

# **APPENDIX 'A'**

# **GEOTECHNICAL REPORT**

NO. WX19714  
2 JANUARY 2023

# FINAL GEOTECHNICAL REPORT

CITY OF WINNIPEG STREET INVESTIGATION PROGRAM  
MCPHILLIPS STREET, SALTER STREET AND SELKIRK  
AVENUE  
WINNIPEG, MANITOBA

STANTEC  
PROJECT WX19714  
JANUARY 2023

<b>REPORT INFORMATION:</b>			
Report Name:		Geotechnical Report City of Winnipeg Street Investigation – McPhillips Street, Salter Street, Selkirk Avenue WSP E&I Canada Limited – WX19714	
Prepared for:		Stantec 500-311 Portage Avenue Winnipeg, Manitoba R3B 2B9	
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Stantec:		Mark Edgar / Kevin Rae	
Third Party:			
Report Classification:			
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Rev.	Date	Revision Notes	
0	8 December 2022	Issued draft to Client	
1	2 January 2023	Issued final to Client	
Permit Stamp		Engineer Seal	
			

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January 2, 2023

Stantec  
500-311 Portage Avenue  
Winnipeg, Manitoba R3B 0R3

**Attention: Mark Edgar / Kevin Rae**

**Subject: City of Winnipeg Street Investigation Program – McPhillips, Salter, Selkirk**

Attached is our geotechnical investigation report for the Street investigation program for McPhillips Street, Salter Street and Selkirk Avenue in the City of Winnipeg, Manitoba.

We wish to inform you that, effective September 21, 2022, Wood Environment & Infrastructure Solutions Canada Limited was acquired by WSP Global Inc. Our legal entity is

**WSP E&I Canada Limited.**

Yours sincerely,

A handwritten signature in black ink, appearing to read 'J. Wiwcharyk', written in a cursive style.

Jorden Wiwcharyk, P.Eng.

Senior Geotechnical Engineer, Saskatchewan and Manitoba



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Standard Proctor and CBR Testing Results

# 1 INTRODUCTION

WSP E&I Canada Limited (WSP), was authorized by Stantec to conduct a geotechnical investigation in conjunction with the City of Winnipeg Street Investigation Program 323-2022, for McPhillips Street, Salter Street and Selkirk Avenue in Winnipeg, Manitoba.

The scope of work for the geotechnical investigation was provided in WSP’s proposal WPG2022.523. The purpose of the investigation was to core the pavement, advance geotechnical test holes, complete lab testing and provide summaries of the pavement structure and soil stratigraphy at select locations on the above referenced streets. Authorization to conduct this investigation was provided by Stantec on 28 September 2022.

# 2 PROJECT DESCRIPTION

WSP understands the above noted streets are to be evaluated for potential upcoming repair or re-construction, and investigation of the existing pavement structure and soil stratigraphy are required to facilitate that evaluation. In this regard, pavement structure cores were to be obtained from select locations along all the streets under evaluation, while test holes were also required on Salter Street and Selkirk Avenue only. Test hole locations on McPhillips Street were selected by Stantec representatives, while Salter Street and Selkirk Avenue locations were selected based on a combination of discussions between WSP and Stantec, given on-going street work at the time of the investigation, and underground utility conflicts within the streets.

Table 2-1, below, summarizes the investigation program on each street.

**Table 2-1: Investigation Program Summary**

Street Name	Investigation Limits	Core Locations		Test Hole Locations	
		Total Number	Naming Sequence	Total Number	Naming Sequence
McPhillips Street	Machray Avenue to Mountain Avenue	6	M01 to M06	0	N/A
Salter Street	Jefferson Avenue to Inkster Boulevard	9	SA01 to SA09	9	SA01 to SA09
Selkirk Avenue	Salter Street to Main Street	9	SE01 to SE09	9	SE01 to SE09



# 3 GEOTECHNICAL INVESTIGATION

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## 3.1 SITE VISIT, GROUND DISTURBANCE CHECKS AND SAFETY

WSP arranged to have the presence and location of existing underground Crown owned utilities (Manitoba Hydro, BellMTS) checked and marked in the field by Manitoba Click Before You Dig, as well as privately owned utilities (Shaw) prior to test drilling. Furthermore, City of Winnipeg sewer and water line locations were provided to WSP by Stantec.

WSP assembled a job safety package and reviewed Relevant Job Hazard Analyses (JHAs) prior to mobilization to the site. A pre-job safety meeting was conducted at the beginning of the day by WSP with site personnel to outline the scope of work, physical hazards, required personal protective equipment (PPE) and drill rig safety.

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## 3.2 SCOPE OF GEOTECHNICAL INVESTIGATION

Between 25 October and 1 December 2022, WSP supervised the coring of a total of twenty-five core hole locations distributed between the three investigated streets. While the original scope only included twenty-four core hole locations, one additional core (SE09B) was obtained on Selkirk Avenue due to the presence of construction barricades and a significant number of underground utilities at the originally planned location of test hole SE09, necessitating the coring of a new location to allow for safe test hole advancement. Between 7 November 2022 and 2 December 2022, WSP supervised the drilling of test holes at a total of eighteen of the core hole locations on Salter Street and Selkirk Avenue. All core holes were advanced to the bottom of the pavement structure, while all test holes were advanced to a depth of 3 m below the pavement structure.

Core holes were advanced using a truck mounted core drill equipped with a 150 mm diameter core barrel. Test holes were drilled using either a truck mounted drill rig (Rig Model: Mobile B40 truck) equipped with 115 mm solid stem augers, owned and operated by Maple Leaf Drilling Ltd, of Springfield, Manitoba.

During drilling, WSP field personnel visually classified the soil stratigraphy within the test holes in accordance with the Modified Unified Soil Classification System (MUSCS); and recorded observed seepage and sloughing conditions. Disturbed soil samples were obtained from auger cuttings at intervals of approximately 300 to 450 mm until the termination depth of each test hole was reached. All samples were retained in sealed plastic bags and shipped to WSP's Oak Bluff laboratory for review and selected testing.

Upon completion of drilling at each test hole, the depth to accumulated slough and groundwater level was measured prior to backfilling. The test holes were then backfilled to the under side of the pavement with bentonite and auger cuttings, and the pavement surface was repaired with asphalt.

Figures 1 to 3 provide the locations of the test holes completed on McPhillips Street (Figure 1), Salter Street (Figure 2) and Selkirk Avenue (Figure 3).

Core logs presented in Appendix A provide the thickness of asphalt and concrete pavements observed at each location, as well as photos of the core samples obtained.

The test hole logs presented in Appendix B include the sampling, field testing, laboratory test results, and subsurface conditions encountered at the test hole locations.

### 3.3 LABORATORY TESTING

Following completion of the field drilling program, a laboratory testing program was conducted. The laboratory testing program consisted of:

- Moisture content tests performed on all soil samples;
- Atterberg limit testing on select grab samples;
- Hydrometer grain size analyses on select grab samples;
- Standard proctor maximum dry density (SPMDD) testing on combined samples from select test holes; and
- California bearing ratio (CBR) testing on above noted combined samples.

Moisture content test results, soil classifications, Atterberg Limit results, hydrometer analysis results and other relevant subsurface information are summarized on the test hole logs in Appendix B. Standard proctor and CBR test results are provided in Appendix C.

## 4 PAVEMENT STRUCTURE

### 4.1 MCPHILLIPS STREET

Table 4-1 provides a summary of the pavement structure encountered at the six core locations on McPhillips Street.

**Table 4-1: McPhillips Street Pavement Thickness Summary**

Core ID	Asphalt Thickness (mm)	Concrete Thickness (mm)	Underlying Structure
M01	105	95	20mm Limestone
M02	105	240	20mm Limestone
M03	190	60 (rubble)	Clay Fill
M04	75	200 (partial rubble)	Clay Fill
M05	100	165	Clay Fill
M06	100	225 (rubble below 100mm)	20mm Limestone

### 4.2 SALTER STREET

Table 4-2 provides a summary of the pavement structure encountered at the six core locations on Salter Street.

**Table 4-2: Salter Street Pavement Thickness Summary**

Core ID	Asphalt Thickness (mm)	Concrete Thickness (mm)
SA01	75	300
SA02	150	175
SA03	125	25 (rubble)
SA04	175	25 (rubble)
SA05	75	300
SA06	75	135
SA07	150	190
SA08	50	250
SA09	75	0

## 4.3 SELKIRK AVENUE

Table 4-3 provides a summary of the pavement structure encountered at the six core locations on Selkirk Avenue.

**Table 4-3: Selkirk Avenue Pavement Thickness Summary**

Core ID	Asphalt Thickness (mm)	Concrete Thickness (mm)
SE01	175	75
SE02	90	210
SE03	175	125
SE04	50	275
SE05	100	500 (rubble)
SE06	215	25
SE07	100	90
SE08	175	425 (rubble)
SE09	75	75 (rubble)
SE09B	75	225 (rubble)

# 5 SOIL STRATIGRAPHY

## 5.1 SALTER STREET

Soil conditions below the pavement on Salter Street generally consisted of a layer of native high plastic clay with an interbedded silt layer. A layer of clay fill was present at test hole SA08 only. Table 5-1 provides a summary of the thicknesses of each layer observed at each test hole location, while the sections below provide details of each soil layer. Clay soils observed above the interbedded silt layer are denoted as “upper clay” while those below the interbedded silt layer are denoted as “lower clay.”

**Table 5-1: Salter Street Soil Stratigraphy Summary**

Test Hole ID	Clay Fill Thickness (mm)	Upper Clay Thickness (mm)	Silt Thickness (mm)	Lower Clay Thickness (mm)
SA01	--	1,400	600	600
SA02	--	1,775	900	--
SA03	--	750	1,500	600
SA04	--	1,000	450	1,350
SA05	--	800	900	1,200
SA06	--	675	750	1,350
SA07	--	850	600	1,500
SA08	600	--	--	2,100
SA09	--	525	1,200	1,200

### 5.1.1 CLAY FILL

Clay fill was present below the pavement surface in test hole SA08. The clay fill was generally silty, contained some gravel, trace sand, and was high plastic, moist, friable and grey. Near the top of the layer. Laboratory testing of the clay fill consisted of moisture content testing, with all results completed and summarized on the test hole logs in Appendix B.

### 5.1.2 CLAY

Native clay was present below pavement surface in all test holes. The native clay was generally silty to and silt, contained trace sand, and was high plastic, moist, firm to very stiff and brown. Near the top of the layer, the clay contained traces of gravel and sand and occasional black staining. Laboratory testing of the clay fill consisted of moisture content testing, Atterberg limit testing, hydrometer grain size evaluation, Standard Proctor Maximum Dry Density (SPMDD) testing, and California Bearing Ratio (CBR) testing. Detailed laboratory testing results of the clay are shown on the test hole logs in Appendix B and CBR summaries in Appendix C, while Atterberg limit, hydrometer grain size analyses and CBR testing are summarized below.

**Table 5-2: Salter Street Clay Atterberg Limit and Hydrometer Testing Results**

Sample ID	Atterberg Limit Results			Hydrometer Grain Size Analysis Results			
	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% Gravel	% Sand	% Silt	% Clay
SA01 Sample 3 1.35 - 1.5m	76	24	52	0.1	3.5	29.7	66.7
SA03 Sample 2 0.45 to 0.6 m	50	18	32	0.0	5.6	32.7	61.7
SA08 Sample 3 0.9m	52	23	29	0.0	17.5	50.3	32.2

**Table 5-3: Salter Street Clay Proctor and CBR Testing Results**

Sample Data	Proctor Testing Results		CBR Testing Results at 95% SPMDD	
	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Moisture Content (%)	CBR @ 2.54mm Penetration	CBR @ 5.08mm Penetration
SA01 Combined Sample	1435	27.4	1.1	1.2
SA03 Combined Sample	1489	23.4	0.9	1.0
SA05 Combined Sample	1413	28.4	1.1	1.1
SA06 Combined Sample	1491	25.3	0.8	0.9
SA08 Combined Sample	1495	22.6	1.1	1.0

### 5.1.3 SILT

A layer of silt was present in the test holes and was located either within the clay layer or directly below the fill soils as noted in Table 5-1. The silt was generally clayey, contained trace sand and was moist to very moist, soft to firm and brown. The plasticity of the silt ranged between low to medium and high plastic. Laboratory testing of the silt consisted of moisture content testing, Atterberg limit testing and hydrometer grain size evaluation. Detailed laboratory testing results of the silt are shown on the test hole logs in Appendix B, while Atterberg limit and hydrometer grain size analyses are summarized below.

**Table 5-4: Salter Street Silt Atterberg Limit and Hydrometer Testing Results**

Sample ID	Atterberg Limit Results			Hydrometer Grain Size Analysis Results			
	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% Gravel	% Sand	% Silt	% Clay
SA05 Sample 3 0.75 – 0.9 m	32	16	16	0.0	4.7	69.9	25.4
SA06 Sample 3 1.15 – 1.4 m	59	23	36	4.7	3.0	71.4	20.9

## 5.2 SELKIRK AVENUE

Soil conditions below the pavement on Selkirk Avenue generally consisted of a layer of gravel fill soils underlain by native high plastic clay with an interbedded silt layer. Table 5-5 provides a summary of the thicknesses of each layer observed at each test hole location, while the sections below provide details of each soil layer. Clay soils observed above the interbedded silt layer are denoted as “upper clay” while those below the interbedded silt layer are denoted as “lower clay.”

**Table 5-5: Selkirk Avenue Soil Stratigraphy Summary**

Test Hole ID	Gravel Fill Thickness (mm)	Upper Clay Thickness (mm)	Silt Thickness (mm)	Lower Clay Thickness (mm)
SE01	350	--	600	1,800
SE02	150	750	150	1,650
SE03	300	--	750	1,650
SE04	265	--	900	1,500
SE05	150	600	1,200	450
SE06	560	--	--	2,250
SE07	410	--	1,200	1,200
SE08	--	1,500	750	150
SE09B	150	--	--	2,550

### 5.2.1 GRAVEL FILL

Gravel fill was present below the pavement structure in the test holes noted in Table 5-5 above. The gravel fill was generally poorly graded, medium grained, compact (inferred), moist to wet and brown. Laboratory testing of the gravel fill consisted of moisture content testing only, which is summarized on the test hole logs in Appendix B.

To date, all moisture content size testing for the gravel fill soils has been completed.

### 5.2.2 CLAY

Native clay was present below the pavement, fill and silt layers in all test holes. The native clay was generally silty, contained trace sand, and was high plastic, moist, firm to very stiff and brown. Laboratory testing of the clay fill consisted of moisture content testing, Atterberg limit testing, hydrometer grain size evaluation, Standard Proctor Maximum Dry Density (SPMDD) testing, and California Bearing Ratio (CBR) testing. Detailed laboratory testing results of the clay are shown on the test hole logs in Appendix B and CBR summaries in Appendix C, while Atterberg limit, hydrometer grain size analyses and CBR testing are summarized below.

**Table 5-6: Selkirk Avenue Clay Atterberg Limit and Hydrometer Testing Results**

Sample ID	Atterberg Limit Results			Hydrometer Grain Size Analysis Results			
	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% Gravel	% Sand	% Silt	% Clay
SE01 Sample 3 1.2 – 1.35m	52	18	34	0.0	6.2	38.2	55.7
SE05 Sample 2 0.65 – 0.8 m	61	19	42	1.6	10.1	25.9	62.4
SE06 Sample 3 1.15 – 1.4 m	64	21	43	0.0	4.3	26.2	69.5
SE08 Sample 3 1.35 – 1.5m	72	25	48	0.0	4.3	31.9	63.8

**Table 5-7: Selkirk Avenue Clay Proctor and CBR Testing Results**

Sample Data	Proctor Testing Results		CBR Testing Results at 95% SPMDD	
	Maximum Dry Density (kg/m <sup>3</sup> )	Optimum Moisture Content (%)	CBR @ 2.54mm Penetration	CBR @ 5.08mm Penetration
SE01 Combined Sample	1396	29.1	0.9	0.9
SE03 Combined Sample	1406	30.7	0.8	0.9
SE05 Combined Sample	1457	26.9	1.1	1.0
SE07 Combined Sample	1472	25.2	0.7	0.9

### 5.2.3 SILT

A layer of silt was present in 6 of the 9 test holes either within the clay layer or directly below the fill soils, The silt was generally clayey, contained trace sand and was low plastic, moist to very moist, soft to firm and brown. Laboratory testing of the silt consisted of moisture content testing, Atterberg limit testing and hydrometer grain size evaluation. Detailed laboratory testing results of the silt are shown on the test hole logs in Appendix B, while Atterberg limit and hydrometer grain size analyses are summarized below.

**Table 5-8: Selkirk Avenue Silt Atterberg Limit and Hydrometer Testing Results**

Sample ID	Atterberg Limit Results			Hydrometer Grain Size Analysis Results			
	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% Gravel	% Sand	% Silt	% Clay
SE04 Sample 2 0.6 – 0.75m	24	18	6	4.7	13.8	64.8	16.8

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## 5.3 AUGER REFUSAL

Auger refusal was not encountered in any of the test holes advanced on either Salter Street or Selkirk Avenue.

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## 5.4 GROUNDWATER AND SLOUGHING CONDITIONS

Seepage and sloughing conditions were noted during drilling, and the depths to the accumulated water levels approximately five minutes after completion of each test hole were measured prior to backfilling. Neither seepage nor sloughing were observed in any of the test holes completed.

It should be noted that only short-term seepage and sloughing conditions were observed and that groundwater levels can fluctuate annually, seasonally, or as a result of construction activity.

## 6 CLOSURE

The findings presented in this report were based on geotechnical evaluation of the subsurface conditions and limited groundwater data observed during the site investigation described in this report. If conditions other than those reported herein are noted during subsequent phases of the project, or if the assumptions stated herein are not in keeping with the current and/or future design stage, this office should be notified immediately in order that the conditions can be verified and revised as required.

The site investigation conducted and described in this report was for the sole purpose of identifying geotechnical conditions at the project Site. 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 in 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 the design and construction procedures.

This report has been prepared for the exclusive use of Stantec, and their agents, for specific application to the project described in this report. The data provided herein should not be used for any other purpose, or by any other parties, without review and written advice from WSP. Any use that a third party makes of this report, or any reliance or decisions made based on this report, are the responsibility of those parties. WSP accepts no responsibility for damages suffered by a third party as a result of decisions made or actions based on this report.

This report has been prepared in accordance with generally accepted geotechnical engineering practices. No other warranty, either expressed or implied, is made.

