

APPENDIX 'A'

GEOTECHNICAL REPORT



wood.

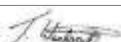
Geotechnical Investigation

City of Winnipeg Street Investigation

Winnipeg, Manitoba

WX19432

28 September 2021

 Environment & Infrastructure Solutions 440 Dovercourt Drive, Winnipeg Manitoba, Canada R3Y 1N4 Phone: (204) 488-2997 www.woodplc.com			
Geotechnical Investigation City of Winnipeg Street Investigation Wood Project Number - WX19432			
Prepared for:	Morrison Hershfield Suite 1 – 59 Scurfield Boulevard Winnipeg, Manitoba R3Y 1V2		
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Report Distribution:			
Morrison Hershfield:	Ron Bruce, P.Eng.		
Third Party:			
Report Classification:	Confidential		
	Name	Job Title	Signature
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Reviewed by:	Brad Wiebe., P.Eng.	Senior Associate Geotechnical Engineer	
Project Manager:	Jorden Wiwcharyk, P.Eng.	Geotechnical Engineer	
Other Technical Contributors			
Rev.	Date	Revision Notes	
0	28 Sept 2021	Issued Final to Client	
Permit Stamp		Engineer Seal	
			



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~~Appendix A~~

~~Mountain Avenue~~

Appendix B

McGregor South

Appendix C

McGregor North



1.0 Introduction

At the authorization of Mr. Ron Bruce, P. Eng., of Morrison Hershfield, 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 twenty-five (25) 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	Location	Number of Cores	Number of Test Holes	Test Hole Numbers
Mountain Avenue	Arlington Street to McPhillips Street	12	12	Mountain – TH01 to Mountain - TH12
McGregor Street (South)	Mountain Avenue to Church Avenue	6	6	MS1 – MS6
McGregor Street (North)	McAdam Avenue to Seven Oaks Avenue	7	7	MN1 – MN7
	Total	25	25	

The geotechnical investigation was completed in accordance with the Scope of Work and Terms and Conditions outlined in Wood Proposal No. WPG2021.462Rev01, dated 30 June 2021.

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. Additionally, Wood utilized the services of ATS Traffic to provide traffic control during drilling. All drilling was completed without incident,

Between 4 and 30 August 2021, Wood supervised the drilling and coring of twenty-five test holes along Mountain Avenue and McGregor Street. The test hole locations are illustrated in Figures A1, B1 and C1. All locations were cored using a 150 mm diameter core barrel, while test hole drilling was conducted using a truck mounted Mobile B40LX or Geoprobe drill rig equipped with 125 mm solid stem augers, owned and operated by Maple Leaf Drilling of Springfield, Manitoba. Coring and test hole locations were initially selected by Morrison Hershfield, however underground utilities required some adjustments to the original test hole locations.

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 ASTM D3282 and ASTM D2487, as well as noted observed seepage and/or sloughing conditions where present. 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. The core photos and underlying pavement structure information are provided in Appendices A, B and C for Mountain Avenue, McGregor South and McGregor North, respectively.

During drilling, Wood field personnel visually classified the soil stratigraphy within the test holes in accordance with ASTM D2487 – *Standard Practice for Classification of Soils for Engineering Purposes* and recorded observed seepage and/or sloughing conditions. Soil sampling consisted of grab samples of the auger cuttings at all test hole locations at depths of about 0.6 m, 0.9 m, 1.2 m, 1.6 m, 2.0 m, and 2.5 m. Test holes were advanced to a depth of about 3.0 m below the pavement surface. The in-situ relative consistency of cohesive soil (i.e. clay) was evaluated during drilling using a pocket penetrometer.

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 on all samples, as well as Atterberg limits, particle size distributions (hydrometer method), Standard Proctor Testing and California Bearing Ratio (CBR) evaluations on selected samples of the anticipated subgrade soils at approximate depths between 0.6 and 1.2 m below the pavement structure. It should be noted that all the above testing has been completed with the exception of CBR testing, which is currently underway. Laboratory testing results and detailed test hole logs summarizing the sampling, field testing, laboratory test results, and subsurface conditions encountered at the test hole locations are presented in Appendices A, B and C for Mountain Avenue, McGregor South and McGregor North, respectively. CBR results will be issued under separate cover as they become available. 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.

3.0 Pavement Summary

The following sections provide summaries of the pavement structure encountered at each test hole location. Details of the soil structure underlying the pavements observed at each test hole can be found on the test hole logs found in Appendices A, B and C, while laboratory testing result summaries are also provided in Appendices A, B and C.

3.1 Mountain Avenue

Table 3-1 provides a summary of the pavement type and thickness encountered at each of the test locations on Mountain Avenue.

Table 3-1: Mountain Avenue Pavement Summary

Test Hole Number	Street Location	Asphalt Thickness (mm)	Concrete Thickness (mm)
Mountain – TH01	EB Median, 50m East of McPhillips	150	250
Mountain – TH02	WB Median, 1120 Mountain	175	125
Mountain – TH03	EB Curb, 1084 Mountain	85	200
Mountain – TH04	EB Curb, 1040 Mountain	50	275 (rubble)
Mountain – TH05	EB Median, 1006 Mountain	115	165 (rubble)
Mountain – TH06	EB Median, 972 Mountain	50	175
Mountain – TH07	WB Median, 958 Mountain	200	150
Mountain – TH08	WB Median, 902 Mountain	200	300
Mountain – TH09	WB Median, 862 Mountain	150	200
Mountain – TH10	WB Median, 834 Mountain	175	325
Mountain – TH11	EB Median, 794 Mountain	100	275

Mountain – TH12	WB Median, 772 Mountain	100	200
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3.2 McGregor Street (South)

Table 3 provides a summary of the pavement type and thickness encountered at each of the test hole locations on McGregor Avenue (South).

Table 3-2: McGregor (South) Pavement Summary

Test Hole Number	Street Location	Asphalt Thickness (mm)	Concrete Thickness (mm)
MS1	NB Median, 394 McGregor	100	100
MS2	NB Median, 410 McGregor	50	175
MS3	NB Median, 416 McGregor	100	175
MS4	SB Median, 442 McGregor	175	125
MS5	SB Median, 453 McGregor	150	150
MS6	SB Median, 463 McGregor	140	160

3.3 McGregor Street (North)

Table 3-3 provides a summary of the pavement type and thickness encountered at each of the test hole locations on McGregor Avenue (North).

Table 3-3: McGregor (North) Pavement Summary

Test Hole Number	Street Location	Asphalt Thickness (mm)	Concrete Thickness (mm)
MN1	NB Curb, 682 McGregor	165	225
MN2	SB Curb, 692 McGregor	90	215
MN3	NB Curb, 696 McGregor	90	135 (rubble)
MN4	SB Curb, 3m North of Rupertsland	60	215
MN5	SB Median, 20m South of Enniskillen	90	200 (rubble)
MN6	NB Curb, 20m North of Enniskillen	120	205
MN7	SB Curb, 5m South of Enniskillen	90	225

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 requirements provided by Morrison Hershfield.

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**

Appendix B

McGregor South

- Test Hole Location Plan
- Core Photos
- Test Hole Logs
- Laboratory Summary



LEGEND:

TEST HOLE	
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REVISION	BY	DATE
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CLIENT:

CITY OF WINNIPEG

wood.

