Appendix A Geotechnical Report

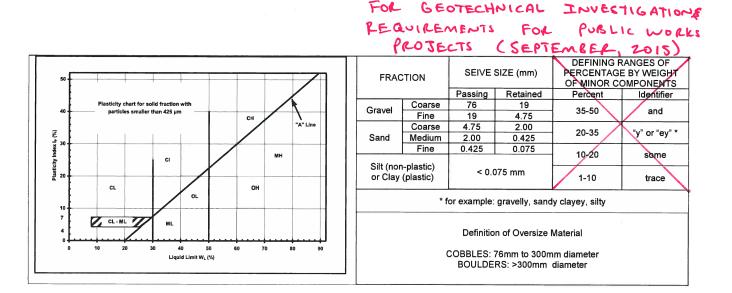
The geotechnical report is provided to aid in the Contractor's evaluation of the existing pavement structure and/or soil conditions. The information presented is considered accurate at the locations shown on the Drawings and at the time of drilling. However, variations in pavement structure and/or soil 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	USCS		Laborator	y Classification Crite	eria
		Descript	lon	5	Log Symbols	Classification	Fines (%)	Grading	Plasticity	Notes
		CLEAN GRAVELS	Well graded gu sandy gravels, v or no fine	vith little	200	GW	0-5	C _U > 4 1 < C _C < 3		
	GRAVELS (More than 50% of coarse	(Little or no fines)	Poorly graded g sandy gravels, v or no fine	vith little		GP	0-5	Not satisfying GW requirements		Dual symbols if 5
OILS	fraction of gravel size)	DIRTY GRAVELS	Silty gravels, silt gravels	y sandy	NI	GM	> 12		Atterberg limits below "A" line or W _P <4	12% fines. Dual symbols if above "A" line and
AINED S((With some fines)	Clayey gravels, sandy grav			GC	> 12		Atterberg limits above "A" line or W _P <7	4 <w<sub>P<7</w<sub>
COARSE GRAINED SOILS		CLEAN SANDS	Well graded s gravelly sands, v or no fine	with little	0.0 494	sw	0-5	C _U > 6 1 < C _C < 3		$C_U = \frac{D_{60}}{D_{10}}$
CO/	SANDS (More than 50% of	(Little or no fines)	Poorly graded gravelly sands, v or no fine	with little	000	SP	0-5	Not satisfying SW requirements		$C_U = \frac{D_{60}}{D_{10}}$ $C_C = \frac{(D_{30})^2}{D_{10} x D_{60}}$
	coarse fraction of sand size)	DIRTY SANDS	Silty sand sand-silt mixt		3F	SM	> 12		Atterberg limits below "A" line or W _P <4	
		(With some fines)	Clayey san sand-clay mix	ds, tures		sc	> 12		Atterberg limits above "A" line or W _P <7	
	SILTS (Below 'A' line	W _L <50	Inorganic silts, clayey fine sand slight plastic	ds, with		ML				
	negligible organic content)	W _L >50	Inorganic silts of plasticity			мн				
SOILS	CLAYS	W. <30	Inorganic clays days, sandy cl low plasticity, lea	aysof		CL				
FINE GRAINED	(Above 'A' line negligible organic	30 <w<sub>L<50</w<sub>	Inorganic clays a clays of med plasticity	lium		СІ			Classification is Based upon Plasticity Chart	
FINE	content)	W _L >50	Inorganic clays plasticity, fat o			сн				
	ORGANIC SILTS & CLAYS	W_<50	Organic silts organic silty clay plasticity	s of low		OL				
	(Below 'Ar line)	W _L >50	Organic clays o plasticity		7 <u>i</u>	ОН				
Н	IGHLY ORGA	NIC SOILS	Peat and other organic so			Pt		on Post fication Limit		r odour, and often s texture
		Asphalt		Т	ïII					
. •	7	Concrete			rock rentiated)				AE	COM
X	\otimes	Fill		Bedi (Limes	rock stone)					

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 REDUILEMENTS FOR PUBLIC WORKS PROJECTS (SEPTEMBER, 2015)



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CLASSIFY SUBGRADE. REFER

SPECIFIC ATIONS

LEGEND OF SYMBOLS

Laboratory and field tests are identified as follows:

- undrained shear strength (kPa) derived from unconfined compression testing. qu
- Tv _ undrained shear strength (kPa) measured using a torvane
- pp undrained shear strength (kPa) measured using a pocket penetrometer.

undrained shear strength (kPa) measured using a lab vane. Lv -

- Fv undrained shear strength (kPa) measured using a field vane. _
- bulk unit weight (kN/m³). γ -
- 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.
- moisture content (W_L, W_P) w

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.
- (I) 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.

