APPENDIX 'G'

GEOTECHNICAL REPORT

EXPLANATION OF FIELD & LABORATORY TEST DATA

					UMA	USCS		Laborator	y Classification Crite	eria
		Descript	ion		Log Symbols	Classification	Fines (%)	Grading	Plasticity	Notes
		CLEAN GRAVELS	Well grade sandy grave or no	d gravels, ls, with little fines	20	GW	0-5	C _U > 4 1 < C _C < 3		
	GRAVELS (More than 50% of	(Little or no fines)	Poorly grad sandy grave or no	ed gravels, ls, with little fines		GP	0-5	Not satisfying GW requirements		Dual symbols if 5-
OILS	fraction of gravel size)	DIRTY GRAVELS	Silty gravels grav	, silty sandy /els	NN	GM	> 12		Atterberg limits below "A" line or W _P <4	12% fines. Dual symbols if above "A" line and
AINED SC	9	(With some fines)	Clayey grav sandy g	rels, clayey jravels		GC	> 12		Atterberg limits above "A" line or W _P <7	4<₩ _P <7
ARSE GR		CLEAN SANDS	Well grade gravelly sand or no	ed sands, Is, with little fines	0.0	sw	0-5	C _U > 6 1 < C _C < 3		$C_U = \frac{D_{60}}{D_{10}}$
Ś	SANDS (More than 50% of	(Little or no fines)	Poorly grad gravelly sand or no	led sands, ls, with little fines	000	SP	0-5	Not satisfying SW requirements		$C_C = \frac{(D_{30})^2}{D_{10} x D_{60}}$
	coarse fraction of sand size)	DIRTY SANDS	Silty sa sand-silt	ands, mixtures		SM	> 12		Atterberg limits below "A" line or W _P <4	
		(With some fines)	Clayey sand-clay	sands, mixtures		SC	> 12		Atterberg limits above "A" line or W _P <7	
	SILTS (Below 'A' Vine	W _L <50	Inorganic si clayey fine s slight pl	ilts, silty or sands, with asticity		ML				
	negligible organic content)	W _L >50	Inorganic s plast	ilts of high icity		MH				
SOILS	CLAYS	WL <30	Inorganic o clays, sand low plasticity	clays silty ly clays of lean clays		CL				
GRAINED	(Above A line negligible organic	30 <w<sub>L<50</w<sub>	Inorganie cla clays of r plast	ys and silty medium icity		CI			Classification is Based upon Plasticity Chart	
FINE	content)	W _L >50	Inorganic cla plasticity,	ays of high fat clays	\square	СН				
	ORGANIC SILTS & CLAYS	₩L<50	Organic s organic silty plast	silts and clays of low icity		OL				
	(Below 'A' line)	W _L >50	Organic cla plasti	ys of high icity	<u>Ti</u>	он				
	GHLY ORG	AINIC SOILS	Peat and ot organic	her highly soils		Pt	V Classi	on Post fication Limit	Strong colour o fibrous	r odour, and often s texture
		Asphalt			Till					
		Concrete		B (Undit	edrock fferentiated)				AE	MOC
×	8	Fill		B (Lir	edrock mestone)					

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

In addition:

(a) Included on the CD's will be a separate drawing in AutoCAD format with the following (8) basic layers (none of which are to include text) and a list describing additional layers used:

Layer Names:

- Street Surface
 Walk
- Surface 5) Ramp Curb
 - 6) Dimensions (to include all dimensions in the drawing)
 - 7) Drainage Inlets
- 4) Approach

3) Alley

- 8) Elevations (min. all hi & low points)
- F2. GEOTECHNICAL INVESTIGATION REQUIREMENTS FOR PUBLIC WORKS PROJECTS (SEPTEMBER 2015)

F2.1 Fieldwork

- (a) Clear all underground services at each test-hole location.
- (b) On most projects, test-holes are required every 50 metres with a minimum of three (3) test holes per Project Location. For street projects greater than 500 metres, test holes may be taken every 100 m. More or fewer test-holes may be required depending upon known 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.

F2.2 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 Pavement Rehabilitations and Mill and Fill Pavement Rehabilitation Method pavement cores may be required. Contact the City's Project Manager to confirm requirements.
- (f) For any uncertain situations and/or locations, or clarification of these requirements, contact the Project Manager.