Respectfully submitted,

**WSP E&I Canada Limited**



# Figures

FIGURE 1: MCPHILLIPS STREET CORE HOLE LOCATION PLAN

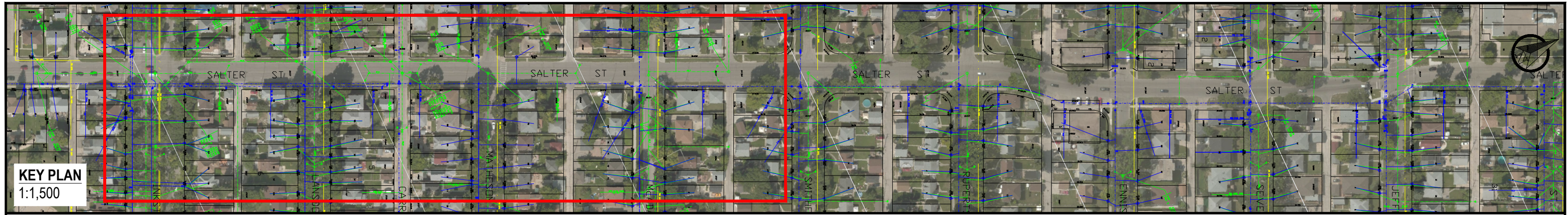
FIGURE 2: SALTER STREET CORE HOLE LOCATION PLAN

FIGURE 3: SELKIRK AVENUE CORE HOLE LOCATION PLAN

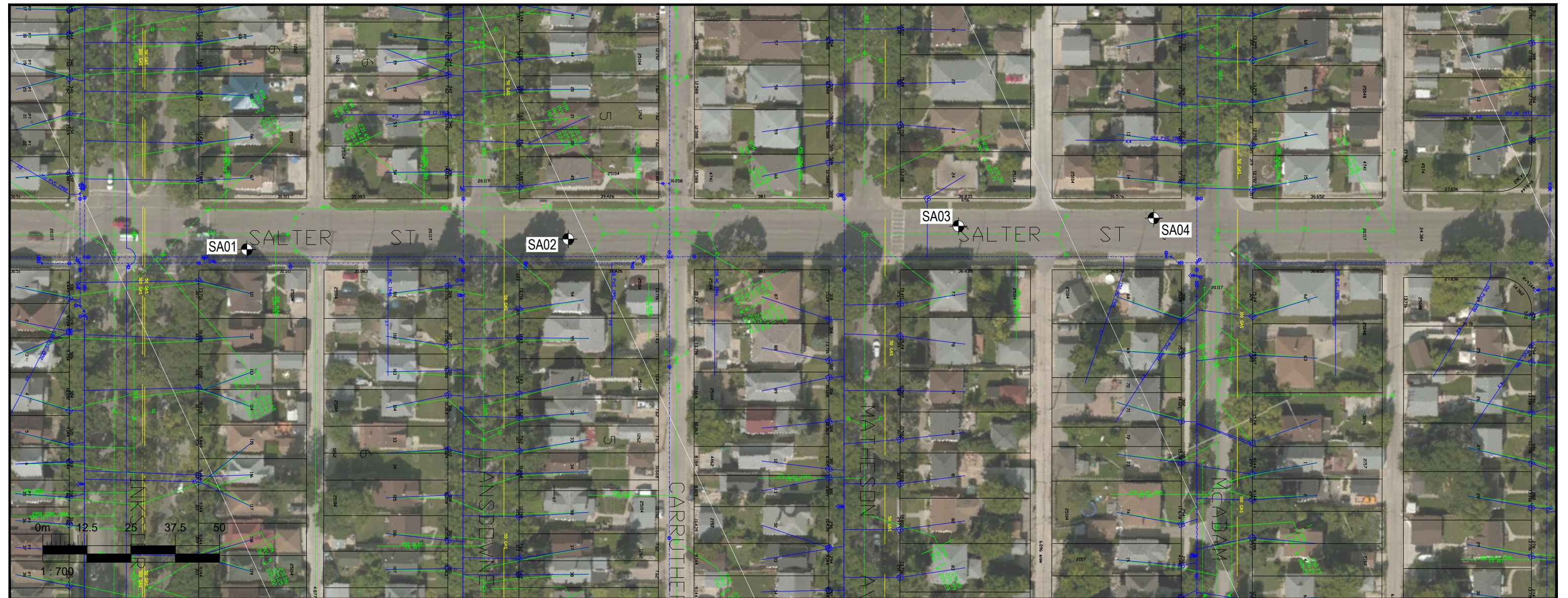


NOTES: SITE FEATURES AND LOCATIONS ARE APPROXIMATE ONLY. IMAGES FROM AUTODESK IMAGERY AND TOPO MAPS

<b>LEGEND:</b> TEST HOLE	REVISION ----	BY ----	DATE ----	CLIENT:  <div style="text-align: center;"><b>STANTEC</b></div>	6 HIGH LEVEL ROAD OAK BLUFF, MANITOBA R4G 0E2 PHONE: 204.488.2997	DWN BY: MD	<b>McPHILLIPS STREET MOUNTAIN AVENUE TO MACHRAY AVENUE WINNIPEG, MANITOBA</b>	DATE: JANUARY 2023
						CHK'D BY: JW		PROJECT NO: WX19714
						DATUM: NAD83		REV. NO.: A
						PROJECTION: UTM Zone 14 U		FIGURE NO: FIGURE 1
						SCALE: AS SHOWN		<b>SITE PLAN</b>

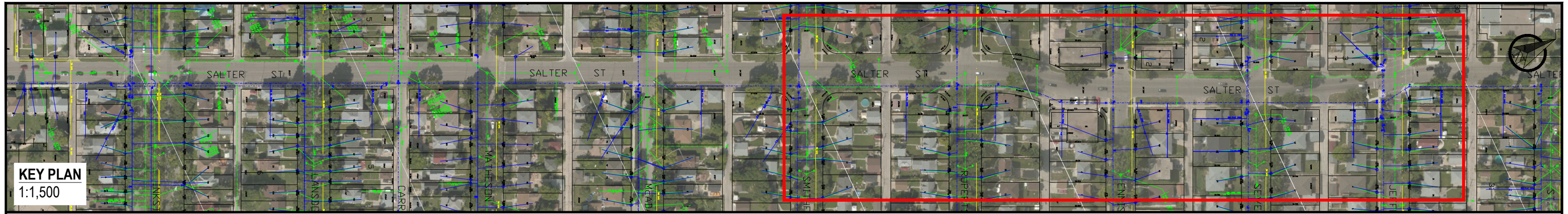


**KEY PLAN**  
1:1,500

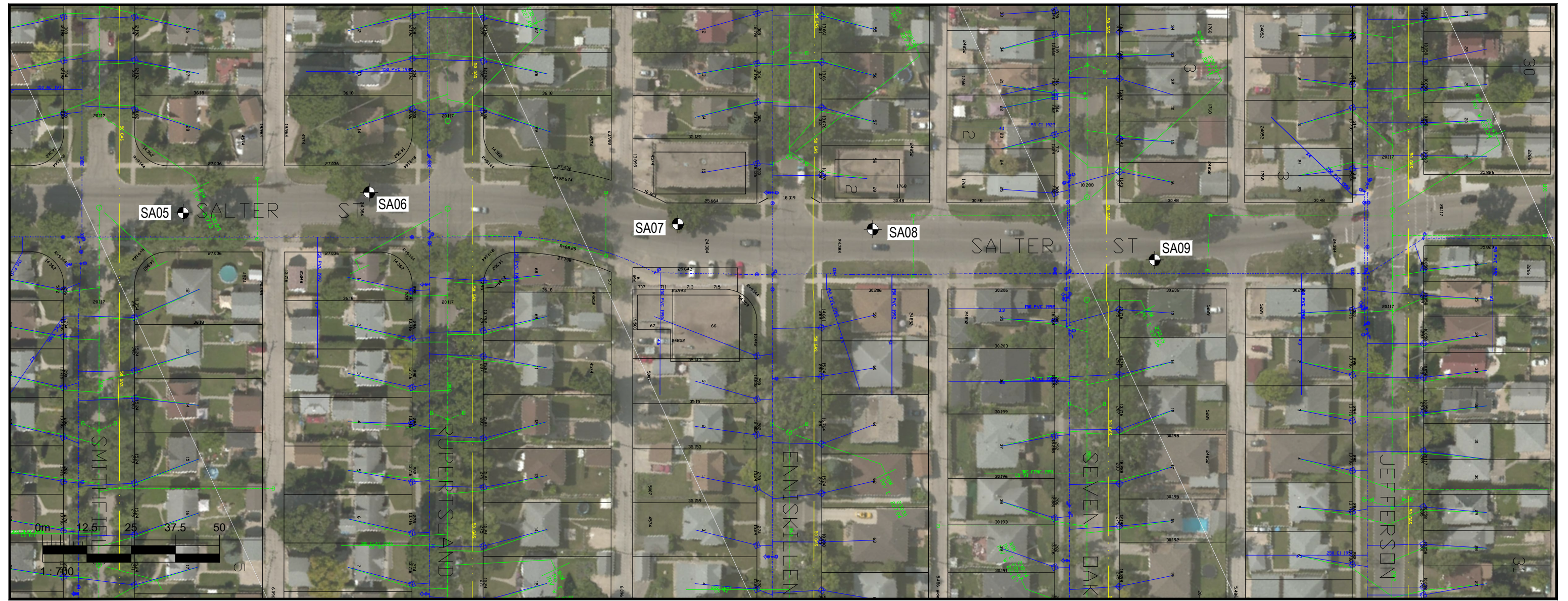


NOTES: SITE FEATURES AND LOCATIONS ARE APPROXIMATE ONLY. IMAGES FROM AUTODESK IMAGERY AND TOPO MAPS.

<b>LEGEND:</b> TEST HOLE	REVISION ---	BY ---	DATE ---	CLIENT:  <p style="text-align: center;"><b>STANTEC</b></p>	<p style="text-align: center;">6 HIGH LEVEL ROAD OAK BLUFF, MANITOBA R4G 0E2 PHONE: 204.488.2997</p>	DWN BY: MD CHK'D BY: JW DATUM: NAD83 PROJECTION: UTM Zone 14 U SCALE: AS SHOWN	<p style="text-align: center;"><b>SALTER STREET</b>  <b>INKSTER BOULEVARD TO JEFFERSON AVENUE</b>  <b>WINNIPEG, MANITOBA</b></p>	DATE: JANUARY 2023 PROJECT NO: WX19714 REV. NO.: A
	<b>SITE PLAN</b>							FIGURE NO: FIGURE 2-1

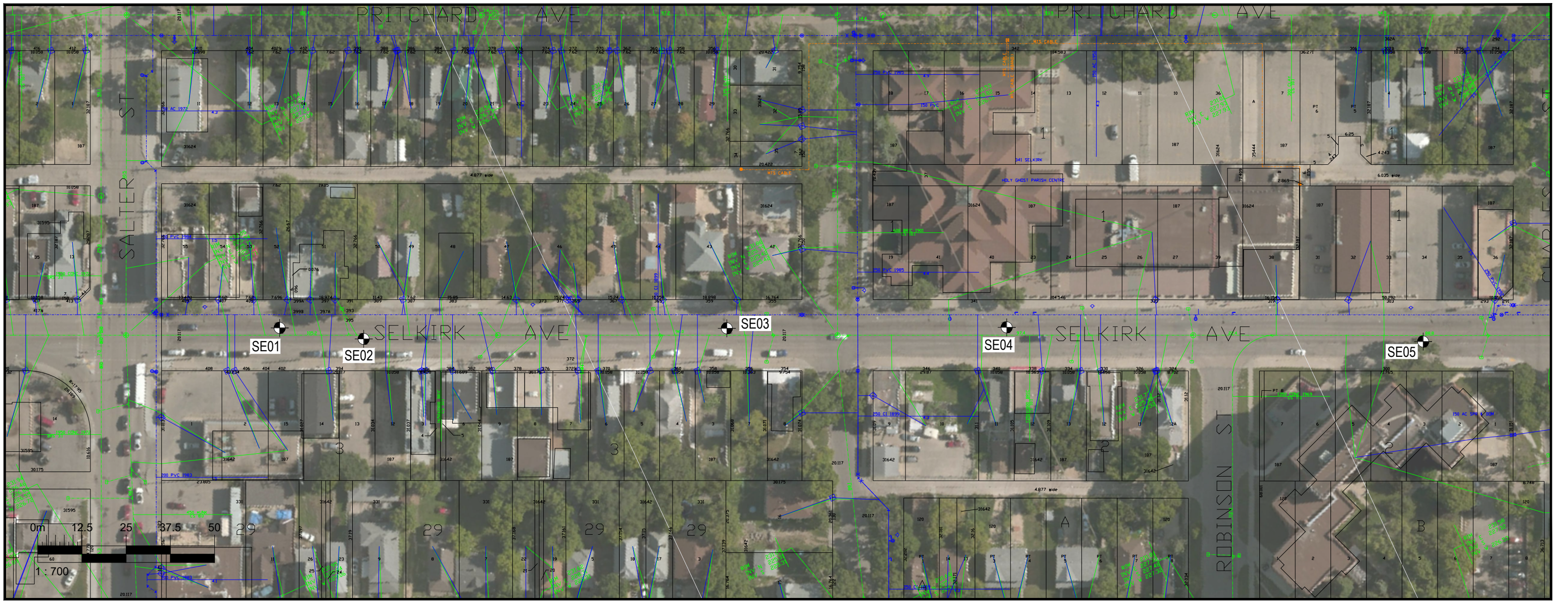
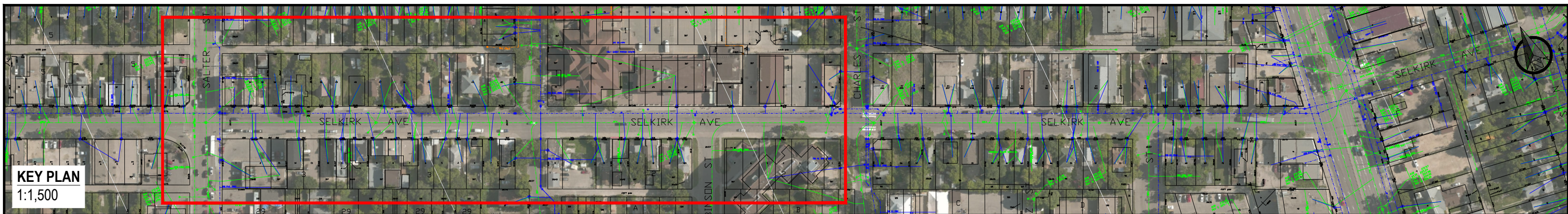


**KEY PLAN**  
1:1,500



NOTES: SITE FEATURES AND LOCATIONS ARE APPROXIMATE ONLY. IMAGES FROM AUTODESK IMAGERY AND TOPO MAPS.

<b>LEGEND:</b> TEST HOLE	REVISION ----	BY ---	DATE ---	CLIENT:  <p style="text-align: center;"><b>STANTEC</b></p>	<p style="text-align: center;">6 HIGH LEVEL ROAD OAK BLUFF, MANITOBA R4G 0E2 PHONE: 204.488.2997</p>	DWN BY: MD	<p><b>SALTER STREET</b>  <b>INKSTER BOULEVARD TO JEFFERSON AVENUE</b>  <b>WINNIPEG, MANITOBA</b></p>	DATE: JANUARY 2023
						CHK'D BY: JW		PROJECT NO: WX19714
						DATUM: NAD83		REV. NO.: A
						PROJECTION: UTM Zone 14 U		FIGURE NO: FIGURE 2-2
						SCALE: AS SHOWN		<b>SITE PLAN</b>



NOTES: SITE FEATURES AND LOCATIONS ARE APPROXIMATE ONLY. IMAGES FROM AUTODESK IMAGERY AND TOPO MAPS.

**LEGEND:**

TEST HOLE	
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REVISION	BY	DATE
----	----	----

CLIENT:

**STANTEC**

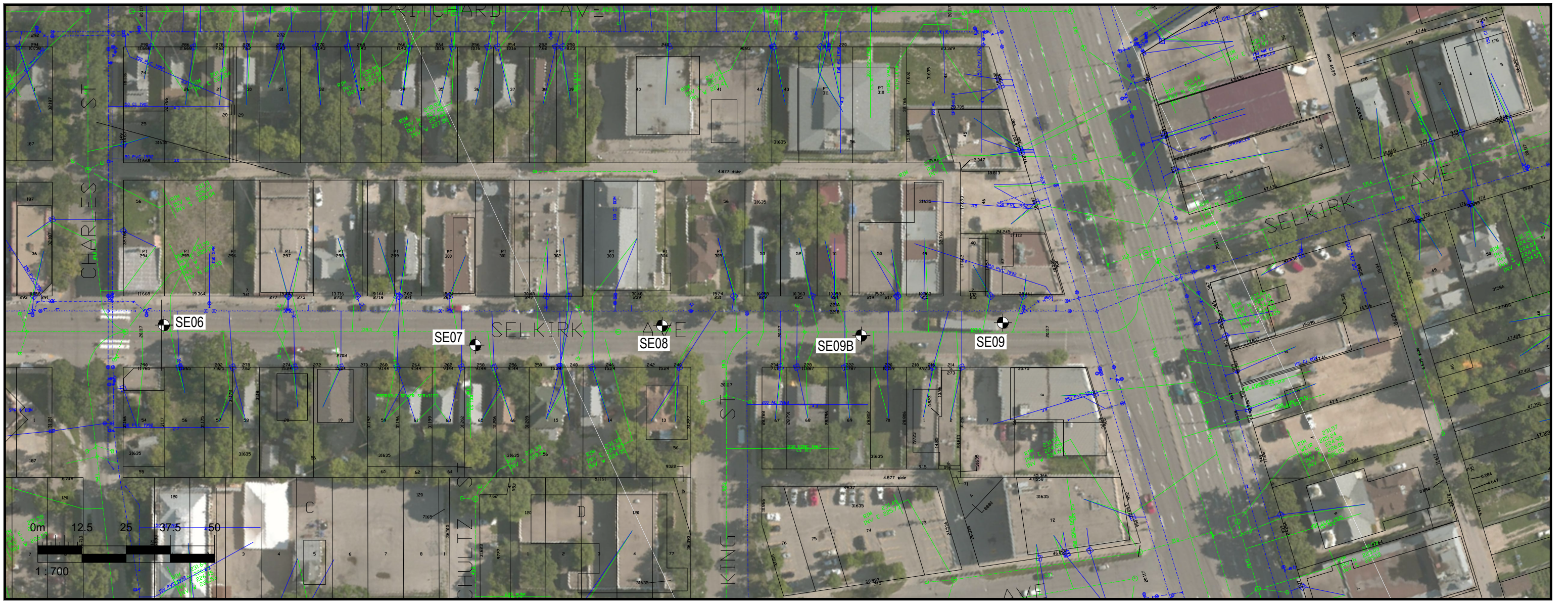
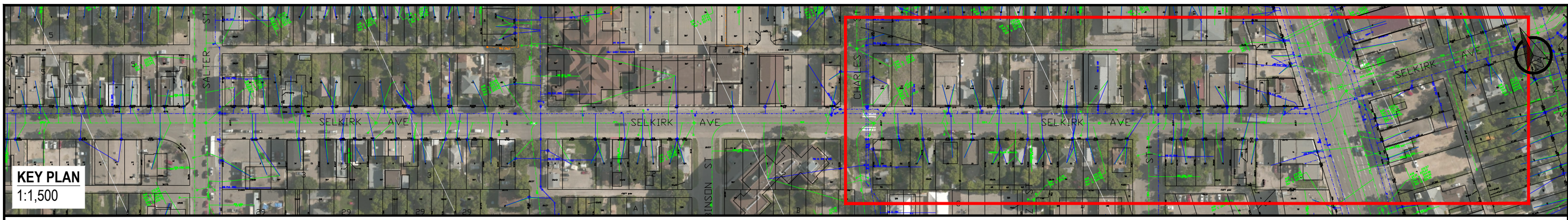
6 HIGH LEVEL ROAD  
OAK BLUFF, MANITOBA R4G 0E2  
PHONE: 204.488.2997

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

**SELKIRK AVENUE  
SALTER STREET TO MAIN STREET  
WINNIPEG, MANITOBA**

**SITE PLAN**

DATE:	JANUARY 2023
PROJECT NO.:	WX19714
REV. NO.:	A
FIGURE NO.:	FIGURE 3-1





NOTES: SITE FEATURES AND LOCATIONS ARE APPROXIMATE ONLY. IMAGES FROM AUTODESK IMAGERY AND TOPO MAPS.

