Appendix A
Geotechnical Report

The geotechnical report is provided to aid in the Contractor's evaluation of the existing pavement structure and/or soil conditions. The information presented is considered accurate at the locations shown on the Drawings and at the time of drilling. However, variations in pavement structure and/or soil conditions may exist between test holes and fluctuations in groundwater levels can be expected seasonally and may occur as a result of construction activities. The nature and extent of variations may not become evident until construction commences.

EXPLANATION OF FIELD & LABORATORY TEST DATA

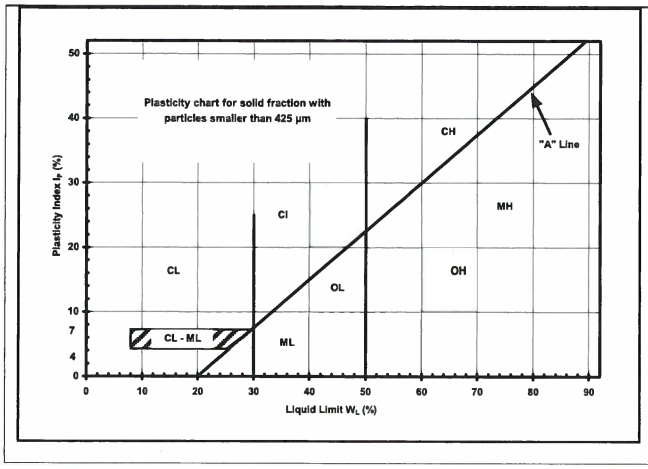
Description				UMA Log Symbols	USCS Classification	Laboratory Classification Criteria			
						Fines (%)	Grading	Plasticity	Notes
COARSE GRAINED SOILS	GRAVELS (More than 50% of coarse fraction of gravel size)	CLEAN GRAVELS (Little or no fines)	Well graded gravels, sandy gravels, with little or no fines		GW	0-5	$C_U > 4$ $1 < C_C < 3$		Dual symbols if 5-12% fines. Dual symbols if above "A" line and $4<W_P<7$ $C_U = \frac{D_{60}}{D_{10}}$ $C_C = \frac{(D_{30})^2}{D_{10} x D_{60}}$
			Poorly graded gravels, sandy gravels, with little or no fines		GP	0-5	Not satisfying GW requirements		
		DIRTY GRAVELS (With some fines)	Silty gravels, silty sandy gravels		GM	> 12		Atterberg limits below "A" line or $W_P<4$	
			Clayey gravels, clayey sandy gravels		GC	> 12		Atterberg limits above "A" line or $W_P<7$	
	SANDS (More than 50% of coarse fraction of sand size)	CLEAN SANDS (Little or no fines)	Well graded sands, gravelly sands, with little or no fines		SW	0-5	$C_U > 6$ $1 < C_C < 3$		
			Poorly graded sands, gravelly sands, with little or no fines		SP	0-5	Not satisfying SW requirements		
		DIRTY SANDS (With some fines)	Silty sands, sand-silt mixtures		SM	> 12		Atterberg limits below "A" line or $W_P<4$	
			Clayey sands, sand-clay mixtures		SC	> 12		Atterberg limits above "A" line or $W_P<7$	
FINE GRAINED SOILS	SILTS (Below 'A' line negligible organic content)	$W_L<50$	Inorganic silts, silty or clayey fine sands, with slight plasticity		ML			Classification is Based upon Plasticity Chart	
		$W_L>50$	Inorganic silts of high plasticity		MH				
	CLAYS (Above 'A' line negligible organic content)	$W_L<30$	Inorganic clays, silty clays, sandy clays of low plasticity, lean clays		CL				
		$30<W_L<50$	Inorganic clays and silty clays of medium plasticity		CI				
		$W_L>50$	Inorganic clays of high plasticity, fat clays		CH				
	ORGANIC SILTS & CLAYS (Below 'A' line)	$W_L<50$	Organic silts and organic silty clays of low plasticity		OL				
		$W_L>50$	Organic clays of high plasticity		OH				
HIGHLY ORGAINIC SOILS			Peat and other highly organic soils		Pt	Von Post Classification Limit		Strong colour or odour, and often fibrous texture	

	Asphalt		Till		
	Concrete		Bedrock (Undifferentiated)		AECOM
	Fill		Bedrock (Limestone)		

When the above classification terms are used in this report or test hole logs, the designated fractions may be visually estimated and not measured.

NOT USED TO CLASSIFY SUBGRADE. REFER TO CITY OF WINNIPEG SPECIFICATIONS FOR GEOTECHNICAL INVESTIGATION REQUIREMENTS FOR PUBLIC WORKS PROJECTS (SEPTEMBER, 2015)

NOT USED TO CLASSIFY SUBGRADE. REFER TO CITY OF WINNIPEG SPECIFICATIONS FOR GEOTECHNICAL INVESTIGATIONS REQUIREMENTS FOR PUBLIC WORKS PROJECTS (SEPTEMBER, 2015)



