked="" type="checkbox"/> SPT (N) | <input checked="" type="checkbox"/> Grab Sample | <input type="checkbox"/> Split-Pen | <input type="checkbox"/> Core |
| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



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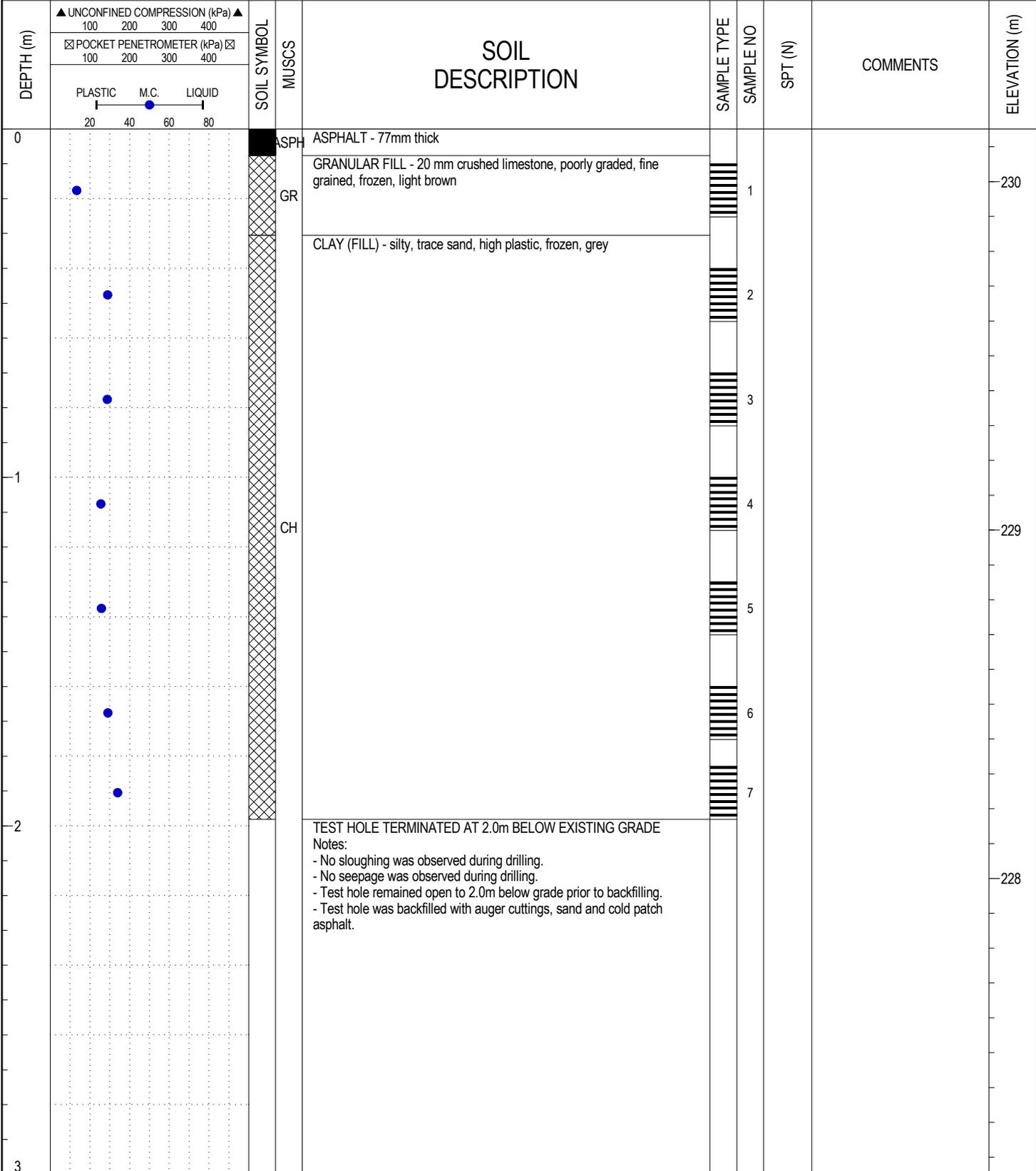


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| LOGGED BY: CM | COMPLETION DEPTH: 2 m |
| REVIEWED BY: BW | COMPLETION DATE: 28 January 2019 |
| Figure No. A3 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|------------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH04 (LYNDALE) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5527010.3 E634293.8 | DRILL METHOD: 125mm SSA | ELEVATION: 230.15 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
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| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



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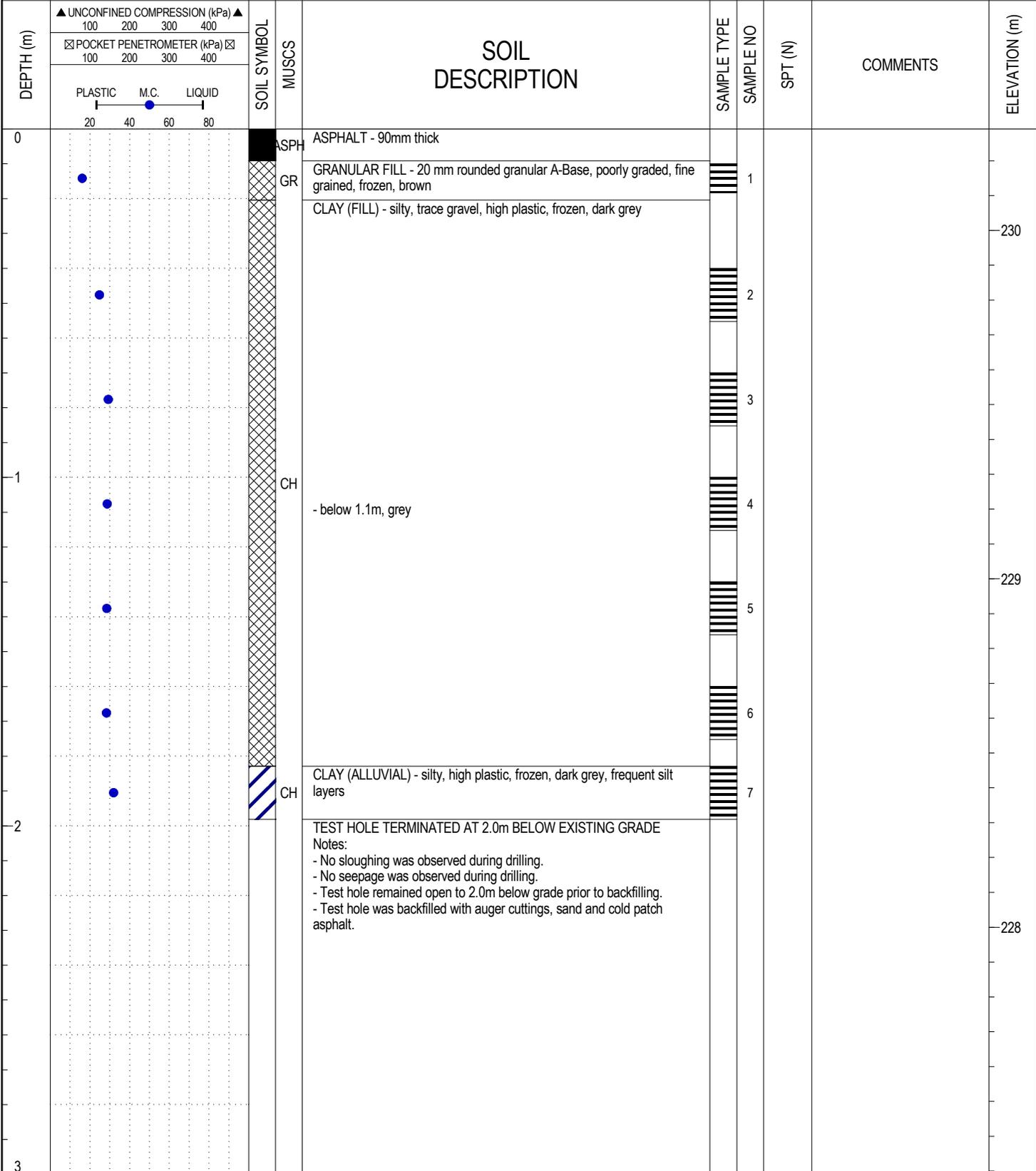


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| REVIEWED BY: BW | COMPLETION DATE: 28 January 2019 |
| Figure No. A4 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|------------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH05 (LYNDALE) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5526977.5 E634262.3 | DRILL METHOD: 125mm SSA | ELEVATION: 230.29 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
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| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



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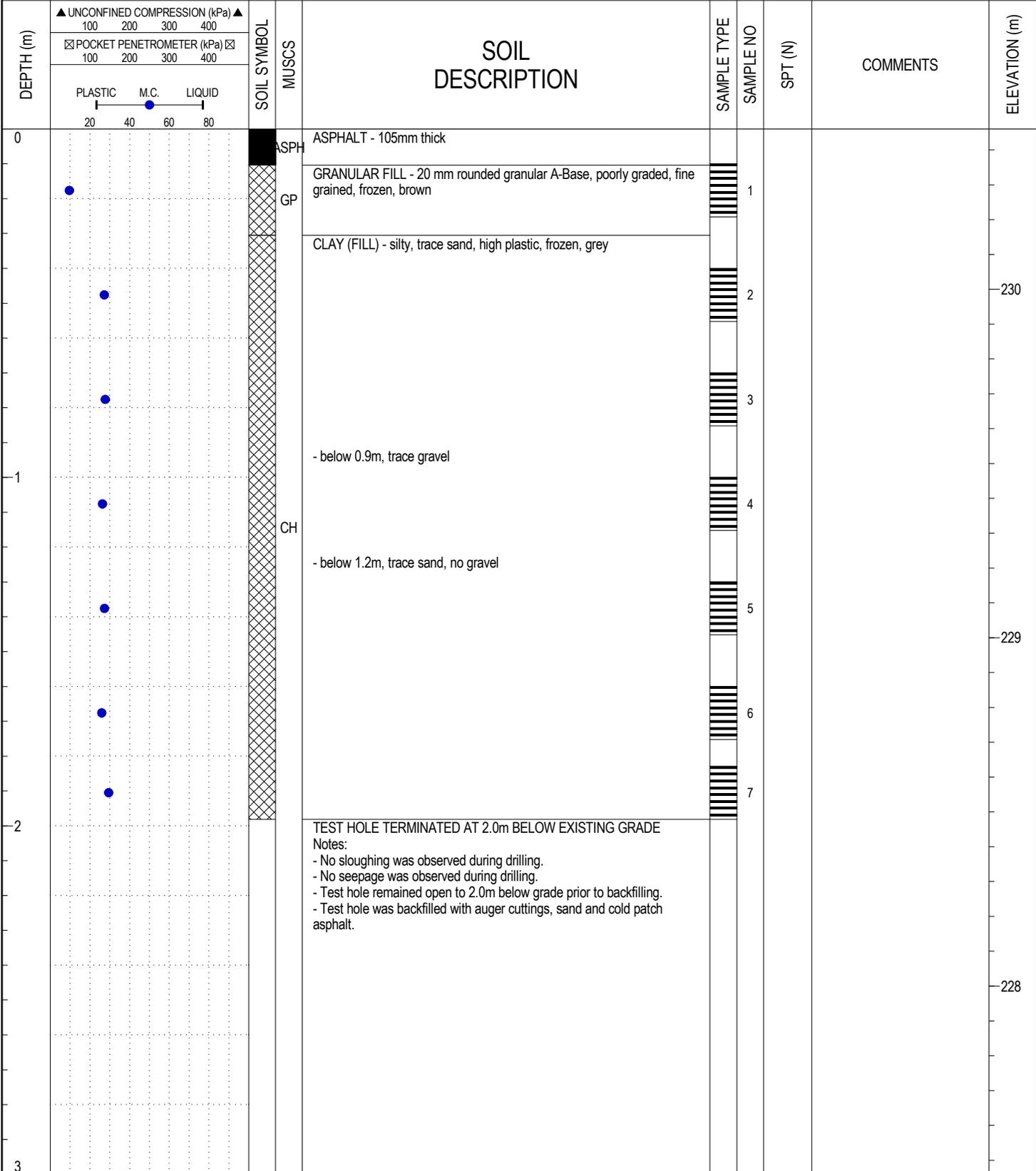


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| REVIEWED BY: BW | COMPLETION DATE: 28 January 2019 |
| Figure No. A5 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|------------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH06 (LYNDALE) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5526939.2 E634237.2 | DRILL METHOD: 125mm SSA | ELEVATION: 230.46 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
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| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



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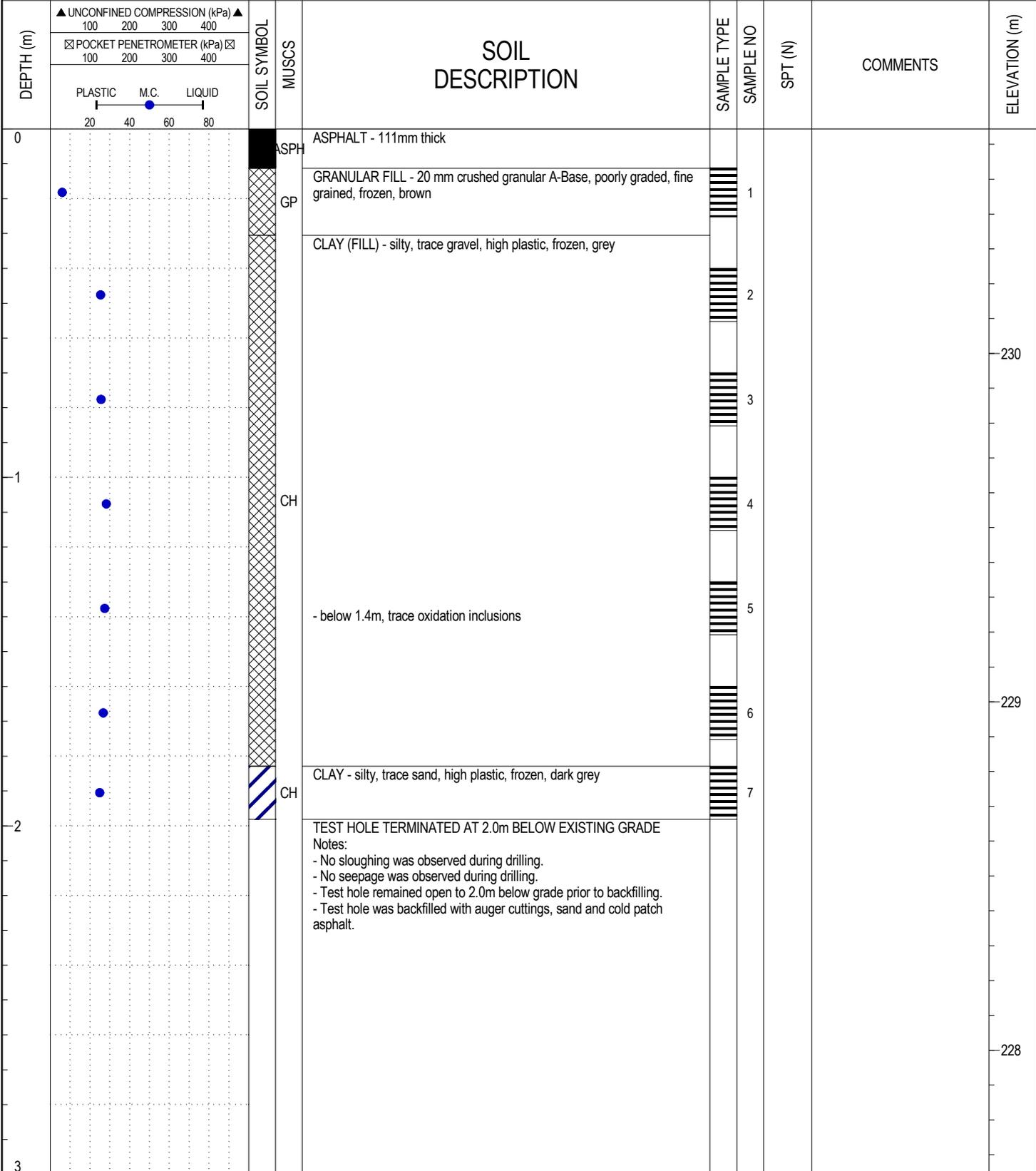


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| REVIEWED BY: BW | COMPLETION DATE: 28 January 2019 |
| Figure No. A6 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|------------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH07 (LYNDALE) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5526903.7 E634206 | DRILL METHOD: 125mm SSA | ELEVATION: 230.64 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
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| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