<b>LEGEND:</b> TEST HOLE 	REVISION	BY	DATE	CLIENT:	 6 HIGH LEVEL ROAD OAK BLUFF, MANITOBA R4G 0E2 PHONE: 204.488.2997	DWN BY:	MD	<b>SELKIRK AVENUE</b> <b>SALTER STREET TO MAIN STREET</b> <b>WINNIPEG, MANITOBA</b>	DATE:	JANUARY 2023
	----	----	----	<b>STANTEC</b>		CHK'D BY:	JW		PROJECT NO:	WX19714
						DATUM:	NAD83		REV. NO.:	A
						PROJECTION:	UTM Zone 14 U		FIGURE NO.:	FIGURE 3-2
						SCALE:	AS SHOWN			
<b>SITE PLAN</b>										

# Appendix A

## Core Logs





	<b>Core Photographs Pavement Core Sample – McPhillips, Winnipeg, MB</b>		<b>Hole ID: M01</b>
			Page: 1 of 6
	Asphalt: 105mm	Concrete: 95mm	<b>Core Date: 25 Oct. 2022</b>
	Project #: WX19714		Logger: AJ





M02





	<b>Core Photographs Pavement Core Sample – McPhillips, Winnipeg, MB</b>		<b>Hole ID: M02</b>
			Page: 2 of 6
	Asphalt: 105mm	Concrete: 240mm	<b>Core Date: 25 Oct. 2022</b>
	Project #: WX19714		Logger: AJ





	<b>Core Photographs Pavement Core Sample – McPhillips, Winnipeg, MB</b>		<b>Hole ID: M03</b>
			Page: 3 of 6
	Asphalt: 190mm	Concrete: 60mm (rubble – no recovery)	<b>Core Date: 25 Oct. 2022</b>
	Project #: WX19714		Logger: AJ

M04





	<b>Core Photographs Pavement Core Sample – McPhillips, Winnipeg, MB</b>		<b>Hole ID: M04</b>
			Page: 4 of 6
	Asphalt: 75mm	Concrete: 200mm (Partial rubble)	<b>Core Date: 25 Oct. 2022</b>
	Project #: WX19714		Logger: AJ





	<b>Core Photographs Pavement Core Sample – McPhillips, Winnipeg, MB</b>		<b>Hole ID: M05</b>
			Page: 5 of 6
	Asphalt: 100mm	Concrete: 165mm	<b>Core Date: 25 Oct. 2022</b>
	Project #: WX19714		<b>Logger: AJ</b>





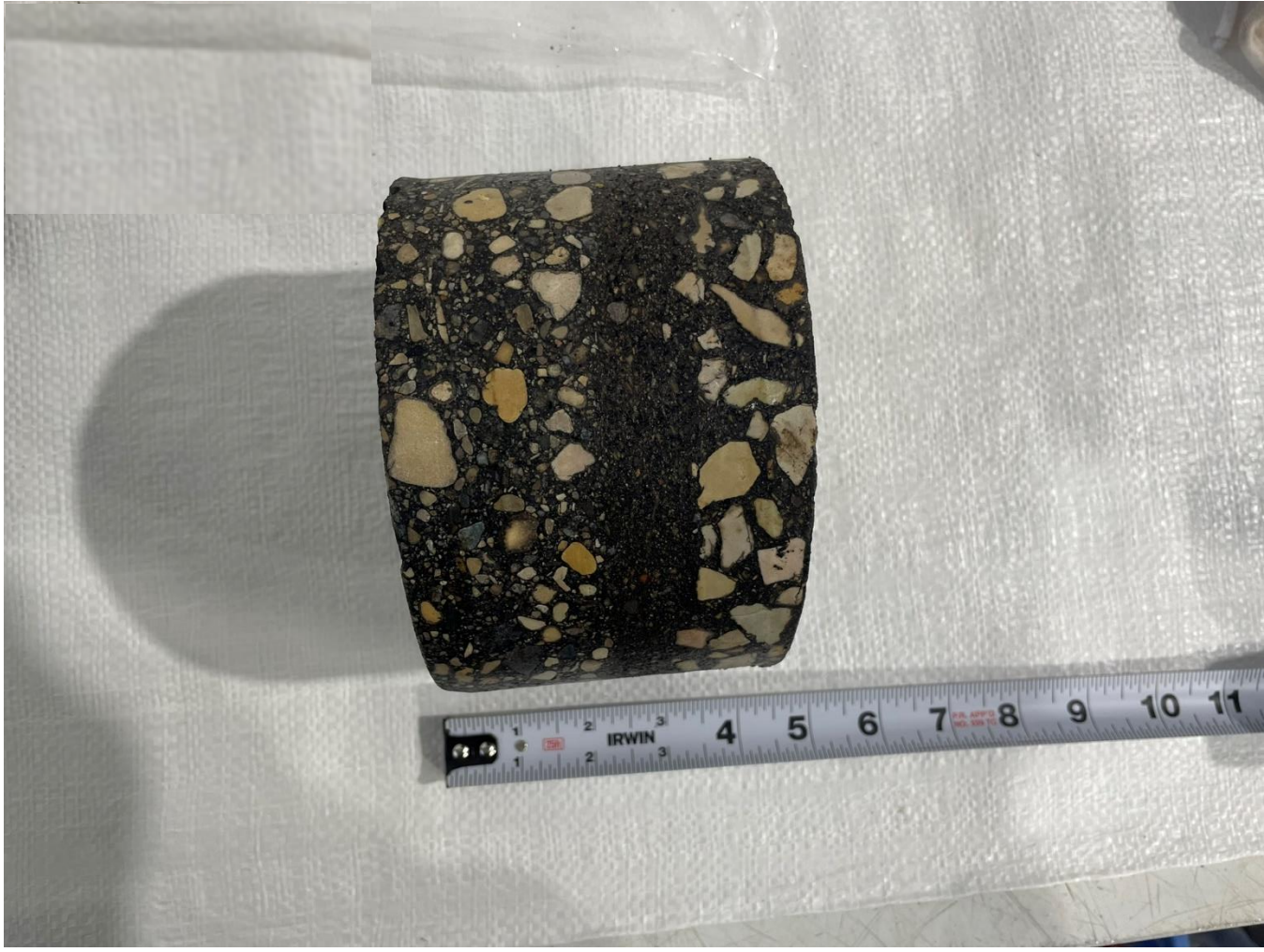
	<b>Core Photographs Pavement Core Sample – McPhillips, Winnipeg, MB</b>		<b>Hole ID: M06</b>
			Page: 6 of 6
	Asphalt: 100mm	Concrete: 225mm (rubble below 100mm)	<b>Core Date: 25 Oct 2022</b>
	Project #: WX19714		Logger: AJ





	<b>Core Photographs Pavement Core Sample – Salter, Winnipeg, MB</b>		<b>Hole ID: SA01</b>
			Page: 1 of 9
	Asphalt:75mm	Concrete:300mm	<b>Core Date: 7 Nov. 2022</b>
	Project #: WX19714		<b>Logger: AJ</b>





	<b>Core Photographs Pavement Core Sample – Salter, Winnipeg, MB</b>		<b>Hole ID: SA02</b>
			<b>Page: 2 of 9</b>
	<b>Asphalt: 150mm</b>	<b>Concrete: 175mm</b>	<b>Core Date: 7 Nov. 2022</b>
	<b>Project #: WX19714</b>		<b>Logger: AJ</b>





	<b>Core Photographs Pavement Core Sample – Salter, Winnipeg, MB</b>		<b>Hole ID: SA03</b>
			<b>Page: 3 of 9</b>
	<b>Asphalt: 125mm</b>	<b>Concrete: 25mm (rubble – no recovery)</b>	<b>Core Date: 28 Nov. 2022</b>
	<b>Project #: WX19714</b>		<b>Logger: AJ</b>







	<b>Core Photographs Pavement Core Sample – Salter, Winnipeg, MB</b>		<b>Hole ID: SA04</b>
			Page: 4 of 9
	Asphalt: 175mm	Concrete: 25mm (rubble)	<b>Core Date: 28 Nov. 2022</b>
	Project #: WX19714		Logger: AJ





	<b>Core Photographs Pavement Core Sample – Salter, Winnipeg, MB</b>		<b>Hole ID: SA05</b>
			Page: 5 of 9
	<b>Asphalt: 75mm</b>	<b>Concrete: 300mm</b>	<b>Core Date: 7 Nov. 2022</b>
	<b>Project #: WX19714</b>		<b>Logger: AJ</b>





	<b>Core Photographs Pavement Core Sample – Salter, Winnipeg, MB</b>		<b>Hole ID: SA06</b>
			Page: 6 of 9
	<b>Asphalt: 75mm</b>	<b>Concrete: 135mm</b>	<b>Core Date: 28 Nov. 2022</b>
	<b>Project #: WX19714</b>		<b>Logger: AJ</b>





	<b>Core Photographs Pavement Core Sample – Salter, Winnipeg, MB</b>		<b>Hole ID: SA07</b>
			Page: 7 of 9
	Asphalt: 150mm	Concrete: 190mm	<b>Core Date: 28 Nov. 2022</b>
	Project #: WX19714		Logger: AJ





	<b>Core Photographs Pavement Core Sample – Salter, Winnipeg, MB</b>		<b>Hole ID: SA08</b>
			Page: 8 of 9
	<b>Asphalt: 50mm</b>	<b>Concrete: 250mm</b>	<b>Core Date: 7 Nov. 2022</b>
	<b>Project #: WX19714</b>		<b>Logger: AJ</b>





	<b>Core Photographs Pavement Core Sample – Salter, Winnipeg, MB</b>		<b>Hole ID: SA09</b>
			<b>Page: 9 of 9</b>
	<b>Asphalt: 75mm</b>	<b>Concrete: 0mm</b>	<b>Core Date: 7 Nov. 2022</b>
	<b>Project #: WX19714</b>		<b>Logger: AJ</b>





	<b>Core Photographs Pavement Core Sample – Selkirk, Winnipeg, MB</b>		<b>Hole ID: SE01</b>
			Page: 1 of 9
	Asphalt: 175mm	Concrete: 75mm	<b>Core Date: 2 Dec. 2022</b>
	Project #: WX19714		Logger: AJ





	<b>Core Photographs Pavement Core Sample – Selkirk, Winnipeg, MB</b>		<b>Hole ID: SE02</b>
			Page: 2 of 9
	Asphalt: 90mm	Concrete: 210mm	<b>Core Date: 2 Dec. 2022</b>
	Project #: WX19714		Logger: AJ







	<b>Core Photographs Pavement Core Sample – Selkirk, Winnipeg, MB</b>		<b>Hole ID: SE03</b>
			Page: 3 of 9
	Asphalt: 175mm	Concrete:125mm (rubble)	<b>Core Date: 28 Nov.2022</b>
	Project #: WX19714		Logger: AJ





	<b>Core Photographs Pavement Core Sample – Selkirk, Winnipeg, MB</b>		<b>Hole ID: SE04</b>
			Page: 4 of 9
	Asphalt:50mm	Concrete:275mm	<b>Core Date: 30 Nov. 2022</b>
	<b>Project #: WX19714</b>		<b>Logger: AJ</b>





	<b>Core Photographs Pavement Core Sample – Selkirk, Winnipeg, MB</b>		<b>Hole ID: SE05</b>
			Page: 5 of 9
	Asphalt:100mm	Concrete:500mm (rubble – no recovery)	<b>Core Date: 29 Nov. 2022</b>
	Project #: WX19714		Logger: AJ





	<b>Core Photographs Pavement Core Sample – Selkirk, Winnipeg, MB</b>		<b>Hole ID: SE06</b>
			Page: 6 of 9
	Asphalt: 215mm	Concrete: 25mm	<b>Core Date: 29 Nov. 2022</b>
	Project #: WX19714		<b>Logger: AJ</b>





	<b>Core Photographs Pavement Core Sample – Selkirk, Winnipeg, MB</b>		<b>Hole ID: SE07</b>
			<b>Page: 7 of 9</b>
	<b>Asphalt: 100mm</b>	<b>Concrete:90mm</b>	<b>Core Date: 29 Nov. 2022</b>
	<b>Project #: WX19714</b>		<b>Logger: AJ</b>





	<b>Core Photographs Pavement Core Sample – Selkirk, Winnipeg, MB</b>		<b>Hole ID: SE08</b>
			<b>Page: 8 of 9</b>
	<b>Asphalt: 175mm</b>	<b>Concrete: 425mm (rubble – no recovery)</b>	<b>Core Date: 30 Nov. 2022</b>
	<b>Project #: WX19714</b>		<b>Logger: AJ</b>



	<b>Core Photographs Pavement Core Sample – Selkirk, Winnipeg, MB</b>		<b>Hole ID: SE09</b>
			Page: 9 of 9
	Asphalt: 75mm	Concrete: 75mm (rubble – no recovery)	<b>Core Date: 30 Nov. 2022</b>
	Project #: WX19714		Logger: AJ



	<b>Core Photographs Pavement Core Sample – Selkirk, Winnipeg, MB</b>		<b>Hole ID: SE09B</b>
			Page: 9 of 9
	Asphalt: 75mm	Concrete: 225mm (rubble – no recovery)	Core Date:
	Project #: WX19714		Logger: AJ



# Appendix B

## Test Hole Logs

PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: SA01	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Salter Street (See Drawing)		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
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"/> Split-Pen	<input type="checkbox"/> Slough	<input type="checkbox"/> Core	<input type="checkbox"/> Sand

DEPTH (m)	UNCONFINED COMPRESSION (kPa)		SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
	▲	▲								
0	100 200 300 400				ASPHALT (75mm thick) CONCRETE (300mm thick)					
0.5	100 200 300 400				CLAY - silty, trace sand, high plastic, moist, stiff, grey	█	1			
1.5	100 200 300 400		CH			█	2			
1.8	100 200 300 400					█	3			
2.2	100 200 300 400		ML		SILT - trace sand, low plastic, moist, soft, brown	█	4		Particle Size Analysis - Sample 3 @ 1.4m: Gravel= 0.1% Sand= 3.5% Silt= 29.7% Clay= 66.7%	
2.8	100 200 300 400		CH		CLAY - silty, high plastic, moist, stiff, brown	█	5			
3.2	100 200 300 400				TERMINATED AT 3.0m BELOW EXISTING GRADE	█	6			
3.5	100 200 300 400				NOTES No sloughing or seepage observed during drilling. Test hole remained open to full depth and was dry prior to backfilling. Test hole backfilled with auger cuttings and bentonite. Pavement surface repaired with asphalt.					

	WSP E&I Canada Limited		LOGGED BY: JW	COMPLETION DEPTH: 3 m
			REVIEWED BY: BW	COMPLETION DATE: November 7, 2022
			Figure No. B-1	Sheet 1 of 1

WX19714.GPJ 22/11/22 05:01 PM (WPG - GEOTECH LOG 4)

PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: <b>SA02</b>	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Salter Street (See Drawing)		DRILL METHOD: 125mm SSA		ELEVATION: Not Surveyed	
SAMPLE TYPE		<input type="checkbox"/> Shelby Tube	<input type="checkbox"/> No Recovery	<input checked="" type="checkbox"/> SPT (N)	<input type="checkbox"/> Grab Sample
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"/> Split-Pen	<input type="checkbox"/> Slough	<input type="checkbox"/> Core	<input type="checkbox"/> Sand

DEPTH (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0			ASPHALT (150mm thick) CONCRETE (175mm thick) CLAY - silty, trace sand, high plastic, moist, stiff, brown		1			
1		CH			2			1
2			SILT - clayey, trace sand, low plastic, very moist, soft, brown		3			
3		ML			4			2
3			TERMINATED AT 3.0m BELOW EXISTING GRADE NOTES No sloughing or seepage observed during drilling. Test hole remained open to full depth and was dry prior to backfilling. Test hole backfilled with auger cuttings and bentonite. Pavement surface repaired with asphalt.		5			
3					6			3
4								4
5								5
6								6
7								7
8								8
9								9
10								10

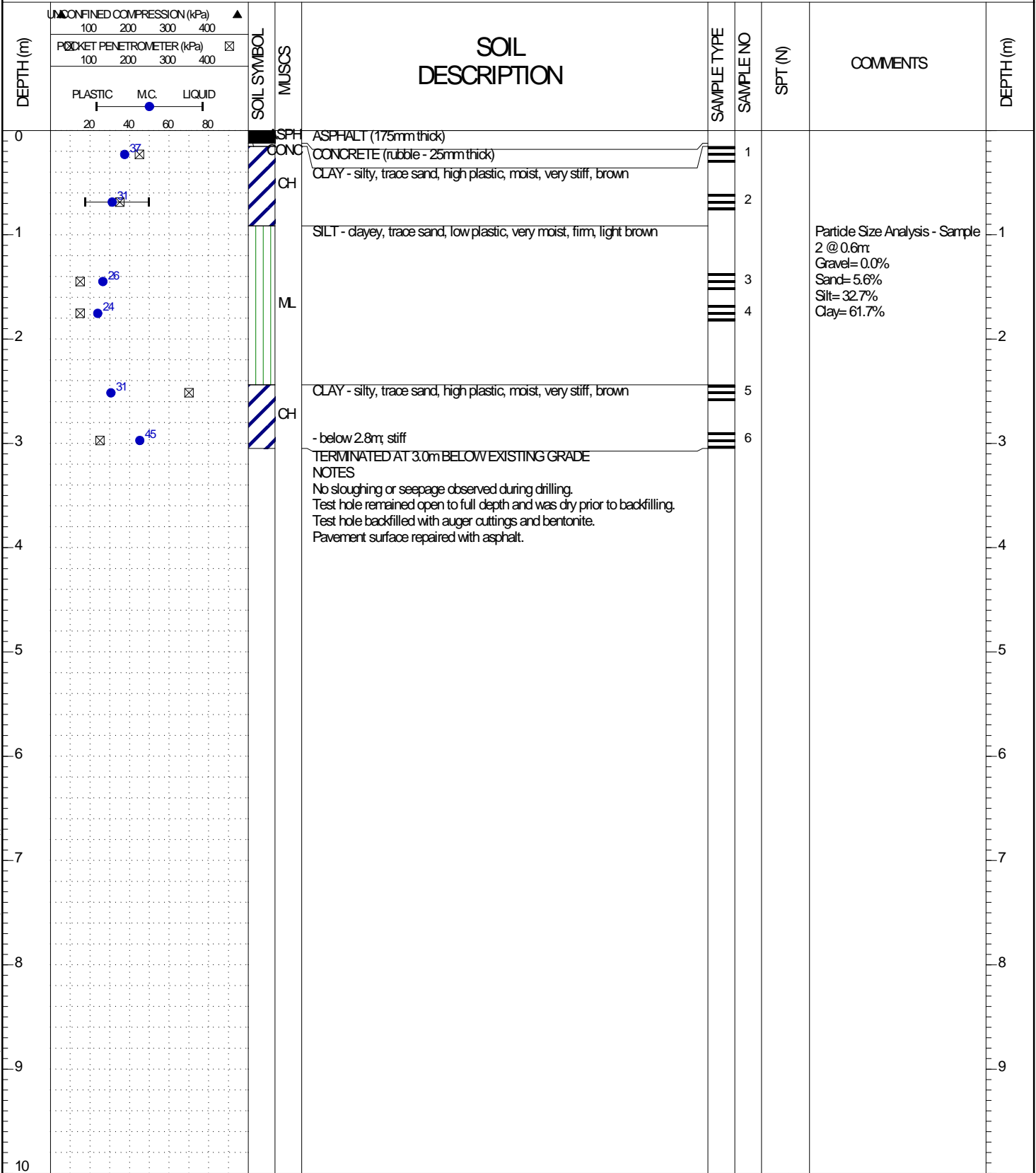
  

	<b>WSP E&amp;I Canada Limited</b>	LOGGED BY: JW	COMPLETION DEPTH: 3 m
		REVIEWED BY: BW	COMPLETION DATE: November 7, 2022
		Figure No. B-2	Sheet 1 of 1

WX19714.GPJ 22/11/22 05:01 PM (WPG - GEOTECH LOG 4)

PROJECT: City of Winnipeg Streets	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: SA03
CLIENT: Stantec	DRILL RIG: Mobile B40	PROJECT No: WX19714
LOCATION: Salter Street (See Drawing)	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



WX19714.GPJ 23/01/02 09:47 AM (WPG - GEOTECH LOG 1 (LABELLED MC))



WSP E&I Canada Limited

LOGGED BY: JB	COMPLETION DEPTH: 3m
REVIEWED BY: JW	COMPLETION DATE: November 29, 2022
Figure No. B-3	Sheet 1 of 1

PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: SA03	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Salter Street (See Drawing)		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
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"/> Split-Pen	<input type="checkbox"/> Core
				<input type="checkbox"/> Slough	<input type="checkbox"/> Sand

DEPTH (m)	UNCONFINED COMPRESSION (kPa)		SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
	▲	▲								
0			ASPH		ASPHALT (175mm thick)					
0			CONC		CONCRETE (rubble - 25mm thick)		1			
0.5			CL		CLAY - silty, trace sand, high plastic, moist, very stiff, brown		2			
1.0					SILT - clayey, trace sand, low plastic, very moist, firm, light brown					
1.5			ML				3			
1.8							4			
2.5			CH		CLAY - silty, trace sand, high plastic, moist, very stiff, brown		5			
3.0					- below 2.8m; stiff		6			
3.0	TERMINATED AT 3.0m BELOW EXISTING GRADE NOTES No sloughing or seepage observed during drilling. Test hole remained open to full depth and was dry prior to backfilling. Test hole backfilled with auger cuttings and bentonite. Pavement surface repaired with asphalt.									