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

DWN BY:	MD
CHKD BY:	JW
DATUM:	---
PROJECTION:	---
SCALE:	AS SHOWN

GEOTECHNICAL INVESTIGATION
McGREGOR STREET
(MOUNTAIN AVENUE TO CHURCH AVENUE)
WINNIPEG, MANITOBA

TEST HOLE LOCATION PLAN

DATE:	AUGUST 2021
PROJECT NO:	WX19432
REV. NO.:	A
FIGURE NO:	FIGURE B1



Asphalt Thickness (mm)	100
Concrete Thickness (mm)	100



Asphalt Thickness (mm)	50
Concrete Thickness (mm)	175



Asphalt Thickness (mm)	100
Concrete Thickness (mm)	175



Asphalt Thickness (mm)	175
Concrete Thickness (mm)	125



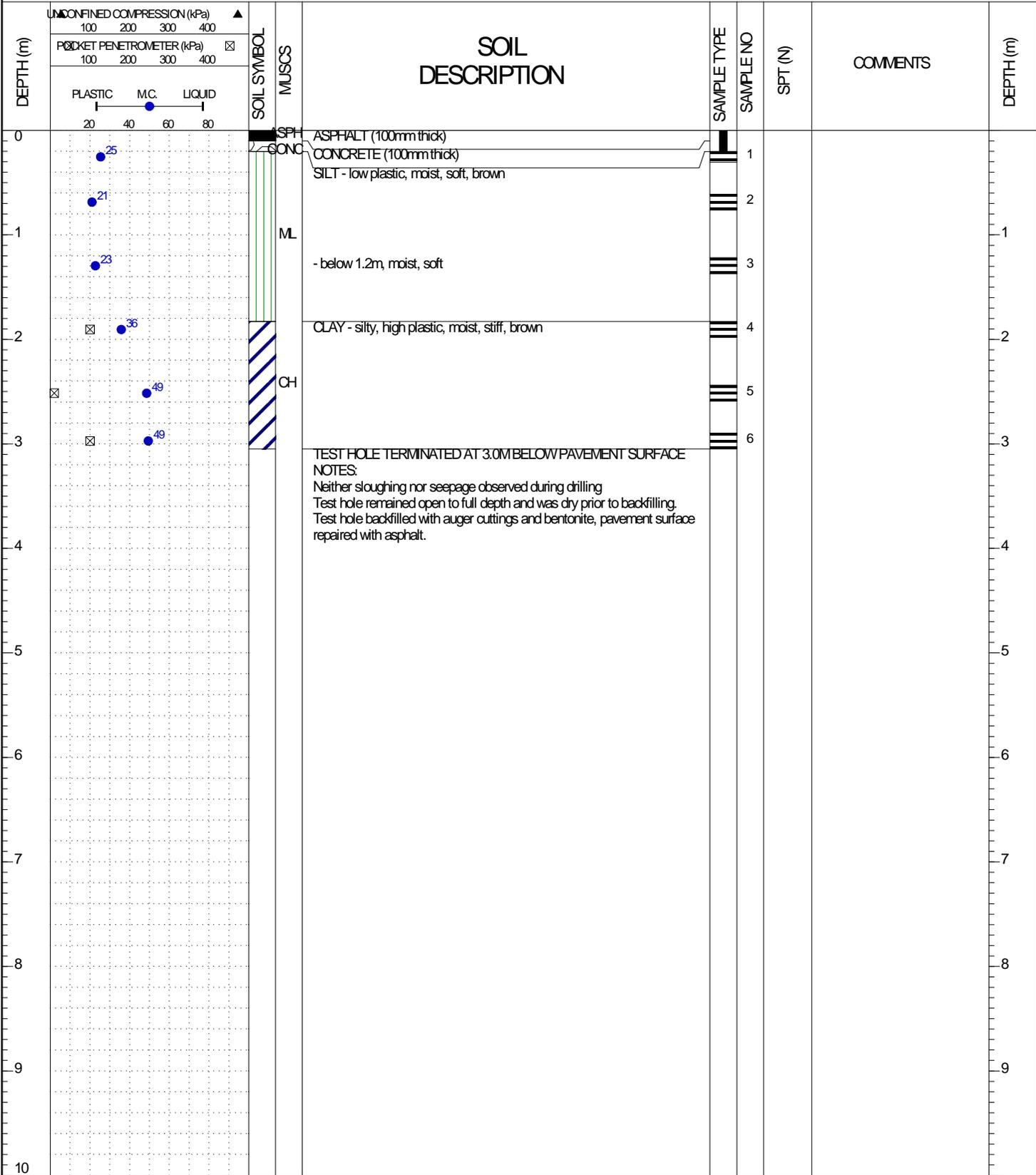
Asphalt Thickness (mm)	150
Concrete Thickness (mm)	150



Asphalt Thickness (mm)	140
Concrete Thickness (mm)	160

PROJECT: City of Winnipeg 2021 Streets Investigation	DRILLER: Maple Leaf Drilling	TEST HOLE ID: MS-1
CLIENT: Morrison Hershfield	DRILL RIG: Mobile B40	PROJECT No: WX19432
LOCATION: NB Median, 394 McGregor	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION: Not Surveyed

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WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:10 AM (WPG - GEOTECH LOG 1 (LABELLED MC))



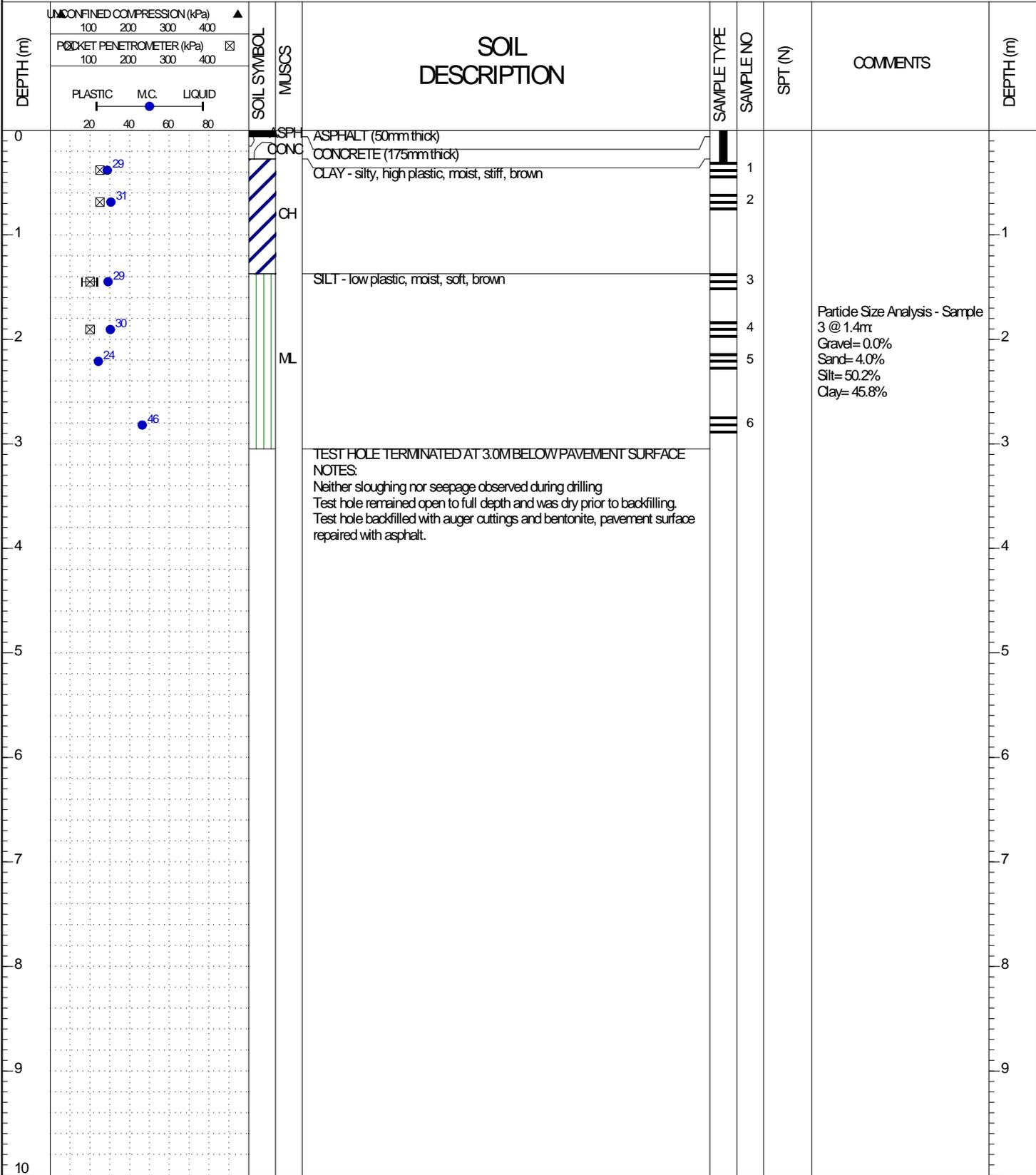
Wood Environment & Infrastructure Solutions
a division of Wood Canada Limited

LOGGED BY: JW
REVIEWED BY: BW
Figure No. B8

COMPLETION DEPTH: 3m
COMPLETION DATE: August 19, 2021
Sheet 1 of 1

PROJECT: City of Winnipeg 2021 Streets Investigation	DRILLER: Maple Leaf Drilling	TEST HOLE ID: MS-2
CLIENT: Morrison Hershfield	DRILL RIG: Mobile B40	PROJECT No: WX19432
LOCATION: NB median, 410 McGregor	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION: Not Surveyed

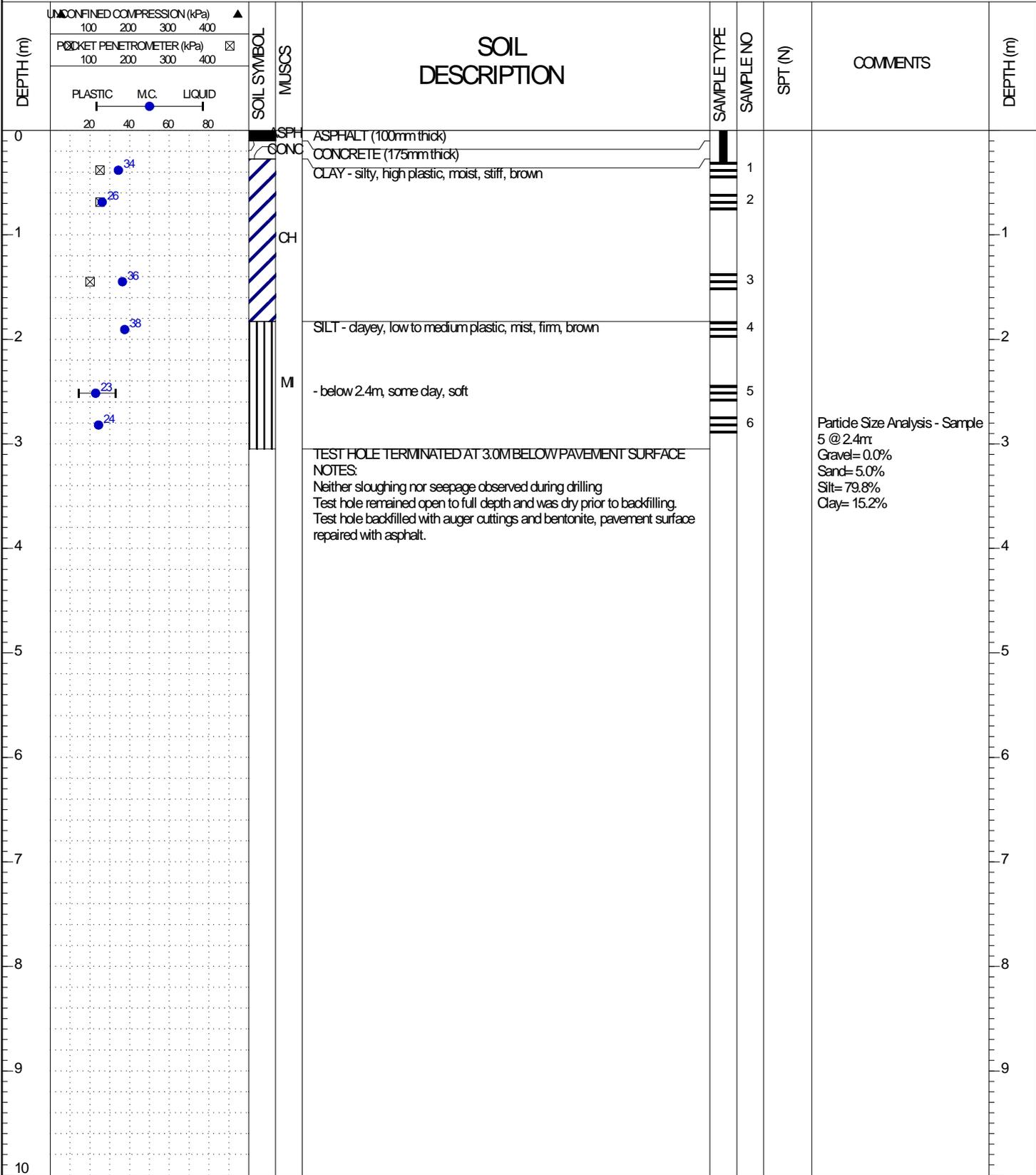
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BACKFILL TYPE	<input checked="" type="checkbox"/> Bentonite	<input type="checkbox"/> Pea Gravel	<input type="checkbox"/> Drill Cuttings	<input type="checkbox"/> Grout	<input type="checkbox"/> Slough	<input type="checkbox"/> Sand



WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:10 AM (WPG - GEOTECH LOG 1 (LABELLED MC))

PROJECT: City of Winnipeg 2021 Streets Investigation	DRILLER: Maple Leaf Drilling	TEST HOLE ID: MS-3
CLIENT: Morrison Hershfield	DRILL RIG: Mobile B40	PROJECT No: WX19432
LOCATION: NB Median, 416 McGregor	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION: Not Surveyed

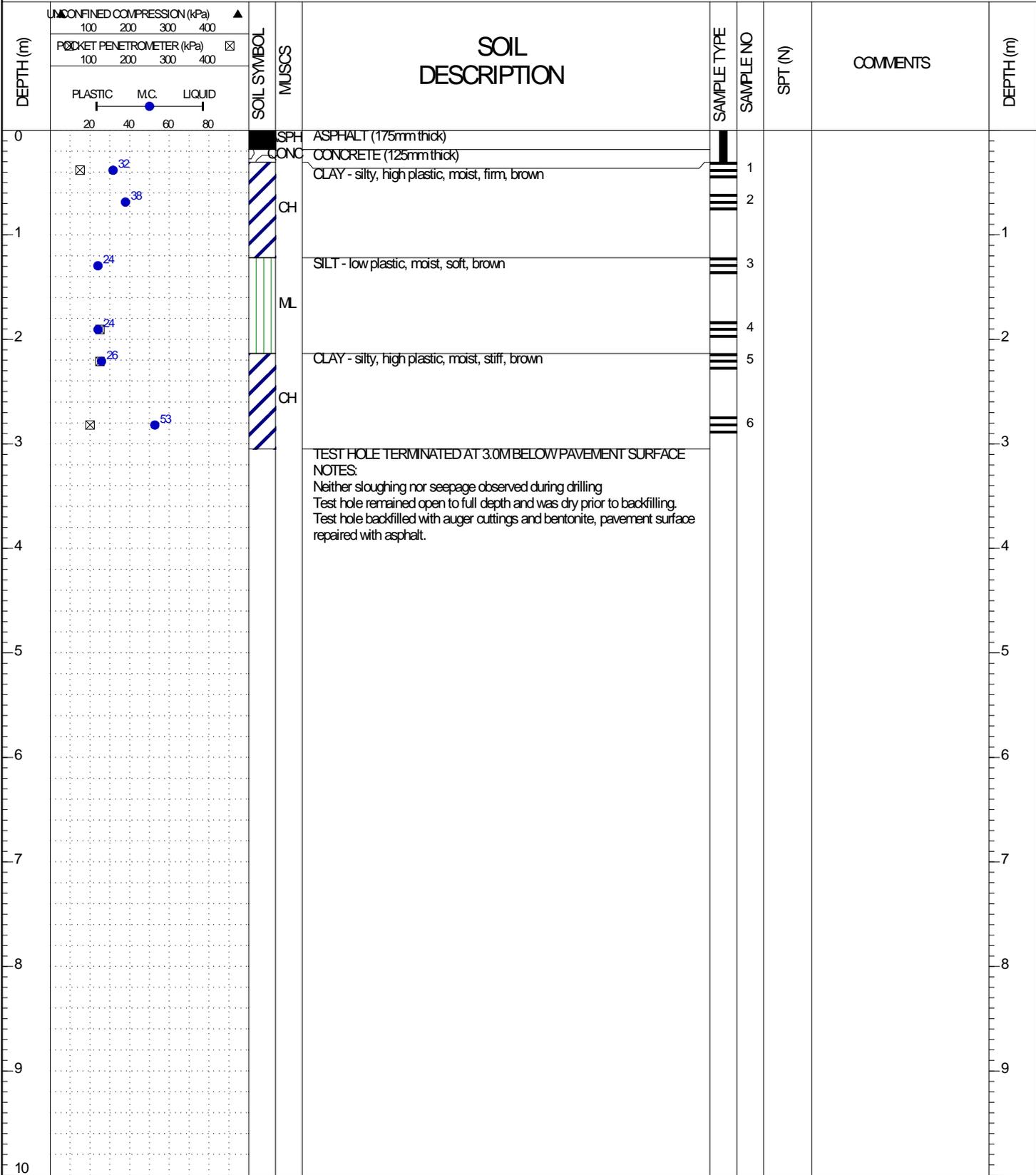
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WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:10 AM (WPG - GEOTECH LOG 1 (LABELLED MC))

PROJECT: City of Winnipeg 2021 Streets Investigation	DRILLER: Maple Leaf Drilling	TEST HOLE ID: MS-4
CLIENT: Morrison Hershfield	DRILL RIG: Mobile B40	PROJECT No: WX19432
LOCATION: SB Median, 442 McGregor	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION: Not Surveyed

SAMPLE TYPE	<input checked="" type="checkbox"/> Shelby Tube	<input type="checkbox"/> No Recovery	<input checked="" type="checkbox"/> SPT (N)	<input 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



WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:10 AM (WPG - GEOTECH LOG 1 (LABELLED MC))



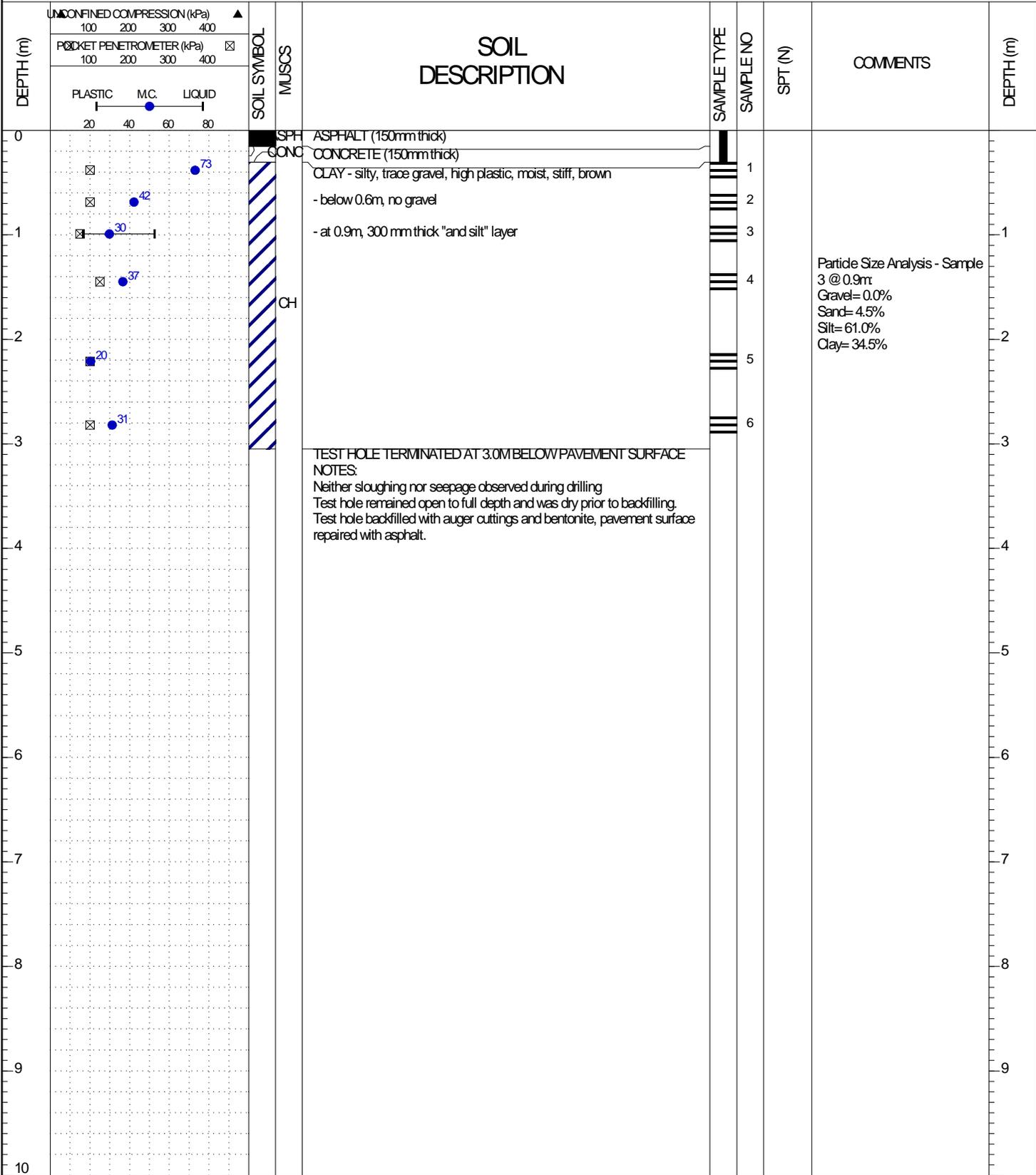
Wood Environment & Infrastructure Solutions
a division of Wood Canada Limited