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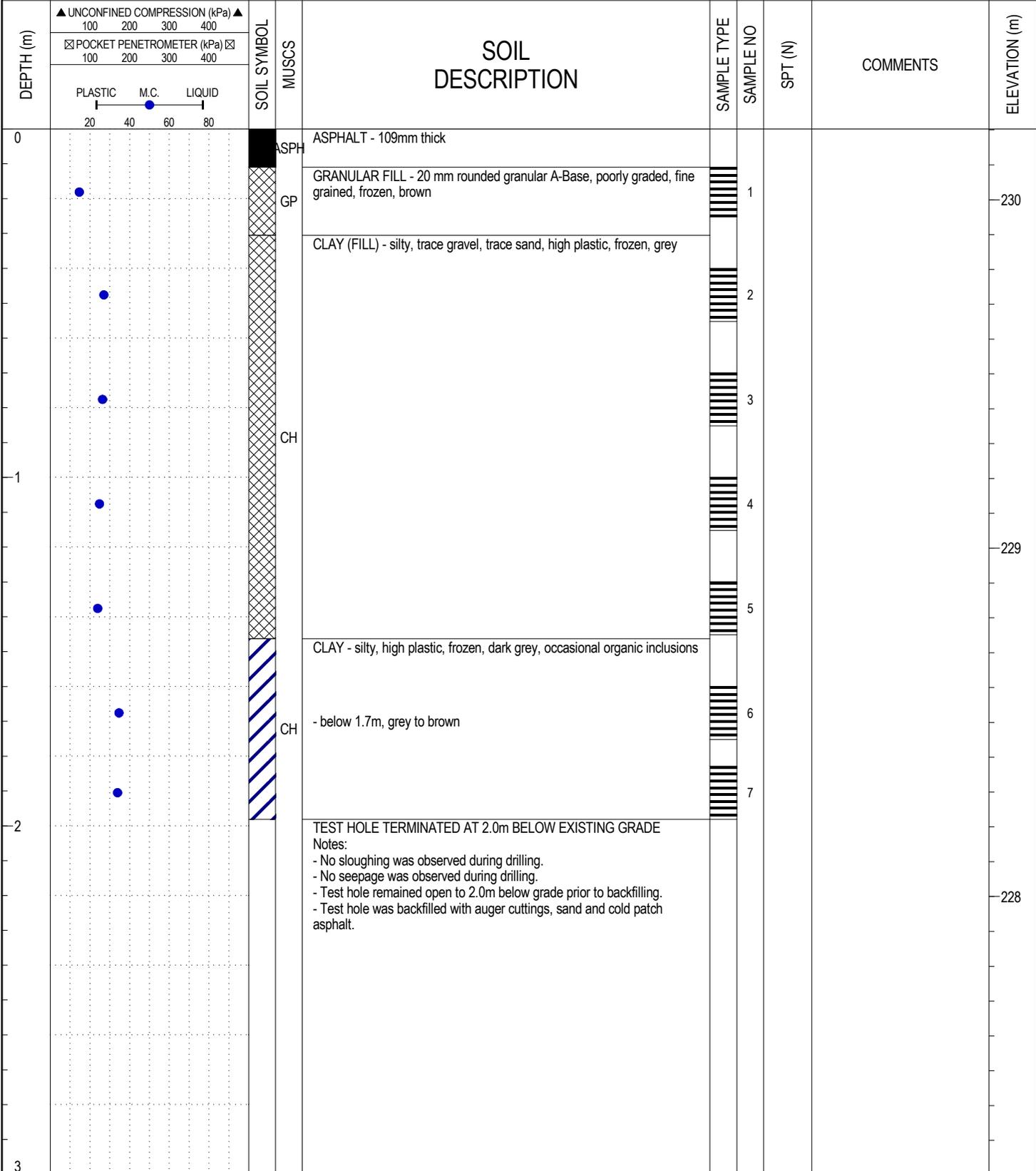


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| REVIEWED BY: BW | COMPLETION DATE: 28 January 2019 |
| Figure No. A7 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|------------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH08 (LYNDALE) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5526862.9 E634187 | DRILL METHOD: 125mm SSA | ELEVATION: 230.2 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
| SAMPLE TYPE | <input checked="" type="checkbox"/> Shelby Tube | <input type="checkbox"/> No Recovery | <input checked="" type="checkbox"/> SPT (N) | <input checked="" type="checkbox"/> Grab Sample | <input type="checkbox"/> Split-Pen | <input type="checkbox"/> Core |
| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



WX18716 DILLON CONSTRUCTION - CITY OF WINNIPEG STREET INVESTIGATION - LOCAL STREETS.GPJ 19/02/19 08:26 AM (WPG - GEOTECH LOG 1)

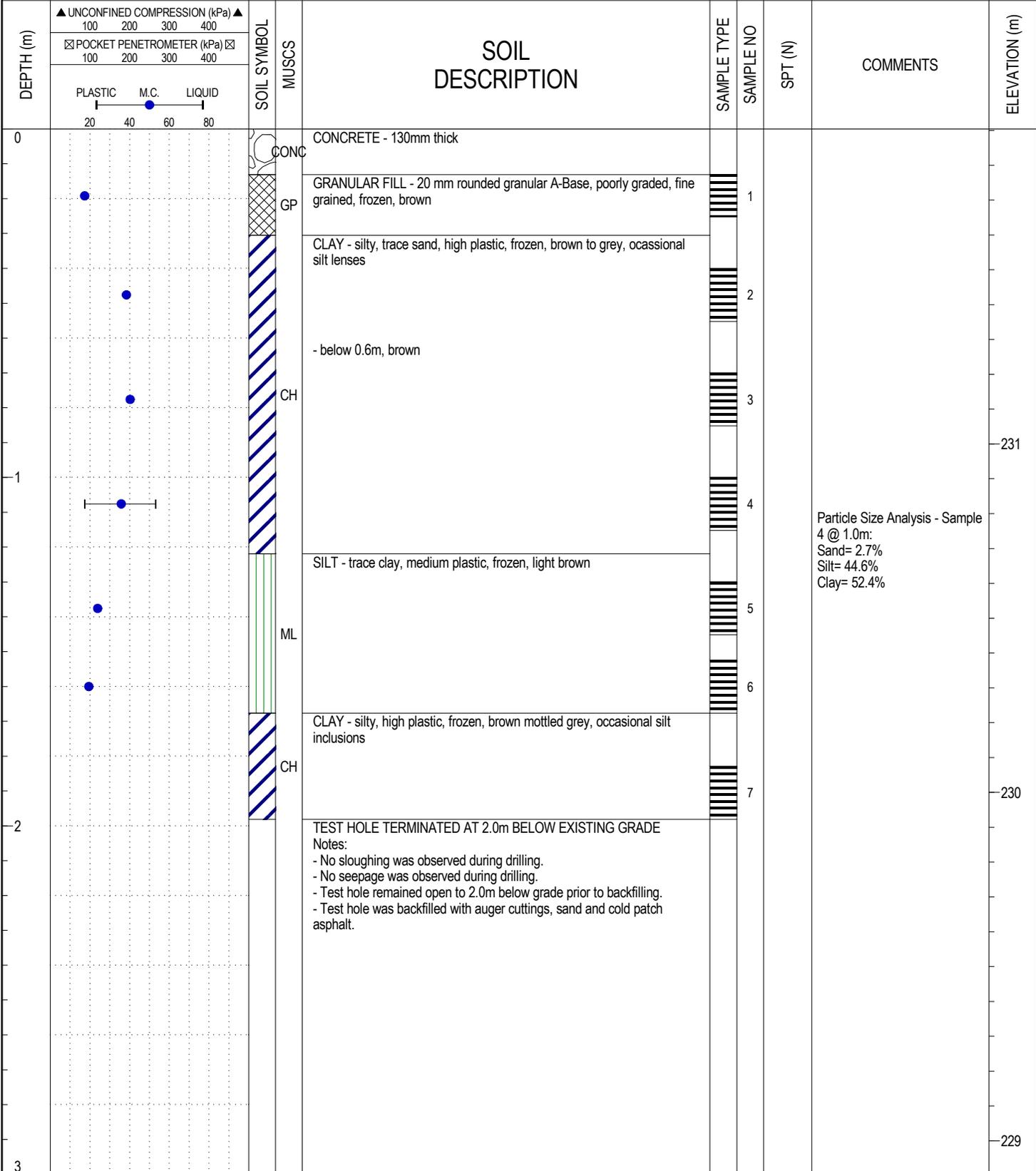


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| LOGGED BY: CM | COMPLETION DEPTH: 2 m |
| REVIEWED BY: BW | COMPLETION DATE: 28 January 2019 |
| Figure No. A8 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|-------------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH09 (PULBERRY) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5521991.7 E635320.7 | DRILL METHOD: 125mm SSA | ELEVATION: 231.9 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
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| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



WX18716 DILLON CONSTRUCTION - CITY OF WINNIPEG STREET INVESTIGATION - LOCAL STREETS.GPJ 19/02/19 08:26 AM (WPG - GEOTECH LOG 1)

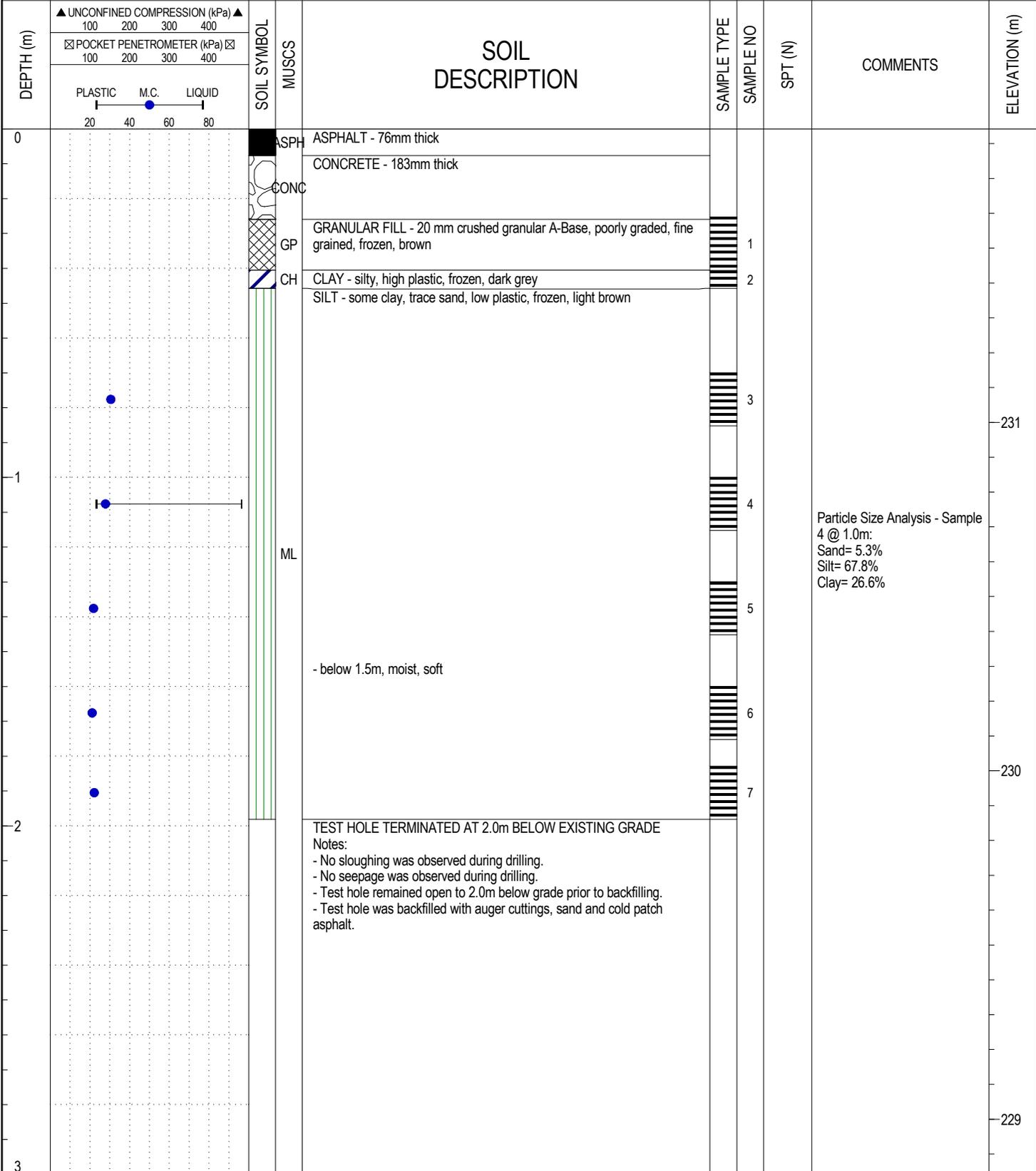


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| | |
|-----------------|----------------------------------|
| LOGGED BY: CM | COMPLETION DEPTH: 2 m |
| REVIEWED BY: BW | COMPLETION DATE: 31 January 2019 |
| Figure No. A9 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|-------------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH11 (PULBERRY) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5521879.8 E635387 | DRILL METHOD: 125mm SSA | ELEVATION: 231.84 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
| SAMPLE TYPE | <input checked="" type="checkbox"/> Shelby Tube | <input type="checkbox"/> No Recovery | <input checked="" type="checkbox"/> SPT (N) | <input checked="" type="checkbox"/> Grab Sample | <input type="checkbox"/> Split-Pen | <input type="checkbox"/> Core |
| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



WX18716 DILLON CONSTRUCTION - CITY OF WINNIPEG STREET INVESTIGATION - LOCAL STREETS.GPJ 19/02/19 08:26 AM (WPG - GEOTECH LOG 1)

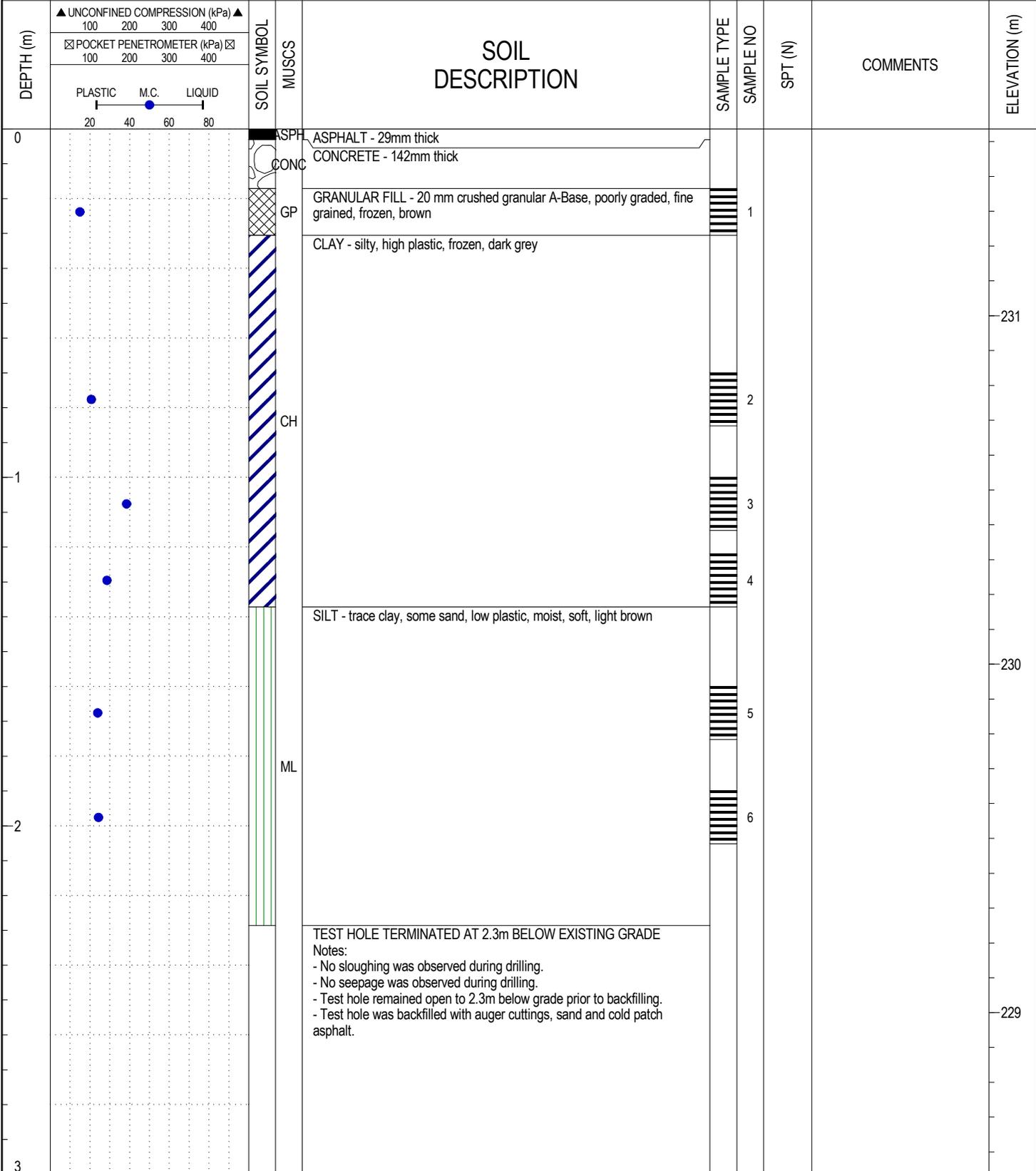


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|-----------------|----------------------------------|
| LOGGED BY: CM | COMPLETION DEPTH: 2 m |
| REVIEWED BY: BW | COMPLETION DATE: 31 January 2019 |
| Figure No. A11 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|-------------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH12 (PULBERRY) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5521795.4 E635434.3 | DRILL METHOD: 125mm SSA | ELEVATION: 231.54 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
| SAMPLE TYPE | <input checked="" type="checkbox"/> Shelby Tube | <input type="checkbox"/> No Recovery | <input checked="" type="checkbox"/> SPT (N) | <input checked="" type="checkbox"/> Grab Sample | <input type="checkbox"/> Split-Pen | <input type="checkbox"/> Core |
| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



WX18716 DILLON CONSTRUCTION - CITY OF WINNIPEG STREET INVESTIGATION - LOCAL STREETS.GPJ 19/02/19 08:26 AM (WPG - GEOTECH LOG 1)