	LOGGED BY: JB	COMPLETION DEPTH: 3 m
	REVIEWED BY: JW	COMPLETION DATE: November 29, 2022
	Figure No. B-3	Sheet 1 of 1

WX19714.GPJ 22/12/22 05:01 PM (WPG - GEOTECH LOG 4)

PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: SA04	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Salter Street (See Drawing)		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
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"/> Split-Pen	<input type="checkbox"/> Slough	<input type="checkbox"/> Core	<input type="checkbox"/> Sand

DEPTH (m)	UNCONFINED COMPRESSION (kPa) ▲		SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
	100	200								
0			ASPH		ASPHALT (175mm thick)					
0			CONC		CONCRETE (rubble - 25mm thick)					
0.5			CH		CLAY - silty, trace gravel, trace sand, high plastic, moist, stiff, brown with black staining		1			
0.5			CH				2			
1.2			ML		SILT - clayey, trace sand, low plastic, very moist, soft, brown		3			
1.8			CH		CLAY - silty, trace sand, high plastic, moist, very stiff, brown		4			
2.4			CH		- below 2.4m; stiff		5			
3.0					TERMINATED AT 3.0m BELOW EXISTING GRADE		6			
NOTES No sloughing or seepage observed during drilling. Test hole remained open to full depth and was dry prior to backfilling. Test hole backfilled with auger cuttings and bentonite. Pavement surface repaired with asphalt.										

WX19714.GPJ 22/12/22 05:01 PM (WPG - GEOTECH LOG 4)



WSP E&I Canada Limited

LOGGED BY: JB	COMPLETION DEPTH: 3 m
REVIEWED BY: JW	COMPLETION DATE: November 29, 2022
Figure No. B-4	Sheet 1 of 1

PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: SA05	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Salter Street (See Drawing)		DRILL METHOD: 125mm SSA		ELEVATION: Not Surveyed	
SAMPLE TYPE		<input type="checkbox"/> Shelby Tube	<input type="checkbox"/> No Recovery	<input checked="" type="checkbox"/> SPT (N)	<input type="checkbox"/> Grab Sample
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"/> Split-Pen	<input type="checkbox"/> Slough	<input type="checkbox"/> Core	<input type="checkbox"/> Sand

DEPTH (m)	UNCONFINED COMPRESSION (kPa)		SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
	▲	▲								
0	▲ 100 200 300 400				ASPHALT (75mm thick) CONCRETE (300mm thick)					
0.5	☒ 100 200 300 400			CH	CLAY - silty, trace sand, high plastic, moist, friable, black, occasional organics	█	1		Particle Size Analysis - Sample 3 @ 0.9m: Gravel= 0.0% Sand= 4.7% Silt= 69.9% Clay= 25.4%	
1.0	★ 50 100 150 200			ML	SILT - clayey, trace sand, low to medium plastic, moist, soft, brown	█	2			
1.5	PLASTIC M.C. LIQUID					█	3			
2.0	20 40 60 80			CH	CLAY - silty, trace sand, high plastic, moist, stiff, brown	█	4			
2.5						█	5			
3.0						█	6			
3.0	TERMINATED AT 3.0m BELOW EXISTING GRADE NOTES No sloughing or seepage observed during drilling. Test hole remained open to full depth and was dry prior to backfilling. Test hole backfilled with auger cuttings and bentonite. Pavement surface repaired with asphalt.									

WX19714.GPJ 22/12/22 05:01 PM (WPG - GEOTECH LOG 4)



WSP E&I Canada Limited

LOGGED BY: JW

REVIEWED BY: BW

Figure No. B-5

COMPLETION DEPTH: 3 m

COMPLETION DATE: November 7, 2022

Sheet 1 of 1

PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: SA06	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Salter Street (See Drawing)		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
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"/> Split-Pen	<input type="checkbox"/> Slough	<input type="checkbox"/> Core	<input type="checkbox"/> Sand

DEPTH (m)	UNCONFINED COMPRESSION (kPa)		SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
	▲	▲							
0	▲ 100 200 300 400 ▲		ASPH	ASPHALT (75mm thick)		1			
	☒ POCKET PENETROMETER (kPa) ☒		CONC	CONCRETE (135mm thick)					
	★ TORVANE (kPa) ★		CH	CLAY - silty, trace gravel, trace sand, high plastic, moist, very stiff, grey with black staining		2			
1	50 100 150 200		MH	SILT - some clay, trace sand, trace gravel, high plastic, damp to moist, soft, light brown		3			1
	PLASTIC M.C. LIQUID								
	20 40 60 80								
2			CH	CLAY - silty, trace sand, high plastic, moist, stiff, brown		4		Particle Size Analysis - Sample 3 @ 1.4m: Gravel= 4.7% Sand= 3.0% Silt= 71.4% Clay= 20.9%	2
						5			3
3						6			4
4				TERMINATED AT 3.0m BELOW EXISTING GRADE					5
5				NOTES					6
6				No sloughing or seepage observed during drilling.					7
7				Test hole remained open to full depth and was dry prior to backfilling.					8
8				Test hole backfilled with auger cuttings and bentonite.					9
9				Pavement surface repaired with asphalt.					10

WX19714.GPJ 22/12/22 05:01 PM (WPG - GEOTECH LOG 4)



WSP E&I Canada Limited

LOGGED BY: JB

REVIEWED BY: JW

Figure No. B-6

COMPLETION DEPTH: 3 m

COMPLETION DATE: November 29, 2022

Sheet 1 of 1



PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: SA07	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Salter Street (See Drawing)		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
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"/> Split-Pen	<input type="checkbox"/> Slough	<input type="checkbox"/> Core	<input type="checkbox"/> Sand

DEPTH (m)	UNCONFINED COMPRESSION (kPa) ▲		SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
	100	200								
0			ASPH		ASPHALT (150mm thick)					
0			CONC		CONCRETE (190mm thick)					
0.5			CH		CLAY - silty, trace gravel, trace sand, high plastic, moist, frozen, grey with black staining	1				
0.5			CH		CLAY - silty, trace gravel, trace sand, high plastic, moist, frozen, grey with black staining	2				
1.0			ML		SILT - clayey, trace sand, low plastic, soft to firm, brown	3				1
1.5			ML		SILT - clayey, trace sand, low plastic, soft to firm, brown	4				
2.0			CH		CLAY - silty, trace sand, high plastic, moist, stiff, brown	5				
2.5			CH		CLAY - silty, trace sand, high plastic, moist, stiff, brown	6				
3.0					TERMINATED AT 3.0m BELOW EXISTING GRADE					
3.0					NOTES					
3.0					No sloughing or seepage observed during drilling.					
3.0					Test hole remained open to full depth and was dry prior to backfilling.					
3.0					Test hole backfilled with auger cuttings and bentonite.					
3.0					Pavement surface repaired with asphalt.					

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REVIEWED BY: JW	COMPLETION DATE: November 29, 2022
Figure No. B-7	Sheet 1 of 1

PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: <b>SA08</b>	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Salter Street (See Drawing)		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
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"/> Split-Pen	<input type="checkbox"/> Core
				<input type="checkbox"/> Slough	<input type="checkbox"/> Sand

DEPTH (m)	UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400	POCKET PENETROMETER (kPa) ☒ 100 200 300 400	TORVANE (kPa) ★ 50 100 150 200	PLASTIC M.C. LIQUID 20 40 60 80	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0							ASPHALT (50mm thick) CONCRETE (250mm thick) CLAY - silty, some gravel, trace sand, high plastic, moist, friable, grey		1			
1							- below 1.0m, silty to and silt, some sand, stiff, brown		2			
1.5									3			
2						CH			4			Particle Size Analysis - Sample 3 @ 0.9m: Gravel= 0.0% Sand= 17.5% Silt= 50.3% Clay= 32.2%
2.5									5			
3									6			
3							TERMINATED AT 3.0m BELOW EXISTING GRADE NOTES No sloughing or seepage observed during drilling. Test hole remained open to full depth and was dry prior to backfilling. Test hole backfilled with auger cuttings and bentonite. Pavement surface repaired with asphalt.					
4												
5												
6												
7												
8												
9												
10												

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LOGGED BY: JW	COMPLETION DEPTH: 3 m
REVIEWED BY: BW	COMPLETION DATE: November 7, 2022
Figure No. B-8	Sheet 1 of 1

PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: <b>SA09</b>	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Salter Street (See Drawing)		DRILL METHOD: 125mm SSA		ELEVATION: Not Surveyed	
SAMPLE TYPE		<input type="checkbox"/> Shelby Tube	<input type="checkbox"/> No Recovery	<input checked="" type="checkbox"/> SPT (N)	<input type="checkbox"/> Grab Sample
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"/> Split-Pen	<input type="checkbox"/> Slough	<input type="checkbox"/> Core	<input type="checkbox"/> Sand

DEPTH (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0			ASPHALT (75mm thick)					
0	CH		CLAY - silty, trace sand, high plastic, moist, very stiff, grey	Core	1			
0.5			SILT - clayey, trace sand, low plastic, moist, soft, brown	Core	2			0.5
1.0	ML			Core	3			1.0
2.0	CH		CLAY - silty, trace sand, high plastic, moist, stiff, brown	Core	4			2.0
2.5				Core	5			2.5
3.0			TERMINATED AT 3.0m BELOW EXISTING GRADE	Core	6			3.0
3.0			NOTES No sloughing or seepage observed during drilling. Test hole remained open to full depth and was dry prior to backfilling. Test hole backfilled with auger cuttings and bentonite. Pavement surface repaired with asphalt.					3.0

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REVIEWED BY: BW	COMPLETION DATE: November 7, 2022
Figure No. B-9	Sheet 1 of 1

PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: <b>SE01</b>	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Selkirk Avenue (See Drawing)		DRILL METHOD: 125mm SSA		ELEVATION: Not Surveyed	
SAMPLE TYPE		<input type="checkbox"/> Shelby Tube	<input type="checkbox"/> No Recovery	<input checked="" type="checkbox"/> SPT (N)	<input type="checkbox"/> Grab Sample
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"/> Split-Pen	<input type="checkbox"/> Slough	<input type="checkbox"/> Core	<input type="checkbox"/> Sand

DEPTH (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0			ASPHALT (175mm thick)					
			CONCRETE (75mm thick)					
		GP	GRAVEL (FILL) - poorly graded, medium grained to coarse grained, moist, compact (inferred), brown		1			
		ML	SILT - clayey, trace sand, low plastic, moist, soft to firm, brown		2			
1								
		CH	CLAY - and silt, trace sand, high plastic, moist, stiff, brown		3			
2					4		Particle Size Analysis - Sample 3 @ 1.2m: Gravel= 0.0% Sand= 6.2% Silt= 38.2% Clay= 55.7%	
					5			
					6			
3			TERMINATED AT 3.0m BELOW EXISTING GRADE					
			NOTES No sloughing or seepage observed during drilling. Test hole remained open to full depth and was dry prior to backfilling. Test hole backfilled with auger cuttings and bentonite. Pavement surface repaired with asphalt.					
4								
5								
6								
7								
8								
9								
10								

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REVIEWED BY: JW	COMPLETION DATE: December 2, 2022
Figure No. B-10	Sheet 1 of 1

PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: <b>SE02</b>	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Selkirk Avenue (See Drawing)		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
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"/> Split-Pen	<input type="checkbox"/> Core
				<input type="checkbox"/> Slough	<input type="checkbox"/> Sand

DEPTH (m)	UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400		SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)	
	POCKET PENETROMETER (kPa) ☒ 100 200 300 400										
		★ TORVANE (kPa) ★ 50 100 150 200									
		PLASTIC M.C. LIQUID 20 40 60 80									
0					ASPHALT (90mm thick) CONCRETE (210mm thick)						
			GP		GRAVEL (FILL) - poorly graded, medium grained to coarse grained, compact (inferred), moist, brown CLAY - and silt, high plastic, moist, very stiff, brown with black staining		1				
					- below 1.2m, silty		2				
					- below 1.4m silty to and silt, trace sand, moist, brown		3				
			CH ML				4				
					- below 2.4m, stiff		5				
							6				
					TERMINATED AT 3.0m BELOW EXISTING GRADE NOTES No sloughing or seepage observed during drilling. Test hole remained open to full depth and was dry prior to backfilling. Test hole backfilled with auger cuttings and bentonite. Pavement surface repaired with asphalt. SILT - trace sand, low plastic, moist, soft to firm, brown						

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Figure No. B-11

COMPLETION DEPTH: 3 m

COMPLETION DATE: December 2, 2022


Sheet 1 of 1

PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: <b>SE03</b>	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Selkirk Avenue (See Drawing)		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
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"/> Split-Pen	<input type="checkbox"/> Core
				<input type="checkbox"/> Slough	<input type="checkbox"/> Sand

DEPTH (m)	UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400		SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
	POCKET PENETROMETER (kPa) ☒ 100 200 300 400	TORVANE (kPa) ★ 50 100 150 200								
	PLASTIC M.C. LIQUID 20 40 60 80									
0					ASPHALT (175mm thick)					
					CONCRETE (125mm thick)					
			GP		GRAVEL (FILL) - poorly graded, medium to coarse grained, moist, compact (inferred), brown	█	1			
			ML		SILT - clayey, trace sand, low plastic, moist, firm, brown with black staining	█	2			
1					CLAY - silty, trace sand, high plastic, stiff, brown	█	3			
			CH			█	4			
2						█	5			
						█	6			
3					TERMINATED AT 3.0m BELOW EXISTING GRADE					
					NOTES					
					No sloughing or seepage observed during drilling.					
					Test hole remained open to full depth and was dry prior to backfilling.					
					Test hole backfilled with auger cuttings and bentonite.					
					Pavement surface repaired with asphalt.					
4										
5										
6										
7										
8										
9										
10										

 <b>WSP E&amp;I Canada Limited</b>	LOGGED BY: JC	COMPLETION DEPTH: 3 m
	REVIEWED BY: JW	COMPLETION DATE: December 2, 2022
	Figure No. B-12	Sheet 1 of 1

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PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: <b>SE04</b>	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Selkirk Avenue (See Drawing)		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
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"/> Split-Pen	<input type="checkbox"/> Slough	<input type="checkbox"/> Core	<input type="checkbox"/> Sand



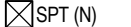


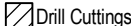
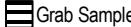


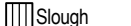


DEPTH (m)	UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400		SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
	POCKET PENETROMETER (kPa) ☒ 100 200 300 400	TORVANE (kPa) ★ 50 100 150 200								
	PLASTIC M.C. LIQUID 20 40 60 80									
0					ASPHALT (60mm thick)					
					CONCRETE (275mm thick)					
			GP		GRAVEL (FILL) - poorly graded, medium to coarse grained, compact (inferred), very moist, brown	█	1			
					SILT - some clay, some sand, trace gravel, low plastic, moist, soft, brown	█	2			
1			ML						Particle Size Analysis - Sample 2 @ 0.6m: Gravel= 4.7% Sand= 13.8% Silt= 64.8% Clay= 16.8%	1
					- below 1.3m; clayey, moist to very moist	█	3			2
					CLAY - silty, trace sand, high plastic, moist, stiff, brown	█	4			3
2			CH			█	5			4
3						█	6			5
4					TERMINATED AT 3.0m BELOW EXISTING GRADE					6
5					NOTES					7
6					No sloughing or seepage observed during drilling.					8
7					Test hole remained open to full depth and was dry prior to backfilling.					9
8					Test hole backfilled with auger cuttings and bentonite.					10
9					Pavement surface repaired with asphalt.					

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






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Figure No. B-13	Sheet 1 of 1

PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: <b>SE05</b>	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Selkirk Avenue (See Drawing)		DRILL METHOD: 125mm SSA		ELEVATION: Not Surveyed	
SAMPLE TYPE  Shelby Tube		 No Recovery		 SPT (N)	
BACKFILL TYPE  Bentonite		 Pea Gravel		 Drill Cuttings	
		 Grab Sample		 Split-Pen	
		 GROUT		 Slough	
		 Core			
		 Sand			

DEPTH (m)	UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400		SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
	POCKET PENETROMETER (kPa) ☒ 100 200 300 400									
	TORVANE (kPa) ★ 50 100 150 200									
	PLASTIC M.C. LIQUID 20 40 60 80									
0			ASPH		ASPHALT (100mm thick)					
			CONC		CONCRETE (500mm thick - rubble)					
			GP		GRAVEL (FILL) - poorly graded, medium to coarse grained, moist, compact (inferred), brown		1			
1			CH		CLAY - silty, trace sand, high plastic, moist, very stiff, brown		2			
					SILT - clayey, trace sand, low plastic, moist to very moist, soft, brown		3			
			ML				4			
2									Particle Size Analysis - Sample 2 @ 0.8m: Gravel= 1.6% Sand= 10.1% Silt= 25.9% Clay= 62.4%	
			CH		CLAY- silty, trace sand, high plastic, moist, very stiff, brown		5			
3							6			
					TERMINATED AT 3.0m BELOW EXISTING GRADE					
					NOTES					
					No sloughing or seepage observed during drilling. Test hole remained open to full depth and was dry prior to backfilling. Test hole backfilled with auger cuttings and bentonite. Pavement surface repaired with asphalt.					