F3. TREE REMOVAL GUIDELINES

- F3.1 These guidelines are applicable to situations where trees in fair to good condition on public boulevards, parks, or natural areas are requested to be removed. The following are some examples:
 - (a) Movie sets;
 - (b) Private and commercial approaches;
 - (c) Planned construction, street work, and water and waste projects.
- F3.2 (0 10cm) Trees can be replaced at approximately the same size. Customer is responsible for removal utilizing an approved contractor and is to forward the replacement cost (currently \$740 / tree) to the Urban Forestry Branch.
- F3.3 (10 30cm) Trees are not easily replaced and are valued according to Council of Tree and Landscape Appraisal Formula.
- F3.4 (30cm +) The Urban Forestry Branch's position is to deny removal and further consultation with the City of Winnipeg Forester is required.
- F3.5 Funding received by The Urban Forestry Branch will be invested back in the form of tree planting within the Ward to maintain the canopy of the urban forest.
- F3.6 Additional Guidelines:
 - (a) There shall be no appraised value applicable for trees that are dead or are in decline.
 - (b) Trees that are part of emergency water and waste projects shall be priced for removal and replacement cost.
 - (c) For new easements Manitoba Hydro shall consult with the City of Winnipeg Urban Forestry Branch prior to any proposed tree removal. During the consultation, all attempts shall be made to minimize tree removal. Trees that are removed shall be compensated at a value of 1 new tree per 10 cm of dbh (diameter at breast height; ie. 40 cm dbh tree = 4 replacement trees @ \$740 / tree = \$2960). If Manitoba Hydro fails to consult with the Urban Forestry Branch in these matters, then the Council of Tree & Landscape Appraisers, Guide for Plant Appraisal (current edition), shall be used to determine the value of trees.
 - (d) Natural stand trees are valued 1:1 ratio for those greater than 5cm dbh. One additional replacement tree will be required for every additional 7.5 cm of dbh (ie. 12.5cm dbh = 2 replacement trees @ \$740 / tree = \$1480). The ISA Species rating will be taken into consideration once a total appraised value has been determined.

F4. SEWER CONDITION ASSESSMENT & CCTV GUIDELINES (2017)

F4.1 Perform condition assessment on all relevant sewers and manholes in the right-of-way within the limits of the street renewal. Condition assessment includes, but is not limited to, the following;

PROJECT:	Local Streets Package - 19-R-04	С	LIEN	T: C	ity of	Win	nipeg	1					TES	STHOLE NO: TH19-1	4
LOCATION	: Lanark St., 1.6 m E of W curb, 14 m N of John Brebeuf	FPI.			·								PR	OJECT NO.: 605963	12
CONTRAC	TOR: Maple Leaf Drilling Ltd.	M	IETH	OD:	Can	erra	<u>C-25</u>	50 Tr	uck I	Rig, 12	25 mn	n SSA	ELE	EVATION (m): N/A	
DEPTH (m)	GRAB SOIL DESCRIPTION	SAMPLE TYPE	SPLIE # SAMPLE #	(N) TRN	ON ◆ SI 0 : 16 1	PENETI	RATION Becke amic C Indard ws/300 (kN/m ³ 8 1 MC 0 6 (kN/m ³ 8 1	ULK N TEST r * Cone < Pen T Omm) 50 : Wt 9 2 2	S est) ♦ 80 100 0 2' iid		INED SH + Tor × Q □ Lab △ Pock ♥ Field (k	NO REC Vane + U/2 × Vane □ et Pen. △ I Vane € Pa) 00 150	ENGTH		DEPTH
0	ASPHALT - 30 mm				·····	20 4							5 200		
	CONCRETE - 190 mm CLAY - trace to some sand - dark grey, frozen to 1.1 m		G73 G74 G75			•									1 -
			G76 G77												
	SILT - clayey, some sand - light brown, soft to firm, moist - intermediate plasticity 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.		G78												2-
LOG OF TES	AECOM				LOC REV PRO	GGED /IEW DJEC) BY: ED B' T EN	Rya Y: Fa GINE	n Har aris Al ER:	ras lobaidy Kevin I	Rae	00 00)mple)mple	TION DEPTH: 2.00 m TION DATE: 1/17/19 Page	1 of 1

PROJECT:	Local Streets Package - 19-R-04	С	LIEN	IT: C	ity of	f Win	nipe	g						TES	STHOLE NO: TH19-1	5
LOCATION	: Lanark St., 1.6 m E of W curb, 83 m N of John Brebeut	f Pl.												PR	OJECT NO .: 605963	12
CONTRAC	TOR: Maple Leaf Drilling Ltd.	M		OD:	Can	terra	<u>C-2</u>	<u>50 T</u>	ruc	k R	ig, 12	25 mm	1 SSA			
DEPTH (m) SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	♦ S 0	PENET * ODyi PT (Sta (Blo 20 To 17 1 Plastic	RATIC Becke andard ows/30 40 otal Un (kN/m 8 MC	N TES or X Cone Pen 0mm) 60 it Wt I	STS STS Test) 80 20 quid	◆ 100 21	UNDRAI	NED SH + Tor ∠QI □ Lab △ Pocke ♥ Field (kl	NO RE IEAR STF vane + J/2 × Vane □ et Pen. ∠ Vane € Pa)	COVEF RENGTH		DEPTH
0	ASPHALT - 89 mm					20	40	60 :	80	100	5	0 1	00 1	50 200		
-	CONCRETE - 167 mm												•			
	CLAY - trace to some sand - dark grey, frozen to 1.1 m		G79													
			G80 G81			•		· · · · · · · · · · · · · · · · · · ·						· · · · · · · · · · · · · · · · · · ·		1 -
	- firm, moist, high plasticity below 1.1 m CLAY - trace sand - brown, firm, moist - high plasticity		G82			······································		· · · · · · · · · · · · · · · · · · ·								
30T 3/12/19			G83 G84				•									
	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 -
	AECOM				LO RE PR	ggei View Ojec) BY: Ed B T EN	Rya Y: F IGIN	an H Faris EER	larra Alc R: K	as baidy íevin F	lae	C	COMPLE	ETION DEPTH: 2.00 m ETION DATE: 1/17/19 Page	1 of 1