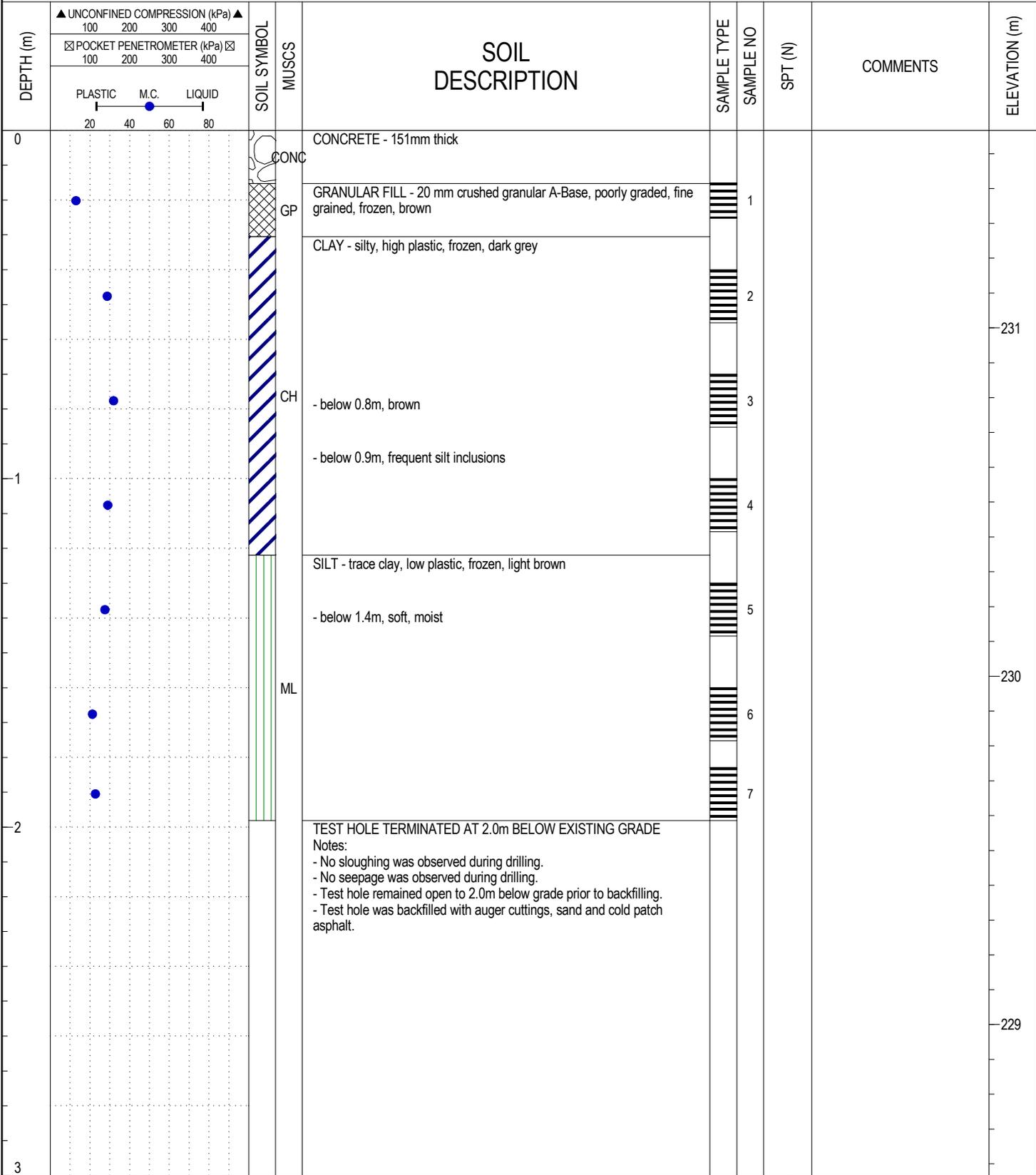


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| LOGGED BY: CM | COMPLETION DEPTH: 2.3 m |
| REVIEWED BY: BW | COMPLETION DATE: 31 January 2019 |
| Figure No. A12 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|-------------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH13 (PULBERRY) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5521835.9 E635408.6 | DRILL METHOD: 125mm SSA | ELEVATION: 231.57 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
| SAMPLE TYPE | <input checked="" type="checkbox"/> Shelby Tube | <input type="checkbox"/> No Recovery | <input checked="" type="checkbox"/> SPT (N) | <input checked="" type="checkbox"/> Grab Sample | <input type="checkbox"/> Split-Pen | <input type="checkbox"/> Core |
| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



WX18716 DILLON CONSTRUCTION - CITY OF WINNIPEG STREET INVESTIGATION - LOCAL STREETS.GPJ 19/02/19 08:26 AM (WPG - GEOTECH LOG 1)

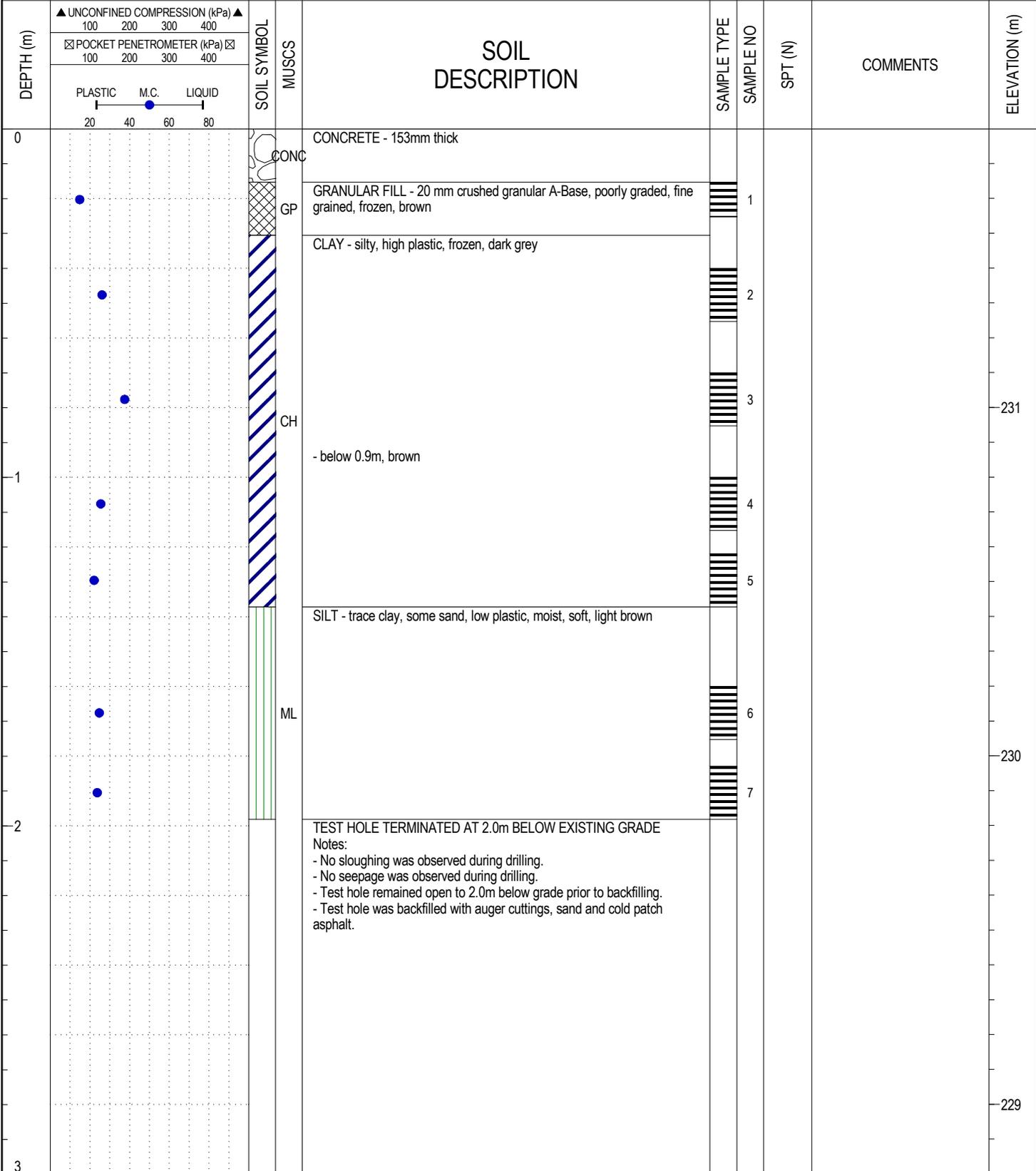


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|-----------------|----------------------------------|
| LOGGED BY: CM | COMPLETION DEPTH: 2 m |
| REVIEWED BY: BW | COMPLETION DATE: 31 January 2019 |
| Figure No. A13 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|------------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH14(PULBERRY) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5521912.4 E635365.7 | DRILL METHOD: 125mm SSA | ELEVATION: 231.8 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
| SAMPLE TYPE | <input checked="" type="checkbox"/> Shelby Tube | <input type="checkbox"/> No Recovery | <input checked="" type="checkbox"/> SPT (N) | <input checked="" type="checkbox"/> Grab Sample | <input type="checkbox"/> Split-Pen | <input type="checkbox"/> Core |
| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



WX18716 DILLON CONSTRUCTION - CITY OF WINNIPEG STREET INVESTIGATION - LOCAL STREETS.GPJ 19/02/19 08:26 AM (WPG - GEOTECH LOG 1)

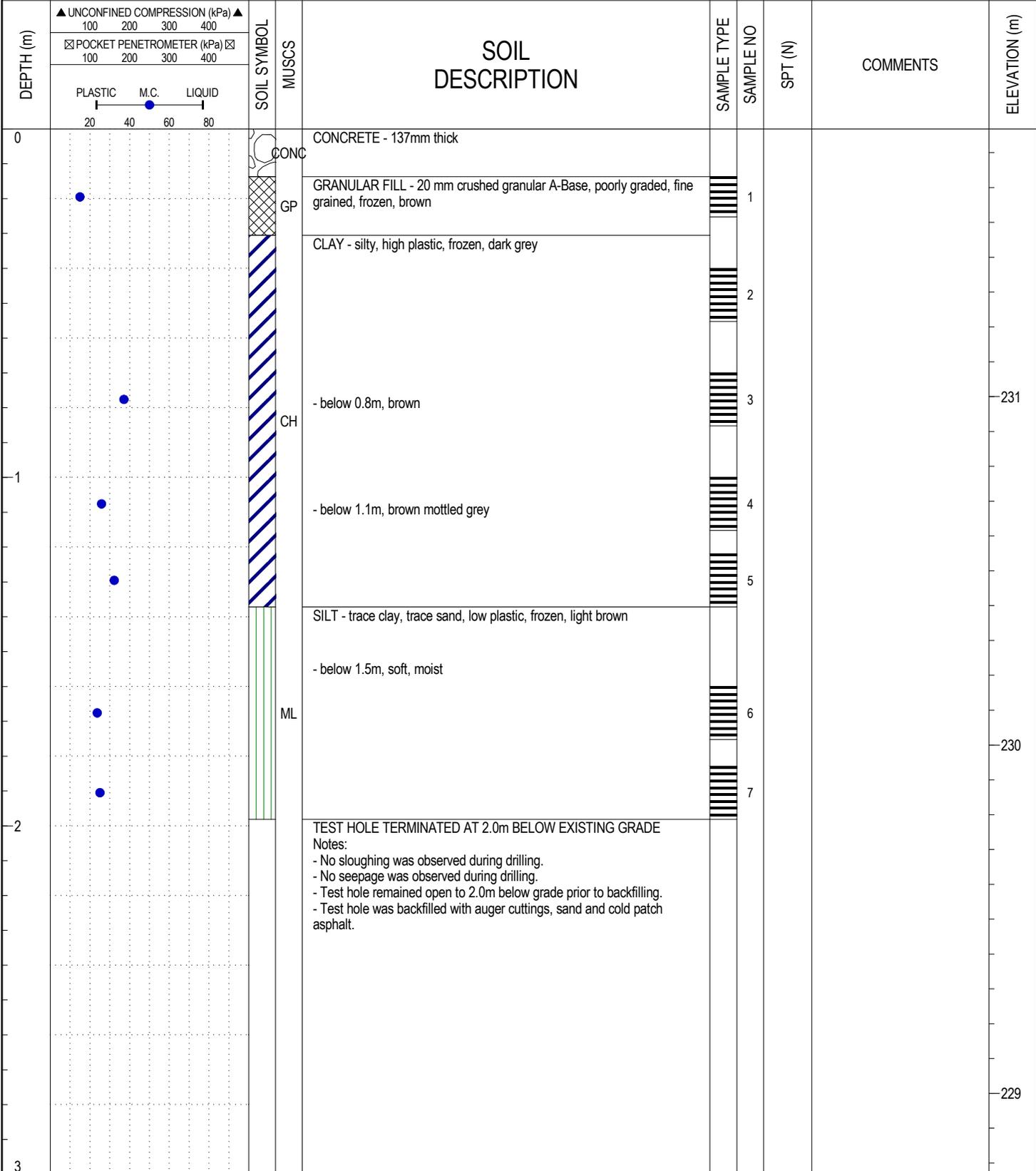


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|-----------------|----------------------------------|
| LOGGED BY: CM | COMPLETION DEPTH: 2 m |
| REVIEWED BY: BW | COMPLETION DATE: 31 January 2019 |
| Figure No. A14 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|-------------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH15 (PULBERRY) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5521745.5 E635459 | DRILL METHOD: 125mm SSA | ELEVATION: 231.77 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
| SAMPLE TYPE | <input checked="" type="checkbox"/> Shelby Tube | <input type="checkbox"/> No Recovery | <input checked="" type="checkbox"/> SPT (N) | <input checked="" type="checkbox"/> Grab Sample | <input type="checkbox"/> Split-Pen | <input type="checkbox"/> Core |
| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



WX18716 DILLON CONSTRUCTION - CITY OF WINNIPEG STREET INVESTIGATION - LOCAL STREETS.GPJ 19/02/19 08:26 AM (WPG - GEOTECH LOG 1)

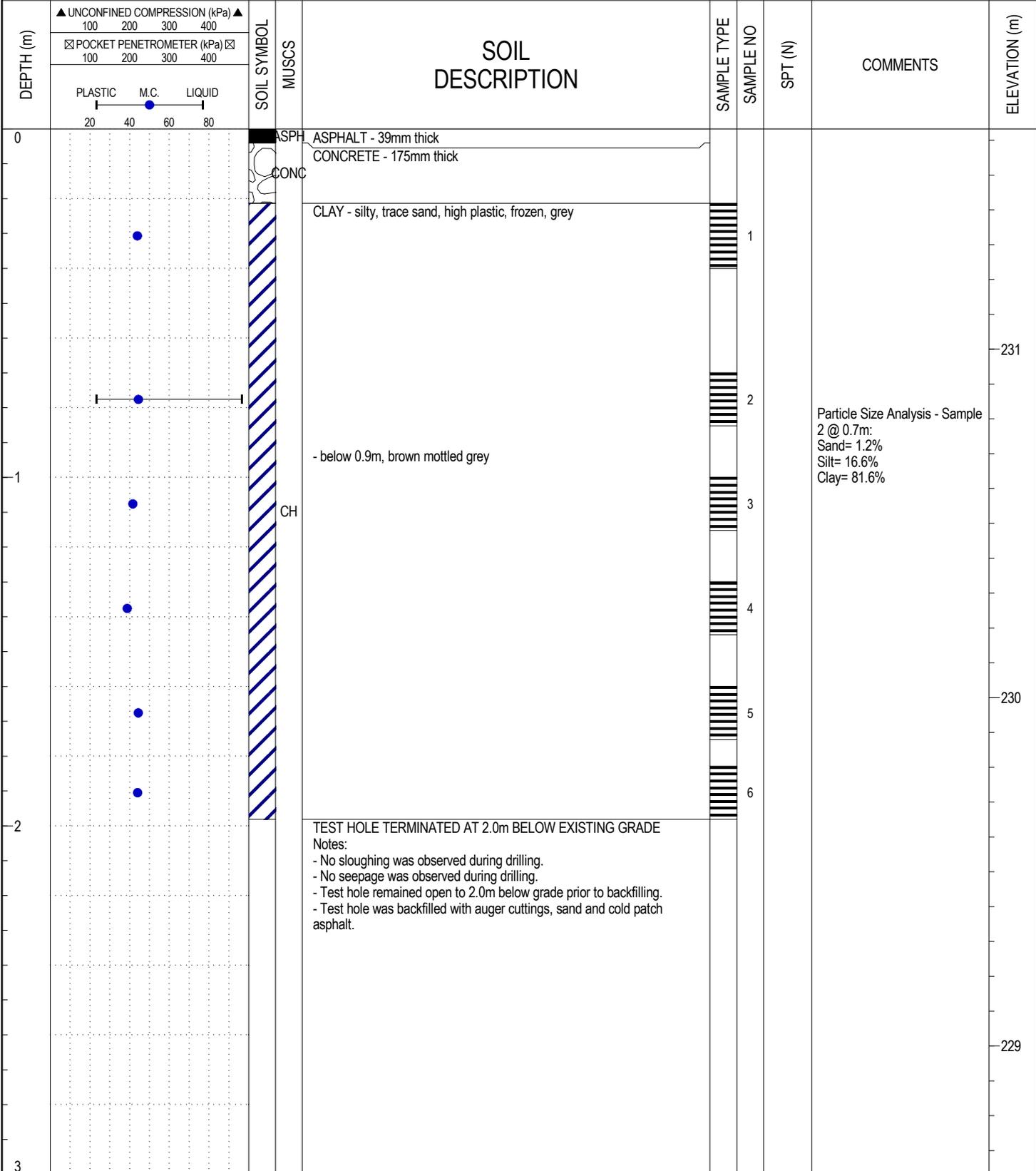


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| | |
|-----------------|----------------------------------|
| LOGGED BY: CM | COMPLETION DEPTH: 2 m |
| REVIEWED BY: BW | COMPLETION DATE: 31 January 2019 |
| Figure No. A15 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|----------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH16 (FLYNN) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5522231.8 E634852.5 | DRILL METHOD: 125mm SSA | ELEVATION: 231.63 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
| SAMPLE TYPE | <input checked="" type="checkbox"/> Shelby Tube | <input type="checkbox"/> No Recovery | <input checked="" type="checkbox"/> SPT (N) | <input checked="" type="checkbox"/> Grab Sample | <input type="checkbox"/> Split-Pen | <input type="checkbox"/> Core |
| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



WX18716 DILLON CONSTRUCTION - CITY OF WINNIPEG STREET INVESTIGATION - LOCAL STREETS.GPJ 19/02/19 08:26 AM (WPG - GEOTECH LOG 1)