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Figure No. B-14

COMPLETION DEPTH: 3 m  
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Sheet 1 of 1



PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: <b>SE06</b>	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Selkirk Avenue (See Drawing)		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
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"/> Split-Pen	<input type="checkbox"/> Slough	<input type="checkbox"/> Core	<input type="checkbox"/> Sand

DEPTH (m)	UNCONFINED COMPRESSION (kPa)		SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
	▲	▲								
0	▲ 100 200 300 400		ASPH		ASPHALT (100mm thick)					
0	☒ 100 200 300 400		CONC		CONCRETE (90mm thick)					
0	★ 50 100 150 200		GP		GRAVEL (FILL) - poorly graded, medium to coarse grained, moist, compact (inferred), brown		1			
1	PLASTIC LIQUID				CLAY - silty, trace sand, high plastic, damp to moist, stiff, brown		2			1
1.5	M.C.				- below 1.5m; moist, greyish brown		3			
2			CH		- below 2.4m; firm		4		Particle Size Analysis - Sample 3 @ 1.4m: Gravel= 0.0% Sand= 4.3% Silt= 26.2% Clay= 69.5%	2
2.4							5			3
3					TERMINATED AT 3.0m BELOW EXISTING GRADE		6			4
4					NOTES No sloughing or seepage observed during drilling. Test hole remained open to full depth and was dry prior to backfilling. Test hole backfilled with auger cuttings and bentonite. Pavement surface repaired with asphalt.					5
5										6
6										7
7										8
8										9
9										10

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Figure No. B-15	Sheet 1 of 1

PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: <b>SE07</b>	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Selkirk Avenue (See Drawing)		DRILL METHOD: 125mm SSA		ELEVATION: Not Surveyed	
SAMPLE TYPE		<input type="checkbox"/> Shelby Tube	<input type="checkbox"/> No Recovery	<input checked="" type="checkbox"/> SPT (N)	<input type="checkbox"/> Grab Sample
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"/> Split-Pen	<input type="checkbox"/> Slough	<input type="checkbox"/> Core	<input type="checkbox"/> Sand

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
0		ASPHALT (100mm thick)					
		CONCRETE (90mm thick)					
	GP	GRAVEL (FILL) - poorly graded, medium to coarse grained, compact (inferred), moist, brown	█	1			
		SILT - clayey, trace sand, low plastic, moist, soft, brown	█	2			
1	ML		█	3			
2	CH	CLAY - silty, trace sand, high plastic, moist, very stiff, brown	█	4			
		- below 2.4m, stiff	█	5			
3		TERMINATED AT 3.0m BELOW EXISTING GRADE	█	6			
4		NOTES No sloughing or seepage observed during drilling. Test hole remained open to full depth and was dry prior to backfilling. Test hole backfilled with auger cuttings and bentonite. Pavement surface repaired with asphalt.					

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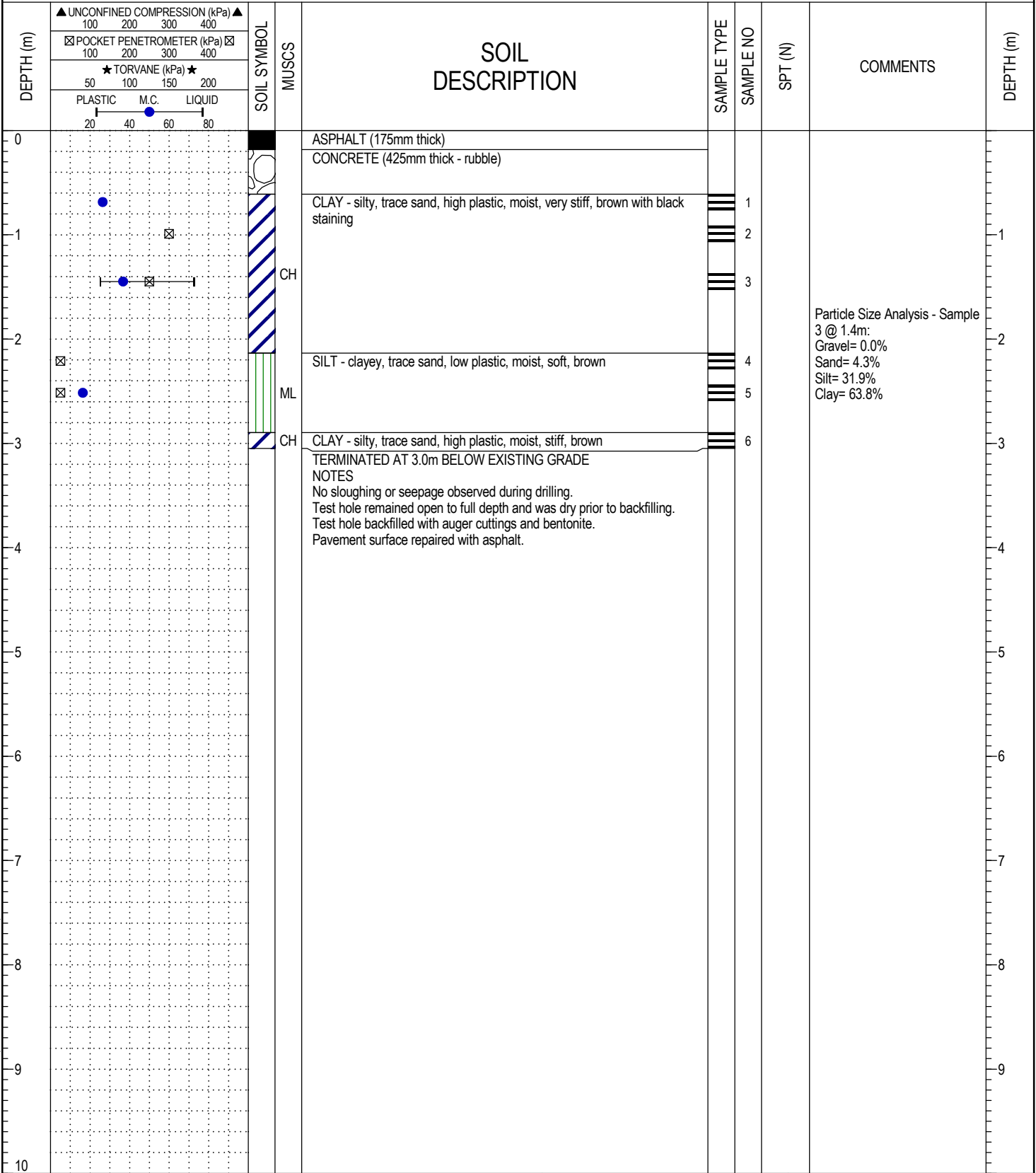


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LOGGED BY: JC	COMPLETION DEPTH: 3 m
REVIEWED BY: JW	COMPLETION DATE: November 30, 2022
Figure No. B-16	Sheet 1 of 1

PROJECT: City of Winnipeg Streets	DRILLER: Maple Leaf Drilling Ltd.	TEST HOLE ID: <b>SE08</b>
CLIENT: Stantec	DRILL RIG: Mobile B40	PROJECT No: WX19714
LOCATION: Selkirk Avenue (See Drawing)	DRILL METHOD: 125mm SSA	ELEVATION: Not Surveyed

SAMPLE TYPE	<input 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



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REVIEWED BY: JW	COMPLETION DATE: November 30, 2022
Figure No. B-17	Sheet 1 of 1

PROJECT: City of Winnipeg Streets		DRILLER: Maple Leaf Drilling Ltd.		TEST HOLE ID: <b>SE09B</b>	
CLIENT: Stantec		DRILL RIG: Mobile B40		PROJECT No: WX19714	
LOCATION: Selkirk Avenue (See Drawing)		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
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"/> Split-Pen	<input type="checkbox"/> Core
				<input type="checkbox"/> Slough	<input type="checkbox"/> Sand

DEPTH (m)	UNCONFINED COMPRESSION (kPa)		SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	DEPTH (m)
	▲	▲								
0	▲ 100 200 300 400				ASPHALT (75mm thick) CONCRETE (225mm thick - rubble)		1			0
0.5	☒ 100 200 300 400			GP	GRAVEL (FILL) - poorly graded, medium to coarse grained, moist, loose (inferred), brown		2			0.5
1.5	★ 50 100 150 200				CLAY - silty, trace sand, high plastic, moist, firm, brown					1.5
2.0	★ 50 100 150 200			CH	- below 1.5m, stiff		3			2.0
2.5	★ 50 100 150 200				- below 2.4m, firm		4			2.5
3.0	★ 50 100 150 200						5			3.0
3.0	★ 50 100 150 200						6			3.0
TERMINATED AT 3.0m BELOW EXISTING GRADE NOTES No sloughing or seepage observed during drilling. Test hole remained open to full depth and was dry prior to backfilling. Test hole backfilled with auger cuttings and bentonite. Pavement surface repaired with asphalt.										

WX19714.GPJ 22/12/22 05:01 PM (WPG - GEOTECH LOG 4)



WSP E&I Canada Limited

LOGGED BY: JC	COMPLETION DEPTH: 3 m
REVIEWED BY: JW	COMPLETION DATE: December 2, 2022
Figure No. B-18	Sheet 1 of 1

# Appendix C

## Standard Proctor and CBR Testing Results

# California Bearing Ratio

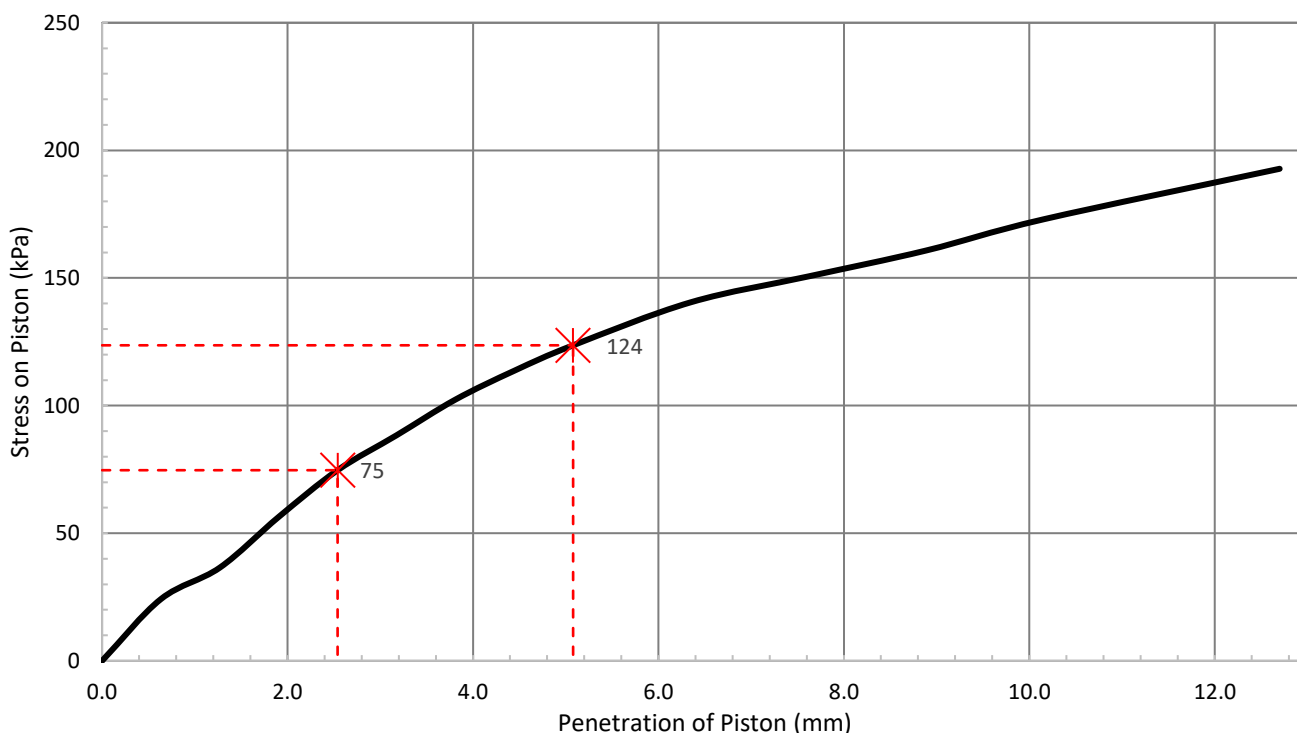
## ASTM D1883-16, Soaking Method

WSP E&I Solutions Canada Limited



Type of Preparation	Standard ASTM D698	Sample Preparation	Soaked
Maximum Dry Density	1435 kg/m <sup>3</sup>	Soaking time	96 hrs
Optimum Moisture Content	27.4 %	Top 1 Inch Soaked Moisture	40.3 %
Compacted Dry Density	1357 kg/m <sup>3</sup>	Bottom 1 Inch Soaked Moisture	34.8 %
Compacted Moisture Content	27.3% %	Average Soaked Moisture	37.0 %
Percent Compaction	95% %	Mass of Surcharge	4.54 kg

Corrected Penetration (mm)	Standard Load of Crushed Stone (kPa)	Corrected Load (kPa)	CBR (%)
2.540	6900	75	<b>1.1</b>
5.080	10300	124	<b>1.2</b>



Client: Stantec  
 Project No: WX19714  
 Date: November 30, 2022  
 Technologist: Mdnazri Mohidin

Project: City of Winnipeg Streets  
 Site Location: SA01  
 Request No: \_\_\_\_\_  
 Reviewed By: Jorden Wiwcharyk

Soil Description: Clay - silty, high plastic, moist, stiff, brown

Liquid Limit 76      Plastic Limit 24      Plasticity Index 52      Swell 0.39%

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results will be provided only upon written request. If you are not the Intended recipient please notify us by telephone as soon as possible and either return the message by post or destroy it. If you are not the intended recipient, any use by you of its contents is prohibited.



# Moisture / Density Relationship

Report Date: December 05, 2022

**Client**

---

**Name:** Stantec

**Address:** 311 Portage Ave, Suite 500 Winnipeg, MB

**Attention:** Kevin Rae

**PO Number:**

**Sample Date:** 11/7/2022 by Jorden Wiwcharyk

**Source:** **SA01 + SA02**

**Project**

---

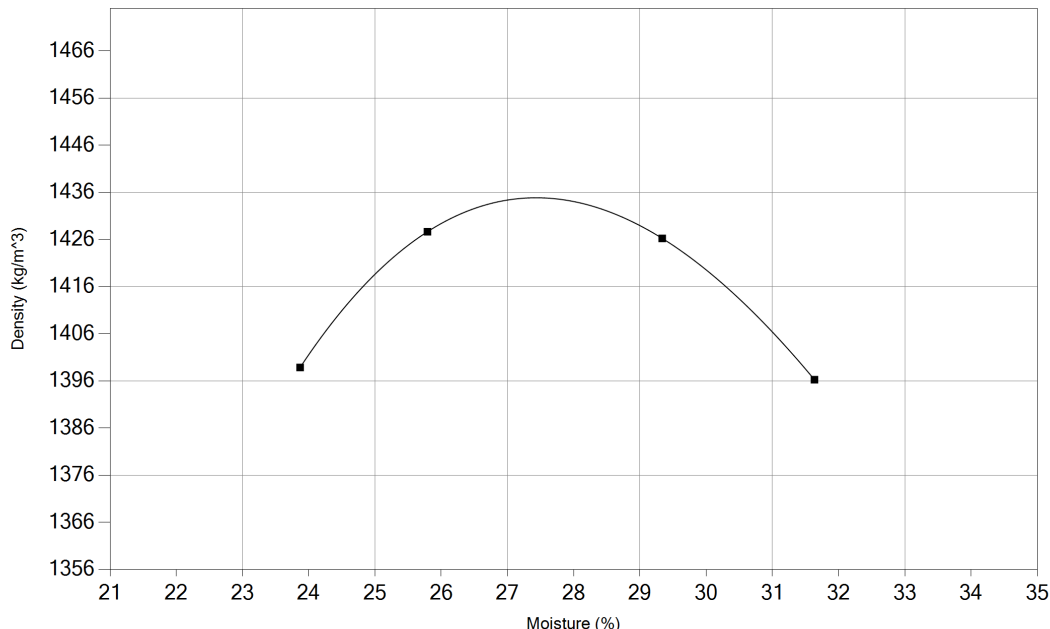
**Name:** (WX19714) City of Winnipeg Street Investigation 323-2022

**Address:** Winnipeg, MB

**Phase:** N/A **Task:** N/A

**Manager:** Jorden Wiwcharyk

**Lab/Ref. #:** WX19714 SA01-02



**Moisture Density Relationship: (ASTM D698-12) Method: A**

Preparation Method: Dry Rammer Type: Mechanical

Maximum Density (kg/m<sup>3</sup>): 1435

Optimum Moisture (%): 27.4

Remarks:

Distribution:

Reviewed By: Jorden Wiwcharyk

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.

WSP E&I Canada Ltd. - 6 High Level Road - Oak Bluff (Wpg), Mb



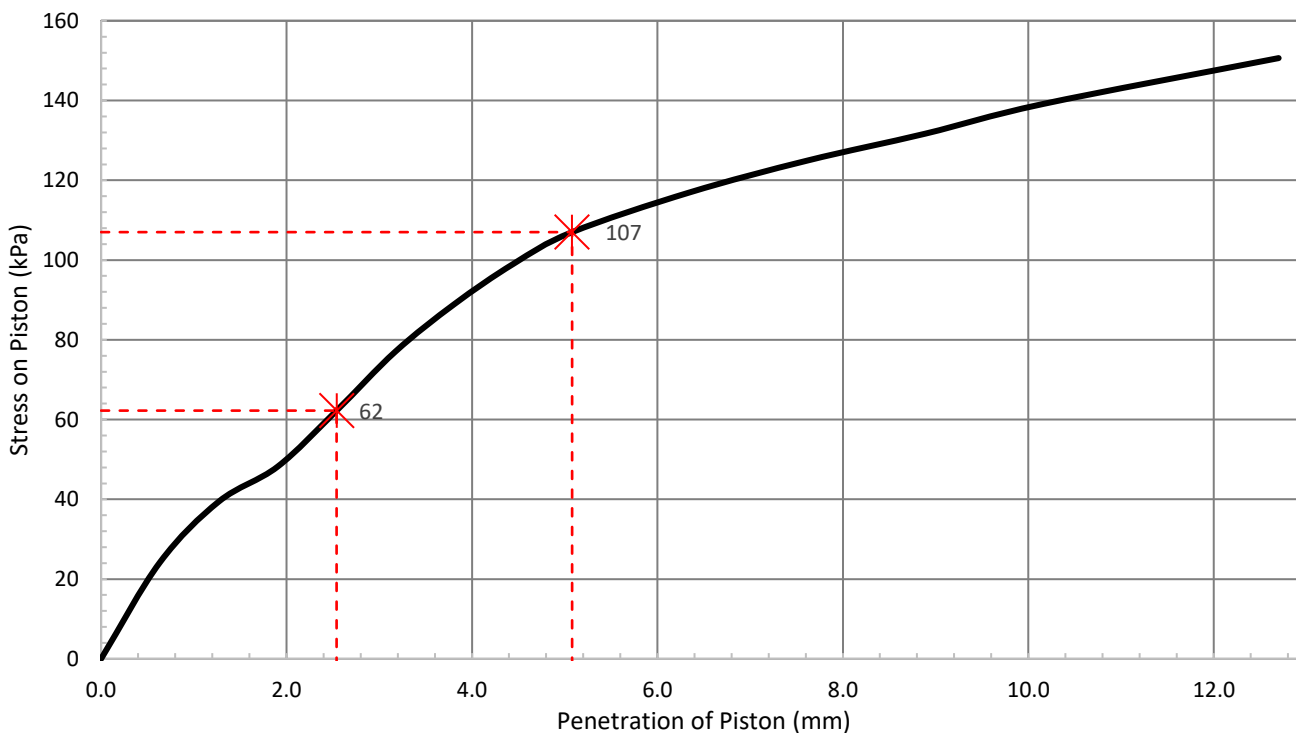
CCIL Certified Aggregate Type C, Type D & Concrete Aggregate Type R in accordance with CSA A283-19

**California Bearing Ratio**  
**ASTM D1883-16, Soaking Method**  
WSP E&I Solutions Canada Limited



Type of Preparation	Standard ASTM D698	Sample Preparation	Soaked
Maximum Dry Density	1489 kg/m <sup>3</sup>	Soaking time	96 hrs
Optimum Moisture Content	23.4 %	Top 1 Inch Soaked Moisture	42.3 %
Compacted Dry Density	1408 kg/m <sup>3</sup>	Bottom 1 Inch Soaked Moisture	31.1 %
Compacted Moisture Content	23.6% %	Average Soaked Moisture	35.1 %
Percent Compaction	95% %	Mass of Surcharge	4.54 kg

Corrected Penetration (mm)	Standard Load of Crushed Stone (kPa)	Corrected Load (kPa)	CBR (%)
2.540	6900	62	<b>0.9</b>
5.080	10300	107	<b>1.0</b>



Client: Stantec  
Project No: WX19714  
Date: December 19, 2022  
Technologist: Mdnazri Mohidin

Project: City of Winnipeg Streets 323-2022  
Site Location: Salter SA03  
Request No: \_\_\_\_\_  
Reviewed By: Jorden Wiwcharyk

Soil Description: Clay - silty, high plastic, moist, stiff, brown

Liquid Limit \_\_\_\_\_ Plastic Limit \_\_\_\_\_ Plasticity Index \_\_\_\_\_ Swell 0.65%

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results will be provided only upon written request. If you are not the Intended recipient please notify us by telephone as soon as possible and either return the message by post or destroy it. If you are not the intended recipient, any use by you of its contents is prohibited.