Vestbound Lanes, 1.7 m S of N curb, 10 m E of La OR: Maple Leaf Drilling Ltd. PE GRAB SHELBY TUBE SOIL DESCRIPTION ASPHALT - 64 mm SAND and GRAVEL (Fill) - 215 mm - aggregate < 15 mm diam. CLAY - some sand - dark grey, frozen - intermediate plasticity	Ν	IETH	T SPO (N) LdS	ON F ◆ SP 0 2 16 17 P	E PENETR * E \$ O Dynamic (Blow (Blow (Blow 18 Tota 18 Tota 0 40 40 40 40	BL RATION Becker amic Co ndard P vs/300n 0 60 al Unit V kN/m ³) 5 19	JLK TESTS * one Pen Tes mm) 0 80 Wt ■ 20 Liquid	st) ♦ 0 100 21	JNDRAI	NED SHI + Torv × QL Lab \ Pocke Field \ (kF	J/2 X Vane □ et Pen. △ Vane ● Pa)		COMMENTS	
PE GRAB SHELBY TUBE SOIL DESCRIPTION ASPHALT - 64 mm SAND and GRAVEL (Fill) - 215 mm - aggregate < 15 mm diam. CLAY - some sand - dark grey, frozen		G1 G2 G2	T SPO (N) LdS	ON F 0 2 16 17 P 2 2 	E PENETR * E \$ O Dynamic (Blow (Blow (Blow 18 Tota 18 Tota 0 40 40 40 40	ATION Becker amic Condard P vs/300n 0 60 al Unit V kN/m ³) 5 19 MC	JLK TESTS * one Pen Tes mm) 0 80 Wt ■ 20 Liquid	$b = \frac{1}{1}$	JNDRAI	NED SHI + Torv × QL Lab \ Pocke Field \ (kF	NO REC EAR STRE yane + J/2 × Vane □ tet Pen. △ Vane Pa)	ENGTH		DEDTH
ASPHALT - 64 mm SAND and GRAVEL (Fill) - 215 mm - aggregate < 15 mm diam. CLAY - some sand - dark grey, frozen		G1 G2	SPT (N)	F ● SP 0 2 16 17/P 2 2	ENETRE ¥EACTR Senerre (Blowmann) (Blowmann (Blowmann) (Blowmann (Blowmann) (Blowmann (Blowmann) (Blowmannn) (Blowmann) (Blowmannn) (Blowmann) (Blowmannn) (Blowmannn) (Blowmannn) (Blowmannn) (Blowmannn) (Blowmannn) (Blowmannn) (Blowmannn) (Blowmannn) (Blowmannn) (Blowmannn) (Blowmannn) (Blowmannn) (Blowmannn) (Blowmann	ATION Becker amic Cc ndard P vs/300n 0 60 al Unit V kN/m ³) 5 19 MC	TESTS * one ◇ Pen Tes mm) 0 80 Wt ■ 20 Liquid	st) ♦ 0 100 21	2	NED SHI + Torv ∠QL □ Lab \ Pocke € Field ` (kF	EAR STRE vane + J/2 × Vane □ et Pen. △ Vane • Pa)	ENGTH	COMMENTS	NEDTU
SAND and GRAVEL (Fill) - 215 mm - aggregate < 15 mm diam. CLAY - some sand - dark grey, frozen CLAY - silty, sandy - light brown, frozen		G2			•									
CLAY - silty, sandy - light brown, frozen		G2			•	·····							-	
- light brown, frozen		G3		H	•	·····	· · · · · · · · · · · · · · · · · · ·		• • • • • • • • • • • • • • • • • • •					
									• • • • • • •				(G3): Gravel: 0.0%, Sand: 20.5%, Silt: 38.4%, Clay: 41.1%	
CLAY - trace to some sand		G4		•	•									
- brown, firm, moist - high plasticity		G5 G6			•									
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.														
						DV- 1	D							
							r van	narra	15				ETION DEPTH: 2.00 m ETION DATE: 1/18/19	
2. 3.	No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and	No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and atched with asphalt upon completion.	No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and atched with asphalt upon completion.	No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and atched with asphalt upon completion.	No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and atched with asphalt upon completion.	No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and atched with asphalt upon completion.	No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and atched with asphalt upon completion.	No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and atched with asphalt upon completion.	No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and atched with asphalt upon completion.	No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and atched with asphalt upon completion.	No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and atched with asphalt upon completion.	No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and atched with asphalt upon completion.	No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and atched with asphalt upon completion.	No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and atched with asphalt upon completion.

		Local Streets Package	e - 19-C-04 .4 m S of N curb, 75 m E of Lan	C ark S	LIEN	IT: Ci	ity of	Winn	ipeg							THOLE NO: TH19-0 JECT NO.: 605963	
		TOR: Maple Leaf Drilli				IOD·	Can	terra (2-25	() Tri	ick F	lia 1'	25 mn	1 SSA		VATION (m): N/A	09
SAMP		·				IT SPO			B			uy, 1/			COVERY		
DEPTH (m)	SOIL SYMBOL	SOIL E	DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	♦ SI 0 : 16 1	 ◇ Dyna PT (Stan (Blow 20 40 ■ Tota (k 7 18 Plastic 	ecker mic C dard F s/300 6 1 Unit (N/m ³)	* > Pen Te mm) 0 8 Wt ■) 2(Liqui	est) ♦ 0 100 0 21		+ Tor X Qi □ Lab △ Pocke ❤ Field (ki	IEAR STR vane + U/2 × Vane ⊡ et Pen. △ Vane € Pa) 00 15	ENGTH 0 200	COMMENTS	
0		ASPHALT - 105 mm - broken into small pieces SAND and GRAVEL (Fill) - aggregate < 15 mm dian CLAY - some sand - dark grey, frozen	- 200 mm I.		G7 G8			•				······					
1		CLAY - silty, sandy - light brown, frozen			G9 G10			•									
		CLAY - trace to some san - brown, firm, moist - high plasticity	d		G11			•									
-2		END OF TEST HOLE AT Notes: 1. No seepage observed of 2. No sloughing observed 3. Test hole backfilled with patched with asphalt upor	luring drilling. during drilling. drill cuttings and bentonite and		G12												
3		AEC	ом				RE	gged Viewe Dject	DB۱	/: Fa	ris Alo	obaidy				FION DEPTH: 2.00 m FION DATE: 1/18/19 Page	