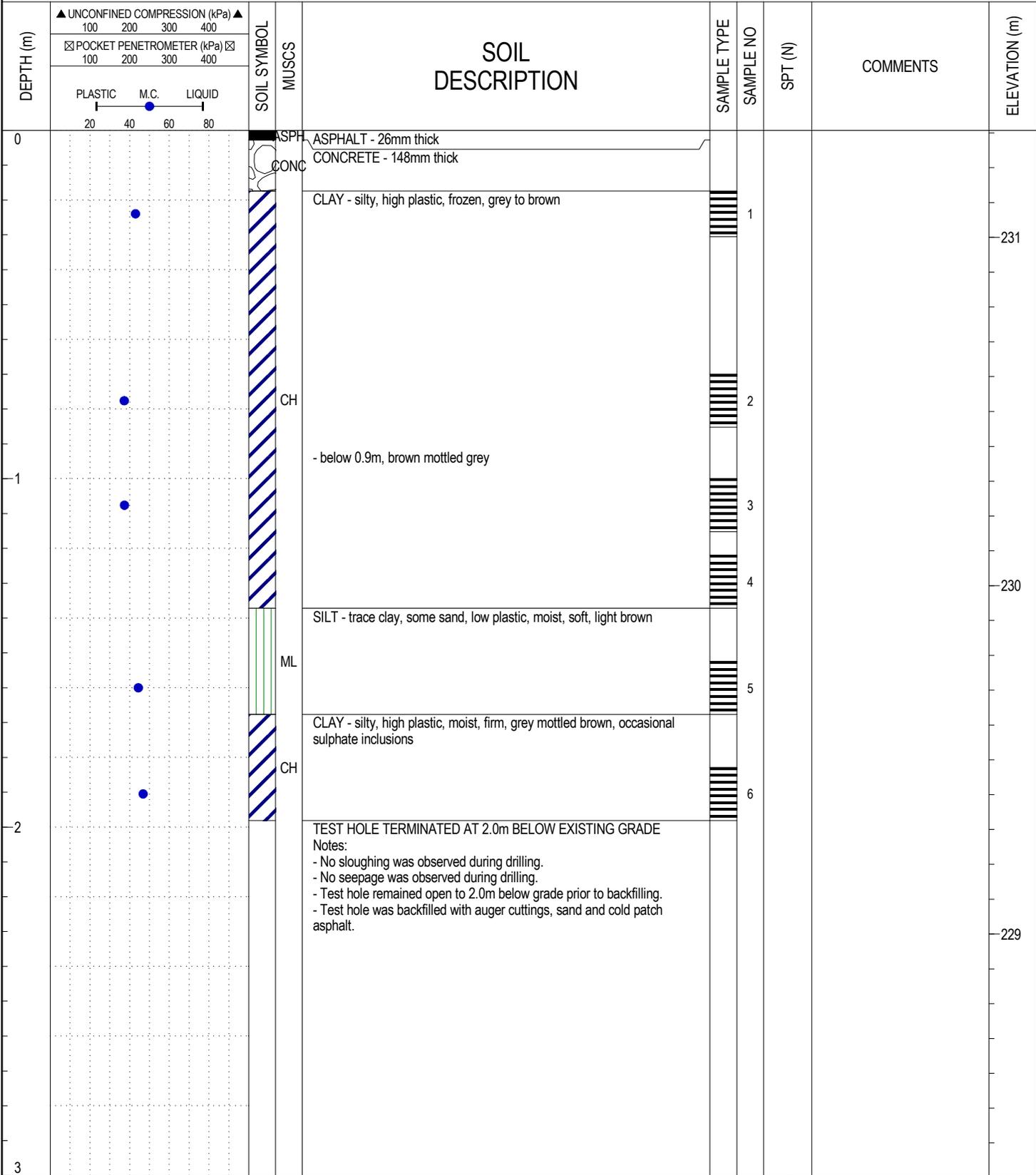


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| | |
|-----------------|----------------------------------|
| LOGGED BY: CM | COMPLETION DEPTH: 2 m |
| REVIEWED BY: BW | COMPLETION DATE: 31 January 2019 |
| Figure No. A16 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|----------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH17 (FLYNN) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5522183.5 E634883.4 | DRILL METHOD: 125mm SSA | ELEVATION: 231.31 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
| SAMPLE TYPE | <input checked="" type="checkbox"/> Shelby Tube | <input type="checkbox"/> No Recovery | <input checked="" type="checkbox"/> SPT (N) | <input checked="" type="checkbox"/> Grab Sample | <input type="checkbox"/> Split-Pen | <input type="checkbox"/> Core |
| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



WX18716 DILLON CONSTRUCTION - CITY OF WINNIPEG STREET INVESTIGATION - LOCAL STREETS.GPJ 19/02/19 08:26 AM (WPG - GEOTECH LOG 1)

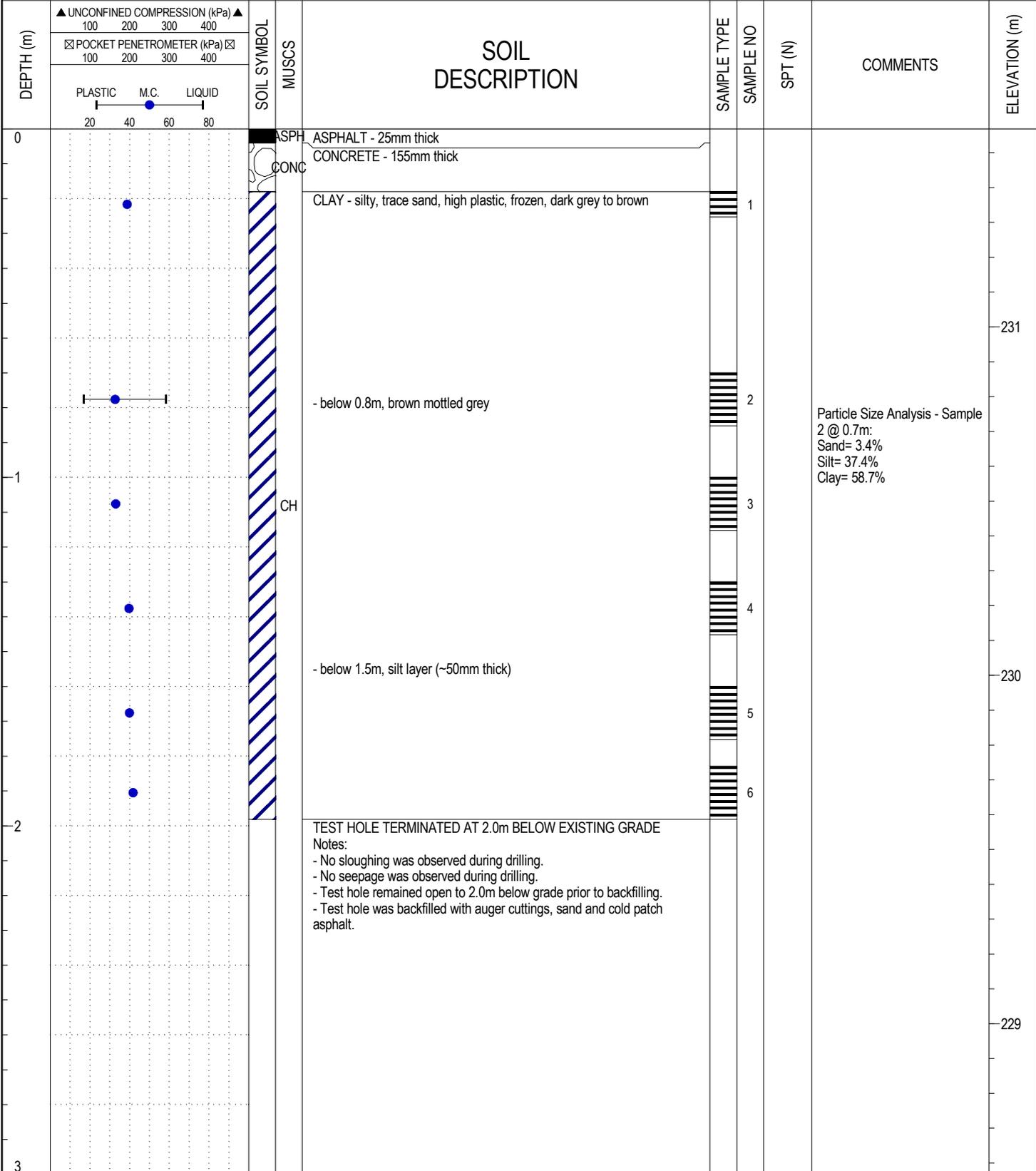


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| | |
|-----------------|----------------------------------|
| LOGGED BY: CM | COMPLETION DEPTH: 2 m |
| REVIEWED BY: BW | COMPLETION DATE: 31 January 2019 |
| Figure No. A17 | Sheet 1 of 1 |

| | | |
|--|---------------------------------------|----------------------------|
| PROJECT: City of Winnipeg Street Investigation | DRILLER: Maple Leaf Drilling Ltd. | TEST HOLE ID: TH18 (FLYNN) |
| CLIENT: Dillon Consulting Limited | DRILL RIG: Mobile B40LX Truck Mounted | PROJECT No: WX18716 |
| LOCATION: N5522145.6 E634902.6 | DRILL METHOD: 125mm SSA | ELEVATION: 231.57 m |

| | | | | | | |
|---------------|---|--------------------------------------|--|---|------------------------------------|-------------------------------|
| SAMPLE TYPE | <input checked="" type="checkbox"/> Shelby Tube | <input type="checkbox"/> No Recovery | <input checked="" type="checkbox"/> SPT (N) | <input checked="" type="checkbox"/> Grab Sample | <input type="checkbox"/> Split-Pen | <input type="checkbox"/> Core |
| BACKFILL TYPE | <input checked="" type="checkbox"/> Bentonite | <input type="checkbox"/> Pea Gravel | <input checked="" type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Grout | <input type="checkbox"/> Slough | <input type="checkbox"/> Sand |



WX18716 DILLON CONSTRUCTION - CITY OF WINNIPEG STREET INVESTIGATION - LOCAL STREETS.GPJ 19/02/19 08:26 AM (WPG - GEOTECH LOG 1)



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| | |
|-----------------|----------------------------------|
| LOGGED BY: CM | COMPLETION DEPTH: 2 m |
| REVIEWED BY: BW | COMPLETION DATE: 31 January 2019 |
| Figure No. A18 | Sheet 1 of 1 |

EXPLANATION OF TERMS AND SYMBOLS

The terms and symbols used on the borehole logs to summarize the results of field investigation and subsequent laboratory testing are described in these pages.

It should be noted that materials, boundaries and conditions have been established only at the borehole locations at the time of investigation and are not necessarily representative of subsurface conditions elsewhere across the site.

TEST DATA

Data obtained during the field investigation and from laboratory testing are shown at the appropriate depth interval.

Abbreviations, graphic symbols, and relevant test method designations are as follows:

| | | | |
|-----------------|--|----------------|---------------------------------------|
| *C | Consolidation test | *ST | Swelling test |
| D _R | Relative density | TV | Torvane shear strength |
| *k | Permeability coefficient | VS | Vane shear strength |
| *MA | Mechanical grain size analysis and hydrometer test | w | Natural Moisture Content (ASTM D2216) |
| N | Standard Penetration Test (CSA A119.1-60) | w _l | Liquid limit (ASTM D 423) |
| N _d | Dynamic cone penetration test | w _p | Plastic Limit (ASTM D 424) |
| NP | Non plastic soil | E _f | Unit strain at failure |
| pp | Pocket penetrometer strength | γ | Unit weight of soil or rock |
| *q | Triaxial compression test | γ _d | Dry unit weight of soil or rock |
| q _u | Unconfined compressive strength | ρ | Density of soil or rock |
| *SB | Shearbox test | ρ _d | Dry Density of soil or rock |
| SO ₄ | Concentration of water-soluble sulphate | C _u | Undrained shear strength |
| | | → | Seepage |
| | | ▼ | Observed water level |

* The results of these tests are usually reported separately

Soils are classified and described according to their engineering properties and behaviour.

The soil of each stratum is described using the Unified Soil Classification System¹ modified slightly so that an inorganic clay of "medium plasticity" is recognized.

The modifying adjectives used to define the actual or estimated percentage range by weight of minor components are consistent with the Canadian Foundation Engineering Manual².

Relative Density and Consistency:

| <u>Cohesionless Soils</u> | | <u>Cohesive Soils</u> | | |
|---------------------------|---------------|-----------------------|---|---------------------------|
| Relative Density | SPT (N) Value | Consistency | Undrained Shear Strength c _u (kPa) | Approximate SPT (N) Value |
| Very Loose | 0-4 | Very Soft | 0-12 | 0-2 |
| Loose | 4-10 | Soft | 12-25 | 2-4 |
| Compact | 10-30 | Firm | 25-50 | 4-8 |
| Dense | 30-50 | Stiff | 50-100 | 8-15 |
| Very Dense | >50 | Very Stiff | 100-200 | 15-30 |
| | | Hard | >200 | >30 |

Standard Penetration Resistance ("N" value)

The number of blows by a 63.6kg hammer dropped 760 mm to drive a 50 mm diameter open sampler attached to "A" drill rods for a distance of 300 mm after an initial penetration of 150 mm.

¹ "Unified Soil Classification System", Technical Memorandum 36-357 prepared by Waterways Experiment Station, Vicksburg, Mississippi, Corps of Engineers, U.S. Army. Vol. 1 March 1953.

² "Canadian Foundation Engineering Manual", 3rd Edition, Canadian Geotechnical Society, 1992.

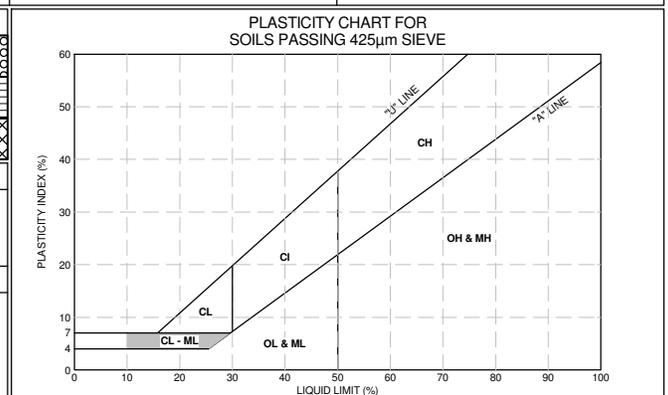
MODIFIED UNIFIED CLASSIFICATION SYSTEM FOR SOILS

| MAJOR DIVISIONS | | | SYMBOLS | | | TYPICAL DESCRIPTION | LABORATORY CLASSIFICATION CRITERIA |
|---|--|---|---------|-------|------------|---|---|
| | | | USCS | GRAPH | COLOUR | | |
| COARSE GRAINED SOILS (MORE THAN HALF BY WEIGHT LARGER THAN 75µm) | GRAVELS MORE THAN HALF THE COARSE FRACTION LARGER THAN 4.75mm | CLEAN GRAVELS (TRACE OR NO FINES) | GW | | RED | WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES | $C_u = D_{60}/D_{10} > 4$; $C_c = (D_{30})^2 / (D_{10} \times D_{60}) = 1$ to 3 |
| | | | GP | | RED | POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES | NOT MEETING ABOVE REQUIREMENTS |
| | | DIRTY GRAVELS (WITH SOME OR MORE FINES) | GM | | YELLOW | SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES | ATTERBERG LIMITS BELOW "A" LINE OR PI LESS THAN 4 |
| | | | GC | | YELLOW | CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES | ATTERBERG LIMITS ABOVE "A" LINE AND PI MORE THAN 7 |
| | SANDS MORE THAN HALF THE COARSE FRACTION SMALLER THAN 4.75mm | CLEAN SANDS (TRACE OR NO FINES) | SW | | RED | WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES | $C_u = D_{60}/D_{10} > 6$; $C_c = (D_{30})^2 / (D_{10} \times D_{60}) = 1$ to 3 |
| | | | SP | | RED | POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES | NOT MEETING ABOVE REQUIREMENTS |
| | | DIRTY SANDS (WITH SOME OR MORE FINES) | SM | | YELLOW | SILTY SANDS, SAND-SILT MIXTURES | ATTERBERG LIMITS BELOW "A" LINE OR PI LESS THAN 4 |
| | | | SC | | YELLOW | CLAYEY SANDS, SAND-CLAY MIXTURES | ATTERBERG LIMITS ABOVE "A" LINE AND PI MORE THAN 7 |
| FINE-GRAINED SOILS (MORE THAN HALF BY WEIGHT SMALLER THAN 75µm) | SILTS BELOW "A" LINE NEGLECTIBLE ORGANIC CONTENT | $W_L < 50\%$ | ML | | GREEN | INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY | CLASSIFICATION IS BASED UPON PLASTICITY CHART (SEE BELOW) |
| | | $W_L > 50\%$ | MH | | BLUE | INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SAND OR SILTY SOILS | |
| | CLAYS ABOVE "A" LINE NEGLECTIBLE ORGANIC CONTENT | $W_L < 30\%$ | CL | | GREEN | INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY OR SILTY CLAYS, LEAN CLAYS | |
| | | $30\% < W_L < 50\%$ | CI | | GREEN-BLUE | INORGANIC CLAYS OF MEDIUM PLASTICITY, SILTY CLAYS | |
| | | $W_L > 50\%$ | CH | | BLUE | INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS | |
| | ORGANIC SILTS & CLAYS BELOW "A" LINE | $W_L < 50\%$ | OL | | GREEN | ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY | WHENEVER THE NATURE OF THE FINES CONTENT HAS NOT BEEN DETERMINED, IT IS DESIGNATED BY THE LETTER "F", E.G. SF IS A MIXTURE OF SAND WITH SILT OR CLAY |
| | | $W_L > 50\%$ | OH | | BLUE | ORGANIC CLAYS OF HIGH PLASTICITY | |
| | HIGHLY ORGANIC SOILS | | | PT | | ORANGE | PEAT AND OTHER HIGHLY ORGANIC SOILS |

| SPECIAL SYMBOLS | | | |
|-----------------|--|-------------------------|--|
| LIMESTONE | | OILSAND | |
| SANDSTONE | | SHALE | |
| SILTSTONE | | FILL (UNDIFFERENTIATED) | |

| SOIL COMPONENTS | | | | |
|--|---------------------------------|----------|--|------------|
| FRACTION | U.S. STANDARD METRIC SIEVE SIZE | | DEFINING RANGES OF PERCENT BY WEIGHT OF MINOR COMPONENTS | |
| | PASSING | RETAINED | PERCENT | DESCRIPTOR |
| GRAVEL | 76mm | 19mm | 35 - 50 | AND |
| | COARSE | 19mm | | |
| SAND | COARSE | 4.75mm | 2.00mm | Y / EY |
| | MEDIUM | 2.00mm | 425µm | SOME |
| | FINE | 425µm | 75µm | TRACE |
| FINES (SILT OR CLAY BASED ON PLASTICITY) | 75µm | | 1 - 10 | TRACE |

| OVERSIZED MATERIAL | |
|---|---|
| ROUNDED OR SUBROUNDED: COBBLES 76mm to 200mm BOULDERS > 200mm | NOT ROUNDED: ROCK FRAGMENTS ? 76mm ROCKS > 0.76 CUBIC METRE IN VOLUME |



- NOTES:**
- ALL SIEVE SIZES MENTIONED ARE U.S. STANDARD ASTM E.11.
 - COARSE GRAINED SOILS WITH TRACE TO SOME FINES GIVEN COMBINED GROUP SYMBOLS, E.G. GW-GC IS A WELL GRADED GRAVEL SAND MIXTURE WITH TRACE TO SOME CLAY.
 - DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.