# Moisture / Density Relationship

Report Date: December 22, 2022

**Client**

---

**Name:** Stantec

**Address:** 311 Portage Ave, Suite 500 Winnipeg, Manitoba

**Attention:** Kevin Rae

**PO Number:**

**Sample Date:** 12/1/2022 by Amal Jayan

**Source:** SA03 + SA04

**Project**

---

**Name:** (WX19714) City of Winnipeg Street Investigation 323-2022

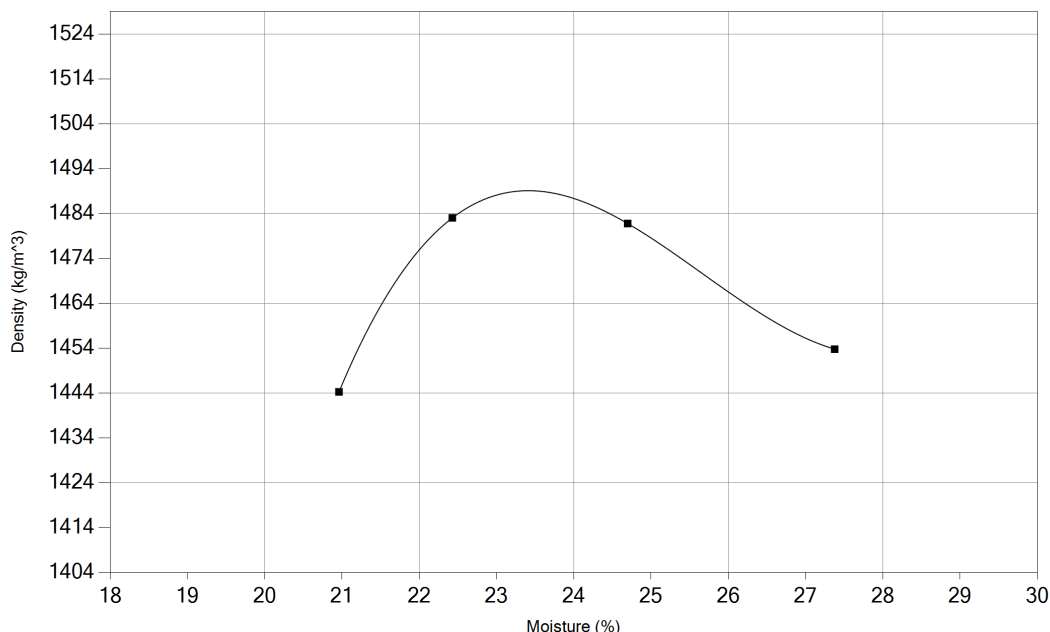
**Address:** Winnipeg, MB

**Phase:** **Task:**

**Manager:** Jordan Wiwcharyk

**Lab/Ref. #:** SA22-03

**Description:** Clay



**Moisture Density Relationship: (ASTM D698-12) Method: A**

Preparation Method: Dry Rammer Type: Mechanical

Maximum Density (kg/m³): 1489

Optimum Moisture (%): 23.4

Remarks:

Distribution:

Reviewed By: Jordan Wiwcharyk

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.

WSP E&I Canada Ltd. - 6 High Level Road - Oak Bluff (Wpg), Mb



CCIL Certified Aggregate Type C, Type D & Concrete Aggregate Type R in accordance with CSA A283-19

# California Bearing Ratio

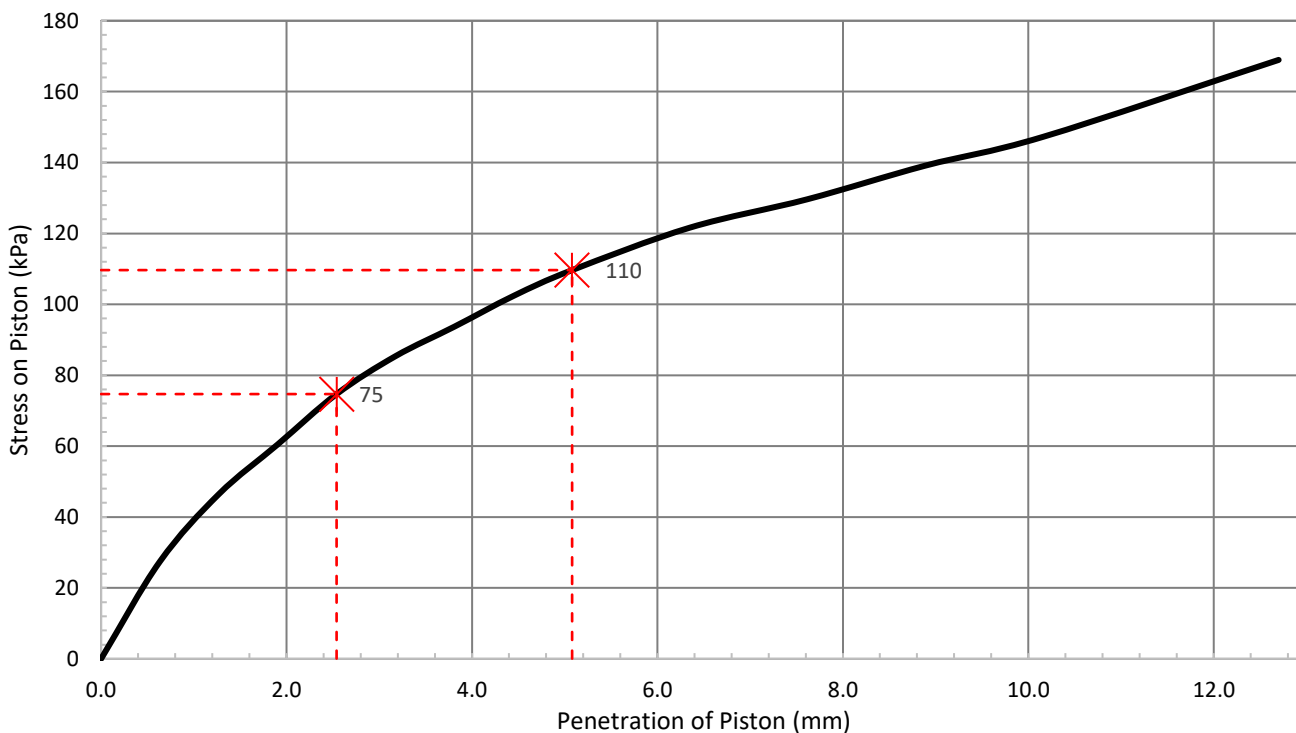
## ASTM D1883-16, Soaking Method



WSP E&I Solutions Canada Limited

Type of Preparation	Standard ASTM D698	Sample Preparation	Soaked
Maximum Dry Density	1413 kg/m <sup>3</sup>	Soaking time	96 hrs
Optimum Moisture Content	28.4 %	Top 1 Inch Soaked Moisture	45.6 %
Compacted Dry Density	1336 kg/m <sup>3</sup>	Bottom 1 Inch Soaked Moisture	33.0 %
Compacted Moisture Content	28.0% %	Average Soaked Moisture	38.0 %
Percent Compaction	95% %	Mass of Surcharge	4.54 kg

Corrected Penetration (mm)	Standard Load of Crushed Stone (kPa)	Corrected Load (kPa)	CBR (%)
2.540	6900	75	<b>1.1</b>
5.080	10300	110	<b>1.1</b>



Client: Stantec  
 Project No: WX19714  
 Date: November 30, 2022  
 Technologist: Mdnazri Mohidin

Project: City of Winnipeg Streets  
 Site Location: SA05  
 Request No: \_\_\_\_\_  
 Reviewed By: Jorden Wiwcharyk

Soil Description: Clay - silty, high plastic, moist, stiff, brown

Liquid Limit N/A      Plastic Limit N/A      Plasticity Index N/A      Swell 0.66%

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results will be provided only upon written request. If you are not the Intended recipient please notify us by telephone as soon as possible and either return the message by post or destroy it. If you are not the intended recipient, any use by you of its contents is prohibited.



# Moisture / Density Relationship

Report Date: December 05, 2022

**Client**

---

**Name:** Stantec

**Address:** 311 Portage Ave, Suite 500 Winnipeg, MB

**Attention:** Kevin Rae

**PO Number:**

**Sample Date:** 11/7/2022 by Jorden Wiwcharyk

**Source:** **SA05**

**Project**

---

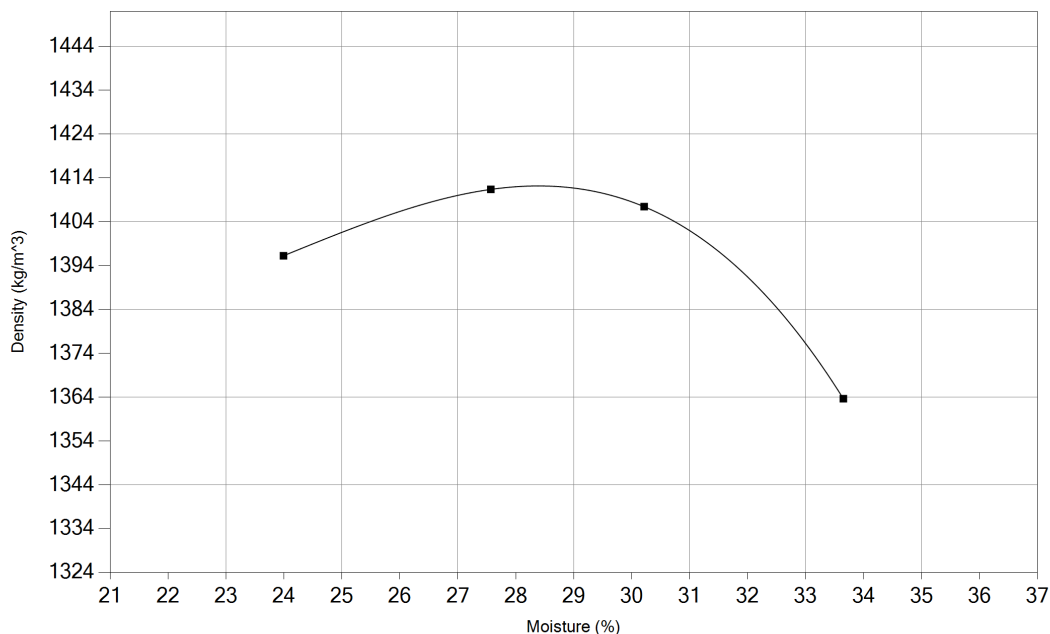
**Name:** (WX19714) City of Winnipeg Street Investigation 323-2022

**Address:** Winnipeg, MB

**Phase:** N/A **Task:** N/A

**Manager:** Jorden Wiwcharyk

**Lab/Ref. #:** WX19714- SA05



**Moisture Density Relationship: (ASTM D698-12) Method: A**

**Preparation Method:** Dry Rammer

**Type:** Mechanical

**Maximum Density (kg/m³):** 1413

**Optimum Moisture (%):** 28.4

**Remarks:**

**Distribution:**

**Reviewed By:** Jorden Wiwcharyk

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.

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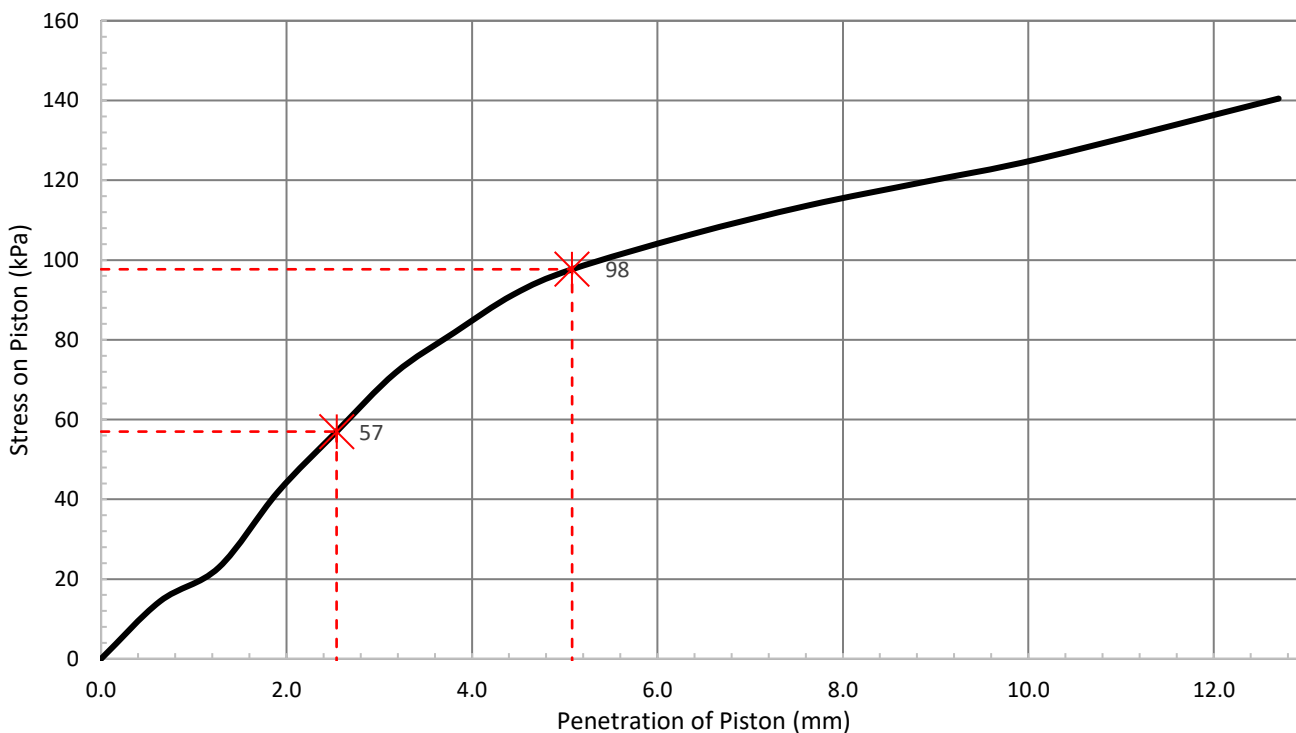
CCIL Certified Aggregate Type C, Type D & Concrete Aggregate Type R in accordance with CSA A283-19

**California Bearing Ratio**  
**ASTM D1883-16, Soaking Method**  
WSP E&I Solutions Canada Limited



Type of Preparation	Standard ASTM D698	Sample Preparation	Soaked
Maximum Dry Density	1491 kg/m <sup>3</sup>	Soaking time	96 hrs
Optimum Moisture Content	25.3 %	Top 1 Inch Soaked Moisture	39.1 %
Compacted Dry Density	1410 kg/m <sup>3</sup>	Bottom 1 Inch Soaked Moisture	31.3 %
Compacted Moisture Content	24.8% %	Average Soaked Moisture	33.8 %
Percent Compaction	95% %	Mass of Surcharge	4.54 kg

Corrected Penetration (mm)	Standard Load of Crushed Stone (kPa)	Corrected Load (kPa)	CBR (%)
2.540	6900	57	<b>0.8</b>
5.080	10300	98	<b>0.9</b>



Client: Stantec  
Project No: WX19714  
Date: December 19, 2022  
Technologist: Mdnazri Mohidin

Project: City of Winnipeg Streets 323-2022  
Site Location: Salter SA06  
Request No: \_\_\_\_\_  
Reviewed By: Jorden Wiwcharyk

Soil Description: Clay - silty, high plastic, moist, stiff, brown

Liquid Limit \_\_\_\_\_ Plastic Limit \_\_\_\_\_ Plasticity Index \_\_\_\_\_ Swell 0.45%

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results will be provided only upon written request. If you are not the Intended recipient please notify us by telephone as soon as possible and either return the message by post or destroy it. If you are not the intended recipient, any use by you of its contents is prohibited.



# Moisture / Density Relationship

Report Date: December 22, 2022

**Client**

---

**Name:** Stantec

**Address:** 311 Portage Ave, Suite 500 Winnipeg, Manitoba

**Attention:** Kevin Rae

**PO Number:**

**Sample Date:** 12/1/2022 by Amal Jayan

**Source:** SA06 + SA07

**Project**

---

**Name:** (WX19714) City of Winnipeg Street Investigation 323-2022

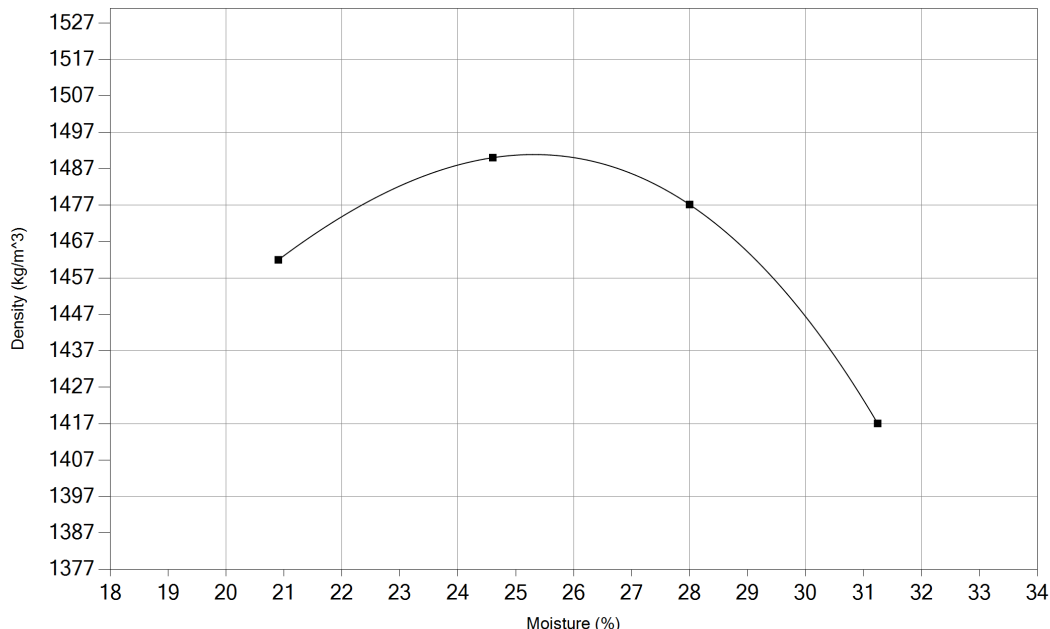
**Address:** Winnipeg, MB

**Phase:** **Task:**

**Manager:** Jordan Wiwcharyk

**Lab/Ref. #:** SA22-06

**Description:** Clay



**Moisture Density Relationship: (ASTM D698-12) Method: A**

Preparation Method: Dry Rammer Type: Mechanical

Maximum Density (kg/m³): 1491

Optimum Moisture (%): 25.3

Remarks:

**Distribution:**

Reviewed By: Jordan Wiwcharyk

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.