- H		Local Streets Package - 19-C-04		NT: C		f Win	nipeg]					TES	STHOLE NO: TH19-0	3
- H		I: Westbound Lanes, 1.9 m S of N curb, 7 m W of Sir Jo												OJECT NO.: 6059630)9
- H		TOR: Maple Leaf Drilling Ltd. YPE GRAB SHELBY TUBE	N	<u>IOD:</u> IT SPC	Can	terra	<u>C-25</u> Шв	<u>i0 Tr</u>	uck F	Rig, 12	25 mm	n <mark>SSA</mark> NO REC		EVATION (m): N/A	
	DEPTH (m)	SOIL DESCRIPTION	SAMPLE TYPE	(N) LdS	♦ S 0	PENET	RATION Becken namic C Indard I ws/300 40 6 tal Unit (kN/m ³ 8 19 MC 40 6 6	NTEST T ₩ Cone Pen Te Imm) 0 8 Wt ■ 2 Liqui	est) ♦ 80 100 0 21		INED SH + Tor ∠ QI □ Lab △ Pocke ♥ Field (ki	IEAR STRE vane + J/2 × Vane □ et Pen. △ Vane € Pa)	ENGTH		DEPTH
	0	ASPHALT - 130 mm				20 4	10 6	0 8	80 100	5	50 1	00 150	0 200		
_		CONCRETE - 155 mm				: 						· · · · · · · · · · · · · · · · · · ·			-
LOG OF TEST HOLE TEST HOLE LOGS - CORYDON AVE.GPJ UMA WINN.GDT 2/26/19	-1	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.													
IC OF TEST HOLE TEST	3	AECOM			RE	VIEW		Y: Fa	aris Al	obaidy				TION DEPTH: 0.28 m TION DATE: 1/18/19	
2					PR	OJEC	T EN	GINE	ER: I	Kevin F	Rae			Page	1 of 1

PROJ	ECT:	Local Streets Package - 19-C-04	С	LIEN	IT: C	ity o	f Win	nipe]					TE	STHOLE NO: TH19-0)4
		I: Westbound Lanes, 2.2 m S of N curb, 45 m W of Lind							-					PR	OJECT NO.: 6059630	09
		TOR: Maple Leaf Drilling Ltd.	N	<u>IETH</u>	IOD:	Can	terra	<u>C-25</u>	50 Tr	uck I	Rig, 1	25 mr	n SSA	ELE	EVATION (m): N/A	
SAMF	PLE T	YPE GRAB SHELBY TUBE		SPL	IT SPC	ON		B			1	~	NO RE			
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	0 16	♦ Dyr PT (Sta (Blc 20 4 ■ To 17 1 Plastic	Becke namic (andard ows/30(40 (tal Uni (kN/m 8 1	r ¥ Cone < Pen Te Omm) 50 8 t Wt ∎) 9 2 Liqu	> est) ◆ 30 100		+ Tor × Q □ Lab △ Pock ● Field (k	HEAR STF vane + (U/2 × Vane □ et Pen. 2 d Vane € :Pa) 100 1:	2	COMMENTS	DEPTH
0		ASPHALT - 118 mm					20	+0 (<u>30 200</u>		
-		CONCRETE - 210 mm	1						: 	: :				:		
-								-								
-		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.					:	:		:			: : 	:		
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LOG											Kevin					1 of 1

		Local Streets Package - 19-C-0				IT: C	ity of	Winr	nipeg]						STHOLE NO: TH19-0	
		I: Westbound Lanes, 1.8 m S of I	N curb, 14 m E of Lind	- İ			_		• •							ROJECT NO.: 605963	09
	I RAC PLE T	TOR: Maple Leaf Drilling Ltd. YPE GRAB	SHELBY TUBE			IOD: IT SPO			<u>С-25</u> В		uck R	<u>Rig, 12</u>		1 SSA NO RE		EVATION (m): N/A	
DEPTH (m)	SOIL SYMBOL	SOIL DESCR		SAMPLE TYPE	SAMPLE #	(N) LdS	♦ SF 0 2 16 1	PENETF	RATION Becker amic C ndard I ws/300 0 6 ial Unit (kN/m ³	N TEST r ★ Cone ≎ Pen Te 0mm) 60 8 : Wt ■ 9 2 Liqu	est) ♦ 60 100 0 21		INED SH + Tor X Q □ Lab △ Pocka ♥ Field (k	IEAR STF vane + U/2 × Vane □ et Pen. △ Vane © Pa)	RENGTH	COMMENTS	
0		ASPHALT - 68 mm - broken into small pieces 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			٠									
		CLAY - some sand - brown, frozen to 1.4 m - firm, moist, high plasticity below 1.4 n	n		G28												
					G29 G30						- - - - - - - - - - - - - - - - - - -						
2		END OF TEST HOLE AT 2.00 m IN CL Notes: 1. No seepage observed during drilling 2. No sloughing observed during drillin 3. Test hole backfilled with drill cutting	g. Ia.											· · · · · · · · · · · · · · · · · · ·			
		3. Test note backfilled with drift cutings patched with asphalt upon completion.	י מות ספוועדווני מוע											- - - - - - - - - - - - - -			
3									RV.	Rvar	: n Harra	as				ETION DEPTH: 2.00 m	
		AECOM									ris Alo		,			ETION DATE: 1/18/19	

		Local Streets Package - 19-C-04	С	LIEN	IT: C	ity o	f Win	nipeg)					TE	STHOLE NO: TH19-(06
		: Westbound Lanes, 2.1 m S of N curb, 9 m W of Bor													ROJECT NO.: 605963	09
SAMP		FOR: Maple Leaf Drilling Ltd. (PE GRAB SHELBY TUBE		1ETH 1.spi	IOD: IT SPO	Can ON	terra	<u>С-25</u> В	<u>50 Tr</u> ULK	uck F	Rig, 12	<u>25 m</u>	<u>m SS/</u> Лио в	A EL ECOVE	EVATION (m): N/A	
DEPTH (m)	SOIL SYMBOL		SAMPLE TYPE		SPT (N)	♦ S 0 16	PENETI	RATIO Becke amic C Indard ws/300 0 6 tal Unit (kN/m 8 1 MC	N TEST r ** Cone Pen Te Omm) 60 8 : Wt) 9 20	est) ♦ 0 100 0 21		AINED S + To × (□ Lal △ Poc ● Fie	GHEAR S prvane + QU/2 × b Vane [ket Pen. ket Pen. kPa)	TRENGTI- - - - - - - - - - - -	COMMENTS	DEPTH
0		ASPHALT - 48 mm	_				20 4		8 0	0 100		50	100	150 20	0	
- - - - - - - - 1 -		CONCRETE - 232 mm SAND and GRAVEL (Fill) - 50 mm - aggregate < 15 mm diam. CLAY - some sand - dark grey, frozen CLAY - some sand - brown, frozen CLAY - silty, sandy - light brown, frozen to 1.2 m		G31 G32 G33			•									1 -
		- 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.				· · · · · · · · · · · · · · · · · · ·					· · · · · · · · · · · · · · · · · · ·					
		AECOM				RE		ED B'	Y: Fa	ris Al	as obaidy Kevin I				ETION DEPTH: 2.00 m ETION DATE: 1/18/19 Page	1 of 1