Appendix B

Laboratory Test Reports

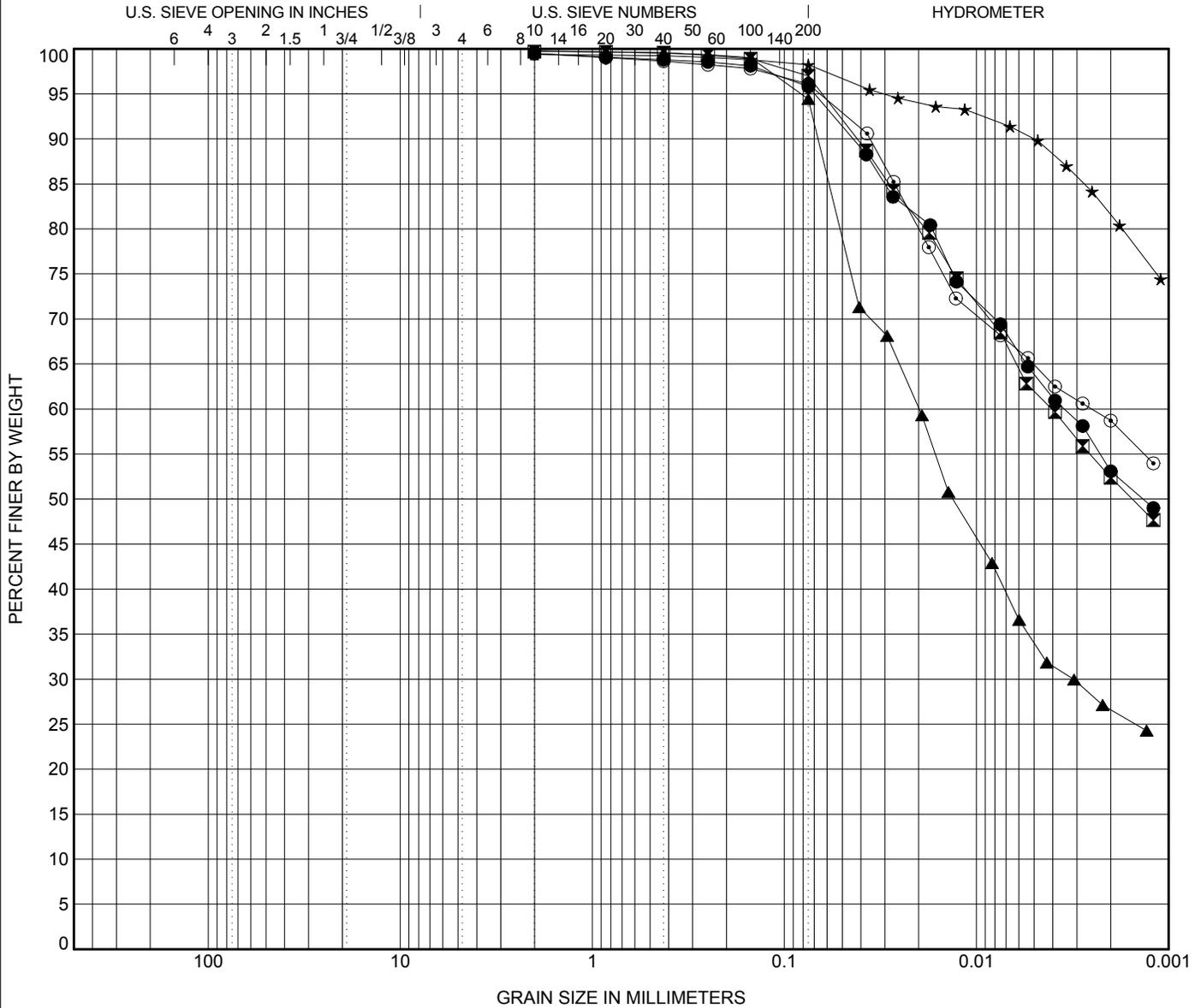


GRAIN SIZE DISTRIBUTION

CLIENT: Dillon Consulting Limited

PROJECT: City of Winnipeg Street Investigation

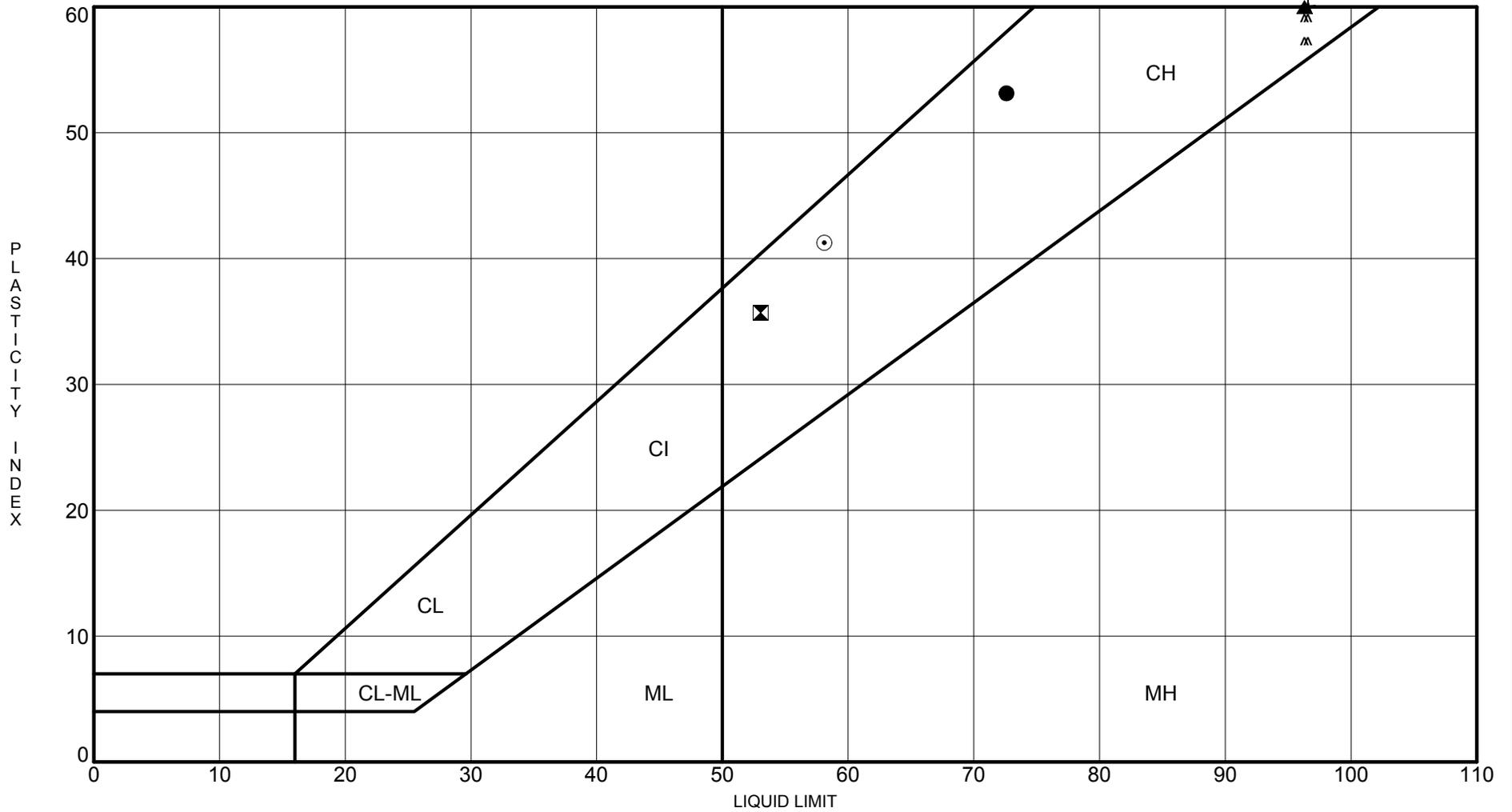
PROJECT NO: WX18716



| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---------|--------|------|--------|--------|------|--------------|
| | coarse | fine | coarse | medium | fine | |

| Sample No. | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|-------------------|------|-------|-------|-----|---------|-------|-------|-------|
| ● TH03 (LYNDALE) | 2 | 0.003 | | | | 3.7 | 42.7 | 53.1 |
| ⊠ TH09 (PULBERRY) | 2 | 0.004 | | | | 2.7 | 44.6 | 52.4 |
| ▲ TH11 (PULBERRY) | 2 | 0.02 | 0.003 | | | 5.3 | 67.8 | 26.6 |
| ★ TH16 (FLYNN) | 2 | | | | | 1.2 | 16.6 | 81.6 |
| ⊙ TH18 (FLYNN) | 2 | 0.003 | | | | 3.4 | 37.4 | 58.7 |

WX18716 DILLON CONSTRUCTION - CITY OF WINNIPEG STREET INVESTIGATION - LOCAL STREETS.GPJ - 19/02/19 08:27 AM (GRAIN SIZE FOR MAT CLIENTS)



| Borehole | Depth (m) | LL | PL | PI |
|----------|-----------|----|----|----|
| ● TH03 | 0.7 | 73 | 19 | 54 |
| ⊠ TH09 | 1.0 | 53 | 17 | 36 |
| ▲ TH11 | 1.0 | 96 | 23 | 73 |
| ★ TH16 | 0.7 | 97 | 23 | 74 |
| ⊙ TH18 | 0.7 | 58 | 17 | 41 |

ATTERBERG LIMIT RESULTS

Appendix C

Core and Test Hole Summary Tables





SUMMARY TABLE

Client: Dillion Construction
 Project: City of Winnipeg Local Street Investigation
 Date Cored: 28-Jan-19
 Cored By: Caolan McEvoy

Project No: WX18716
 Core Diameter: 150 mm Core Barrel
 Street: Lyndale Drive
 Measured By: Rolando Rongcal

| Test Hole No. | Test Hole Location | Pavement Surface | | Soil Description | Sample Depth (m) | | Moisture Content (%) | Grain Size Analysis | | | | Atterberg Limits | | |
|---------------|--|------------------|----------------|------------------|------------------|--------|----------------------|---------------------|----------|----------|----------|------------------|---------|------------------|
| | | Type | Thickness (mm) | | Top | Bottom | | Gravel (%) | Sand (%) | Silt (%) | Clay (%) | Liquid | Plastic | Plasticity Index |
| TH01 | UTM 14U Northing 5527117.169, Easting 634374.396 | Asphalt | 86 | GRANULAR FILL | 0.1 | 0.3 | 16.5 | | | | | | | |
| | | | | CLAY FILL | 0.4 | 0.6 | 23.8 | | | | | | | |
| | | | | CLAY FILL | 0.7 | 0.9 | 23.5 | | | | | | | |
| | | | | CLAY FILL | 1.0 | 1.2 | 18.5 | | | | | | | |
| | | | | CLAY FILL | 1.2 | 1.4 | 21.4 | | | | | | | |
| | | | | CLAY | 1.6 | 1.8 | 22.3 | | | | | | | |
| | | | | CLAY | 1.8 | 2.0 | 28.4 | | | | | | | |
| TH02 | UTM 14U Northing 5527081.962, Easting 634351.002 | Asphalt | 95 | GRANULAR FILL | 0.1 | 0.2 | 14.7 | | | | | | | |
| | | | | CLAY FILL | 0.4 | 0.6 | 24.7 | | | | | | | |
| | | | | CLAY FILL | 0.7 | 0.9 | 24.5 | | | | | | | |
| | | | | CLAY FILL | 1.0 | 1.2 | 24.7 | | | | | | | |
| | | | | CLAY FILL | 1.3 | 1.5 | 26.1 | | | | | | | |
| | | | | CLAY FILL | 1.5 | 1.7 | 24.2 | | | | | | | |
| | | | | CLAY | 1.8 | 2.0 | 27.7 | | | | | | | |
| TH03 | UTM 14U Northing 5527048.796, Easting 634318.251 | Asphalt | 98 | GRANULAR FILL | 0.1 | 0.3 | 13.8 | | | | | | | |
| | | | | CLAY FILL | 0.4 | 0.6 | 29.0 | | | | | | | |
| | | | | CLAY FILL | 0.7 | 0.9 | 27.5 | 0 | 3.7 | 42.7 | 53.1 | 73 | 19 | 54 |
| | | | | CLAY FILL | 1.0 | 1.2 | 24.1 | | | | | | | |
| | | | | CLAY FILL | 1.3 | 1.5 | 28.2 | | | | | | | |
| | | | | CLAY FILL | 1.6 | 1.8 | 28.9 | | | | | | | |
| | | | | CLAY FILL | 1.8 | 2.0 | 23.9 | | | | | | | |
| TH04 | UTM 14U Northing 5527010.284, Easting 634293.752 | Asphalt | 77 | GRANULAR FILL | 0.1 | 0.3 | 13.3 | | | | | | | |
| | | | | CLAY FILL | 0.4 | 0.6 | 28.9 | | | | | | | |
| | | | | CLAY FILL | 0.7 | 0.9 | 28.7 | | | | | | | |
| | | | | CLAY FILL | 1.0 | 1.2 | 25.5 | | | | | | | |
| | | | | CLAY FILL | 1.3 | 1.5 | 25.8 | | | | | | | |
| | | | | CLAY FILL | 1.6 | 1.8 | 29.0 | | | | | | | |
| | | | | CLAY FILL | 1.8 | 2.0 | 34.0 | | | | | | | |



SUMMARY TABLE

Client: Dillion Construction
 Project: City of Winnipeg Local Street Investigation
 Date Cored: 28-Jan-19
 Cored By: Caolan McEvoy

Project No: WX18716
 Core Diameter: 150 mm Core Barrel
 Street: Lyndale Drive
 Measured By: Rolando Rongcal

| Test Hole No. | Test Hole Location | Pavement Surface | | Soil Description | Sample Depth (m) | | Moisture Content (%) | Grain Size Analysis | | | | Atterberg Limits | | |
|---------------|---|------------------|----------------|------------------|------------------|--------|----------------------|---------------------|----------|----------|----------|------------------|---------|------------------|
| | | Type | Thickness (mm) | | Top | Bottom | | Gravel (%) | Sand (%) | Silt (%) | Clay (%) | Liquid | Plastic | Plasticity Index |
| TH05 | UTM 14U Northing 5526977.486, Easting 6634262.343 | Asphalt | 90 | GRANULAR FILL | 0.1 | 0.2 | 16.1 | | | | | | | |
| | | | | CLAY FILL | 0.4 | 0.6 | 24.7 | | | | | | | |
| | | | | CLAY FILL | 0.7 | 0.9 | 29.2 | | | | | | | |
| | | | | CLAY FILL | 1.0 | 1.2 | 28.7 | | | | | | | |
| | | | | CLAY FILL | 1.3 | 1.5 | 28.4 | | | | | | | |
| | | | | CLAY FILL | 1.6 | 1.8 | 28.3 | | | | | | | |
| | | | | ALLUVIAL CLAY | 1.8 | 2.0 | 31.9 | | | | | | | |
| TH06 | UTM 14U Northing 5526939.179, Easting 634237.2 | Asphalt | 105 | GRANULAR FILL | 0.1 | 0.3 | 9.6 | | | | | | | |
| | | | | CLAY FILL | 0.4 | 0.6 | 27.2 | | | | | | | |
| | | | | CLAY FILL | 0.7 | 0.9 | 27.7 | | | | | | | |
| | | | | CLAY FILL | 1.0 | 1.2 | 26.3 | | | | | | | |
| | | | | CLAY FILL | 1.3 | 1.5 | 27.3 | | | | | | | |
| | | | | CLAY FILL | 1.6 | 1.8 | 25.9 | | | | | | | |
| | | | | CLAY FILL | 1.8 | 2.0 | 29.4 | | | | | | | |
| TH07 | UTM 14U Northing 5526903.654, Easting 634206.047 | Asphalt | 111 | GRANULAR FILL | 0.1 | 0.3 | 6.0 | | | | | | | |
| | | | | CLAY FILL | 0.4 | 0.6 | 25.4 | | | | | | | |
| | | | | CLAY FILL | 0.7 | 0.9 | 25.6 | | | | | | | |
| | | | | CLAY FILL | 1.0 | 1.2 | 28.2 | | | | | | | |
| | | | | CLAY FILL | 1.3 | 1.5 | 27.4 | | | | | | | |
| | | | | CLAY FILL | 1.6 | 1.8 | 26.7 | | | | | | | |
| | | | | CLAY | 1.8 | 2.0 | 24.9 | | | | | | | |
| TH08 | UTM 14U Northing 5526862.918, Easting 634187.04 | Asphalt | 109 | GRANULAR FILL | 0.1 | 0.3 | 14.6 | | | | | | | |
| | | | | CLAY FILL | 0.4 | 0.6 | 27.0 | | | | | | | |
| | | | | CLAY FILL | 0.7 | 0.9 | 26.3 | | | | | | | |
| | | | | CLAY FILL | 1.0 | 1.2 | 24.8 | | | | | | | |
| | | | | CLAY FILL | 1.3 | 1.5 | 23.9 | | | | | | | |
| | | | | CLAY | 1.6 | 1.8 | 34.6 | | | | | | | |
| | | | | CLAY | 1.8 | 2.0 | 33.9 | | | | | | | |



SUMMARY TABLE

Client: Dillion Construction
 Project: City of Winnipeg Local Street Investigation
 Date Cored: 31-Jan-19
 Cored By: Caolan McEvoy