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CCIL Certified Aggregate Type C, Type D & Concrete Aggregate Type R in accordance with CSA A283-19

# California Bearing Ratio

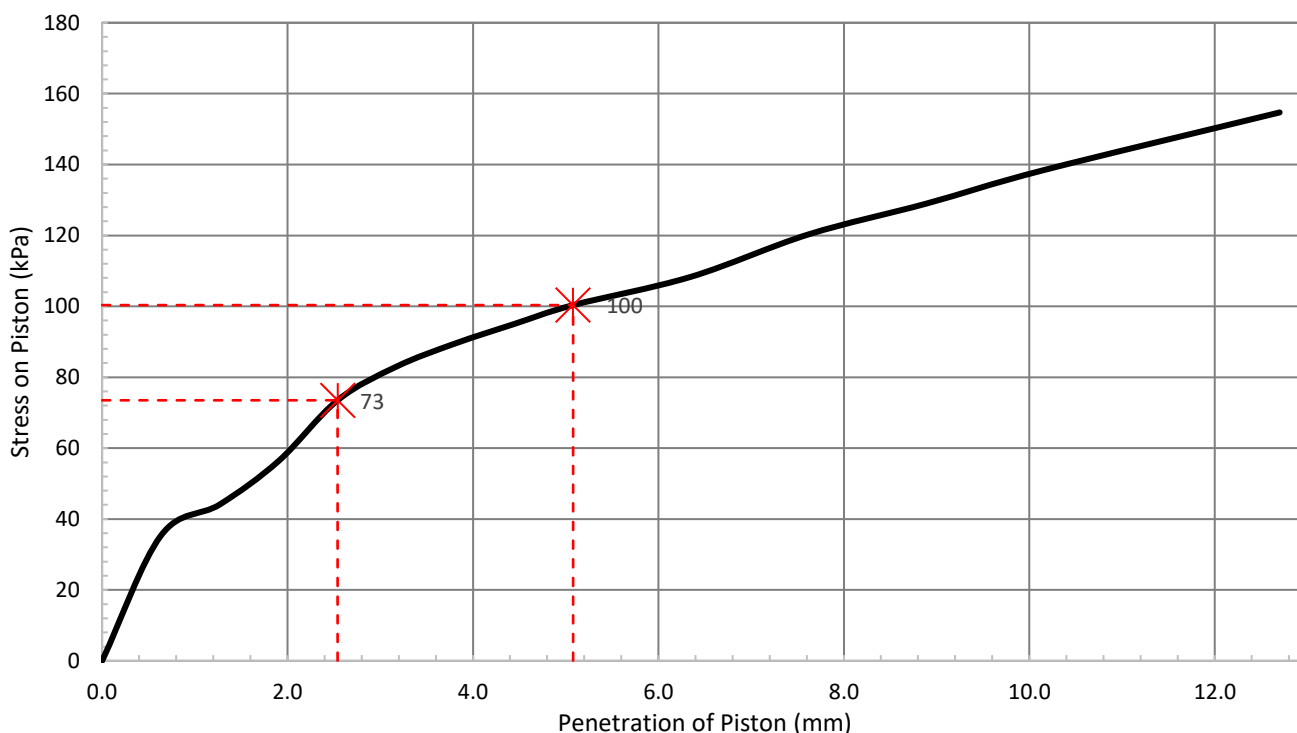
## ASTM D1883-16, Soaking Method



WSP E&I Solutions Canada Limited

Type of Preparation	Standard ASTM D698	Sample Preparation	Soaked
Maximum Dry Density	1495 kg/m <sup>3</sup>	Soaking time	96 hrs
Optimum Moisture Content	22.6 %	Top 1 Inch Soaked Moisture	41.7 %
Compacted Dry Density	1426 kg/m <sup>3</sup>	Bottom 1 Inch Soaked Moisture	30.0 %
Compacted Moisture Content	22.2% %	Average Soaked Moisture	34.7 %
Percent Compaction	95% %	Mass of Surcharge	4.54 kg

Corrected Penetration (mm)	Standard Load of Crushed Stone (kPa)	Corrected Load (kPa)	CBR (%)
2.540	6900	73	<b>1.1</b>
5.080	10300	100	<b>1.0</b>



Client: Stantec  
 Project No: WX19714  
 Date: November 29, 2022  
 Technologist: Mdnazri Mohidin

Project: City of Winnipeg Streets  
 Site Location: SA08  
 Request No: \_\_\_\_\_  
 Reviewed By: Jorden Wiwcharyk

Soil Description: Clay - silty, high plastic, moist, stiff, brown

Liquid Limit 52      Plastic Limit 23      Plasticity Index 29      Swell 0.75%

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results will be provided only upon written request. If you are not the Intended recipient please notify us by telephone as soon as possible and either return the message by post or destroy it. If you are not the intended recipient, any use by you of its contents is prohibited.



# Moisture / Density Relationship

Report Date: December 05, 2022

**Client**

---

**Name:** Stantec

**Address:** 311 Portage Ave, Suite 500 Winnipeg, MB

**Attention:** Kevin Rae

**PO Number:**

**Sample Date:** 11/7/2022 by Jorden Wiwcharyk

**Source:** SA08 + SA09

**Project**

---

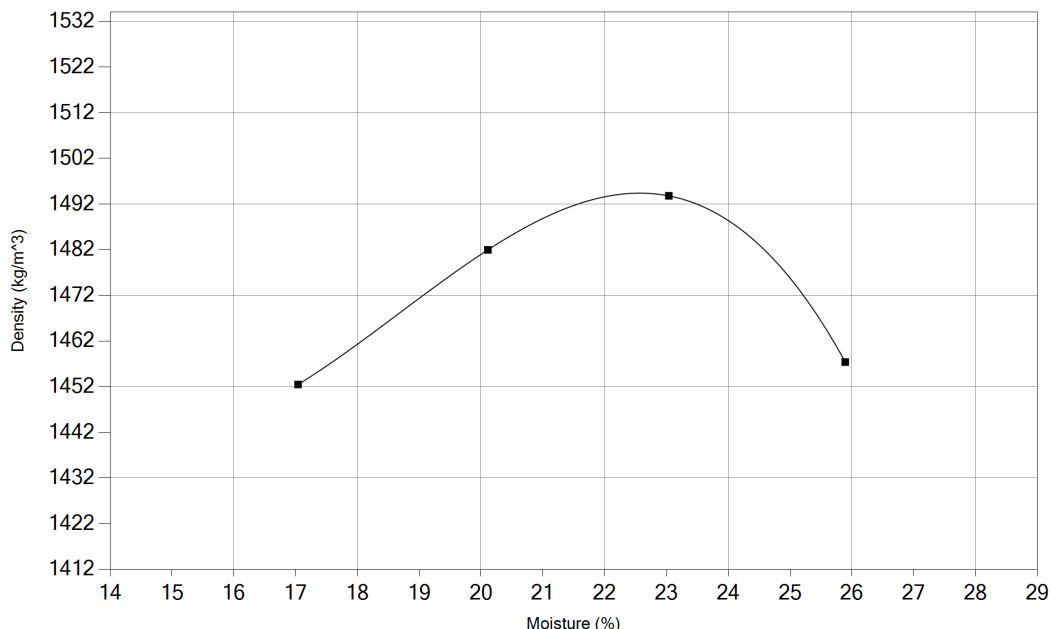
**Name:** (WX19714) City of Winnipeg Street Investigation 323-2022

**Address:** Winnipeg, MB

**Phase:** N/A **Task:** N/A

**Manager:** Jorden Wiwcharyk

**Lab/Ref. #:** WX19714- SA08-09



**Moisture Density Relationship: (ASTM D698-12) Method: A**

**Preparation Method:** Dry Rammer

**Type:** Mechanical

**Maximum Density (kg/m<sup>3</sup>):** 1495

**Optimum Moisture (%):** 22.6

**Remarks:**

**Distribution:**

**Reviewed By:** Jorden Wiwcharyk

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.

WSP E&I Canada Ltd. - 6 High Level Road - Oak Bluff (Wpg), Mb



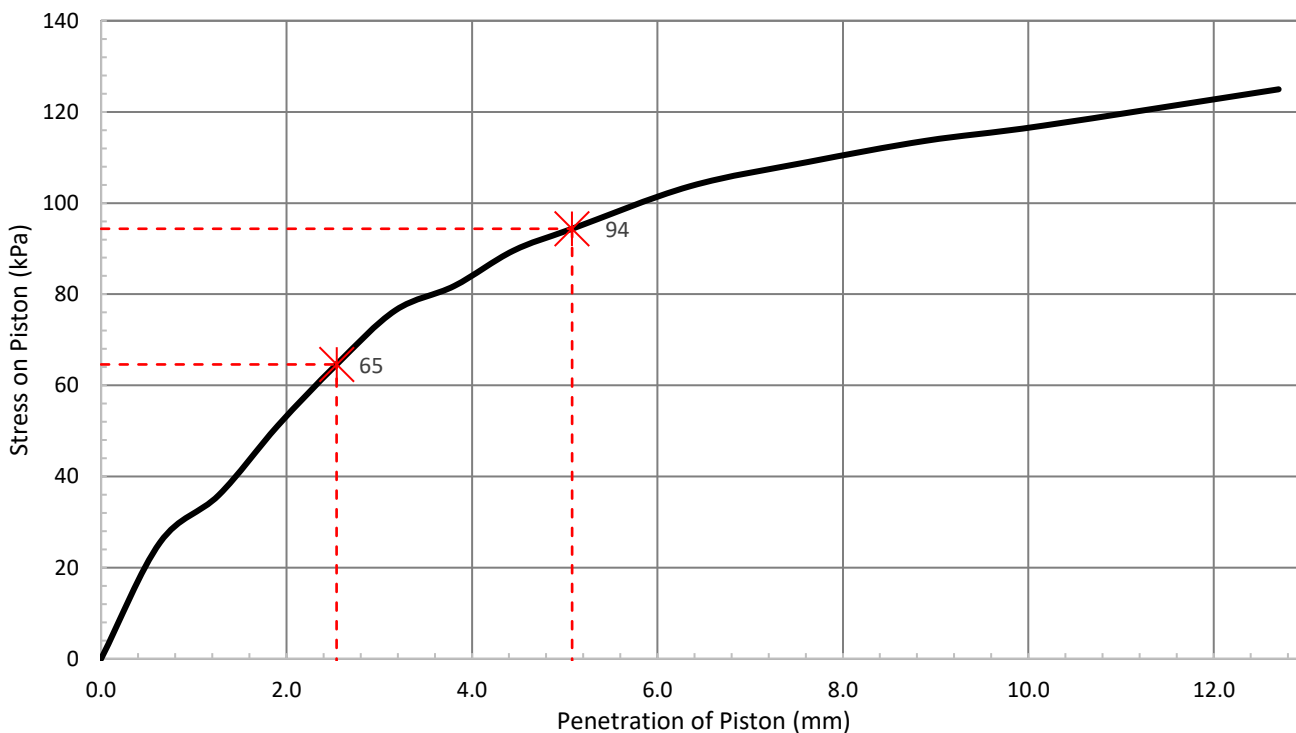
CCIL Certified Aggregate Type C, Type D & Concrete Aggregate Type R in accordance with CSA A283-19

**California Bearing Ratio**  
**ASTM D1883-16, Soaking Method**  
WSP E&I Solutions Canada Limited



Type of Preparation	Standard ASTM D698	Sample Preparation	Soaked
Maximum Dry Density	1396 kg/m <sup>3</sup>	Soaking time	96 hrs
Optimum Moisture Content	29.1 %	Top 1 Inch Soaked Moisture	48.2 %
Compacted Dry Density	1320 kg/m <sup>3</sup>	Bottom 1 Inch Soaked Moisture	37.5 %
Compacted Moisture Content	29.2% %	Average Soaked Moisture	41.8 %
Percent Compaction	95% %	Mass of Surcharge	4.54 kg

Corrected Penetration (mm)	Standard Load of Crushed Stone (kPa)	Corrected Load (kPa)	CBR (%)
2.540	6900	65	<b>0.9</b>
5.080	10300	94	<b>0.9</b>



Client: Stantec  
Project No: WX19714  
Date: December 20, 2022  
Technologist: Mdnazri Mohidin

Project: City of Winnipeg Streets 323-2022  
Site Location: Selkirk SE01  
Request No: \_\_\_\_\_  
Reviewed By: Jorden Wiwcharyk

Soil Description: Clay - silty, high plastic, moist, stiff, brown

Liquid Limit \_\_\_\_\_ Plastic Limit \_\_\_\_\_ Plasticity Index \_\_\_\_\_ Swell 0.84%

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results will be provided only upon written request. If you are not the Intended recipient please notify us by telephone as soon as possible and either return the message by post or destroy it. If you are not the intended recipient, any use by you of its contents is prohibited.





# Moisture / Density Relationship

Report Date: December 22, 2022

**Client**

---

**Name:** Stantec

**Address:** 311 Portage Ave, Suite 500 Winnipeg, Manitoba

**Attention:** Kevin Rae

**PO Number:**

**Sample Date:** 12/1/2022 by Amal Jayan

**Source:** SE01 + SE02

**Project**

---

**Name:** (WX19714) City of Winnipeg Street Investigation 323-2022

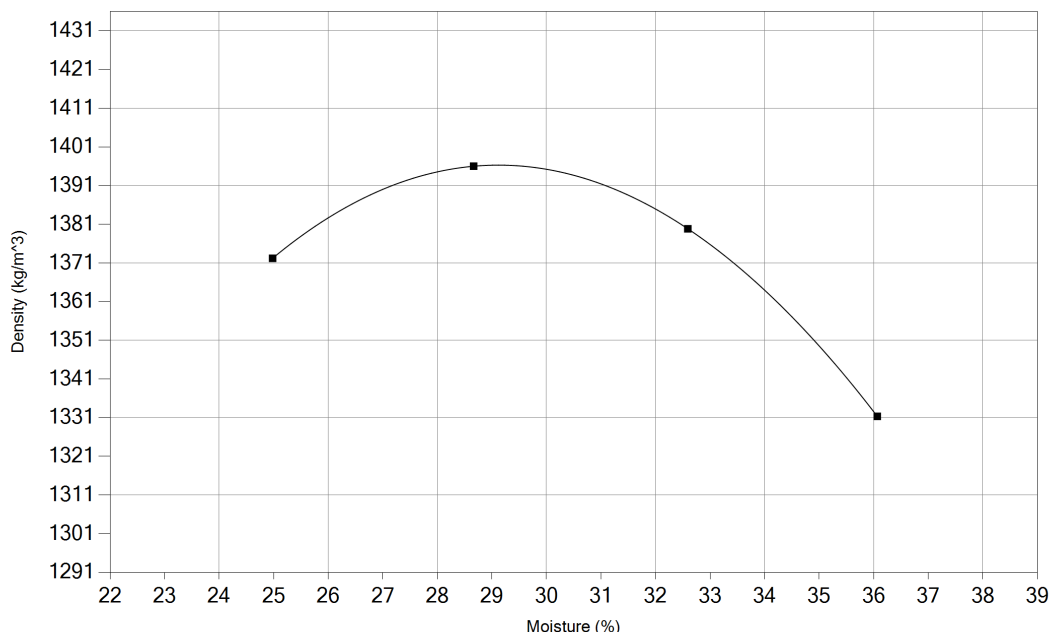
**Address:** Winnipeg, MB

**Phase:** **Task:**

**Manager:** Jordan Wiwcharyk

**Lab/Ref. #:** SE22-01

**Description:** Clay



**Moisture Density Relationship: (ASTM D698-12) Method: A**

Preparation Method: Dry Rammer Type: Mechanical

Maximum Density (kg/m³): 1396

Optimum Moisture (%): 29.1

Remarks:

Distribution:

Reviewed By: Jordan Wiwcharyk

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.

WSP E&I Canada Ltd. - 6 High Level Road - Oak Bluff (Wpg), Mb



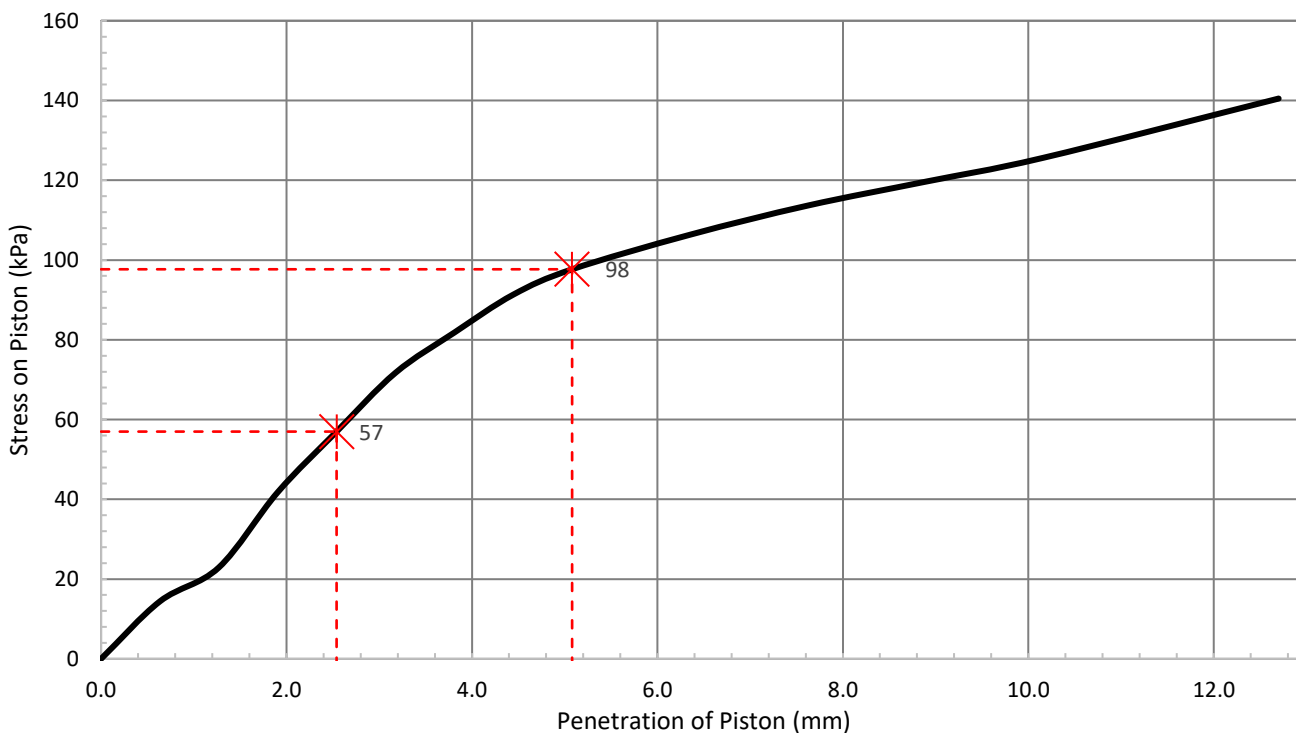
CCIL Certified Aggregate Type C, Type D & Concrete Aggregate Type R in accordance with CSA A283-19

**California Bearing Ratio**  
**ASTM D1883-16, Soaking Method**  
WSP E&I Solutions Canada Limited



Type of Preparation	Standard ASTM D698	Sample Preparation	Soaked
Maximum Dry Density	1406 kg/m <sup>3</sup>	Soaking time	96 hrs
Optimum Moisture Content	30.7 %	Top 1 Inch Soaked Moisture	48.2 %
Compacted Dry Density	1329 kg/m <sup>3</sup>	Bottom 1 Inch Soaked Moisture	35.7 %
Compacted Moisture Content	31.1% %	Average Soaked Moisture	40.4 %
Percent Compaction	95% %	Mass of Surcharge	4.54 kg

Corrected Penetration (mm)	Standard Load of Crushed Stone (kPa)	Corrected Load (kPa)	CBR (%)
2.540	6900	57	<b>0.8</b>
5.080	10300	98	<b>0.9</b>



Client: Stantec  
Project No: WX19714  
Date: December 20, 2022  
Technologist: Mdnazri Mohidin

Project: City of Winnipeg Streets 323-2022  
Site Location: Selkirk SE03  
Request No: \_\_\_\_\_  
Reviewed By: Jorden Wiwcharyk

Soil Description: Clay - silty, high plastic, moist, stiff, brown

Liquid Limit \_\_\_\_\_ Plastic Limit \_\_\_\_\_ Plasticity Index \_\_\_\_\_ Swell 0.57%

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results will be provided only upon written request. If you are not the Intended recipient please notify us by telephone as soon as possible and either return the message by post or destroy it. If you are not the intended recipient, any use by you of its contents is prohibited.