		Local Streets Package - 19-0				IT: Ci	ty of	Winn	ipeg							ESTHOLE NO: TH19-0	
		: Westbound Lanes, 1.9 m S														ROJECT NO.: 6059630)9
		TOR: Maple Leaf Drilling Ltd.									uck F	Rig, 1:					
SAMF	ίĿΓ	YPE GRAB	SHELBY TUBE		JSPLI I	T SPO			B			10.55	-	NO RE			
DEPTH (m)	SOIL SYMBOL	SOIL DESC	RIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	♦ SF 0 2 16 1] F	 ◇ Dyna PT (Stan (Blow 0 40 ■ Tota (I 7 18 Plastic 	Becker amic C Idard F vs/300 (vs/300 (vs/300 (vs/300 (vs/300) (vs/30) (vs/3	× Pen Te mm) 0 8 Wt∎ 20 Liqui	est) ♦ 0 100		+ Tor ×Q □ Lab △ Pock ♥ Field (k	HEAR ST vane + U/2 × Vane □ et Pen. 2 d Vane ₽ iPa) 100 1]	COMMENTS	
0		ASPHALT - 90 mm															
		CONCRETE - 130 mm															
	\bigotimes	SAND and GRAVEL (Fill) - 85 mm $_{\sim}$ - aggregate < 15 mm diam.	1	_							· · · · ·		•	•	· · · ·		
		CLAY - trace to some sand - dark grey, frozen			G37		•				· · · · · · ·			· · · · · ·	· · · ·		
		CLAY - some sand, trace gravel - brown, frozen - high plasticity			G38			•			T		•			(G38): Gravel: 1.8%, Sand: 12.4%, Silt:	
											· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·		· · · ·	27.8%, Clay: 57.9% (Bulk) Soaked CBR: 3.2	
1					G39			٠)				· · · · ·	•	· · · ·		
		CLAY - silty, sandy - light brown, firm, moist - intermediate plasticity			G40			•					· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·		
					G41			•			· · · · · · · · ·		· · · · · ·		· · · ·		
		- soft to firm below 1.7 m											· · · · ·	•			
2		END OF TEST HOLE AT 2.00 m II	N SILT		G42			•			•		•	•	· · · ·		
		Notes: 1. No seepage observed during dr 2. No sloughing observed during c 3. Two additional holes drilled at th	Irillina.										· · · · · ·	•			
		sample between 0.3 m and 1.5 m. 4. Test hole backfilled with drill cut patched with asphalt upon comple	tings and bentonite and														
											· · · · · · · · · · · · · · · · · · ·		- - - - - - - - - - - - - - - - - - -	· • • • • • • • • • • • • • • • • • • •	•		
													- - - - - - - - - - - - - - - - - - -	· · · · · · · · · · · · · · · · · · ·	•		
3							1.00	GED	DV-	Duc			•			LETION DEPTH: 2.00 m	
		A <u></u> CO/	M					IEWE					,			LETION DEPTH: 2.00 m LETION DATE: 1/18/19	

		Local Streets Package - 1	9-C-04 I S of N curb, 14 m E of Car	<u>C</u>	<u>CLIEN</u> ILSt	NT: Ci	ity of	Winn	ipeg]						STHOLE NO: TH19- DJECT NO.: 605963	
		TOR: Maple Leaf Drilling L				IOD.	Can	erra (2-25	50 Tr	uck F	Ria 1	25 m	n SSA		EVATION (m): N/A	09
	PLE T	· •	SHELBY TUBE			IT SPO				ULK		<u></u>			COVER		
DEPTH (m)	SOIL SYMBOL	SOIL DES	SCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	♦ SF 0 : 16 1	 ◇ Dyna ◇ Dyna ○ T (Stan (Blow 20 40 ■ Tota (I 7 18 Plastic 	Becker amic C Idard I vs/300) 6 al Unit kN/m ³	r ₩ Cone ≎ Pen Te 0mm) 60 8 : Wt ■) 9 2 Liqu	est) ♦ 30 100 0 21		+ To × C □ Lab △ Pock ♥ Field (H	HEAR STF rvane + 2U/2 × 2 Vane □ 3 tet Pen. 2 d Vane • (Pa) 100 1	4	COMMENTS	
0		CONCRETE - 226 mm															
		SAND and GRAVEL (Fill) - 155 - aggregate < 15 mm diam.									· · · · · · · · · · · · · · · · · · ·						
		CLAY (Fill) - silty, some sand, t - dark grey, frozen - mulched rail tie observed thro	-		G43			•		<pre></pre>	· · · · · ·		· · · · · · ·	· · · · · · · · · · · · · · · · · · ·			
					G44			•		· · · · · · · · · · · · · · · · · · ·			· · · · · · ·	· · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
1					G45			•		<pre></pre>	· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
	\mathbb{X}	CLAY - trace to some sand - brown, firm, moist - high plasticity			G46			•						· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
					G47			•			· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·		
2		END OF TEST HOLE AT 2.00	m IN CLAY		G48			C	•••••		· · · · · · · · ·		· · · · · · · ·	· · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
		Notes: 1. No seepage observed during 2. No sloughing observed durin 3. Test hole backfilled with drill patched with asphalt upon com	g drilling. cuttings and bentonite and								· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
										· · · · · · · · · · · · · · · · · · ·	· · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
											· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
3													· · · · · · · · · · · · · · · · · · ·	······			
		AECO	M					gged /Iewe					,			TION DEPTH: 2.00 m TION DATE: 1/18/19	