Project No: WX18716
 Core Diameter: 150 mm Core Barrel
 Street: Pulberry Street
 Measured By: Rolando Rongcal

| Test Hole No. | Test Hole Location | Pavement Surface | | Soil Description | Sample Depth (m) | | Moisture Content (%) | Grain Size Analysis | | | | Atterberg Limits | | | |
|---------------|--|------------------|----------------|------------------|------------------|--------|---------------------------|---------------------|----------|----------|----------|------------------|---------|------------------|--|
| | | Type | Thickness (mm) | | Top | Bottom | | Gravel (%) | Sand (%) | Silt (%) | Clay (%) | Liquid | Plastic | Plasticity Index | |
| TH13 | UTM 14U Northing 5521835.908, Easting 635408.615 | Concrete | 151 | GRANULAR FILL | 0.2 | 0.3 | 12.9 | | | | | | | | |
| | | | | CLAY | 0.4 | 0.6 | 28.7 | | | | | | | | |
| | | | | CLAY | 0.7 | 0.9 | 31.9 | | | | | | | | |
| | | | | CLAY | 1.0 | 1.2 | 29.0 | | | | | | | | |
| | | | | SILT | 1.3 | 1.5 | 27.5 | | | | | | | | |
| | | | | SILT | 1.6 | 1.8 | 21.2 | | | | | | | | |
| | | | | SILT | 1.8 | 2.0 | 22.7 | | | | | | | | |
| TH14 | UTM 14U Northing 5521912.363, Easting 635365.72 | Concrete | 153 | GRANULAR FILL | 0.2 | 0.3 | 14.8 | | | | | | | | |
| | | | | CLAY | 0.4 | 0.6 | 26.1 | | | | | | | | |
| | | | | CLAY | 0.7 | 0.9 | 37.5 | | | | | | | | |
| | | | | CLAY | 1.0 | 1.2 | 25.4 | | | | | | | | |
| | | | | CLAY | 1.2 | 1.4 | 22.1 | | | | | | | | |
| | | | | SILT | 1.6 | 1.8 | 24.7 | | | | | | | | |
| | | | | SILT | 1.8 | 2.0 | 23.7 | | | | | | | | |
| TH15 | UTM 14U Northing 5521745.462, Easting 635458.992 | Concrete | 137 | GRANULAR FILL | 0.1 | 0.3 | 15.0 | | | | | | | | |
| | | | | CLAY | 0.4 | 0.6 | No Recovery at this depth | | | | | | | | |
| | | | | CLAY | 0.7 | 0.9 | 37.1 | | | | | | | | |
| | | | | CLAY | 1.0 | 1.2 | 25.8 | | | | | | | | |
| | | | | CLAY | 1.2 | 1.4 | 32.2 | | | | | | | | |
| | | | | SILT | 1.6 | 1.8 | 23.6 | | | | | | | | |
| | | | | SILT | 1.8 | 2.0 | 25.0 | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |



SUMMARY TABLE

Client: Dillion Construction
 Project: City of Winnipeg Local Street Investigation
 Date Cored: 23-Jan-19
 Cored By: Michael Lafrance

Project No: WX18716
 Core Diameter: 150 mm Core Barrel
 Street: Speers Road
 Measured By: Rolando Rongcal

| Test Hole No. | Test Hole Location | | | | Pavement Surface | | Underlying Soil Description |
|---------------|---|---------------------------|------------------|-----------------|------------------|----------------|-----------------------------|
| | Distance from Cross Street | Offset From Curb | House Number | Travel Lane | Type | Thickness (mm) | |
| TH-S01 | 50 m South of Elizabeth Road | 1.5 m East from West Curb | None | Southbound Lane | Asphalt | 38.7 | CLAY |
| | | | | | Concrete | 187.3 | |
| | | | | | | | |
| TH-S02 | 150 m South of Elizabeth Road | 2.0 m West from East Curb | 1055 Baudoux Pl. | Northbound Lane | Asphalt | 47.0 | CLAY |
| | | | | | Concrete | 207.7 | |
| | | | | | | | |
| TH-S03 | 20 m North of Northwest corner of Bernier Bay | 1.0 m East from West Curb | 139 Speers Road | Southbound Lane | Asphalt | 37.0 | CLAY |
| | | | | | Concrete | 187.7 | |
| | | | | | | | |
| TH-S04 | 17 m North of Northwest corner of Bernier bay | 2.0 m West from East Curb | 163 Speers Road | Northbound Lane | Asphalt | 32.0 | CLAY |
| | | | | | Concrete | 203.0 | |
| | | | | | | | |
| TH-S05 | 12 m North of new corner of Halliday Bay | 1.2 m East from West Curb | 189 Speers Road | Southbound Lane | Asphalt | 53.3 | CLAY |
| | | | | | Concrete | 189.7 | |
| | | | | | | | |
| TH-S06 | 4 m South of Southwest corner of Halliday Bay | 2.0 m West from East Curb | 217 Speers Road | Northbound Lane | Asphalt | 57.0 | CLAY |
| | | | | | Concrete | 203.3 | |
| | | | | | | | |
| TH-S07 | 15 m south of Betournay Street | 1.5 m West from East Curb | 243 Speers Road | Northbound Lane | Concrete | 160.0 | CLAY |
| | | | | | | | |
| | | | | | | | |
| TH-S08 | 49 m North of Winakwa | 1.5 m East from West Curb | 269 Speers Road | Southbound Lane | Asphalt | 6.7 | CLAY |
| | | | | | Concrete | 153.0 | |
| | | | | | | | |

Remarks: _____



SUMMARY TABLE

Client: Dillion Construction
 Project: City of Winnipeg Local Street Investigation
 Date Cored: 24-Jan-19
 Cored By: Michael Lafrance

Project No: WX18716
 Core Diameter: 150 mm Core Barrel
 Street: Traverse Avenue
 Measured By: Rolando Rongcal

| Test Hole No. | Test Hole Location | | | | Pavement Surface | | Underlying Soil Description |
|---------------|-----------------------------------|---------------------------|-------------------------|-----------------|------------------|----------------|-----------------------------|
| | Distance from Cross Street | Offset From Curb | House Number | Travel Lane | Type | Thickness (mm) | |
| TH-TA01 | 16 m South of Dollard Blvd. | 2.0 m East from West Curb | 240 Dollard Blvd. | Southbound Lane | Asphalt | 33.3 | CLAY |
| | | | | | Concrete | 175.0 | |
| | | | | | | | |
| TH-TA02 | 116 m South of Dollard Blvd. | 2.0 m West from East Curb | None | Northbound Lane | Asphalt | 41.3 | CLAY |
| | | | | | Concrete | 151.0 | |
| | | | | | | | |
| TH-TA03 | 18.5 m South of Bertrand Street | 2.0 m East from West Curb | 244 Bertrand Street | Southbound Lane | Asphalt | 37.3 | CLAY |
| | | | | | Concrete | 143.0 | |
| | | | | | | | |
| TH-TA04 | 21 m North of Thomas Berry Street | 1.5 m West from East Curb | 241 Thomas Berry Street | Northbound Lane | Asphalt | 177.6 | UNKNOWN |
| | | | | | Concrete | *200+ | |
| | | | | | | | |
| TH-TA05 | 21 m South of Thomas Berry Street | 2.0 m East from West Curb | 242 Thomas Berry Street | Southbound Lane | Asphalt | 38.3 | CLAY |
| | | | | | Concrete | 149.7 | |
| | | | | | | | |
| TH-TA06 | 32 m North of Goulet Street | 1.5 m West from East Curb | 261 Goulet Street | Northbound Lane | Asphalt | 36.7 | CLAY |
| | | | | | Concrete | 118.3 | |
| | | | | | | | |
| TH-TA07 | 30 m North of Marion Street | 1.5 m West from East Curb | 245 Marion Street | Northbound Lane | Asphalt | 43.7 | CLAY |
| | | | | | Concrete | 152.7 | |
| | | | | | | | |
| TH-TA08 | 17 m North of Marion Street | 2.0 m East from West Curb | None | Southbound Lane | Asphalt | 47.7 | CLAY |
| | | | | | Concrete | 148.7 | |
| | | | | | | | |

Remarks: *Core Barrel Maxed out on TH-TA04, could not extract core



SUMMARY TABLE

Client: Dillion Construction
 Project: City of Winnipeg Local Street Investigation
 Date Cored: 25-Jan-19
 Cored By: Michael Lafrance

Project No: WX18716
 Core Diameter: 150 mm Core Barrel
 Street: Hamel Avenue
 Measured By: Rolando Rongcal

| Test Hole No. | Test Hole Location | | | | Pavement Surface | | Underlying Soil Description |
|---------------|---------------------------------|-----------------------------|------------------------|----------------|------------------|----------------|-----------------------------|
| | Distance from Cross Street | Offset From Curb | House Number | Travel Lane | Type | Thickness (mm) | |
| TH-H01 | 58 m East of Rue Aulneau | 1.5 m South from North Curb | 240 Hamel Avenue | Westbound Lane | Asphalt | 48.3 | CLAY |
| | | | | | Concrete | 214.7 | |
| | | | | | | | |
| TH-H02 | 39 m West of Rue Ritchot | 1.2 m North from South Curb | 270 Hamel Avenue | Eastbound Lane | Asphalt | 37.0 | CLAY |
| | | | | | Concrete | 214.0 | |
| | | | | | | | |
| TH-H03 | 30 m East of Rue Ritchot | 1.0 m South from North Curb | 500 Rue Ritchot | Westbound Lane | Asphalt | 69.0 | CLAY |
| | | | | | Concrete | 214.3 | |
| | | | | | | | |
| TH-H04 | 28 m West of Rue de la Morenie | 2.0 m North from South Curb | 491 Rue de la Morenie | Eastbound Lane | Asphalt | 62.7 | UNKNOWN |
| | | | | | Concrete | *250+ | |
| | | | | | | | |
| TH-H05* | 32 m West of Des Meurons Street | 1.5 m South from North Curb | 495 Des Meurons Street | Westbound Lane | Asphalt | 50.0 | CLAY |
| | | | | | Concrete | 250.0 | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Remarks: *Core Barrel Maxed out on TH-H04, could not extract core, TH-H05 concrete and asphalt was poor condition core could not be retrieved, clay was observed during coring, depth was measured from penetration from the core barrel.



SUMMARY TABLE

Client: Dillion Construction
 Project: City of Winnipeg Local Street Investigation
 Date Cored: 28-Jan-19
 Cored By: Michael Lafrance

Project No: WX18716
 Core Diameter: 150 mm Core Barrel
 Street: Des Meurons Street
 Measured By: Rolando Rongcal

| Test Hole No. | Test Hole Location | | | | Pavement Surface | | Underlying Soil Description |
|---------------|-------------------------------|---------------------------|--------------------|-----------------|------------------|----------------|-----------------------------|
| | Distance from Cross Street | Offset From Curb | House Number | Travel Lane | Type | Thickness (mm) | |
| TH-D01 | 28 m South of Carriere Avenue | 2.0 m East from West Curb | 62 Carriere Avenue | Southbound Lane | Asphalt | 62.0 | CLAY |
| | | | | | Concrete | 205.0 | |
| TH-D02 | 28 m North of Fifth Avenue | 1.5 m West from East Curb | 65 Fifth Avenue | Northbound Lane | Asphalt | 50.0 | CLAY |
| | | | | | Concrete | 195.0 | |
| TH-D03 | 28 m South of Fifth Avenue | 1.0 m East from West Curb | 58 Fifth Avenue | Southbound Lane | Concrete | 208.3 | CLAY |
| | | | | | | | |
| TH-D04 | 21m North of Guay Avenue | 1.2 m West from East Curb | 61 Guay Avenue | Northbound Lane | Concrete | 193.7 | CLAY |
| | | | | | | | |
| TH-D05 | 26 m South of Guay Avenue | 1.0 m East from West Curb | 56 Guay Avenue | Southbound Lane | Asphalt | 49.0 | CLAY |
| | | | | | Concrete | 183.7 | |
| TH-D06 | 17 m North of Morier Avenue | 1.0 m West from East Curb | 59 Morier Avenue | Northbound Lane | Asphalt | 24.0 | CLAY |
| | | | | | Concrete | 214.0 | |
| | | | | | | | |
| | | | | | | | |

Remarks: _____



SUMMARY TABLE

Client: Dillion Construction
 Project: City of Winnipeg Local Street Investigation
 Date Cored: 31-Jan-19
 Cored By: Michael Lafrance

Project No: WX18716
 Core Diameter: 150 mm Core Barrel
 Street: Hazelwood Avenue
 Measured By: Rolando Rongcal

| Test Hole No. | Test Hole Location | | | | Pavement Surface | | Underlying Soil Description |
|---------------|-----------------------------|-----------------------------|----------------------|----------------|------------------|----------------|--|
| | Distance from Cross Street | Offset From Curb | House Number | Travel Lane | Type | Thickness (mm) | |
| TH-HW01 | 21 m West of Dells Crescent | 1.5 m South from North Curb | 291 Hazelwood Avenue | Westbound Lane | Concrete | 153.3 | CLAY |
| TH-HW02 | 78 m West of Dells Crescent | 1.2 m North from South Curb | 274 Hazelwood Avenue | Eastbound Lane | Concrete | 155.0 | CLAY |
| TH-HW03 | 32 m East of Wakopa Street | 1.5 m South from North Curb | 263 Hazelwood Avenue | Westbound Lane | Concrete | 155.0 | GRANULAR FILL - (20 mm crushed A-Base) |
| TH-HW04 | 8 m West of Wakopa Street | 1.5 m North from South Curb | 250 Hazelwood Avenue | Eastbound Lane | Concrete | 153.3 | GRANULAR FILL - (20 mm crushed A-Base) |
| TH-HW05 | 13 m East of Dells Crescent | 1.5 m South from North Curb | 239 Hazelwood Avenue | Westbound Lane | Concrete | 142.7 | GRANULAR FILL - (20 mm crushed A-Base) |
| TH-HW06 | 31 m West of Dells Crescent | 1.5 m North from South Curb | 223 Hazelwood Avenue | Eastbound Lane | Concrete | 163.3 | GRANULAR FILL - (20 mm crushed A-Base) |
| TH-HW07 | 35 m East of Dakota Street | 1.5 m South from North Curb | 219 Hazelwood Avenue | Westbound Lane | Concrete | 142.7 | GRANULAR FILL - (20 mm crushed A-Base) |
| | | | | | | | |

Remarks: _____



SUMMARY TABLE

Client: Dillion Construction
 Project: City of Winnipeg Local Street Investigation
 Date Cored: 1-Feb-19
 Cored By: Michael Lafrance

Project No: WX18716
 Core Diameter: 150 mm Core Barrel
 Street: Traynor Bay
 Measured By: Rolando Rongcal

| Test Hole No. | Test Hole Location | | | | Pavement Surface | | Underlying Soil Description |
|---------------|---------------------------------|-----------------------------|----------------|-----------------|------------------|----------------|-----------------------------|
| | Distance from Cross Street | Offset From Curb | House Number | Travel Lane | Type | Thickness (mm) | |
| TH-TB01 | 37 m North of St. Michael Road | 1.0 m West from East Curb | 7 Traynor Bay | Northbound Lane | Concrete | 162.3 | CLAY |
| TH-TB02 | 64 m North of St. Michael Road | 1.0 m West from East Curb | 15 Traynor Bay | Northbound Lane | Concrete | 141.7 | CLAY |
| TH-TB03 | 120 m North of St. Michael Road | 0.5 m North from South Curb | 31 Traynor Bay | Eastbound Lane | Concrete | 145.0 | CLAY |
| TH-TB04 | 71 m North of St. Michael Road | 1.5 m East from West Curb | 51 Traynor Bay | Southbound Lane | Concrete | 151.7 | CLAY |
| TH-TB05 | 34 m North of St. Michael Road | 2.0 m West from East Curb | 58 Traynor Bay | Northbound Lane | Concrete | 152.7 | CLAY |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Remarks: _____

Appendix D

Core Photo Log





CORE #TH01

| | | | | |
|---|---|-------------------------------|-----------------------------|-------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH01 LYNDALE DRIVE WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D1</p> |



CORE #TH02

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH02
LYNDALE DRIVE
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

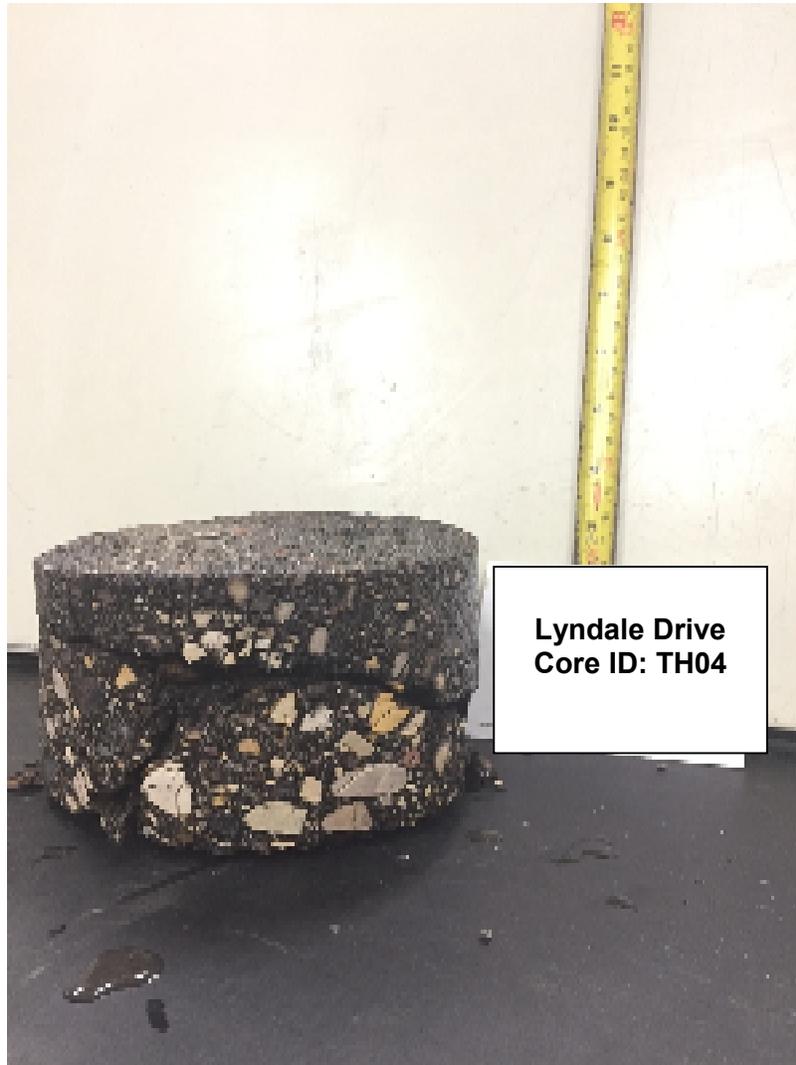
Project No.: WX18716

Figure: D2



CORE #TH03

| | | | | |
|---|---|-------------------------------|-----------------------------|-------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH03 LYNDALE DRIVE WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D3</p> |