FRACTION		SEIVE SIZE (mm)		DEFINING RANGES OF PERCENTAGE BY WEIGHT OF MINOR COMPONENTS	
		Passing	Retained	Percent	Identifier
Gravel	Coarse	76	19	35-50	and
	Fine	19	4.75		
Sand	Coarse	4.75	2.00	20-35	"y" or "ey" *
	Medium	2.00	0.425		
	Fine	0.425	0.075	10-20	some
Silt (non-plastic) or Clay (plastic)		< 0.075 mm		1-10	trace

* for example: gravelly, sandy clayey, silty

Definition of Oversize Material

COBBLES: 76mm to 300mm diameter
BOULDERS: >300mm diameter

LEGEND OF SYMBOLS

Laboratory and field tests are identified as follows:

- q_u - undrained shear strength (kPa) derived from unconfined compression testing.
- T_v - undrained shear strength (kPa) measured using a torvane
- pp - undrained shear strength (kPa) measured using a pocket penetrometer.
- L_v - undrained shear strength (kPa) measured using a lab vane.
- F_v - undrained shear strength (kPa) measured using a field vane.
- γ - bulk unit weight (kN/m^3).
- SPT - Standard Penetration Test. Recorded as number of blows (N) from a 63.5 kg hammer dropped 0.76 m (free fall) which is required to drive a 51 mm O.D. Raymond type sampler 0.30 m into the soil.
- DPPT - Drive Point Pentrometer Test. Recorded as number of blows from a 63.5 kg hammer dropped 0.76 m (free fall) which is required to drive a 50 mm drive point 0.30 m into the soil.
- w - moisture content (W_L, W_P)

The undrained shear strength (Su) of a cohesive soil can be related to its consistency as follows:

Su (kPa)	CONSISTENCY
<12	very soft
12 – 25	soft
25 – 50	medium or firm
50 – 100	stiff
100 – 200	very stiff
200	hard

The resistance (N) of a non-cohesive soil can be related to compactness condition as follows

N – BLOWS/0.30 m	COMPACTNESS
0 - 4	very loose
4 - 10	loose
10 - 30	compact
30 - 50	dense
50	very dense

F2. SEWER TELEVISING GUIDELINES FOR PUBLIC WORKS PROJECTS (JANUARY 2009)

F2.1 The Consultant is required to assess the extent of Closed Circuit Television (CCTV) inspection for all combined, wastewater, land drainage and storm relief sewers to confirm any sewer repairs required in the right-of-way within the limits of the street renewal.

F2.2 The criteria provided are general guidelines and are not intended to replace sound municipal engineering judgement specific to the individual Project scope and/or location.

F2.3 The available sewer televising information is contained within the City of Winnipeg's Sewer Management System (SMS) application.

F2.4 Confirm televising requirements with Project Manager.

F2.5 CCTV inspection general guidelines:

(a) Confirm CCTV requirements with Water & Waste Department for sewers 1050 mm and larger in diameter;

(b) Televise if no previous CCTV inspections have been completed;

(c) Re-televise sewers in Categories A/B/C/X with a Structural Performance Grade (SPG) of 3 or higher that have not been televised in the previous 5 years;

(d) Sewers located more than two metres from the curb line (i.e. not located under pavement) do not need to be re-televised if previous CCTV inspection data exist. If a sewer repair or renewal requiring excavation is noted, contact the WWD;

(e) On all street reconstructions, regardless of location of the sewer (within the right-of-way);

(f) If the street exhibits obvious distress at/along the underground plant;

(g) Of all CB leads to be reused, as part of a street reconstruction or major rehabilitation.

F2.6 For any uncertain situations and/or locations, contact the Project Manager.

F2.7 The Consultant is required to coordinate the sewer-televising contract and communicate the results to the Water & Waste Department. Any repairs or other activities deemed necessary from these inspections must be coordinated with the Water & Waste Department.

F3. GEOTECHNICAL INVESTIGATION REQUIREMENTS FOR PUBLIC WORKS PROJECTS (OCTOBER 2008)

F3.1 Fieldwork

(a) Clear all underground services at each test-hole location.

(b) As this street project is greater than 500 metres, test holes may be taken every 100 m. More or fewer test-holes may be required depending upon Site conditions – confirm with the Project Manager.

(c) Record location of test-hole (offset from curb, distance from cross street and house number).

(d) Drill 150 mm-diameter cores in pavement.

(e) Drill 125 mm-diameter test-holes into fill materials and subgrade.

(f) If a service trench backfilled with granular materials is encountered, another hole shall be drilled to define the existing sub-surface conditions.

(g) Test-holes shall be drilled to depth of 2 m $\pm$150 mm below surface of the pavement.

(h) Recover pavement core sample and representative samples of soil (fill materials, pavement structure materials and subgrade).

(i) Measure and record pavement section exposed in the test-hole (thickness of concrete or asphalt and different types of pavement structure materials).

(j) Pavement structure materials to be identified as crushed limestone or granular fill and the maximum aggregate size of the material (20 mm, 50 mm or 150 mm).

(k) Log soil profile for the subgrade.

(l) Representative samples of soil must be obtained at the following depths below the bottom of the pavement structure materials – 0.1 m, 0.4 m, 0.7 m, 1.0 m, 1.3 m, 1.6 m, etc. Ensure a sample is obtained from each soil type encountered in the test-hole.

(m) Make note of any water seepage into the test-hole.