PROJ	IECT:	Local Streets Package - 19-C-04	С	LIEN	IT: C	ity c	f Wir	nipe	g					TES	STHOLE NO: TH19-0)9
		: Westbound Lanes, 1.4 m S of N curb, 20 m W of Cord	ova	St.											OJECT NO.: 6059630	09
		TOR: Maple Leaf Drilling Ltd.	M		OD:	Car	iterra	<u>C-2</u>	<u>50 T</u>	ruck	Rig, 1	<u>25 m</u>	n SSA			
SAMF DEPTH (m)	SOIL SYMBOL	GRAB SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	(N) LdS	♦ 5 0 16	◇ Dy SPT (St; (Bk 20 ■ To 17 Plastic	Becke namic andarc ows/30 40 otal Un (kN/m 18	N TES er X Pen T Omm) 60 it Wt 19 Liq	TS iest) ♦ 80 10 20 2 uid	0	AINED SI + To ∠ C □ Lab △ Pock ● Field (H	NO RE(HEAR STRI rvane + U/2 × Vane □ tet Pen. △ d Vane € (Pa)	ENGTH		DEPTH
0		ASPHALT - 100 mm					20	40	60	80 10	0	50	100 15	0 200		
-		SAND and GRAVEL (Fill) - 280 mm - aggregate < 15 mm diam.							· · · · · · · · · · · · · · · · · · ·							
-		CLAY - some sand - dark grey, frozen		G50					· · · · ·							
-		CLAY - silty, sandy - light brown, frozen to 1.2 m		G50				· · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·			· · · · · · · · ·				
1 - - -		- some sand, firm, moist, intermediate plasticity below 1.2 m		G52			•									1-
-		CLAY - trace to some sand - brown, firm, moist - high plasticity		G53			· · · · · · · · · · · · · · · · · · ·	•	· · · · · · · · · · · · · · · · · · ·							
21/07/7 1/2/2/1/2/2/2/1/2/2/2/2/2/2/2/2/2/2/2/2		END OF TEST HOLE AT 2.00 m IN CLAY Notes:		G54			· · · · · · · · · · · · · · · · · · ·	•								2-
		 No seepage observed during drilling. No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion. 														
							· · · · · · · · · · · · · · · · · · ·									
3						LC	GGEI	D BY	Rva	: In Hai	ras	:		OMPLF	TION DEPTH: 2.00 m	
		AECOM				RE	VIEW	/ED E	Y: F	aris A	lobaid				ETION DATE: 1/18/19	
č						PF	OJEC	T EN	IGINE	ER:	Kevin	Rae			Page	1 of 1

	Local Streets Package - 19-C-04			IT: C	ity o	Win	nipeç]					TE	STHOLE NO: TH19-1	0
	: Eastbound Lanes, 1.3 m N or S curb, 20 m E of Bo													OJECT NO.: 6059630)9
	TOR: Maple Leaf Drilling Ltd. YPE GRAB SHELBY TUBE			IOD: IT SPO	Can	terra	<u>С-25</u> Шв	50 Tr	uck F	Rig, 1	25 m		A ELI ECOVEI	EVATION (m): N/A	
SAMPLE T DEPTH (m) SOIL SYMBOL		SAMPLE TYPE	SAMPLE #	(N) LdS	♦ S 0	PENETI	RATIO Becke amic C Indard ws/300 0 6 tal Unit (kN/m 8 1 MC	N TEST r ★ Cone Pen Te Dmm) 50 & Wt ■) 9 2 Liqu	est) ♦ 80 100 0 21		AINED S + To × (□ Lal △ Poc ● Fie	SHEAR ST prvane + QU/2 × b Vane [ket Pen. ld Vane (kPa)	TRENGTH	COMMENTS	DEPTH
0	ASPHALT - 160 mm					20 4				· · · · ·	<u>.</u>	100	150 200		
	SAND and GRAVEL (Fill) - 94 mm - aggregate < 15 mm diam. CLAY - some sand - dark grey, frozen CLAY - some sand		G55		•								· · · · · · · · · · · · · · · · · · ·		
	- brown, frozen - high plasticity		G56			•	<pre></pre>	F					· · · · · · · · · · · · · · · · · · ·	(G56): Gravel: 0.0%, Sand: 12.9%, Silt: 28.1%, Clay: 59.0%	
			G57			•	: 	· · · ·			· · · ·		· · · ·		1 -
	CLAY - silty, sandy - light brown, frozen to 1.4 m - soft, moist, intermediate plasticity below 1.4 m		G58			•	 . /ul>	Notes and the second			· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
2/26/19			G59 G60			•									
	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	I	<u> </u>	<u> </u>	RE		ED B'	Y: Fa	aris Al	ras obaidy Kevin				ETION DEPTH: 2.00 m ETION DATE: 1/18/19 Page	1 of 1