LOGGED BY: JW
REVIEWED BY: BW
Figure No. B11

COMPLETION DEPTH: 3m
COMPLETION DATE: August 19, 2021
Sheet 1 of 1

PROJECT: City of Winnipeg 2021 Streets Investigation	DRILLER: Maple Leaf Drilling	TEST HOLE ID: MS-5
CLIENT: Morrison Hershfield	DRILL RIG: Mobile B40	PROJECT No: WX19432
LOCATION: SB Median, 453 McGregor	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION: Not Surveyed

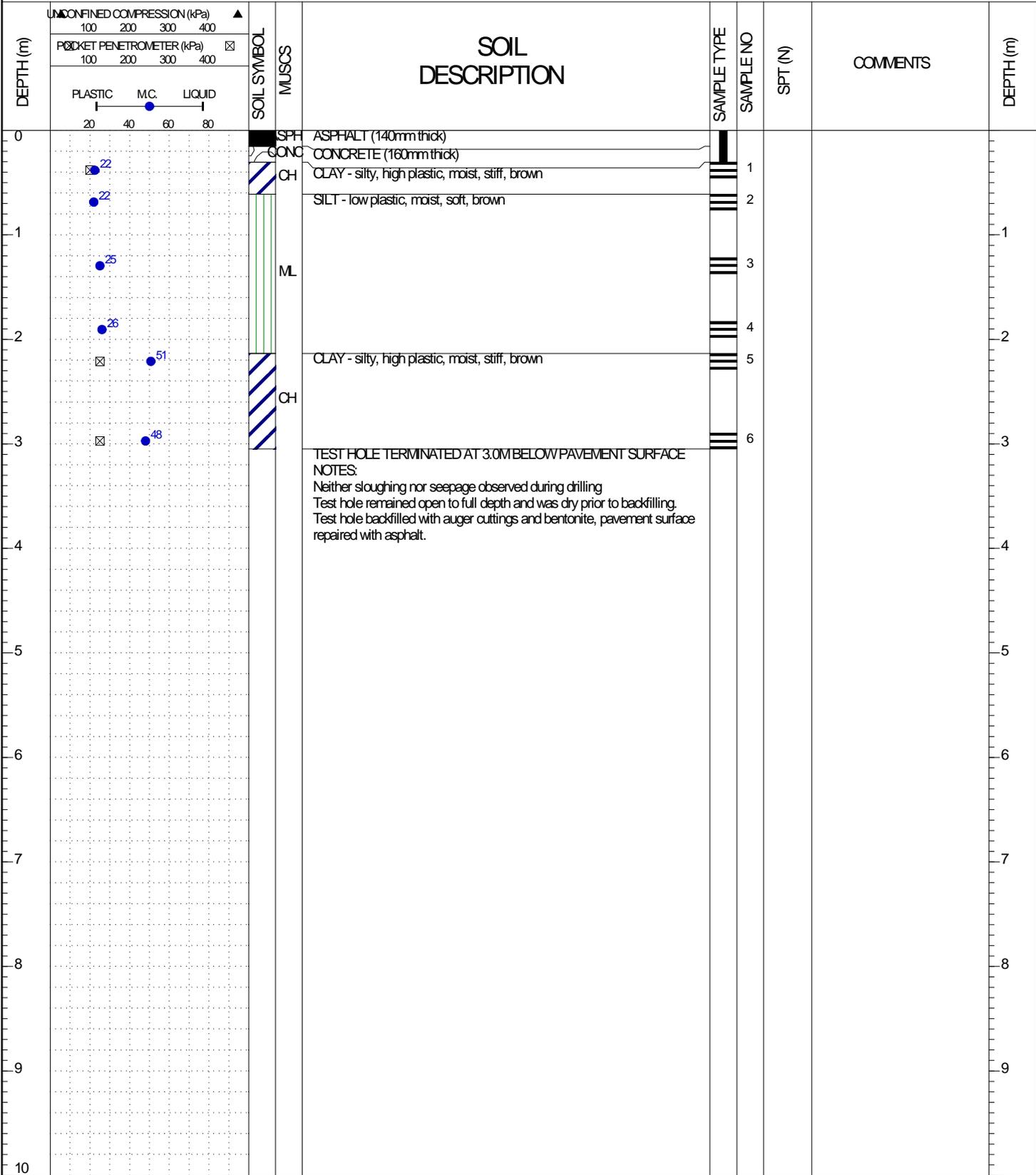
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BACKFILL TYPE	<input checked="" type="checkbox"/> Bentonite	<input type="checkbox"/> Pea Gravel	<input type="checkbox"/> Drill Cuttings	<input type="checkbox"/> Grout	<input type="checkbox"/> Slough	<input type="checkbox"/> Sand



WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:10 AM (WPG - GEOTECH LOG 1 (LABELLED MC))

PROJECT: City of Winnipeg 2021 Streets Investigation	DRILLER: Maple Leaf Drilling	TEST HOLE ID: MS-6
CLIENT: Morrison Hershfield	DRILL RIG: Mobile B40	PROJECT No: WX19432
LOCATION: SB Median, 463 McGregor	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION: Not Surveyed

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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



WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:10 AM (WPG - GEOTECH LOG 1 (LABELLED MC))

PARTICLE SIZE ANALYSIS



Report Date: 28 September 2021

Client

Name: Morrison Hershfield

Address:

Attention:

PO Number:

Project

Name: City of Winnipeg 2021 Streets Investigation

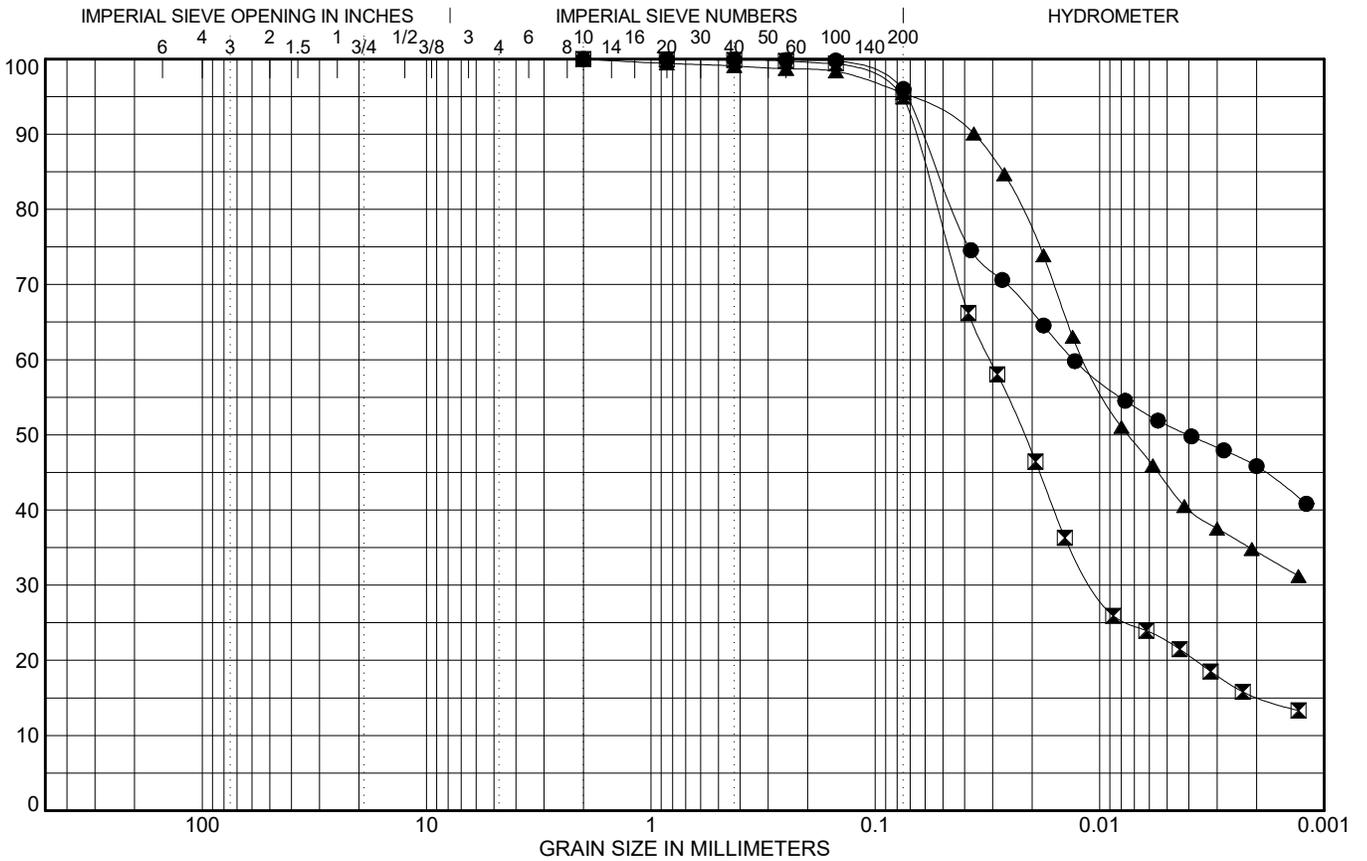
Address: Mountain Avenue / McGregor Street