(n) Backfill test-hole with native materials and additional granular fill, if required. Patch pavement surface with hot mix asphalt or high strength durable concrete mix.

(o) Return core sample from the pavement and soil samples to the laboratory.

F3.2 Lab Work

(a) Test all soil samples for moisture content.

(b) Photograph core samples recovered from the pavement surface.

(c) Conduct tests for plasticity index and hydrometer analysis on selected soil samples which are between 0.5 m and 1 m below top of pavement (this is the sub-grade on which the pavement and sub-base will be built). The selection will be based upon visual classification and moisture content test results, with a minimum of one sample of each soil type per street to be tested.

(d) Prepare test-hole logs and classify subgrade (based on hydrometer) as follows:

< 30% silt	- classify as clay
30% - 50% silt	- classify as silty clay
50% - 70% silt	- classify as clayey silt
> 70% silt	- classify as silt

(e) For any uncertain situations and/or locations, or clarification of these requirements, contact the Project Manager.

PROJECT: Local Streets Package - 19-C-04	CLIENT: City of Winnipeg	TESTHOLE NO: **TH19-01**
LOCATION: Westbound Lanes, 1.7 m S of N curb, 10 m E of Lanark St.		PROJECT NO.: 60596309
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Canterra C-250 Truck Rig, 125 mm SSA	ELEVATION (m): N/A

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS: Becker; Dynamic Cone; SPT (Standard Pen Test) (Blows/300mm) 0 20 40 60 80 100; Total Unit Wt (kN/m³) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100	UNDRAINED SHEAR STRENGTH: Torvane; QU/2; Lab Vane; Pocket Pen.; Field Vane (kPa) 50 100 150 200	COMMENTS	DEPTH
0		ASPHALT - 64 mm							
		SAND and GRAVEL (Fill) - 215 mm - aggregate < 15 mm diam.							
		CLAY - some sand - dark grey, frozen		G1					
				G2					
		CLAY - silty, sandy - light brown, frozen - intermediate plasticity		G3				(G3): Gravel: 0.0%, Sand: 20.5%, Silt: 38.4%, Clay: 41.1%	
1				G4					1
		CLAY - trace to some sand - brown, firm, moist - high plasticity		G5					
				G6					
2		END OF TEST HOLE AT 2.00 m IN CLAY Notes: 1. No seepage observed during drilling. 2. No sloughing observed during drilling. 3. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion.							2
3									

AECOM

LOGGED BY: Ryan Harras	COMPLETION DEPTH: 2.00 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/18/19
PROJECT ENGINEER: Kevin Rae	Page 1 of 1

LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19

PROJECT: Local Streets Package - 19-C-04	CLIENT: City of Winnipeg	TESTHOLE NO: **TH19-02**
LOCATION: Westbound Lanes, 1.4 m S of N curb, 75 m E of Lanark St.		PROJECT NO.: 60596309
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Canterra C-250 Truck Rig, 125 mm SSA	ELEVATION (m): N/A

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS: ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100; ■ Total Unit Wt ■ (kN/m^3) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100	UNDRAINED SHEAR STRENGTH: + Torvane + × QU/2 × □ Lab Vane □ △ Pocket Pen. △ ✣ Field Vane ✣ (kPa) 50 100 150 200	COMMENTS	DEPTH
0		ASPHALT - 105 mm - broken into small pieces							
		SAND and GRAVEL (Fill) - 200 mm - aggregate < 15 mm diam.							
		CLAY - some sand - dark grey, frozen		G7					
				G8					
1		CLAY - silty, sandy - light brown, frozen		G9					1
				G10					
		CLAY - trace to some sand - brown, firm, moist - high plasticity		G11					
				G12					
2		END OF TEST HOLE AT 2.00 m IN CLAY Notes: 1. No seepage observed during drilling. 2. No sloughing observed during drilling. 3. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion.							2
3									

AECOM

LOGGED BY: Ryan Harras	COMPLETION DEPTH: 2.00 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/18/19
PROJECT ENGINEER: Kevin Rae	Page 1 of 1

LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19

PROJECT: Local Streets Package - 19-C-04	CLIENT: City of Winnipeg	TESTHOLE NO: **TH19-03**
LOCATION: Westbound Lanes, 1.9 m S of N curb, 7 m W of Sir John Franklin Rd.		PROJECT NO.: 60596309
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Canterra C-250 Truck Rig, 125 mm SSA	ELEVATION (m): N/A

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS: ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100; ■ Total Unit Wt ■ (kN/m^3) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100	UNDRAINED SHEAR STRENGTH: + Torvane + × QU/2 × ☐ Lab Vane ☐ △ Pocket Pen. △ ⊕ Field Vane ⊕ (kPa) 50 100 150 200	COMMENTS	DEPTH
0		ASPHALT - 130 mm							
	■	CONCRETE - 155 mm							
		END OF TEST HOLE AT 0.28 m. Notes: 1. Did not drill beneath concrete due to nearby underground utilities in this area. 2. Test hole patched with asphalt upon completion.							
1									1
2									2
3									

AECOM

LOGGED BY: Ryan Harras	COMPLETION DEPTH: 0.28 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/18/19
PROJECT ENGINEER: Kevin Rae	Page 1 of 1

LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19

PROJECT: Local Streets Package - 19-C-04	CLIENT: City of Winnipeg	TESTHOLE NO: **TH19-04**
LOCATION: Westbound Lanes, 2.2 m S of N curb, 45 m W of Lindsay St.		PROJECT NO.: 60596309
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Canterra C-250 Truck Rig, 125 mm SSA	ELEVATION (m): N/A

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ▨ SPLIT SPOON ▤ BULK ▨ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100 ■ Total Unit Wt ■ (kN/m³) 16 17 18 19 20 21 Plastic MC Liquid 20 40 60 80 100	UNDRAINED SHEAR STRENGTH + Torvane + × QU/2 × □ Lab Vane □ △ Pocket Pen. △ ✣ Field Vane ✣ (kPa) 50 100 150 200	COMMENTS	DEPTH
0		ASPHALT - 118 mm							
	■	CONCRETE - 210 mm							
		END OF TEST HOLE AT 0.33 m. Notes: 1. Did not drill beneath concrete due to nearby underground utilities in this area. 2. Test hole patched with asphalt upon completion.							
1									1
2									2
3									

AECOM

LOGGED BY: Ryan Harras	COMPLETION DEPTH: 0.33 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/18/19
PROJECT ENGINEER: Kevin Rae	Page 1 of 1

LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19

PROJECT: Local Streets Package - 19-C-04	CLIENT: City of Winnipeg	TESTHOLE NO: **TH19-05**
LOCATION: Westbound Lanes, 1.8 m S of N curb, 14 m E of Lindsay St.		PROJECT NO.: 60596309
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Canterra C-250 Truck Rig, 125 mm SSA	ELEVATION (m): N/A

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS: Becker; Dynamic Cone; SPT (Standard Pen Test) (Blows/300mm) 0 20 40 60 80 100; Total Unit Wt (kN/m³) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100	UNDRAINED SHEAR STRENGTH: Torvane; QU/2; Lab Vane; Pocket Pen.; Field Vane (kPa) 50 100 150 200	COMMENTS	DEPTH
0		ASPHALT - 68 mm - broken into small pieces							0
		CONCRETE - 182 mm							
		SAND and GRAVEL (Fill) - 55 mm - aggregate < 15 mm diam.							
		CLAY - some sand - dark grey, frozen - high plasticity		G25					
				G26				(G26): Gravel: 0.1%, Sand: 10.7%, Silt: 13.8%, Clay: 75.3%	
1				G27					1
		CLAY - some sand - brown, frozen to 1.4 m - firm, moist, high plasticity below 1.4 m		G28					
				G29					
				G30					
2		END OF TEST HOLE AT 2.00 m IN CLAY Notes: 1. No seepage observed during drilling. 2. No sloughing observed during drilling. 3. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion.							2
3									

AECOM

LOGGED BY: Ryan Harras	COMPLETION DEPTH: 2.00 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/18/19
PROJECT ENGINEER: Kevin Rae	Page 1 of 1

LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19

PROJECT: Local Streets Package - 19-C-04	CLIENT: City of Winnipeg	TESTHOLE NO: **TH19-06**
LOCATION: Westbound Lanes, 2.1 m S of N curb, 9 m W of Borebank St.		PROJECT NO.: 60596309
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Canterra C-250 Truck Rig, 125 mm SSA	ELEVATION (m): N/A

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS: Becker; Dynamic Cone; SPT (Standard Pen Test) (Blows/300mm) 0 20 40 60 80 100; Total Unit Wt (kN/m³) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100	UNDRAINED SHEAR STRENGTH: Torvane; QU/2; Lab Vane; Pocket Pen.; Field Vane (kPa) 50 100 150 200	COMMENTS	DEPTH
0		ASPHALT - 48 mm							
		CONCRETE - 232 mm							
		SAND and GRAVEL (Fill) - 50 mm - aggregate < 15 mm diam.							
		CLAY - some sand - dark grey, frozen		G31					
		CLAY - some sand - brown, frozen		G32					
1				G33					1
		CLAY - silty, sandy - light brown, frozen to 1.2 m - firm, moist, intermediate plasticity below 1.2 m		G34					
				G35					
				G36					
2		END OF TEST HOLE AT 2.00 m IN SILT Notes: 1. No seepage observed during drilling. 2. No sloughing observed during drilling. 3. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion.							2
3									

AECOM

LOGGED BY: Ryan Harras	COMPLETION DEPTH: 2.00 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/18/19
PROJECT ENGINEER: Kevin Rae	Page 1 of 1

LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19

PROJECT: Local Streets Package - 19-C-04	CLIENT: City of Winnipeg	TESTHOLE NO: **TH19-07**
LOCATION: Westbound Lanes, 1.9 m S of N curb, 35 m E of Borebank St.		PROJECT NO.: 60596309
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Canterra C-250 Truck Rig, 125 mm SSA	ELEVATION (m): N/A

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

PENETRATION TESTS: Becker; Dynamic Cone; SPT (Standard Pen Test) (Blows/300mm) 0 20 40 60 80 100; Total Unit Wt (kN/m³) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100

UNDRAINED SHEAR STRENGTH: Torvane; QU/2; Lab Vane; Pocket Pen.; Field Vane (kPa) 50 100 150 200

DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	COMMENTS	DEPTH
0	ASPHALT - 90 mm					
	CONCRETE - 130 mm					
	SAND and GRAVEL (Fill) - 85 mm - aggregate < 15 mm diam.					
	CLAY - trace to some sand - dark grey, frozen		G37			
	CLAY - some sand, trace gravel - brown, frozen - high plasticity		G38		(G38): Gravel: 1.8%, Sand: 12.4%, Silt: 27.8%, Clay: 57.9% (Bulk) Soaked CBR: 3.2	
1			G39			1
	CLAY - silty, sandy - light brown, firm, moist - intermediate plasticity		G40			
			G41			
	- soft to firm below 1.7 m		G42			
2	END OF TEST HOLE AT 2.00 m IN SILT Notes: 1. No seepage observed during drilling. 2. No sloughing observed during drilling. 3. Two additional holes drilled at this location to collect bulk sample between 0.3 m and 1.5 m. 4. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion.					2
3						

AECOM

LOGGED BY: Ryan Harras	COMPLETION DEPTH: 2.00 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/18/19
PROJECT ENGINEER: Kevin Rae	Page 1 of 1

LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19

PROJECT: Local Streets Package - 19-C-04	CLIENT: City of Winnipeg	TESTHOLE NO: **TH19-08**
LOCATION: Westbound Lanes, 1.8 m S of N curb, 14 m E of Campbell St.		PROJECT NO.: 60596309
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Canterra C-250 Truck Rig, 125 mm SSA	ELEVATION (m): N/A

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS: Becker; Dynamic Cone; SPT (Standard Pen Test) (Blows/300mm) 0 20 40 60 80 100; Total Unit Wt (kN/m³) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100	UNDRAINED SHEAR STRENGTH: Torvane; QU/2; Lab Vane; Pocket Pen.; Field Vane (kPa) 50 100 150 200	COMMENTS	DEPTH
0		CONCRETE - 226 mm							
		SAND and GRAVEL (Fill) - 155 mm - aggregate < 15 mm diam.							
		CLAY (Fill) - silty, some sand, trace gravel - dark grey, frozen - mulched rail tie observed throughout		G43					
				G44					
1				G45					1
		CLAY - trace to some sand - brown, firm, moist - high plasticity		G46					
				G47					
				G48					
2		END OF TEST HOLE AT 2.00 m IN CLAY Notes: 1. No seepage observed during drilling. 2. No sloughing observed during drilling. 3. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion.							2
3									

LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19

AECOM

LOGGED BY: Ryan Harras	COMPLETION DEPTH: 2.00 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/18/19
PROJECT ENGINEER: Kevin Rae	Page 1 of 1

PROJECT: Local Streets Package - 19-C-04	CLIENT: City of Winnipeg	TESTHOLE NO: **TH19-09**
LOCATION: Westbound Lanes, 1.4 m S of N curb, 20 m W of Cordova St.		PROJECT NO.: 60596309
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Canterra C-250 Truck Rig, 125 mm SSA	ELEVATION (m): N/A

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS: ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100; ■ Total Unit Wt ■ (kN/m³) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100	UNDRAINED SHEAR STRENGTH: + Torvane + × QU/2 × ☐ Lab Vane ☐ △ Pocket Pen. △ ⛢ Field Vane ⛢ (kPa) 50 100 150 200	COMMENTS	DEPTH
0		ASPHALT - 100 mm							
		SAND and GRAVEL (Fill) - 280 mm - aggregate < 15 mm diam.							
		CLAY - some sand - dark grey, frozen		G50					
1		CLAY - silty, sandy - light brown, frozen to 1.2 m		G51					1
		- some sand, firm, moist, intermediate plasticity below 1.2 m		G52					
		CLAY - trace to some sand - brown, firm, moist - high plasticity		G53					
				G54					
2		END OF TEST HOLE AT 2.00 m IN CLAY Notes: 1. No seepage observed during drilling. 2. No sloughing observed during drilling. 3. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion.							2
3									

AECOM

LOGGED BY: Ryan Harras	COMPLETION DEPTH: 2.00 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/18/19
PROJECT ENGINEER: Kevin Rae	Page 1 of 1

LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19

PROJECT: Local Streets Package - 19-C-04	CLIENT: City of Winnipeg	TESTHOLE NO: **TH19-10**
LOCATION: Eastbound Lanes, 1.3 m N or S curb, 20 m E of Borebank St.		PROJECT NO.: 60596309
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Canterra C-250 Truck Rig, 125 mm SSA	ELEVATION (m): N/A

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS / UNDRAINED SHEAR STRENGTH	COMMENTS	DEPTH
0		ASPHALT - 160 mm						
		SAND and GRAVEL (Fill) - 94 mm - aggregate < 15 mm diam.						
		CLAY - some sand - dark grey, frozen		G55				
		CLAY - some sand - brown, frozen - high plasticity		G56			(G56): Gravel: 0.0%, Sand: 12.9%, Silt: 28.1%, Clay: 59.0%	
1				G57				1
		CLAY - silty, sandy - light brown, frozen to 1.4 m		G58				
		- soft, moist, intermediate plasticity below 1.4 m		G59				
				G60				
2		END OF TEST HOLE AT 2.00 m IN SILT						2
3		Notes: 1. No seepage observed during drilling. 2. No sloughing observed during drilling. 3. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion.						