		Local Streets Package - 19-C-04	CLIENT: City of Winnipeg										TESTHOLE NO: TH19-11				
		: Eastbound Lanes, 2.0 m N or S curb, 24 m W of Ca												OJECT NO.: 605963	09		
		TOR: Maple Leaf Drilling Ltd.								Rig, 1				EVATION (m): N/A			
SAMF	PLET	YPE GRAB SHELBY TUBE		SPL	IT SPO	1		BUI			~	NO RE			1		
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	♦ SF 0 : 16 1	 ◇ Dynan ○ T (Stand (Blows) 20 40 ■ Total (kl) 7 18 Plastic 	cker * nic Cor ard Pe /300m /300m 00 00 00 00 00 00 00 00 00 00 00 00	<pre></pre>	<u>D</u> 1	+ Tor X Q □ Lab △ Pock ● Field (k	HEAR STR vane + ∪/2 × Vane □ et Pen. △ t Vane € tPa) 100 15		COMMENTS			
0		CONCRETE - 212 mm								-							
		SAND and GRAVEL (Fill) - 398 mm - aggregate < 15 mm diam.															
		SAND and SILT (Fill) - trace gravel - brown, frozen - intermediate plasticity CLAY - silty, sandy - light brown, frozen		G62			•-1							(G62): Gravel: 1.9%, Sand: 43.8%, Silt: 38.8%, Clay: 15.5%			
1				G63			•										
		CLAY - trace to some sand - brown, firm, moist - high plasticity		G64			•										
		- ngn prosierty		G65			•										
2		END OF TEST HOLE AT 2.00 m IN CLAY		G66			•						· · · · · · · · ·				
		 No seepage observed during drilling. No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion. 															
3																	
3	1				1	LO	GGED E	3Y: R	i Ryan Har	ras		C	OMPL	ETION DEPTH: 2.00 m	1		
		AECOM							Faris A		y			ETION DATE: 1/18/19			

LOCATION: Eastbaurd Lanes, 2.0 m N or S curt, 37 m E of Campbell S. CONTRACTOR: Mapbe Lation During MA. SAMPLE TYPE ORB IN CONTRACTOR Mapbe Lation During MA. SAMPLE TYPE ORB INFORMATION IN MALENCE SAMPLE TYPE ORB INFORMATION IN MALENCE SAMPLE TYPE ORB INFORMATION IN THE INFORMATION IN MALENCE SAMPLE TYPE ORB INFORMATION IN THE INFORE			Local Streets Package - 19-C-04			NT: C	ity of	Winr	nipeg						TES	STHOLE NO: TH19-1	2	
SAMPLE TYPE GRAB □SHELBY TUBE SPLIT SPOON ■BULK □NO RECOVERY CORE Image: Solid DESCRIPTION Image: Solid DESCRIPION Image: Solid DESCRIPTION<)9	
Image: Constraint of the second sec			· · · · · · · · · · · · · · · · · · ·	<u> </u>		IOD:	Cant	erra	C-25	<u>0 Tru</u>	uck F	<u> Rig, 12</u>	<u>5 mm</u>	SSA		EVATION (m): N/A		
0 ASPHALT - 85 mm CONCRETE - 220 mm G67 CLAY - some sand - dark grey, frozen G67 SAND and SILT - light brown, frozen to 1.2 m - low plasticity G68 - clayey below 0.9 m G68 - clayey below 0.9 m G69 - firm, moist below 1.2 m G70 - firm, moist below 1.2 m G71		SYMBOL					♦ SF 0 2 16 1	PENETF	RATION Becker amic C ndard I ws/300 0 6 al Unit (kN/m ³) 3 19 MC	I TESTS Sone ◇ Pen Te: mm) 0 80 Wt ■) 20 Liquid	st) ♦ 0 100 1 21	2	NED SHE + Torva × QU □ Lab V △ Pocket ♥ Field \ (kP	EAR STR ane + //2 × /ane □ t Pen. △ /ane	ENGTH	COMMENTS	DEPTH	
CLAY - some sand - dark grey, frozen - light forw, frozen to 1.2 m - low plasticity - clayey below 0.9 m - 1 - firm, moist below 1.2 m - firm, moist below 1.2 m - firm, moist below 1.2 m - firm, moist - firm, moist - high plasticity - firm, moist - firm, moi	0		ASPHALT - 85 mm					.0 4	0 0	0 01	5 100		<u>, iq</u>	0 19	0 200			
 - dark grey, frozen SAND and SiLT - light brown, frozen to 1.2 m - low plasticity - dayey below 0.9 m - clayey below 0.9 m - firm, moist below 1.2 m <li< td=""><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></li<>	-																	
 - light brown, frozen to 1.2 m - low plasticity - clayey below 0.9 m - clayey below 0.9 m - firm, moist below 1.2 m 	-				G67			•				• • • • •						
 - clayey below 0.9 m - clayey below 0.9 m - firm, moist below 1.2 m - firm, moist below 1.2 m - clayey below 0.9 m - firm, moist below 1.2 m - firm, moist below	-	000000000000000000000000000000000000000	- light brown, frozen to 1.2 m		G68			Ð				· · · · · · · · · · · · · · · · · · ·				(G68): Gravel: 0.0%,		
G70 CLAY - trace to some sand - brown, firm, moist - high plasticity G71 G71	- - 1	000000000000000000000000000000000000000	- clayey below 0.9 m		G69			•								37.2%, Clay: 19.9%	1 -	
- brown, firm, moist - high plasticity	-	00000000000000000000000000000000000000	- firm, moist below 1.2 m		G70			•										
G72 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.	-		- brown, firm, moist		G71			•										
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.	NN.GDI 2/26/19		END OF TEST HOLE AT 2.00 m IN CLAY		G72							• • • • • • • • • • • • • • • • • • •					2 -	
	A AVE.GPJ UMA WI		 No seepage observed during drilling. No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and 											-				
LOGGED BY: Ryan Harras COMPLETION DEPTH: 2.00 m REVIEWED BY: Faris Alobaidy COMPLETION DATE: 1/18/19	H L		ΔΞΟΟΜ															
PROJECT ENGINEER: Kevin Rae Page	200		ALCOM										lae			Page 1 of 1		