Project No.: WX19432

Manager: JW

Gradation Specification:

WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:23 AM (WOOD - PSA MULTI RESULT WITH ATTERBERG)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	mUSCS	MC	D100	D60	D30	D10	LL	PL	% Gravel	% Sand	% Fines
● MS-2, 1.4 m	CL-ML	29.1	2	0			24	16	0	4	50 (Silt) : 46 (Clay)
☒ MS-3, 2.4 m	CL-ML	22.8	2	0	0		33	14	0	5	80 (Silt) : 15 (Clay)
▲ MS-5, 0.9 m	CH	29.8	2	0			52	16	0	5	61 (Silt) : 34 (Clay)

Appendix C

McGregor North

- Test Hole Location Plan
- Core Photos
- Test Hole Logs
- Laboratory Summary



LEGEND:	
TEST HOLE	

REVISION	BY	DATE
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CLIENT:

CITY OF WINNIPEG

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

DWN BY:	MD
CHK'D BY:	JW
DATUM:	---
PROJECTION:	---
SCALE:	AS SHOWN

GEOTECHNICAL INVESTIGATION
McGREGOR STREET
(McADAM AVENUE TO SEVEN OAKS AVENUE)
WINNIPEG, MANITOBA

TEST HOLE LOCATION PLAN

DATE:	SEPTEMBER 2021
PROJECT NO:	WX19432
REV. NO.:	A
FIGURE NO:	FIGURE C1



Asphalt Thickness (mm)	165
Concrete Thickness (mm)	225



Asphalt Thickness (mm)	90
Concrete Thickness (mm)	215



Asphalt Thickness (mm)	90
Concrete Thickness (mm)	135



Asphalt Thickness (mm)	60
Concrete Thickness (mm)	215



Asphalt Thickness (mm)	90
Concrete Thickness (mm)	200 (rubble only)



Asphalt Thickness (mm)	120
Concrete Thickness (mm)	205

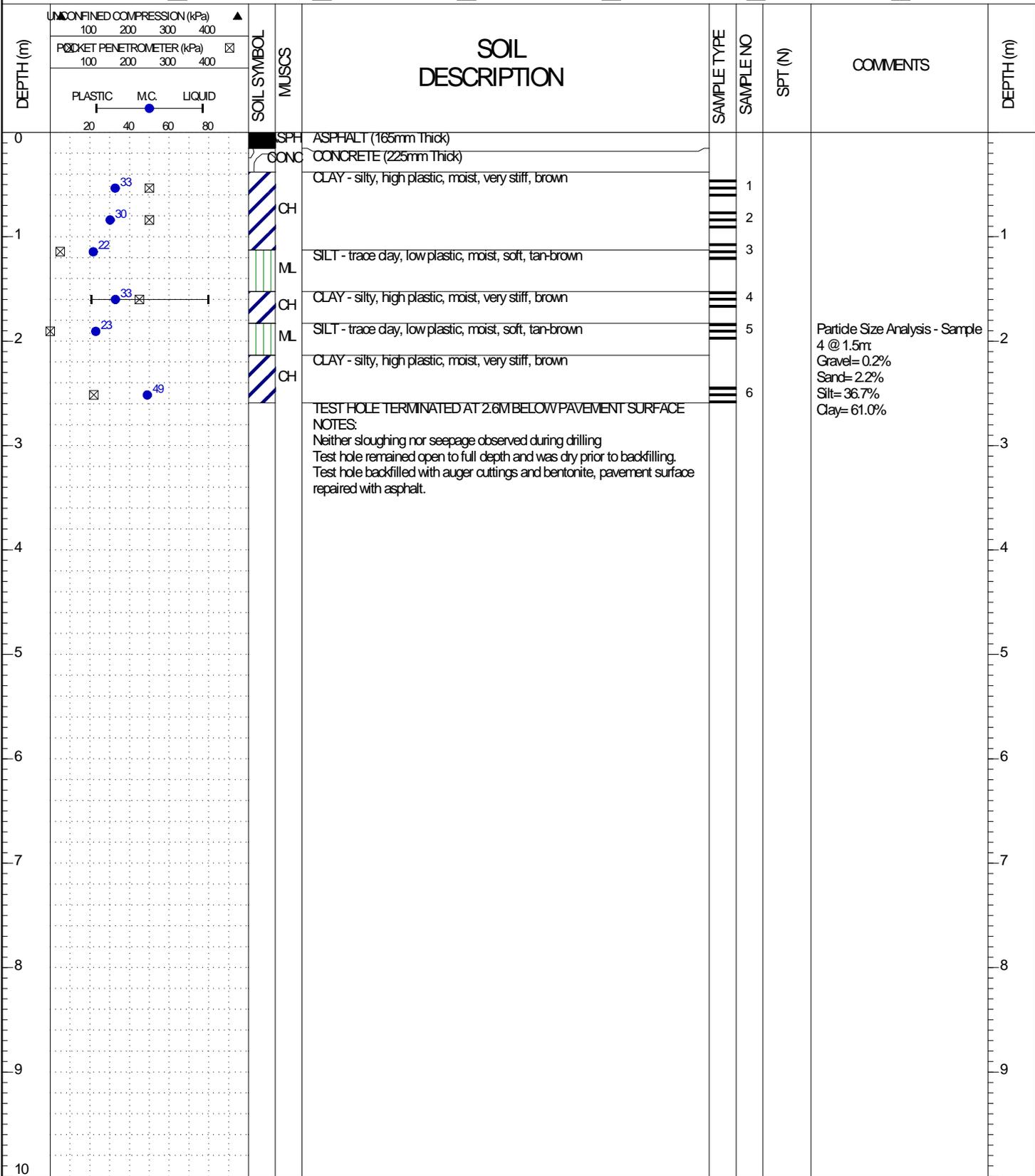


Asphalt Thickness (mm)	90
Concrete Thickness (mm)	225

PROJECT: City of Winnipeg 2021 Streets Investigation	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: MN1
CLIENT: Morrison Hershfield	DRILL RIG: Mobile B40	PROJECT No: WX19432
LOCATION: NB Curb, 682 McGregor	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

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
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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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WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:10 AM (WPG - GEOTECH LOG 1 (LABELLED MC))



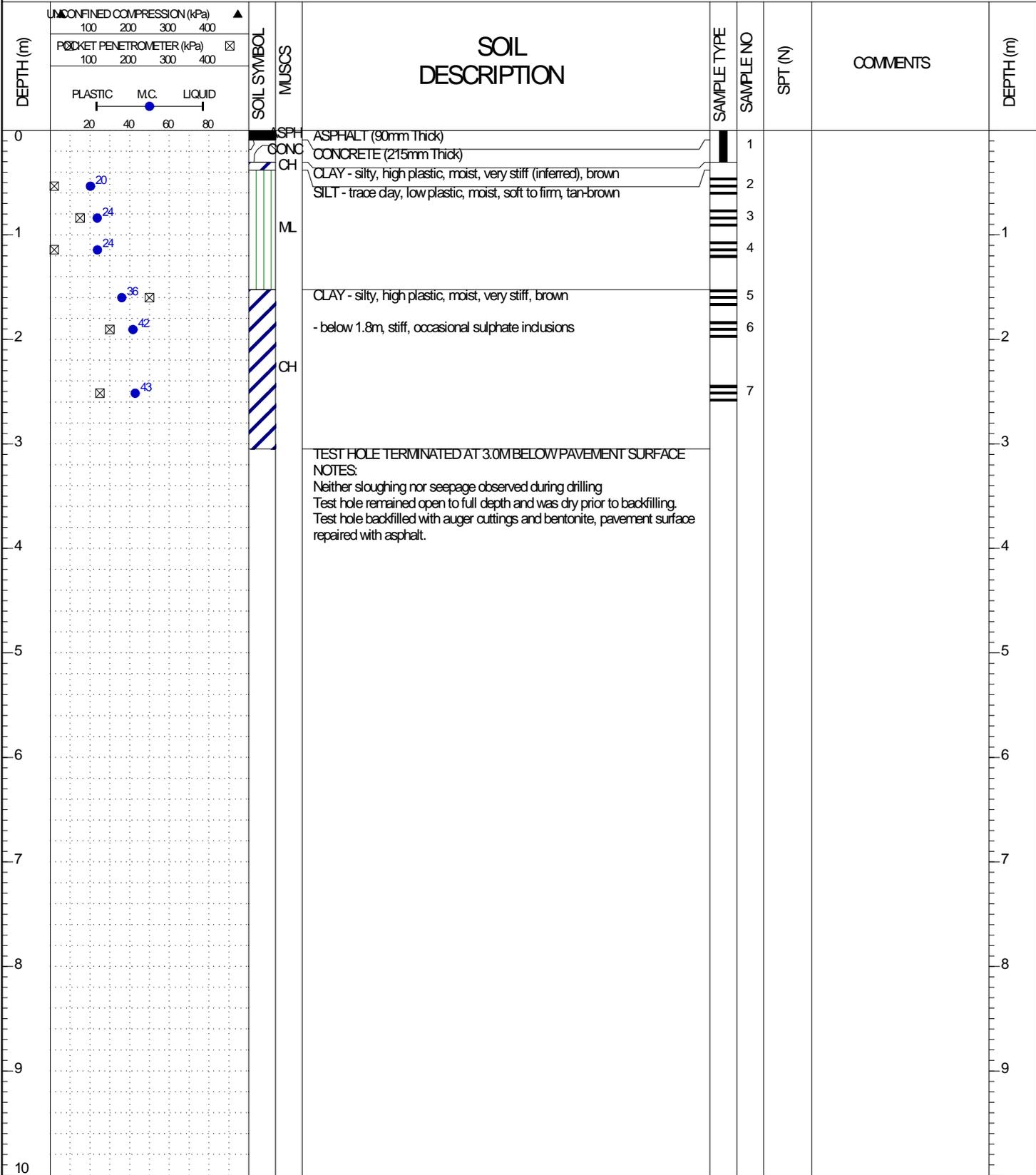
Wood Environment & Infrastructure Solutions
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LOGGED BY: RB
REVIEWED BY: JW
Figure No. C9