PENETRATION TESTS: ✳ Becker ✳ | ◇ Dynamic Cone ◇ | ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100 | ■ Total Unit Wt ■ (kN/m^3) 16 17 18 19 20 21 | Plastic MC Liquid 20 40 60 80 100

UNDRAINED SHEAR STRENGTH: + Torvane + | × QU/2 × | □ Lab Vane □ | △ Pocket Pen. △ | ✤ Field Vane ✤ (kPa) 50 100 150 200

AECOM

LOGGED BY: Ryan Harras	COMPLETION DEPTH: 2.00 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/18/19
PROJECT ENGINEER: Kevin Rae	Page 1 of 1

LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19

PROJECT: Local Streets Package - 19-C-04	CLIENT: City of Winnipeg	TESTHOLE NO: **TH19-11**
LOCATION: Eastbound Lanes, 2.0 m N or S curb, 24 m W of Campbell St.		PROJECT NO.: 60596309
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Canterra C-250 Truck Rig, 125 mm SSA	ELEVATION (m): N/A

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS: ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100; ■ Total Unit Wt ■ (kN/m^3) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100	UNDRAINED SHEAR STRENGTH: + Torvane + × QU/2 × ☐ Lab Vane ☐ △ Pocket Pen. △ ⬘ Field Vane ⬘ (kPa) 50 100 150 200	COMMENTS	DEPTH
0		CONCRETE - 212 mm							
		SAND and GRAVEL (Fill) - 398 mm - aggregate < 15 mm diam.							
		SAND and SILT (Fill) - trace gravel - brown, frozen - intermediate plasticity		G62				(G62): Gravel: 1.9%, Sand: 43.8%, Silt: 38.8%, Clay: 15.5%	
1		CLAY - silty, sandy - light brown, frozen		G63					1
				G64					
		CLAY - trace to some sand - brown, firm, moist - high plasticity		G65					
				G66					
2		END OF TEST HOLE AT 2.00 m IN CLAY Notes: 1. No seepage observed during drilling. 2. No sloughing observed during drilling. 3. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion.							2
3									

AECOM

LOGGED BY: Ryan Harras	COMPLETION DEPTH: 2.00 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/18/19
PROJECT ENGINEER: Kevin Rae	Page 1 of 1

LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19

PROJECT: Local Streets Package - 19-C-04	CLIENT: City of Winnipeg	TESTHOLE NO: **TH19-12**
LOCATION: Eastbound Lanes, 2.0 m N or S curb, 37 m E of Campbell St.		PROJECT NO.: 60596309
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Canterra C-250 Truck Rig, 125 mm SSA	ELEVATION (m): N/A

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	COMMENTS
0		ASPHALT - 85 mm				
		CONCRETE - 220 mm				
		CLAY - some sand - dark grey, frozen		G67		
		SAND and SILT - light brown, frozen to 1.2 m - low plasticity		G68		(G68): Gravel: 0.0%, Sand: 42.9%, Silt: 37.2%, Clay: 19.9%
1		- clayey below 0.9 m		G69		
		- firm, moist below 1.2 m		G70		
		CLAY - trace to some sand - brown, firm, moist - high plasticity		G71		
				G72		
2		END OF TEST HOLE AT 2.00 m IN CLAY Notes: 1. No seepage observed during drilling. 2. No sloughing observed during drilling. 3. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion.				
3						

PENETRATION TESTS: ✳ Becker ✳ | ◇ Dynamic Cone ◇ | ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100 | ■ Total Unit Wt ■ (kN/m^3) 16 17 18 19 20 21 | Plastic MC Liquid 20 40 60 80 100

UNDRAINED SHEAR STRENGTH: + Torvane + | × QU/2 × | ☐ Lab Vane ☐ | △ Pocket Pen. △ | ✣ Field Vane ✣ (kPa) 50 100 150 200

AECOM	LOGGED BY: Ryan Harras	COMPLETION DEPTH: 2.00 m
	REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/18/19
	PROJECT ENGINEER: Kevin Rae	Page 1 of 1

LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19

PROJECT: Local Streets Package - 19-C-04	CLIENT: City of Winnipeg	TESTHOLE NO: **TH19-13**
LOCATION: Eastbound Lanes, 1.8 m N or S curb, 17 m E of Cordova St.		PROJECT NO.: 60596309
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Canterra C-250 Truck Rig, 125 mm SSA	ELEVATION (m): N/A

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS: ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100; ■ Total Unit Wt ■ (kN/m^3) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100	UNDRAINED SHEAR STRENGTH: + Torvane + × QU/2 × □ Lab Vane □ △ Pocket Pen. △ ✣ Field Vane ✣ (kPa) 50 100 150 200	COMMENTS	DEPTH
0		ASPHALT - 158 mm - broken into small pieces							
		SAND and GRAVEL (Fill) - 147 mm - aggregate < 15 mm diam.							
		CLAY - some sand - dark grey, frozen		G73					
				G74					
1				G75					1
				G76					
		CLAY - trace to some sand - brown, firm, moist - high plasticity		G77					
				G78					
2		END OF TEST HOLE AT 2.00 m IN CLAY Notes: 1. No seepage observed during drilling. 2. No sloughing observed during drilling. 3. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion.							2
3									