		Local Streets F		C-04 or S curb, 17 m E of Cord	C Sove	LIEN St	IT: Ci	ty of	Winn	ipeg]							
		TOR: Maple Le						Cant	orra (2.25	() Tr	ick E	2ia 1'	25 mm	n SSA		<u>)JECT NO.: 605963</u> VATION (m): N/A	009
			GRAB	SHELBY TUBE			IT SPO			<u>Б-20</u> В			<u>uy, 1</u> 2			COVER		
DEPTH (m)	SOIL SYMBOL	S	DIL DESC	RIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	◆ SF 0 2 16 1	 ◇ Dyna ◇ Dyna ◇ T (Star (Blow 20 40 ✓ Tota (17) ✓ Tota (17) ✓ Tota (18) 	Becker amic C ndard I vs/300 0 6 al Unit kN/m ³	r ₩ Cone Pen Te Imm) 0 8 Wt ■) 21 Liqui	est) ♦ 0 100 0 21		+ Tor ×Q □ Lab △ Pock ❤ Field (k	HEAR STR vane + U/2 × Vane ⊡ et Pen. △ I Vane ⊕ Pa) 00 15		COMMENTS	
0		ASPHALT - 158 r - broken into sma																
	\bigotimes	SAND and GRAV - aggregate < 15 CLAY - some san - dark grey, frozer	nm diam. d	n		G73					· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·				
		dan groy, nozor				010					- - - - - - - - - - - - - - - - - - -			· · · · · · · · ·				
						G74			•		<pre></pre>			• • • • • • • • • • • • • • • • • • •				
1						G75			•					· · · · · · · · · · · · · · · · · · ·				
		CLAY - trace to so - brown, firm, mois				G76			•					- - - - - - - - - - - - - - - - - - -				
		- high plasticity				G77			•					· · · · · · · · · · · · · · · · · · ·				
2		END OF TEST H	DLE AT 2.00 m II	NCLAY		G78			C	•••••				· · · · · · · · · ·				
		Notes: 1. No seepage ob 2. No sloughing o 3. Test hole backf patched with aspl	bserved during c illed with drill cut	Irilling. tings and bentonite and										· · · · · · · · · · · · · · · · · · ·				
		ραιοτου with ασμι		uvn.														
														· · · · · · · · · · · · · · · · · · ·				
3									0000					• • • • • • • •				
		Δ	ECO/	N					gged /Iewe					,			TION DEPTH: 2.00 m TION DATE: 1/18/19	

		Local Streets Package - 19-C-04			NT: C	ity o	^f Win	nipeç]					TESTHOLE NO: TH19-14				
		: Eastbound Lanes, 2.0 m N or S curb, 28 m W of E				~	1.	0.07	·• -			05			ROJECT NO.: 6059630	9		
	PLE T	TOR: Maple Leaf Drilling Ltd. YPE GRAB SHELBY TUBE			<u>IOD:</u> .IT SPC			<u>С-25</u> В		uck F	≺ı <u>g</u> , 1:		<u>n SS/</u>]NO RI		LEVATION (m): N/A ERY			
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE		SPT (N)	♦ S 0	PENET	RATION Becke namic C andard ows/300 40 6 otal Unit (kN/m 8 1 <u>MC</u>	N TEST r ★ Cone ≎ Pen Te Dmm) i0 & i Wt ∎) 9 2 Liqui	est) ♦ 8 <u>0 100</u> 0 21		UNED S + To ∠ C □ Lat △ Pocł � Fiel (I	HEAR ST rvane + QU/2 × o Vane C xet Pen d Vane 4 (Pa)	TRENGTI	COMMENTS			
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			•			· · · · · · · · · · · · · · · · · · ·		-	•					
		CLAY - trace to some sand - brown, firm, moist - high plasticity		G82			•	•		· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	•	· · · · · · · · · · · · · · · · · · ·				
				G83								· · · · · · · · · · · · · · · · · · ·						
2		END OF TEST HOLE AT 2.00 m IN CLAY		G84			······································	•					· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·				
		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							GGEL	<u>:</u> פער ד	Buar	Harr			:		LETION DEPTH: 2.00 m			
		AECOM									obaidy	/			LETION DATE: 1/18/19	-		