COMPLETION DEPTH: 2.6m
COMPLETION DATE: August 30, 2021
Sheet 1 of 1

PROJECT: City of Winnipeg 2021 Streets Investigation	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: MN2
CLIENT: Morrison Hershfield	DRILL RIG: Mobile B40	PROJECT No: WX19432
LOCATION: SB Curb, 692 McGregor	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

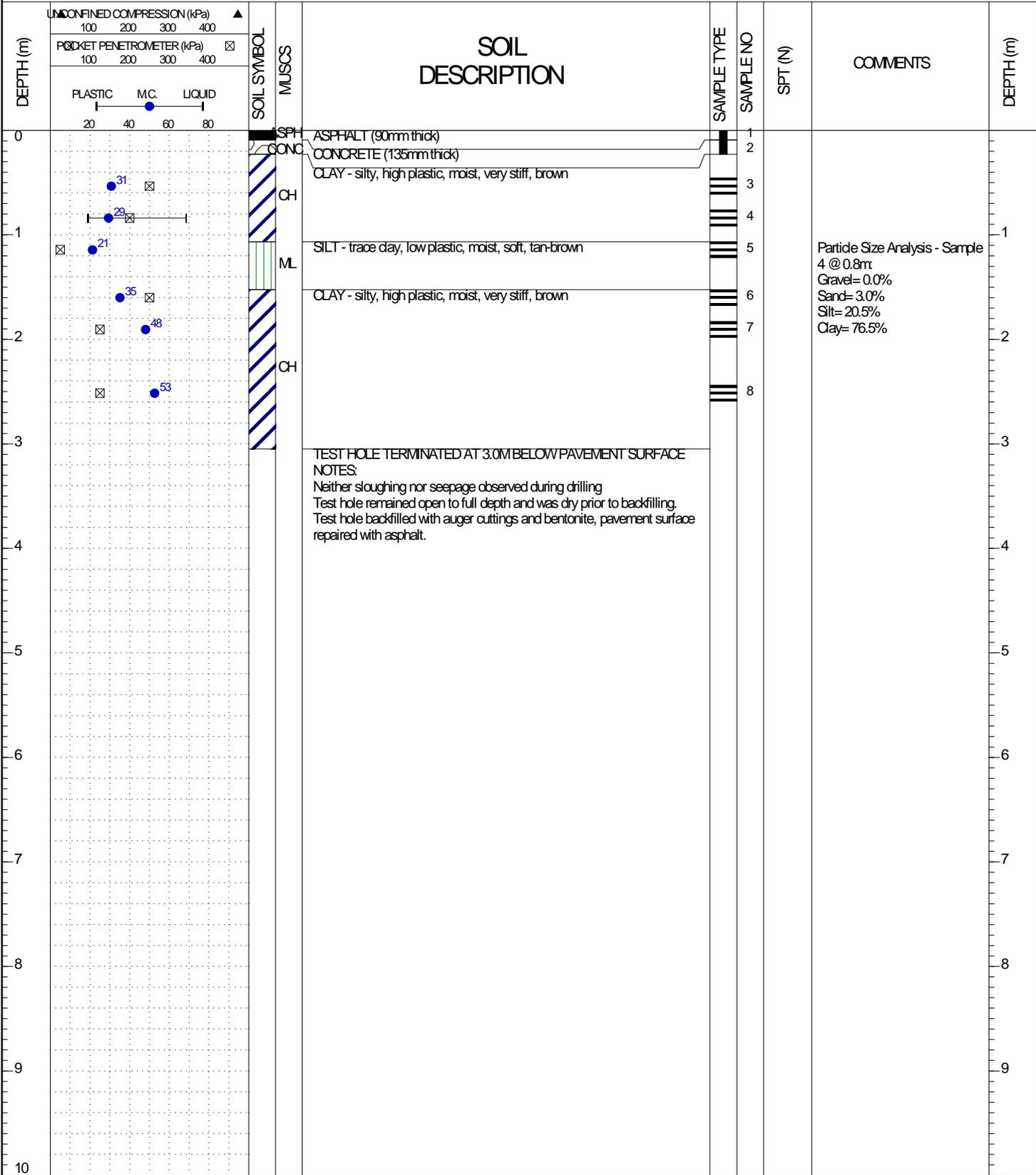
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WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:10 AM (WPG - GEOTECH LOG 1 (LABELLED MC))

PROJECT: City of Winnipeg 2021 Streets Investigation	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: MN3
CLIENT: Morrison Hershfield	DRILL RIG: Mobile B40	PROJECT No: WX19432
LOCATION: NB Curb, 696 McGregor	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

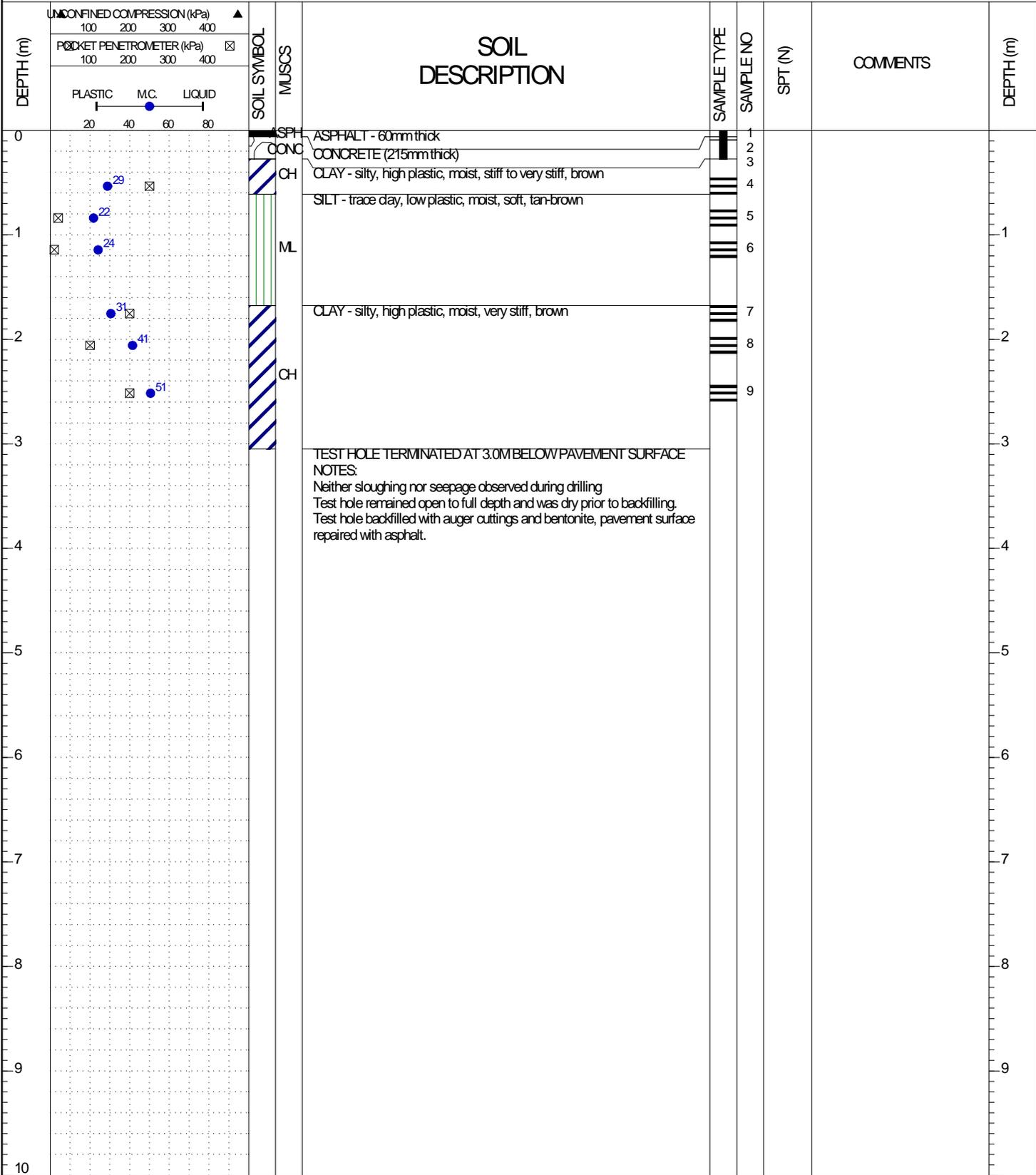
SAMPLE TYPE	<input checked="" type="checkbox"/> Shelby Tube	<input type="checkbox"/> No Recovery	<input checked="" type="checkbox"/> SPT (N)	<input checked="" type="checkbox"/> Grab Sample	<input type="checkbox"/> Split-Pen	<input type="checkbox"/> Core
BACKFILL TYPE	<input checked="" type="checkbox"/>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



WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:10 AM (WPG - GEOTECH LOG 1 (LABELLED MC))

PROJECT: City of Winnipeg 2021 Streets Investigation	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: MN4
CLIENT: Morrison Hershfield	DRILL RIG: Mobile B40	PROJECT No: WX19432
LOCATION: SB Curb, 3m North of Rupertsland	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