Lyndale Drive
Core ID: TH04

CORE #TH04

| | | | | |
|---|---|-------------------------------|-----------------------------|-------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH04 LYNDALE DRIVE WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D4</p> |



Lyndale Drive
Core ID: TH05

CORE #TH05

| | | | | |
|---|---|-------------------------------|-----------------------------|-------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH05 LYNDALE DRIVE WINNIPEG, MANITOBA</p> | | | |
| | | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D6</p> |



Lyndale Drive
Core ID: TH06

CORE #TH06

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH06
LYNDALE DRIVE
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D6



Lyndale Drive
Core ID: TH07

CORE #TH07

Wood Environment and Infrastructure
Solutions

CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH07
LYNDALE DRIVE
WINNIPEG, MANITOBA

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D7



**Lyndale Drive
Core ID: TH08**

CORE #TH08

| | | | | |
|--|------------|--|----------------------|------------|
| Wood Environment and Infrastructure Solutions | | CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH08 LYNDALE DRIVE WINNIPEG, MANITOBA | | |
| | | | | |
| Drawn: CM | Scale: N/A | Date: 14 February 2019 | Project No.: WX18716 | Figure: D8 |



**Pulberry Street
Core ID: TH09**

CORE #TH09

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH09
PULBERRY STREET
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

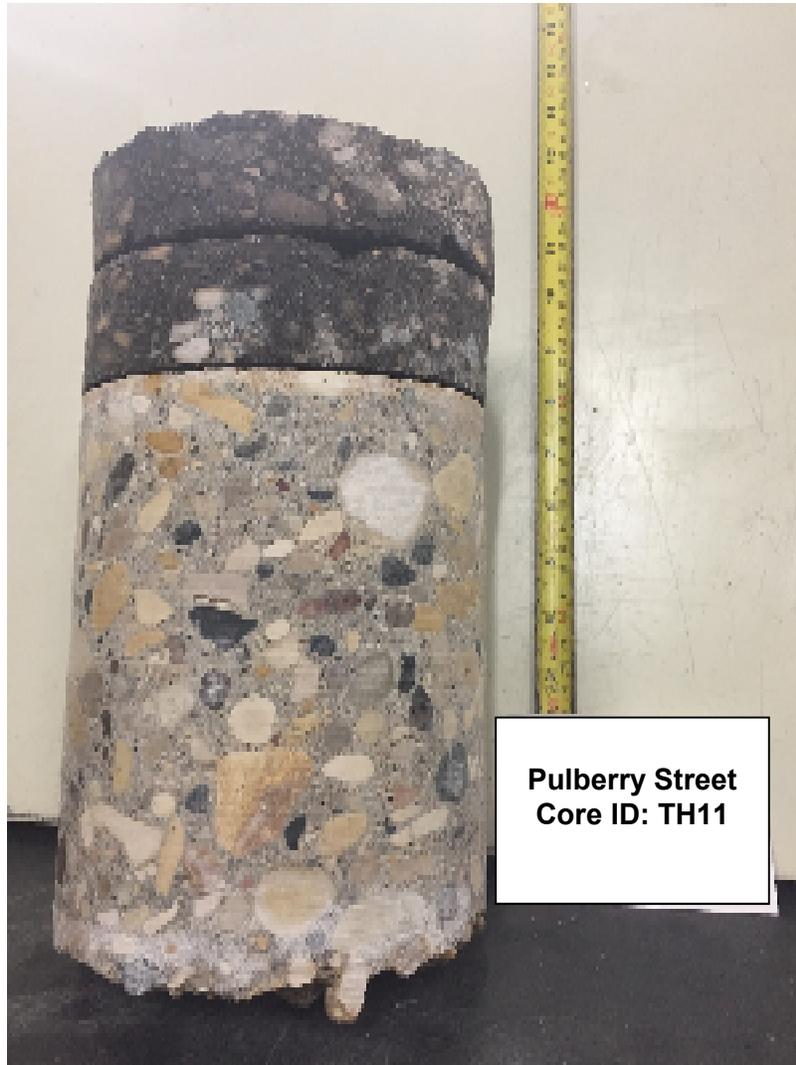
Figure: D9



**Pulberry Street
Core ID: TH10**

CORE #TH10

| | | | | |
|--|------------|--|----------------------|-------------|
| Wood Environment and Infrastructure Solutions | | CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH10 PULBERRY STREET WINNIPEG, MANITOBA | | |
| | | | | |
| Drawn: CM | Scale: N/A | Date: 14 February 2019 | Project No.: WX18716 | Figure: D10 |



CORE #TH11

| | | | | |
|---|---|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH11 PULBERRY STREET WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D11</p> |



CORE #TH12

| | | | | |
|--|------------|--|----------------------|-------------|
| Wood Environment and Infrastructure Solutions | | CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH12 PULBERRY STREET WINNIPEG, MANITOBA | | |
| | | | | |
| Drawn: CM | Scale: N/A | Date: 14 February 2019 | Project No.: WX18716 | Figure: D12 |



**Pulberry Street
Core ID: TH13**

CORE #TH13

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH13
PULBERRY STREET
WINNIPEG, MANITOBA**

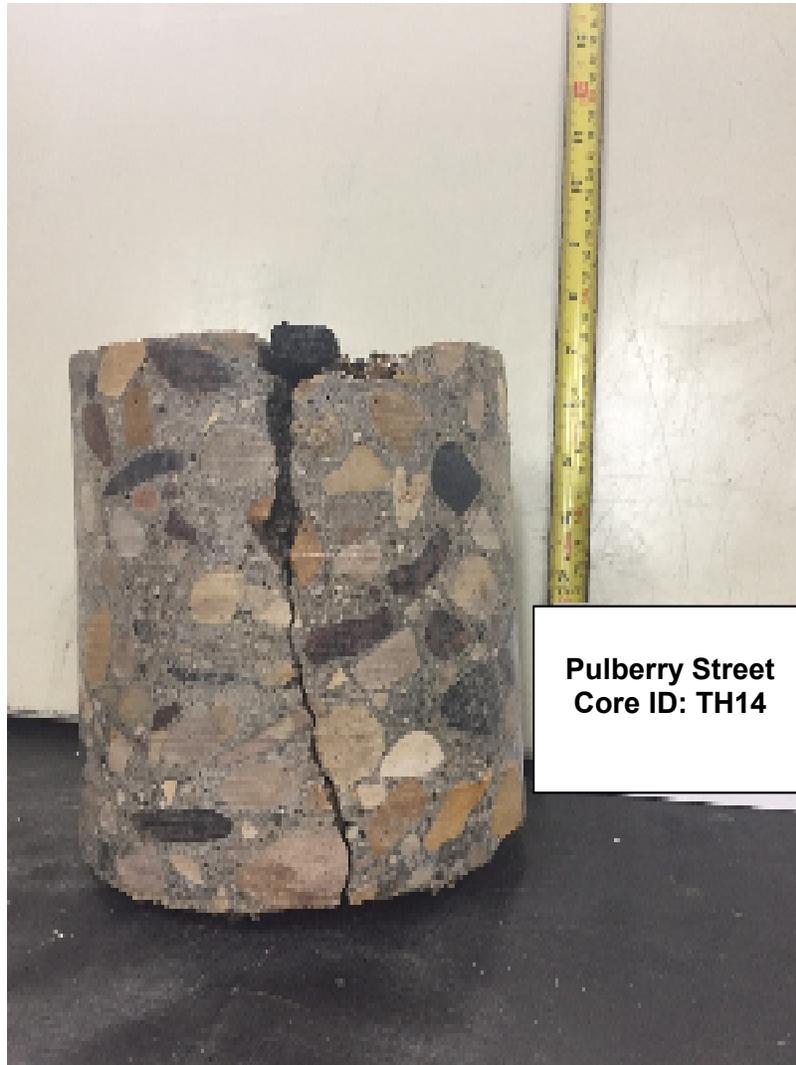
Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D13



**Pulberry Street
Core ID: TH14**

CORE #TH14

| | | | | |
|--|------------|--|----------------------|-------------|
| Wood Environment and Infrastructure Solutions | | CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH14 PULBERRY STREET WINNIPEG, MANITOBA | | |
| | | | | |
| Drawn: CM | Scale: N/A | Date: 14 February 2019 | Project No.: WX18716 | Figure: D14 |



**Pulberry Street
Core ID: TH15**

CORE #TH15

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH15
PULBERRY STREET
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D15



CORE #TH16

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH16
PULBERRY STREET
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D16



**Flynn Street
Core ID: TH17**

CORE #TH17

| | | | | |
|---|---|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH17 PULBERRY STREET WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D17</p> |



CORE #TH18

| | | | | |
|--|------------|--|----------------------|-------------|
| Wood Environment and Infrastructure Solutions | | CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH18 PULBERRY STREET WINNIPEG, MANITOBA | | |
| | | | | |
| Drawn: CM | Scale: N/A | Date: 14 February 2019 | Project No.: WX18716 | Figure: D18 |



**Speers Road
Core ID: TH-S01**

CORE #TH-S01

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH-S01
SPEERS ROAD
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D19



CORE #TH-S02

| | | | | |
|---|---|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-S02 SPEERS ROAD WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D20</p> |



CORE #TH-S03

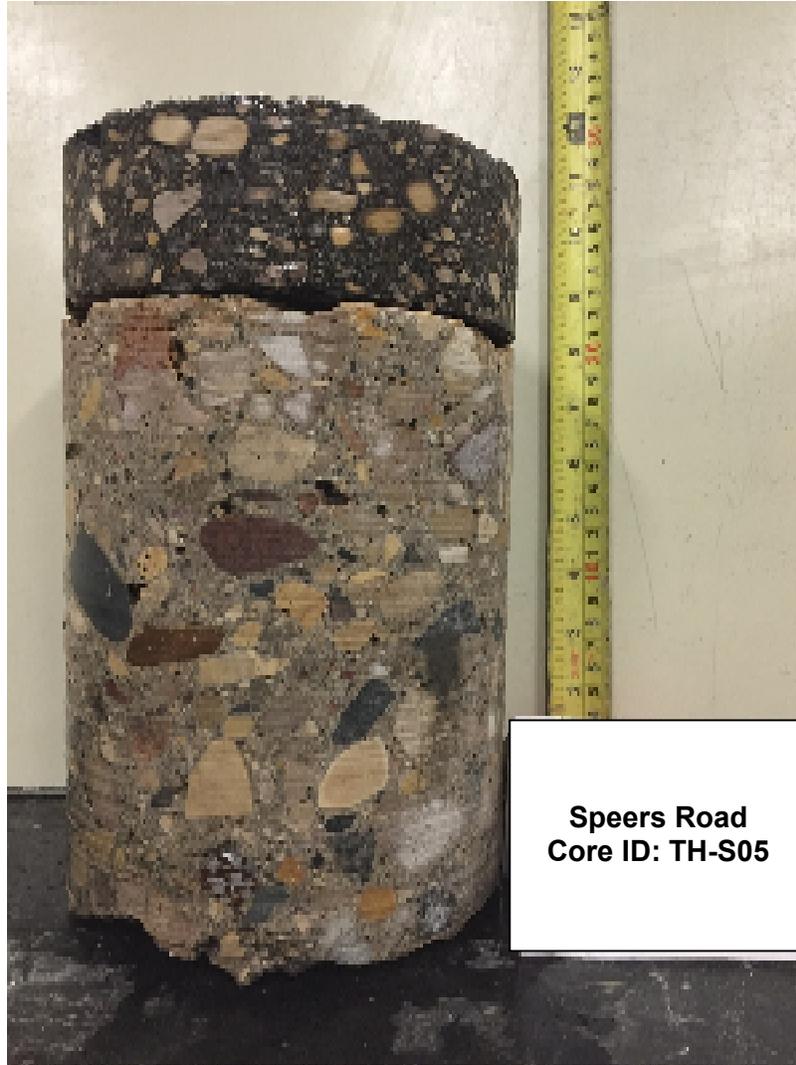
| | | | | |
|---|---|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-S03 SPEERS ROAD WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D21</p> |



**Speers Road
Core ID: TH-S04**

CORE #TH-S04

| | | | | |
|---|---|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-S04 SPEERS ROAD WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D22</p> |



**Speers Road
Core ID: TH-S05**

CORE #TH-S05

| | | | | |
|--|------------|--|----------------------|-------------|
| Wood Environment and Infrastructure Solutions | | CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-S05 SPEERS ROAD WINNIPEG, MANITOBA | | |
| | | | | |
| Drawn: CM | Scale: N/A | Date: 14 February 2019 | Project No.: WX18716 | Figure: D23 |



CORE #TH-S06

| | | | | |
|--|------------|--|----------------------|-------------|
| Wood Environment and Infrastructure Solutions | | CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-S06 SPEERS ROAD WINNIPEG, MANITOBA | | |
| | | | | |
| Drawn: CM | Scale: N/A | Date: 14 February 2019 | Project No.: WX18716 | Figure: D24 |



CORE #TH-S07

| | | | | |
|---|---|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-S07 SPEERS ROAD WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D25</p> |



CORE #TH-S08

| | | | | |
|---|---|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-S08 SPEERS ROAD WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D26</p> |



**Traverse Avenue
Core ID: TH-TA01**

CORE #TH-TA01

| | | | | |
|---|--|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-TA01 TRAVERSE AVENUE WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D27</p> |



CORE #TH-TA02

| | | | | |
|---|--|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-TA02 TRAVERSE AVENUE WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D28</p> |



**Traverse Avenue
Core ID: TH-TA03**

CORE #TH-TA03

| | | | | |
|---|--|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-TA03 TRAVERSE AVENUE WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D29</p> |



**Traverse Avenue
Core ID: TH-TA04**

CORE #TH-TA04

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH-TA04
TRAVERSE AVENUE
WINNIPEG, MANITOBA**