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

Test Hole		Pavement Struct	ure		Sample	Moisture		Hydromet	er Analysis		A	tterberg Lin	nits
No.	Test Hole Location	Туре	Thickness (mm)	Subgrade Description *	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
		Asphalt	64	CLAY	0.3	27.9							
	Corydon Avenue (WB) -	Asphare	04	CLAY	0.6	38.0							
TH19-01	1.7 m S of N curb, 10 m E of	Concrete	0	SILTY CLAY	0.9	31.5	0.0	20.5	38.4	41.1	40.9	15.5	25.4
11115 01	Lanark St.	Contracte	Ŭ	SILTY CLAY	1.2	23.0							
		Sand and Gravel (Fill)	215	CLAY	1.5	38.2							
				CLAY	1.8	41.6							
		Asphalt	105	CLAY	0.3	22.9							
	Corydon Avenue (WB) -	Asphare	105	CLAY	0.6	32.8							
TH19-02	1.4 m S of N curb, 75 m E of	Concrete	0	SILTY CLAY	0.9	23.7							
1113-02	Lanark St.	Concrete	0	SILTY CLAY	1.2	29.0							
	Lanark St.	Cound and Crowal (Fill)	200	CLAY	1.5	39.0							
		Sand and Gravel (Fill)	200	CLAY	1.8	39.7							
TH19-03	Corydon Avenue (WB) - 1.9 m S of N curb, 7 m W of	Asphalt	130										
1113-03	Sir John Franklin Rd.	Concrete	155										
TH19-04	Corydon Avenue (WB) - 2.2 m S of N curb, 45 m W	Asphalt	118										
1019-04	of Lindsay St.	Concrete	210										
				CLAY	0.3	27.8					I		
		Asphalt	68	CLAY	0.6	34.7	0.1	10.7	13.8	75.3	73.3	22.5	50.8
TU40.05	Corydon Avenue (WB) -	Constalla	100	CLAY	0.9	34.2							
TH19-05	1.8 m S of N curb, 14 m E of	Concrete	182	CLAY	1.2	33.8							
	Lindsay St.	Cond and Crevel (FIII)		CLAY	1.5	39.1							
		Sand and Gravel (Fill)	55	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		Pavement Struct	ture		Sample	Moisture		Hydromet	er Analysis		At	tterberg Lin	nits
No.	Test Hole Location	Туре	Thickness (mm)	Subgrade Description *	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
		Asphalt	48	CLAY	0.3	14.4							
	Corydon Avenue (WB) -	Asphare		CLAY	0.6	31.1							
TH19-06	2.1 m S of N curb, 9 m W of	Concrete	232	CLAY	0.9	31.8							
11115 00	Borebank St.	Contracte	232	SILTY CLAY	1.2	34.4							<u> </u>
		Sand and Gravel (Fill)	50	SILTY CLAY	1.5	19.6							<u> </u>
		Sana ana Graver (rin)	30	SILTY CLAY	1.8	33.9							
		Asphalt	90	CLAY	0.3	14.3							
	Conviden Avenue (M/D)	Asphalt	50	CLAY	0.6	34.2	1.8	12.4	27.8	57.9	85.6	19.4	66.2
TH19-07	Corydon Avenue (WB) - 1.9 m S of N curb, 35 m E of	Concrete	130	CLAY	0.9	38.5							
1019-07	Borebank St.	Concrete	150	SILTY CLAY	1.2	23.6							
	borebank St.	Cond and Crowal (Fill)	05	SILTY CLAY	1.5	24.6							
		Sand and Gravel (Fill)	85	SILTY CLAY	1.8	26.6							
		Acabalt	0	SILTY CLAY (FILL)	0.4	27.8							
		Asphalt	0	SILTY CLAY (FILL)	0.6	29.4							
TH19-08	Corydon Avenue (WB) - 1.8 m S of N curb, 14 m E of	Concroto	226	SILTY CLAY (FILL)	0.9	26.6							
1019-00	Campbell St.	Concrete	220	CLAY	1.2	29.8							
	Campben St.	Sand and Gravel (Fill)	155	CLAY	1.5	33.9							
		Saliu aliu Gravel (Fill)	155	CLAY	1.8	40.0							
		Asphalt	100	CLAY	0.6	25.9							
	Corydon Avenue (WB) -	Aspirat	100	SILTY CLAY	0.9	21.4							
TH19-09	1.4 m S of N curb, 20 m W	Concrete	0	SILTY CLAY	1.2	21.3							
	of Cordova St.	Concrete	0	CLAY	1.5	38.3							
		Sand and Gravel (Fill)	280	CLAY	1.8	40.0							
		Asphalt	160	CLAY	0.3	11.7							
	Corydon Avenue (EB) -	Asphalt	100	CLAY	0.6	31.4	0.0	12.9	28.1	59.0	58.7	17.7	41.0
TH19-10	1.3 m N of S curb, 20 m E of	Concrete	0	CLAY	0.9	34.6							
1013-10	Borebank St.	CONCIELE	U	SILTY CLAY	1.2	23.0							
		Sand and Gravel (Fill)	94	SILTY CLAY	1.5	23.0							
		Sana ana Graver (EIII)	54	SILTY CLAY	1.8	23.0							

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Test Hole		Pavement Struct	ure		Sample	Moisture		Hydromet	er Analysis		A	tterberg Lin	nits
No.	Test Hole Location	Туре	Thickness (mm)	Subgrade Description *	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
		Asphalt	0	SAND AND SILT (FILL)	0.6	22.9	1.9	43.8	38.8	15.5	36.4	18.7	17.7
	Corydon Avenue (EB) -	Aspilait	0	SILTY CLAY	0.9	25.4							
TH19-11	2.0 m N of S curb, 24 m W	Concrete	212	SILTY CLAY	1.2	28.6							
	of Campbell St.	concrete	212	CLAY	1.5	38.7							
		Sand and Gravel (Fill)	398	CLAY	1.8	34.4							
				CLAY	0.3	34.3							
		Asphalt	85	SAND AND SILT	0.6	20.9	0.0	42.9	37.2	19.9	27.2	15.9	11.3
TU10 10	Corydon Avenue (EB) -			SAND AND SILT	0.9	32.6							
TH19-12	2.0 m N of S curb, 37 m E of Campbell St.			SAND AND SILT	1.2	30.8							
	Campben St.	Concrete	220	CLAY	1.5	29.1							
				CLAY	1.8	39.5							
		A h . h	450	CLAY	0.3	22.8							
		Asphalt	158	CLAY	0.6	32.9							
TU40 42	Corydon Avenue (EB) -	Commente	0	CLAY	0.9	32.6							
TH19-13	1.8 m N of S curb, 17 m E of Cordova St.	Concrete	0	CLAY	1.2	35.7							
	Cordova St.	Cond and Croud (Fill)	147	CLAY	1.5	30.8							
		Sand and Gravel (Fill)	147	CLAY	1.8	39.8							
		Acabalt	00	CLAY	0.4	31.8							
		Asphalt	88	CLAY	0.6	32.7	0.0	7.4	20.5	72.0	69.8	20.8	49.0
TH19-14	Corydon Avenue (EB) -	Concrete	192	CLAY	0.9	32.0							
1019-14	2.0 m N of S curb, 28 m W of Brock St.	Concrete	192	CLAY	1.2	32.2							
	OF DEOCK St.	Sand and Cravel (Fill)	100	CLAY	1.5	39.1							
		Sand and Gravel (Fill)	100	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)