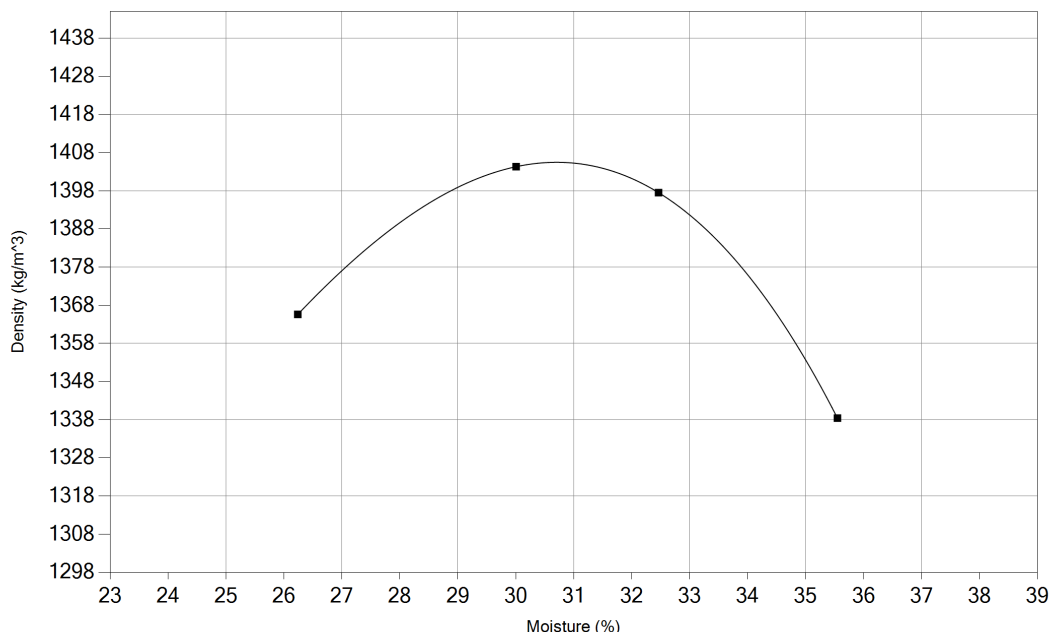


# Moisture / Density Relationship

Report Date: December 22, 2022

**Client**  
**Name:** Stantec  
**Address:** 311 Portage Ave, Suite 500 Winnipeg, Manitoba  
**Attention:** Kevin Rae  
**PO Number:**  
**Sample Date:** 12/1/2022 by Amal Jayan  
**Source:** SE03 + SE04

**Project**  
**Name:** (WX19714) City of Winnipeg Street Investigation 323-2022  
**Address:** Winnipeg, MB  
**Phase:** **Task:**  
**Manager:** Jordan Wiwcharyk  
**Lab/Ref. #:** SE22-03  
**Description:** Clay



**Moisture Density Relationship: (ASTM D698-12) Method: A**

**Preparation Method:** Dry **Rammer Type:** Mechanical

**Maximum Density (kg/m³):** 1406

**Optimum Moisture (%):** 30.7

**Remarks:**

**Distribution:**

**Reviewed By:** Jordan Wiwcharyk

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.

WSP E&I Canada Ltd. - 6 High Level Road - Oak Bluff (Wpg), Mb



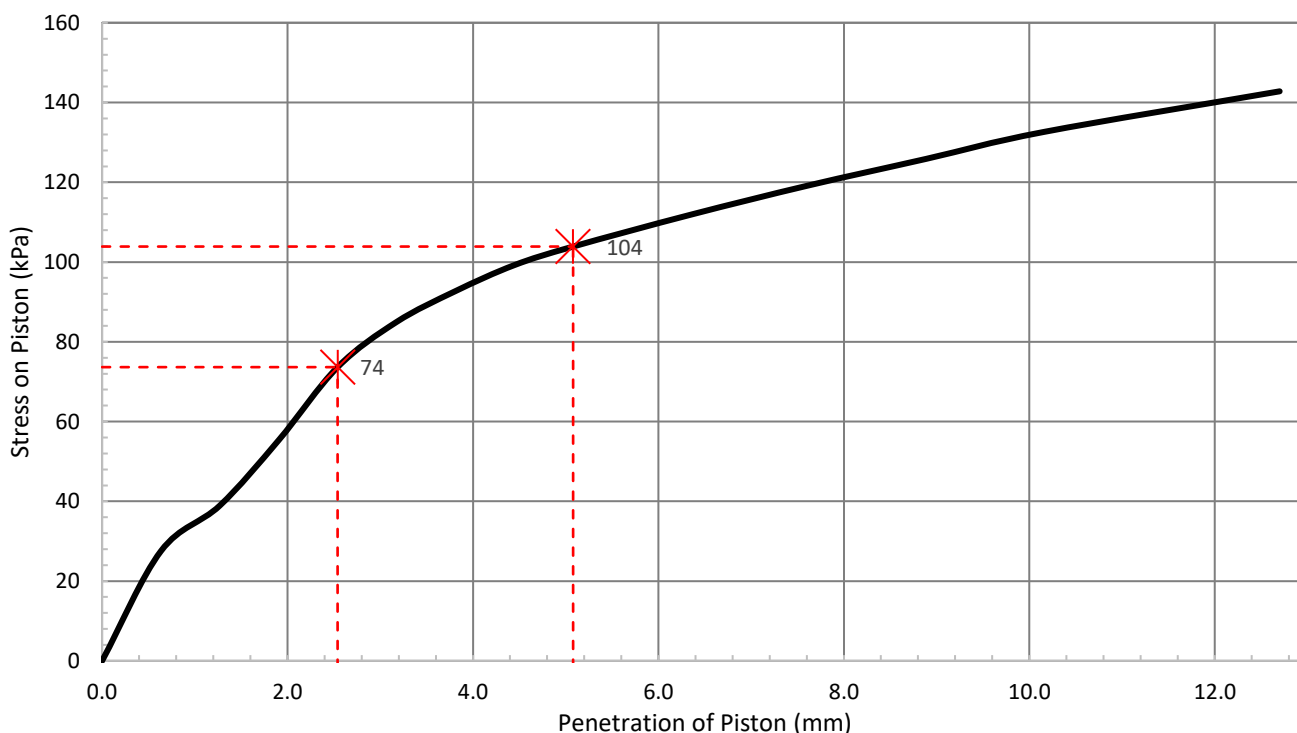
CCIL Certified Aggregate Type C, Type D & Concrete Aggregate  
Type R in accordance with CSA A283-19

**California Bearing Ratio**  
**ASTM D1883-16, Soaking Method**  
WSP E&I Solutions Canada Limited



Type of Preparation	Standard ASTM D698	Sample Preparation	Soaked
Maximum Dry Density	1457 kg/m <sup>3</sup>	Soaking time	96 hrs
Optimum Moisture Content	26.9 %	Top 1 Inch Soaked Moisture	40.9 %
Compacted Dry Density	1389 kg/m <sup>3</sup>	Bottom 1 Inch Soaked Moisture	31.1 %
Compacted Moisture Content	27.3% %	Average Soaked Moisture	34.9 %
Percent Compaction	95% %	Mass of Surcharge	4.54 kg

Corrected Penetration (mm)	Standard Load of Crushed Stone (kPa)	Corrected Load (kPa)	CBR (%)
2.540	6900	74	<b>1.1</b>
5.080	10300	104	<b>1.0</b>



Client: Stantec  
Project No: WX19714  
Date: December 23, 2022  
Technologist: Mdnazri Mohidin

Project: City of Winnipeg Streets 323-2022  
Site Location: Selkirk SE05  
Request No: \_\_\_\_\_  
Reviewed By: Jorden Wiwcharyk

Soil Description: Clay - silty, high plastic, moist, stiff, brown

Liquid Limit \_\_\_\_\_ Plastic Limit \_\_\_\_\_ Plasticity Index \_\_\_\_\_ Swell 0.47%

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results will be provided only upon written request. If you are not the Intended recipient please notify us by telephone as soon as possible and either return the message by post or destroy it. If you are not the intended recipient, any use by you of its contents is prohibited.

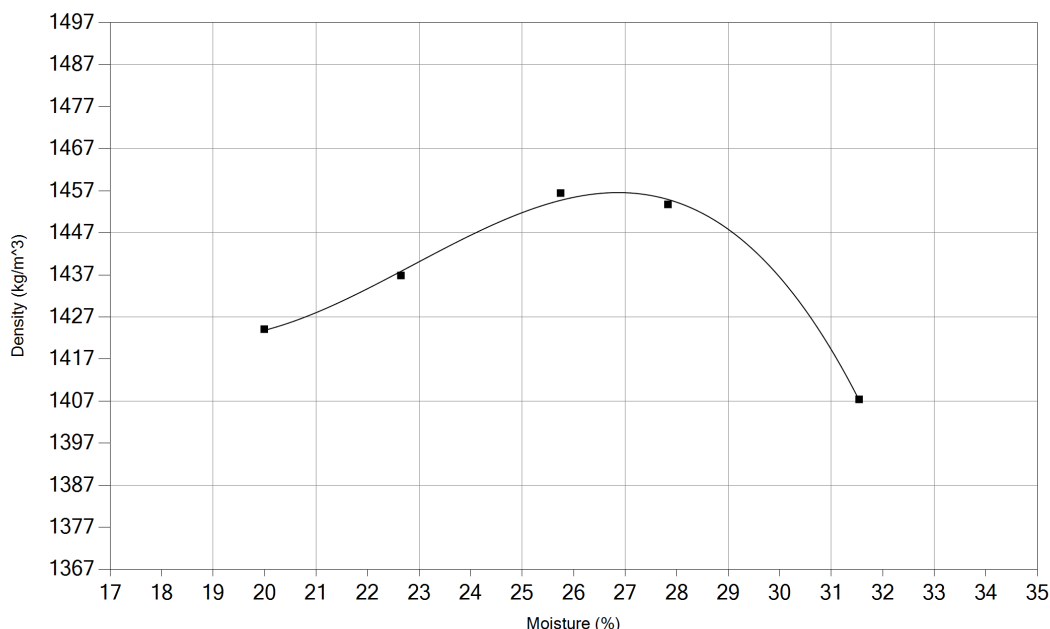


# Moisture / Density Relationship

Report Date: December 22, 2022

**Client**  
**Name:** Stantec  
**Address:** 311 Portage Ave, Suite 500 Winnipeg, Manitoba  
**Attention:** Kevin Rae  
**PO Number:**  
**Sample Date:** 12/1/2022 by Amal Jayan  
**Source:** SE05 + SE06

**Project**  
**Name:** (WX19714) City of Winnipeg Street Investigation 323-2022  
**Address:** Winnipeg, MB  
**Phase:** **Task:**  
**Manager:** Jordan Wiwcharyk  
**Lab/Ref. #:** SE22-05  
**Description:** Clay



**Moisture Density Relationship: (ASTM D698-12) Method: A**

Preparation Method: Dry Rammer Type: Mechanical

Maximum Density (kg/m<sup>3</sup>): 1457

Optimum Moisture (%): 26.9

Remarks:

Distribution:

Reviewed By: Jordan Wiwcharyk

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.

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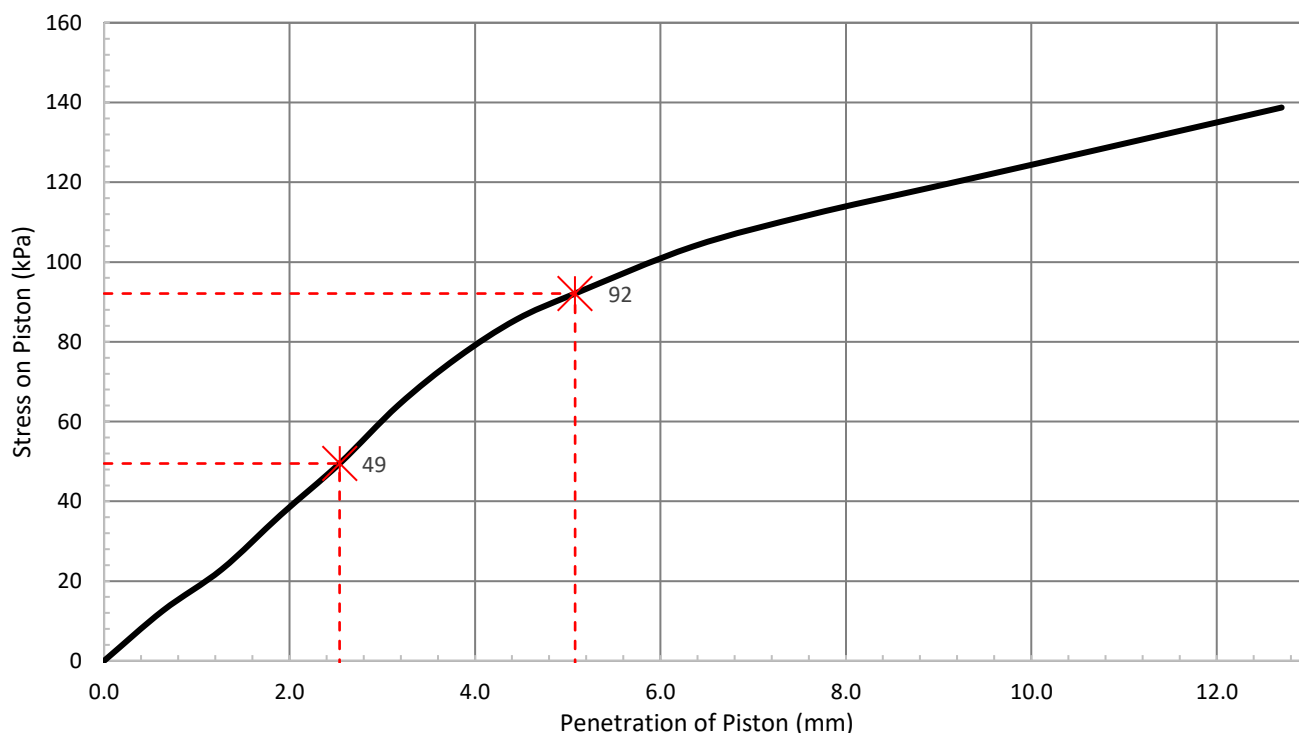
CCIL Certified Aggregate Type C, Type D & Concrete Aggregate Type R in accordance with CSA A283-19



**California Bearing Ratio**  
**ASTM D1883-16, Soaking Method**  
WSP E&I Solutions Canada Limited

Type of Preparation	Standard ASTM D698	Sample Preparation	Soaked
Maximum Dry Density	1472 kg/m <sup>3</sup>	Soaking time	96 hrs
Optimum Moisture Content	25.2 %	Top 1 Inch Soaked Moisture	38.4 %
Compacted Dry Density	1391 kg/m <sup>3</sup>	Bottom 1 Inch Soaked Moisture	35.4 %
Compacted Moisture Content	25.0% %	Average Soaked Moisture	36.4 %
Percent Compaction	95% %	Mass of Surcharge	4.54 kg

Corrected Penetration (mm)	Standard Load of Crushed Stone (kPa)	Corrected Load (kPa)	CBR (%)
2.540	6900	49	<b>0.7</b>
5.080	10300	92	<b>0.9</b>



Client: Stantec  
Project No: WX19714  
Date: December 23, 2022  
Technologist: Mdnazri Mohidin

Project: City of Winnipeg Streets 323-2022  
Site Location: Selkirk SE07  
Request No: \_\_\_\_\_  
Reviewed By: Jorden Wiwcharyk

Soil Description: Clay - silty, high plastic, moist, stiff, brown

Liquid Limit \_\_\_\_\_ Plastic Limit \_\_\_\_\_ Plasticity Index \_\_\_\_\_ Swell 0.54%

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results will be provided only upon written request. If you are not the Intended recipient please notify us by telephone as soon as possible and either return the message by post or destroy it. If you are not the intended recipient, any use by you of its contents is prohibited.



# Moisture / Density Relationship

Report Date: December 22, 2022

**Client**

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**Name:** Stantec

**Address:** 311 Portage Ave, Suite 500 Winnipeg, Manitoba

**Attention:** Kevin Rae

**PO Number:**

**Sample Date:** 12/1/2022 by Amal Jayan

**Source:** SE07 + SE08

**Project**

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**Name:** (WX19714) City of Winnipeg Street Investigation 323-2022

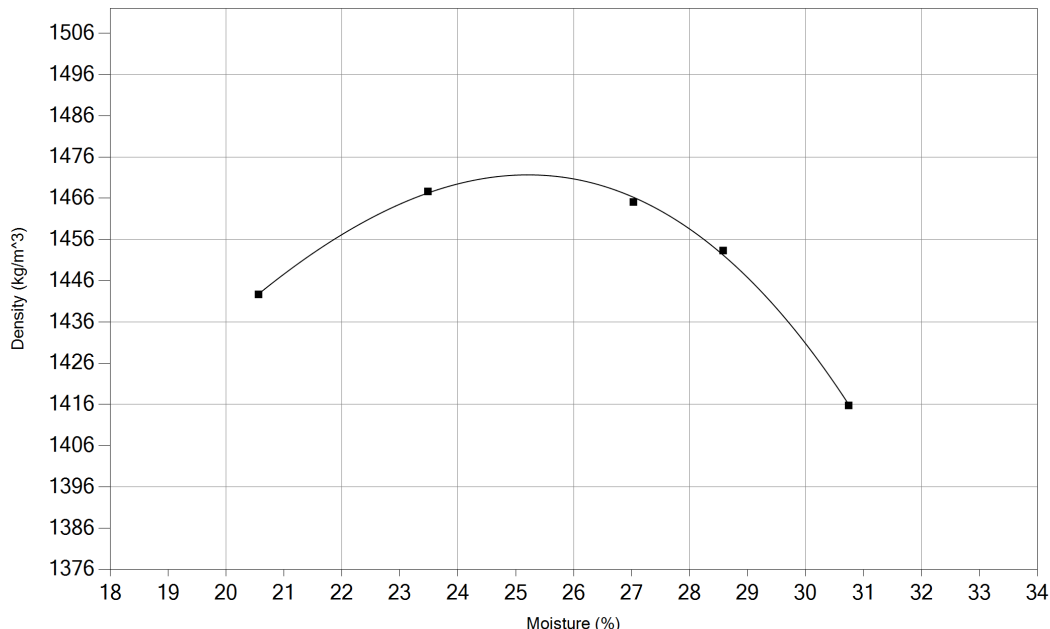
**Address:** Winnipeg, MB

**Phase:** **Task:**

**Manager:** Jordan Wiwcharyk

**Lab/Ref. #:** SE22-07

**Description:** Clay



**Moisture Density Relationship: (ASTM D698-12) Method: A**

Preparation Method: Dry Rammer Type: Mechanical

Maximum Density (kg/m<sup>3</sup>): 1472

Optimum Moisture (%): 25.2

Remarks:

Distribution:

Reviewed By: Jordan Wiwcharyk

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.

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