AECOM

LOGGED BY: Ryan Harras	COMPLETION DEPTH: 2.00 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/18/19
PROJECT ENGINEER: Kevin Rae	Page 1 of 1

LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19

PROJECT: Local Streets Package - 19-C-04	CLIENT: City of Winnipeg	TESTHOLE NO: **TH19-14**
LOCATION: Eastbound Lanes, 2.0 m N or S curb, 28 m W of Brock St.		PROJECT NO.: 60596309
CONTRACTOR: Maple Leaf Drilling Ltd.	METHOD: Canterra C-250 Truck Rig, 125 mm SSA	ELEVATION (m): N/A

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

PENETRATION TESTS: ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100 ■ Total Unit Wt ■ (kN/m^3) 16 17 18 19 20 21 Plastic MC Liquid 20 40 60 80 100

UNDRAINED SHEAR STRENGTH: + Torvane + × QU/2 × ☐ Lab Vane ☐ △ Pocket Pen. △ ⬘ Field Vane ⬘ (kPa) 50 100 150 200

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	COMMENTS	DEPTH
0		ASPHALT - 88 mm					
		CONCRETE - 192 mm					
		SAND and GRAVEL (Fill) - 100 mm - aggregate < 15 mm diam.					
		CLAY - trace sand - dark grey, frozen - high plasticity		G79			
				G80		(G3): Gravel: 0.0%, Sand: 7.4%, Silt: 20.5%, Clay: 72.1%	
1				G81			1
				G82			
		CLAY - trace to some sand - brown, firm, moist - high plasticity		G83			
				G84			
2		END OF TEST HOLE AT 2.00 m IN CLAY Notes: 1. No seepage observed during drilling. 2. No sloughing observed during drilling. 3. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion.					2
3							

AECOM

LOGGED BY: Ryan Harras	COMPLETION DEPTH: 2.00 m
REVIEWED BY: Faris Alobaidy	COMPLETION DATE: 1/18/19
PROJECT ENGINEER: Kevin Rae	Page 1 of 1

LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19

City of Winnipeg
Local Streets Pkg 19-C-04 – Corydon Avenue
Geotechnical Investigation
Table 01- Summary of Laboratory Soil Test Results

Test Hole No.	Test Hole Location	Pavement Structure		Subgrade Description *	Sample Depth (m)	Moisture Content (%)	Hydrometer Analysis				Atterberg Limits		
		Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH19-01	Corydon Avenue (WB) - 1.7 m S of N curb, 10 m E of Lanark St.	Asphalt	64	CLAY	0.3	27.9							
				CLAY	0.6	38.0							
		Concrete	0	SILTY CLAY	0.9	31.5	0.0	20.5	38.4	41.1	40.9	15.5	25.4
				SILTY CLAY	1.2	23.0							
		Sand and Gravel (Fill)	215	CLAY	1.5	38.2							
				CLAY	1.8	41.6							
TH19-02	Corydon Avenue (WB) - 1.4 m S of N curb, 75 m E of Lanark St.	Asphalt	105	CLAY	0.3	22.9							
				CLAY	0.6	32.8							
		Concrete	0	SILTY CLAY	0.9	23.7							
				SILTY CLAY	1.2	29.0							
		Sand and Gravel (Fill)	200	CLAY	1.5	39.0							
				CLAY	1.8	39.7							
TH19-03	Corydon Avenue (WB) - 1.9 m S of N curb, 7 m W of Sir John Franklin Rd.	Asphalt	130										
		Concrete	155										
TH19-04	Corydon Avenue (WB) - 2.2 m S of N curb, 45 m W of Lindsay St.	Asphalt	118										
		Concrete	210										
TH19-05	Corydon Avenue (WB) - 1.8 m S of N curb, 14 m E of Lindsay St.	Asphalt	68	CLAY	0.3	27.8							
				CLAY	0.6	34.7	0.1	10.7	13.8	75.3	73.3	22.5	50.8
		Concrete	182	CLAY	0.9	34.2							
				CLAY	1.2	33.8							
		Sand and Gravel (Fill)	55	CLAY	1.5	39.1							
				CLAY	1.8	36.9							

* Note – Subgrade Description based o

n City of Winnipeg Specifications for Geotechnical Investigation Requirements for Public Works Projects (September 2015)