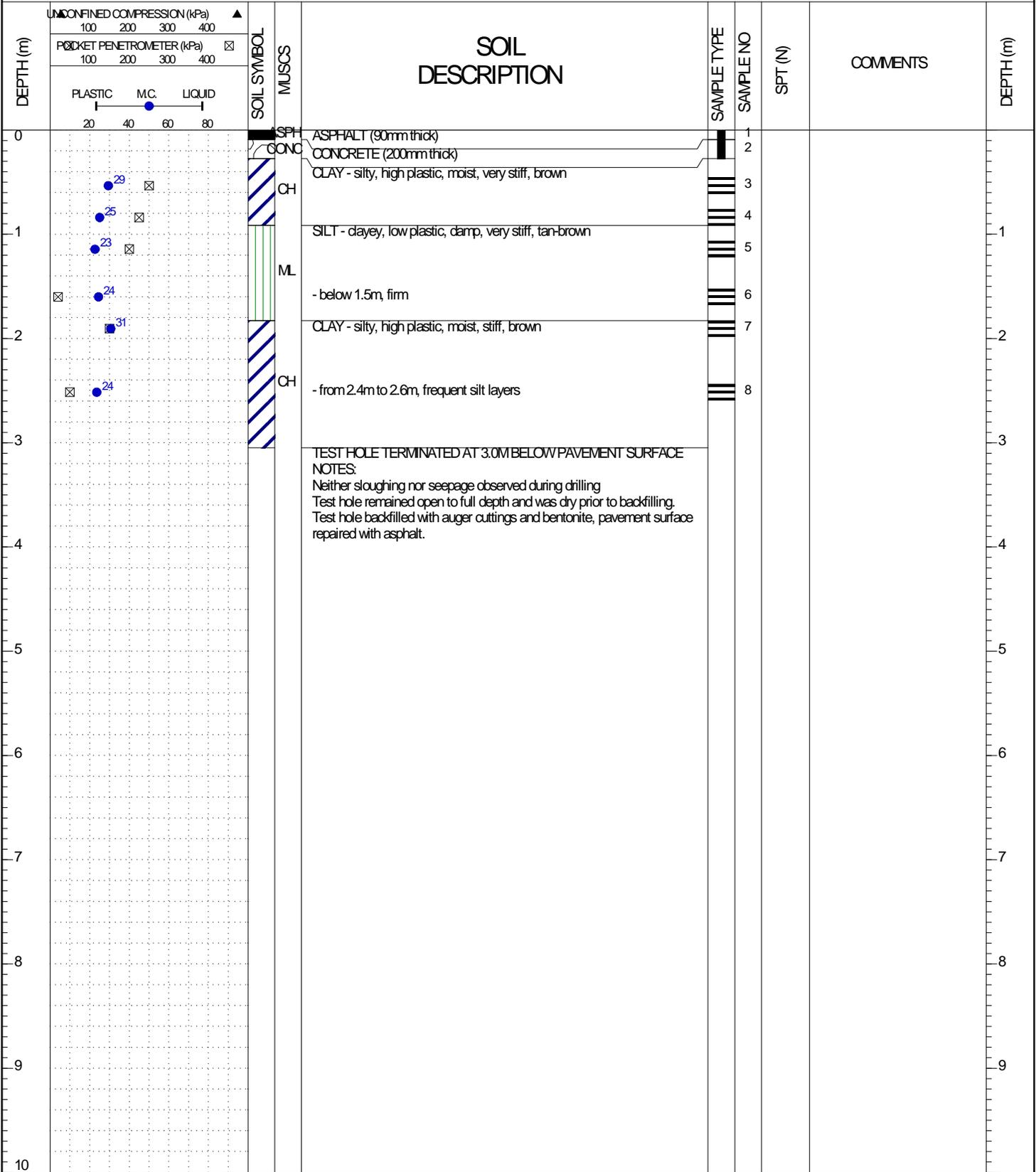
SAMPLE TYPE	<input checked="" type="checkbox"/> Shelby Tube	<input type="checkbox"/> No Recovery	<input checked="" type="checkbox"/> SPT (N)	<input type="checkbox"/> Grab Sample	<input type="checkbox"/> Split-Pen	<input type="checkbox"/> Core
BACKFILL TYPE	<input checked="" type="checkbox"/> Bentonite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



WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:10 AM (WPG - GEOTECH LOG 1 (LABELLED MC))

PROJECT: City of Winnipeg 2021 Streets Investigation	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: MN5
CLIENT: Morrison Hershfield	DRILL RIG: Mobile B40	PROJECT No: WX19432
LOCATION: SB Median, 20m South of Enniskillen	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

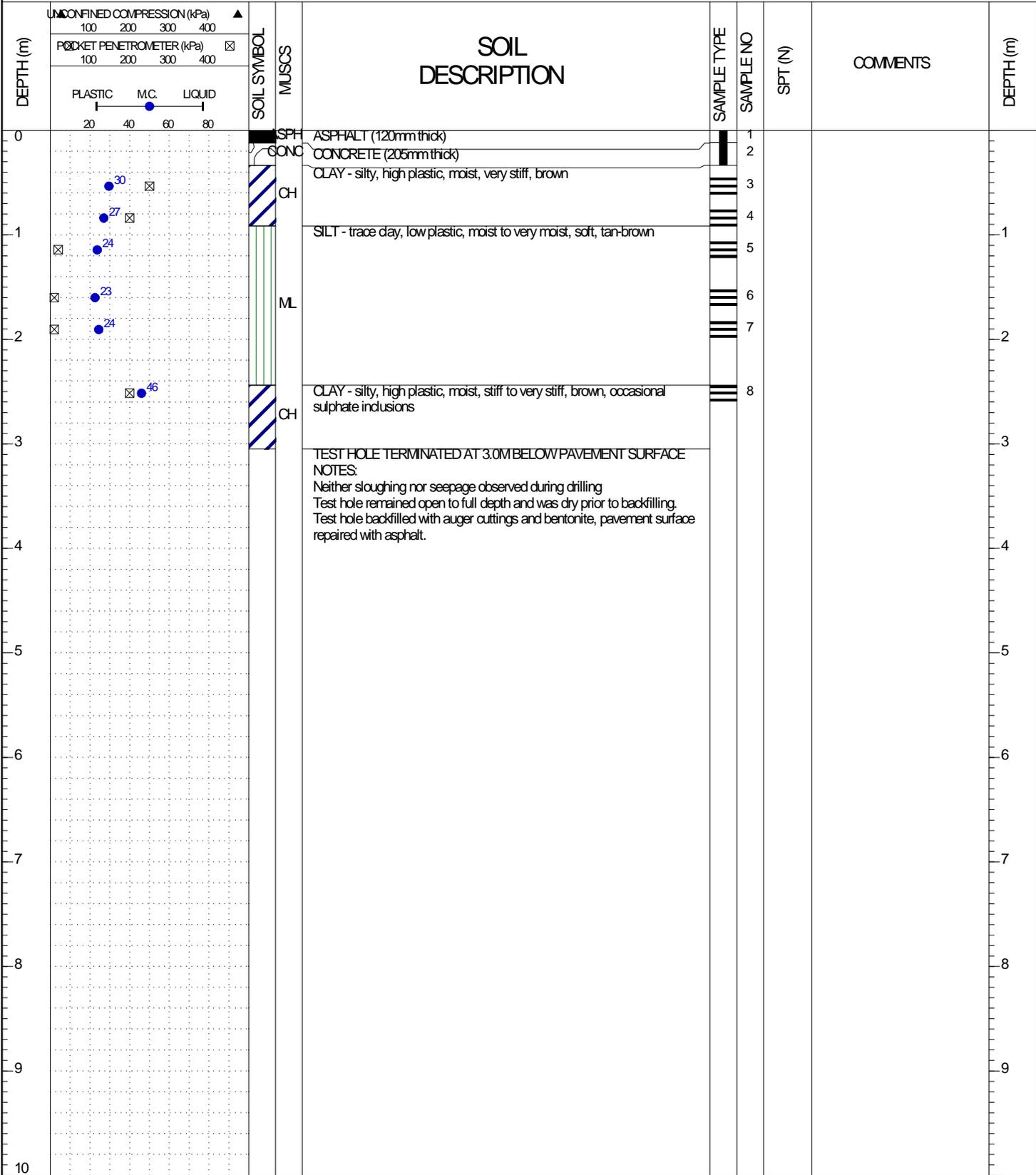
SAMPLE TYPE	<input checked="" type="checkbox"/> Shelby Tube	<input type="checkbox"/> No Recovery	<input checked="" type="checkbox"/> SPT (N)	<input type="checkbox"/> Grab Sample	<input type="checkbox"/> Split-Pen	<input type="checkbox"/> Core
BACKFILL TYPE	<input checked="" type="checkbox"/> Bentonite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



WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:10 AM (WPG - GEOTECH LOG 1 (LABELLED MC))

PROJECT: City of Winnipeg 2021 Streets Investigation	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: MN6
CLIENT: Morrison Hershfield	DRILL RIG: Mobile B40	PROJECT No: WX19432
LOCATION: NB Curb, 20m North of Enniskillen	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

SAMPLE TYPE	<input checked="" type="checkbox"/> Shelby Tube	<input type="checkbox"/> No Recovery	<input checked="" type="checkbox"/> SPT (N)	<input 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



WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:10 AM (WPG - GEOTECH LOG 1 (LABELLED MC))