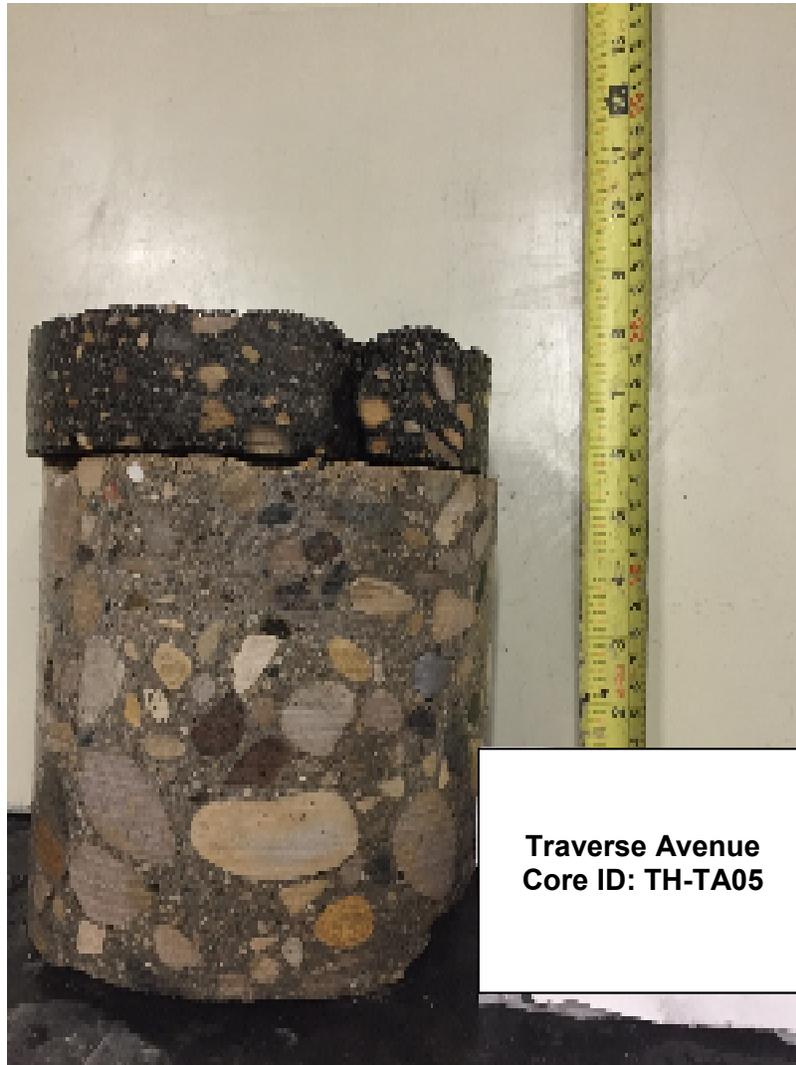
Drawn: CM

Scale: N/A

Date: 14 February 2019

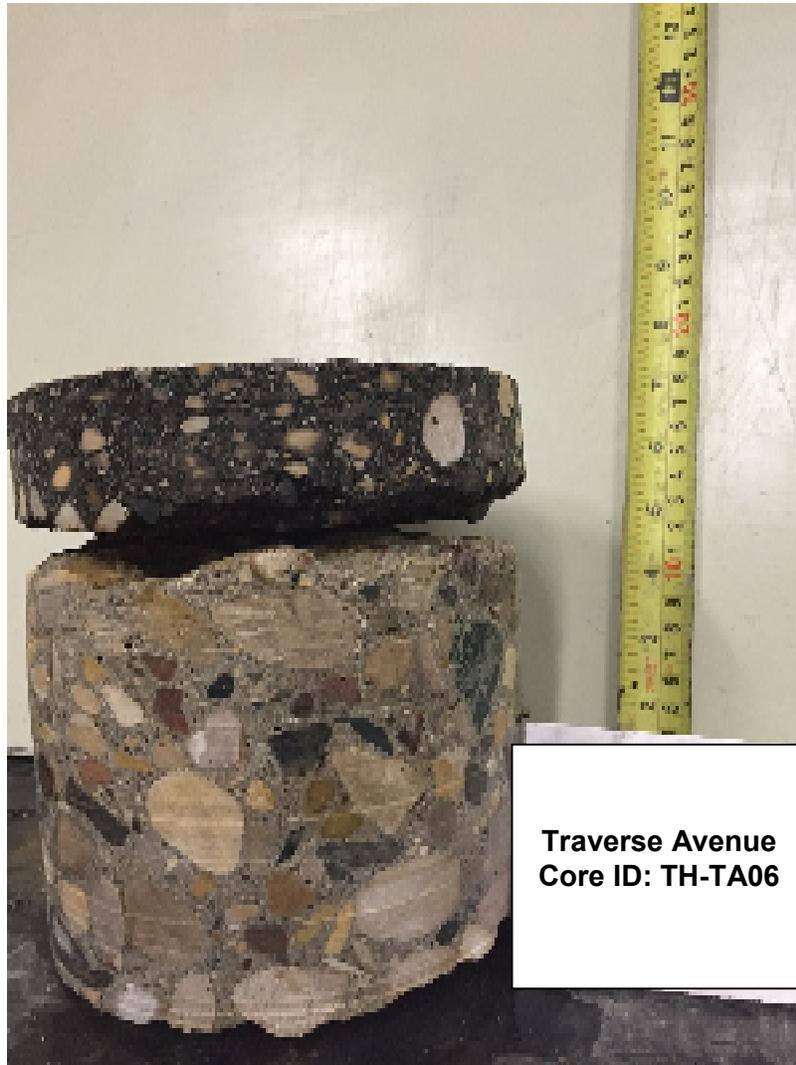
Project No.: WX18716

Figure: D30



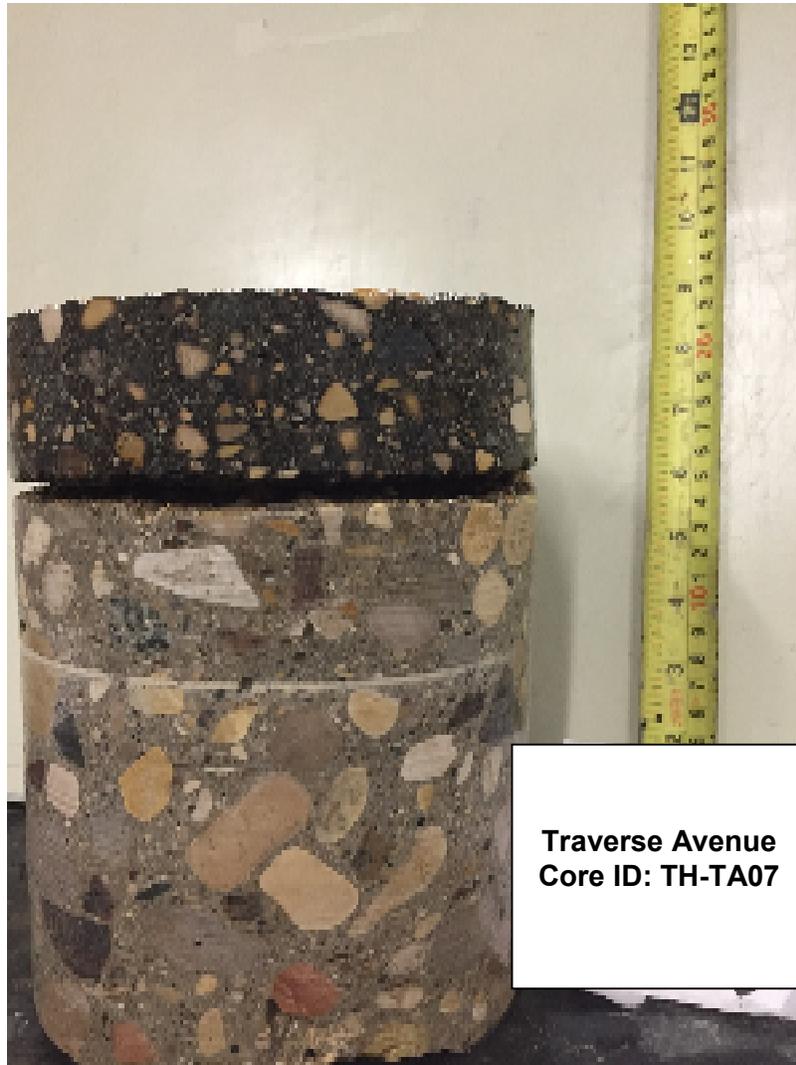
CORE #TH-TA05

| | | | | |
|---|--|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-TA05 TRAVERSE AVENUE WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D31</p> |



CORE #TH-TA06

| | | | | |
|---|--|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-TA06 TRAVERSE AVENUE WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D32</p> |



**Traverse Avenue
Core ID: TH-TA07**

CORE #TH-TA07

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH-TA07
TRAVERSE AVENUE
WINNIPEG, MANITOBA**

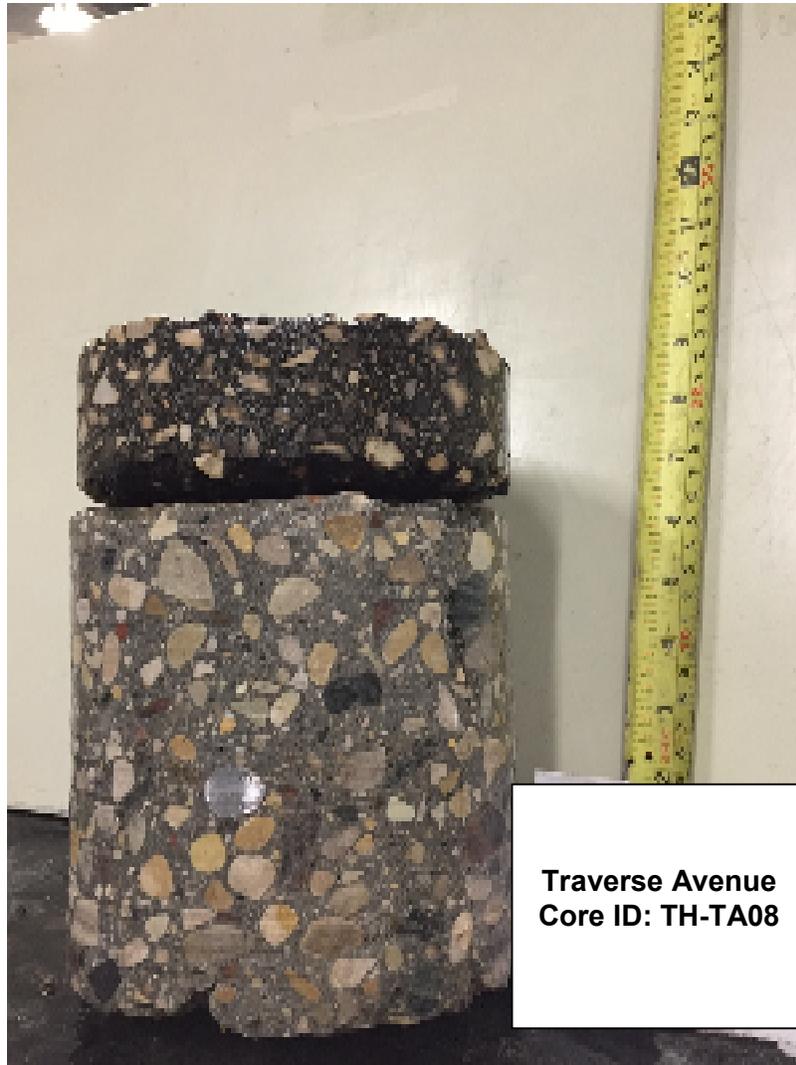
Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D33



**Traverse Avenue
Core ID: TH-TA08**

CORE #TH-TA08

| | | | | |
|---|--|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-TA08 TRAVERSE AVENUE WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D34</p> |



CORE #TH-H01

| | | | | |
|--|------------|---|----------------------|-------------|
| Wood Environment and Infrastructure Solutions | | CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-H01 HAMEL AVENUE WINNIPEG, MANITOBA | | |
| | | | | |
| Drawn: CM | Scale: N/A | Date: 14 February 2019 | Project No.: WX18716 | Figure: D35 |



**Hamel Avenue
Core ID: TH-H02**

CORE #TH-H02

| | | | | |
|---|--|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-H02 HAMEL AVENUE WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D36</p> |



**Hamel Avenue
Core ID: TH-H03**

CORE #TH-H03

| | | | | |
|---|--|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-H03 HAMEL AVENUE WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D37</p> |



Hamel Avenue
Core ID: TH-H04

CORE #TH-H04

Wood Environment and Infrastructure
Solutions

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH-H04
HAMEL AVENUE
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D38



CORE #TH-D01

| | | | | |
|---|--|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-D01 DES MEURONS STREET WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D39</p> |



**Des Meurons
Street
Core ID: TH-D02**

CORE #TH-D02

| | | | | |
|---|--|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-D02 DES MEURONS STREET WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D40</p> |



**Des Meurons
Street
Core ID: TH-D03**

CORE #TH-D03

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH-D03
DES MEURONS STREET
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D41



**Des Meurons
Street
Core ID: TH-D04**

CORE #TH-D04

| | | | | |
|---|--|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-D04 DES MEURONS STREET WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D42</p> |



**Des Meurons
Street
Core ID: TH-D05**

CORE #TH-D05

| | | | | |
|---|--|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-D05 DES MEURONS STREET WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D43</p> |



CORE #TH-D06

| | | | | |
|--|------------|---|----------------------|-------------|
| Wood Environment and Infrastructure Solutions | | CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-D06 DES MEURONS STREET WINNIPEG, MANITOBA | | |
| | | | | |
| Drawn: CM | Scale: N/A | Date: 14 February 2019 | Project No.: WX18716 | Figure: D44 |



**Hazelwood Street
Core ID: TH-HW01**

CORE #TH-HW01

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH-HW01
HAZELWOOD AVENUE
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D45



**Hazelwood Street
Core ID: TH-HW02**

CORE #TH-HW02

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH-HW02
HAZELWOOD AVENUE
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D46



**Hazelwood Street
Core ID: TH-HW03**

CORE #TH-HW03

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH-HW03
HAZELWOOD AVENUE
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D47



**Hazelwood Street
Core ID: TH-HW04**

CORE #TH-HW04

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH-HW04
HAZELWOOD AVENUE
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D48



**Hazelwood Street
Core ID: TH-HW05**

CORE #TH-HW05

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH-HW05
HAZELWOOD AVENUE
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D49



**Hazelwood Street
Core ID: TH-HW06**

CORE #TH-HW06

| | | | | |
|---|---|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-HW06 HAZELWOOD AVENUE WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D50</p> |



**Hazelwood Street
Core ID: TH-HW07**

CORE #TH-HW07

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH-HW07
HAZELWOOD AVENUE
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D51



**Traynor Bay
Core ID: TH-TB01**

CORE #TH-TB01

| | | | | |
|--|------------|---|----------------------|-------------|
| Wood Environment and Infrastructure Solutions | | CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-TB01 TRAYNOR BAY WINNIPEG, MANITOBA | | |
| | | | | |
| Drawn: CM | Scale: N/A | Date: 14 February 2019 | Project No.: WX18716 | Figure: D52 |



**Traynor Bay
Core ID: TH-TB02**

CORE #TH-TB02

| | | | | |
|---|--|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-TB02 TRAYNOR BAY WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D53</p> |



CORE #TH-TB03

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH-TB03
TRAYNOR BAY
WINNIPEG, MANITOBA**

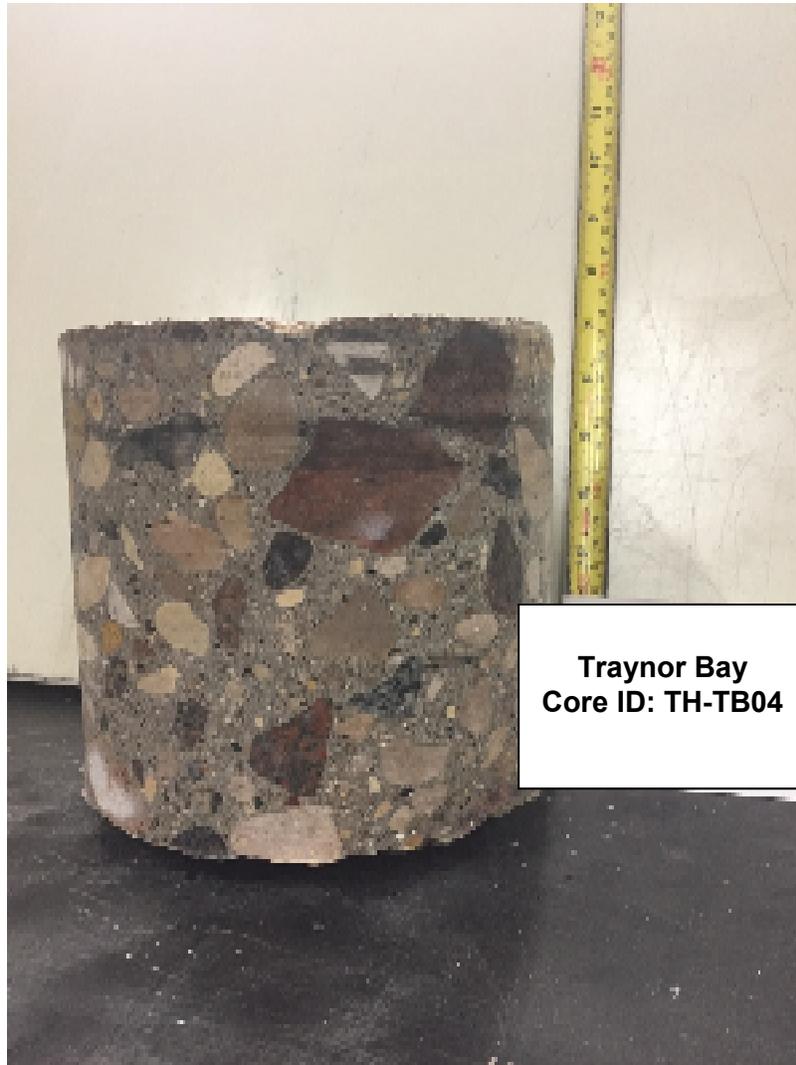
Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

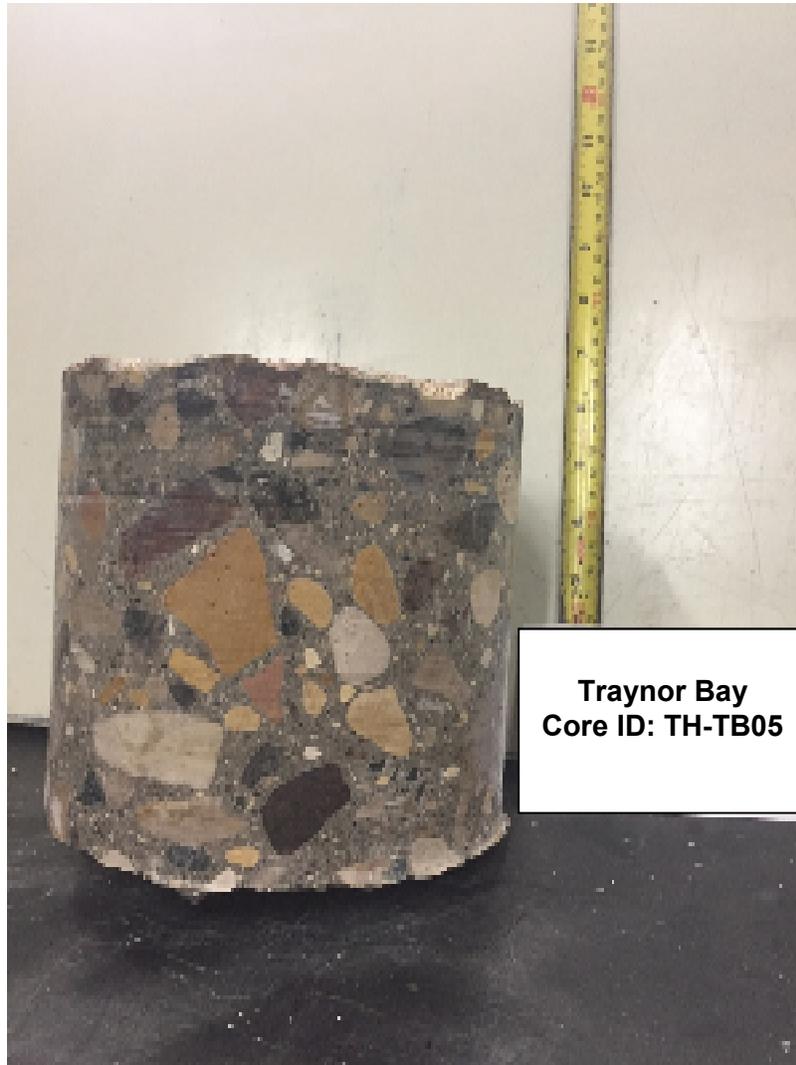
Figure: D54



**Traynor Bay
Core ID: TH-TB04**

CORE #TH-TB04

| | | | | |
|---|--|-------------------------------|-----------------------------|--------------------|
| <p>Wood Environment and Infrastructure Solutions</p> | <p>CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE TH-TB04 TRAYNOR BAY WINNIPEG, MANITOBA</p> | | | |
| <p>Drawn: CM</p> | <p>Scale: N/A</p> | <p>Date: 14 February 2019</p> | <p>Project No.: WX18716</p> | <p>Figure: D55</p> |



**Traynor Bay
Core ID: TH-TB05**

CORE #TH-TB05

**Wood Environment and Infrastructure
Solutions**

**CORE PHOTOGRAPHS
PAVEMENT CORE SAMPLE TH-TB05
TRAYNOR BAY
WINNIPEG, MANITOBA**

Drawn: CM

Scale: N/A

Date: 14 February 2019

Project No.: WX18716

Figure: D56