Test Hole No.	Test Hole Location	Pavement Structure		Subgrade Description *	Sample Depth (m)	Moisture Content (%)	Hydrometer Analysis				Atterberg Limits		
		Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH19-06	Corydon Avenue (WB) - 2.1 m S of N curb, 9 m W of Borebank St.	Asphalt	48	CLAY	0.3	14.4							
				CLAY	0.6	31.1							
		Concrete	232	CLAY	0.9	31.8							
				SILTY CLAY	1.2	34.4							
		Sand and Gravel (Fill)	50	SILTY CLAY	1.5	19.6							
				SILTY CLAY	1.8	33.9							
TH19-07	Corydon Avenue (WB) - 1.9 m S of N curb, 35 m E of Borebank St.	Asphalt	90	CLAY	0.3	14.3							
				CLAY	0.6	34.2	1.8	12.4	27.8	57.9	85.6	19.4	66.2
		Concrete	130	CLAY	0.9	38.5							
				SILTY CLAY	1.2	23.6							
		Sand and Gravel (Fill)	85	SILTY CLAY	1.5	24.6							
				SILTY CLAY	1.8	26.6							
TH19-08	Corydon Avenue (WB) - 1.8 m S of N curb, 14 m E of Campbell St.	Asphalt	0	SILTY CLAY (FILL)	0.4	27.8							
				SILTY CLAY (FILL)	0.6	29.4							
		Concrete	226	SILTY CLAY (FILL)	0.9	26.6							
				CLAY	1.2	29.8							
		Sand and Gravel (Fill)	155	CLAY	1.5	33.9							
				CLAY	1.8	40.0							
TH19-09	Corydon Avenue (WB) - 1.4 m S of N curb, 20 m W of Cordova St.	Asphalt	100	CLAY	0.6	25.9							
				SILTY CLAY	0.9	21.4							
		Concrete	0	SILTY CLAY	1.2	21.3							
				CLAY	1.5	38.3							
		Sand and Gravel (Fill)	280	CLAY	1.8	40.0							
TH19-10	Corydon Avenue (EB) - 1.3 m N of S curb, 20 m E of Borebank St.	Asphalt	160	CLAY	0.3	11.7							
				CLAY	0.6	31.4	0.0	12.9	28.1	59.0	58.7	17.7	41.0
		Concrete	0	CLAY	0.9	34.6							
				SILTY CLAY	1.2	23.0							
		Sand and Gravel (Fill)	94	SILTY CLAY	1.5	23.0							
				SILTY CLAY	1.8	23.0							

* Note – Subgrade Description based on City of Winnipeg Specifications for Geotechnical Investigation Requirements for Public Works Projects (September 2015)

Test Hole No.	Test Hole Location	Pavement Structure		Subgrade Description *	Sample Depth (m)	Moisture Content (%)	Hydrometer Analysis				Atterberg Limits		
		Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH19-11	Corydon Avenue (EB) - 2.0 m N of S curb, 24 m W of Campbell St.	Asphalt	0	SAND AND SILT (FILL)	0.6	22.9	1.9	43.8	38.8	15.5	36.4	18.7	17.7
				SILTY CLAY	0.9	25.4							
		Concrete	212	SILTY CLAY	1.2	28.6							
				CLAY	1.5	38.7							
		Sand and Gravel (Fill)	398	CLAY	1.8	34.4							
TH19-12	Corydon Avenue (EB) - 2.0 m N of S curb, 37 m E of Campbell St.	Asphalt	85	CLAY	0.3	34.3							
				SAND AND SILT	0.6	20.9	0.0	42.9	37.2	19.9	27.2	15.9	11.3
				SAND AND SILT	0.9	32.6							
		Concrete	220	SAND AND SILT	1.2	30.8							
				CLAY	1.5	29.1							
				CLAY	1.8	39.5							
TH19-13	Corydon Avenue (EB) - 1.8 m N of S curb, 17 m E of Cordova St.	Asphalt	158	CLAY	0.3	22.8							
				CLAY	0.6	32.9							
		Concrete	0	CLAY	0.9	32.6							
				CLAY	1.2	35.7							
		Sand and Gravel (Fill)	147	CLAY	1.5	30.8							
				CLAY	1.8	39.8							
TH19-14	Corydon Avenue (EB) - 2.0 m N of S curb, 28 m W of Brock St.	Asphalt	88	CLAY	0.4	31.8							
				CLAY	0.6	32.7	0.0	7.4	20.5	72.0	69.8	20.8	49.0
		Concrete	192	CLAY	0.9	32.0							
				CLAY	1.2	32.2							
		Sand and Gravel (Fill)	100	CLAY	1.5	39.1							
				CLAY	1.8	41.0							

* Note – Subgrade Description based on City of Winnipeg Specifications for Geotechnical Investigation Requirements for Public Works Projects (September 2015)

Photograph 1: Test Hole TH19-01 - Corydon Avenue (Westbound)

Photograph 2: Test Hole TH19-03 - Corydon Avenue (Westbound)

Photograph 3: Test Hole TH19-04 - Corydon Avenue (Westbound)

Photograph 4: Test Hole TH19-05 - Corydon Avenue (Westbound) - Not all recovered

Photograph 5: Test Hole TH19-06 - Corydon Avenue (Westbound)

Photograph 6: Test Hole TH19-07 - Corydon Avenue (Westbound)

Photograph 7: Test Hole TH19-08 - Corydon Avenue (Westbound)

Photograph 8: Test Hole TH19-09 - Corydon Avenue (Westbound)

Photograph 9: Test Hole TH19-10 - Corydon Avenue (Eastbound)

Photograph 10: Test Hole TH19-11 - Corydon Avenue (Eastbound)

Photograph 11: Test Hole TH19-12 - Corydon Avenue (Eastbound)

Photograph 12: Test Hole TH19-13 - Corydon Avenue (Eastbound) - Not all recovered

Photograph 13: Test Hole TH19-14 - Corydon Avenue (Eastbound)