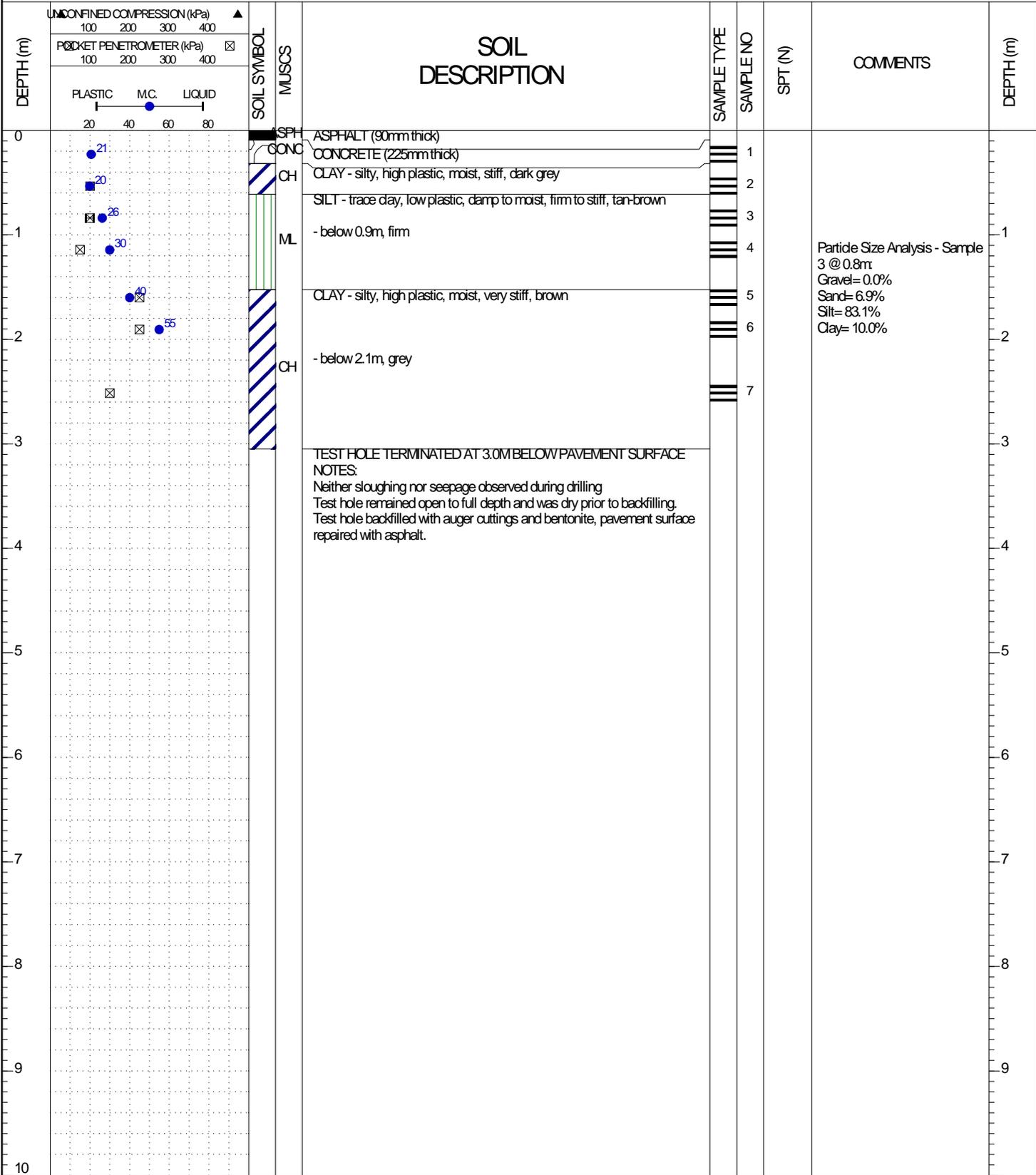
Wood Environment & Infrastructure Solutions
a division of Wood Canada Limited

LOGGED BY: RB
REVIEWED BY: JW
Figure No. C14

COMPLETION DEPTH: 3m
COMPLETION DATE: August 30, 2021
Sheet 1 of 1

PROJECT: City of Winnipeg 2021 Streets Investigation	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: MN7
CLIENT: Morrison Hershfield	DRILL RIG: Mobile B40	PROJECT No: WX19432
LOCATION: SB Curb, 5m South of Enniskilen	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

SAMPLE TYPE	<input checked="" type="checkbox"/> Shelby Tube	<input type="checkbox"/> No Recovery	<input type="checkbox"/> SPT (N)	<input 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 type="checkbox"/> Drill Cuttings	<input type="checkbox"/> Grout	<input type="checkbox"/> Slough	<input type="checkbox"/> Sand



WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:10 AM (WPG - GEOTECH LOG 1 (LABELLED MC))



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LOGGED BY: RB	COMPLETION DEPTH: 3m
REVIEWED BY: JW	COMPLETION DATE: August 30, 2021
Figure No. C15	Sheet 1 of 1

PARTICLE SIZE ANALYSIS



Report Date: 28 September 2021

Client

Name: Morrison Hershfield

Address:

Attention:

PO Number:

Project

Name: City of Winnipeg 2021 Streets Investigation

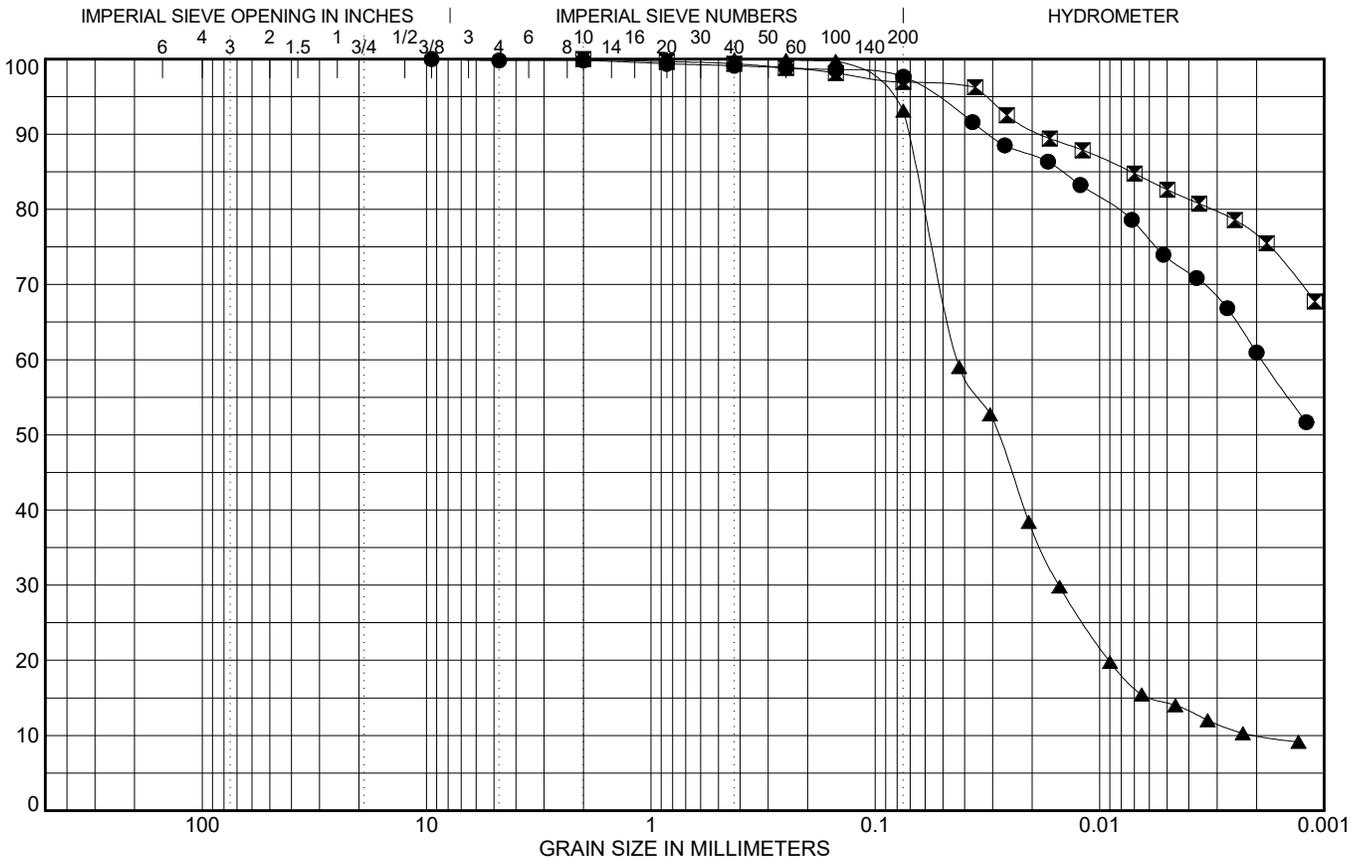
Address: Mountain Avenue / McGregor Street

Project No.: WX19432

Manager: JW

Gradation Specification:

WX19432 MORRISON HERSHFIELD - CITY OF WINNIPEG STREETS INVESTIGATION 2021.GPJ 21/09/28 08:14 AM (WOOD - PSA MULTI RESULT WITH ATTERBERG)



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Sample ID	mUSCS	MC	D100	D60	D30	D10	LL	PL	% Gravel	% Sand	% Fines
● MN1, 1.5 m	CH	32.9	9.5	0			80	21	0	2	37 (Silt) : 61 (Clay)
☒ MN3, 0.8 m	CH	29.3	2				69	19	0	3	20 (Silt) : 76 (Clay)
▲ MN7, 0.8 m	CL-ML	26.2	0.9	0	0	0	22	18	0	7	83 (Silt) : 10 (Clay)

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.
 Wood Environment & Infrastructure Solutions - 440 Dovercourt Drive - Winnipeg, MB - R3Y 1N4