PRO	JECT:	Local Streets Package - 19-R-04	LIEN	NT: C	ity o	f Win	nipe	g					TE	STHOLE NO: TH19-1	6	
LOCA	TION	: 500 Lanark St., 1.4 m E of W curb, 145 m N of John E	Breb	euf P	9.									PR	OJECT NO .: 6059631	12
CON		IOR: Maple Leaf Drilling Ltd.	<u> </u>		IOD:	Can	terra	C-2	50 TI	ruck I	Rig, 1	25 m	n SSA			
DEPTH (m)		SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	(N) LdS	◆ S 0	PENET * OUV PT (Sta (Blc 20 TC 17 Plastic 20	RATIO Becke andard ows/30 40 tal Uni (kN/m 8 MC	N TES er # Cone < Pen T 0mm) 60 t Wt i Wt i Liq	TS ⇒ rest) ♦ 80 100 20 2 ⁻ uid		AINED S + To × C □ Lab • Pock • Fiel (I	HEAR ST rvane + QU/2 × o Vane C ket Pen d Vane 6 kPa)		COMMENTS	DEPTH
0		ASPHALT - 50 mm	_			+	20	40	60 •	80 10	<u> </u>	50	100 ·	150 200		
-	\gg	CONCRETE - 200 mm SAND and GRAVEL (Fill) - 50 mm - aggregate < 15 mm diam. CLAY - trace to some sand, trace gravel - dark grey, frozen to 1.1 m - high plasticity		G85										· · · · · · · · · · · · · · · · · · ·		
- - - 1				G86 G87			⊢●		· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·			(G86): Gravel: 7.1%, Sand: 20.6%, Silt: 23.6%, Clay: 48.8%	1 -
-		- firm, moist below 1.1 m SILT - clayey, trace to some sand - light brown, firm, moist - intermediate plasticity CLAY - trace sand - brown, firm, moist - high plasticity		G88 G89				•	· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·		· · · · ·
L STREETS.GPJ UMA WINN.GDT 3/12/19		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.		G90				•								2-
		ΑΞϹΟΜ				LO	<u>GGEI</u> VIEW) BY: ED B	Rya Y: F	<u>n Har</u> aris A	ras	······		<u>Compli</u> Compli	ETION DEPTH: 2.00 m ETION DATE: 1/17/19	

PROJECT: Local Streets Packa	ge - 19-R-04	С	LIEN	T: C	ity of	Winr	nipeg						TES	STHOLE NO: TH19-	17
LOCATION: 528 Lanark St., 1.8	m E of W curb, 130 m S of Corydo	n A	ve.										PR	OJECT NO.: 605963	12
CONTRACTOR: Maple Leaf Dri	illing Ltd.	M		OD:	Can	erra	C-25	<u>0 Tr</u>	uck F	Rig, 12	25 mn	1 SSA		EVATION (m): N/A	
(ŵ) HE SOIL		SAMPLE TYPE	SAMPLE #	SPT (N)	♦ SI 0 16 1	PENETF & Dyn PT (Stal (Blov 20 4 Tot (7 18 Plastic	RATION Becker amic C ndard I ws/300 0 6 al Unit (kN/m ³ 3 19 MC	ULK I TEST Sone ≎ Pen Te mm) 0 8 Wt ■) 2 Liqu	S est) ◆ <u>0 21</u> id	UNDRA	JNED SH + Tor × Q □ Lab △ Pocke ♥ Field (k	NO RE IEAR STF vane + U/2 × Vane ⊡ et Pen. ∠ Vane € Pa)	RENGTH		DEPTH
0 ASPHALT - 45 mm						20 4	0 - 6	<u>0 -</u> 8	30 100		50 <u>1</u>	00 1:	50 200 :		
SAND and GRAVEL (Fi - aggregate < 15 mm dia CLAY - trace sand - dark grey, frozen to 1.4	II) - 33 mm am		G91 G92				•								
- 1 - firm, moist, high plastic	sity below 1.1 m ome sand		G93 G94			•									1-
- light brown, firm, moist - intermediate plasticity - CLAY - trace sand - brown, firm, moist - high plasticity			G95 G96				•								
END OF TEST HOLE A Notes: 1. No seepage observed 2. No sloughing observed 3. Test hole backfilled w patched with asphalt up 1001 100	T 2.00 m IN CLAY d during drilling. ad during drilling. ith drill cuttings and bentonite and on completion.				· · · · · · · · · · · · · · · · · · ·					· · · · · · · · · · · · · · · · · · ·					2-
	COM	1			LO RE PR	GGED /IEWE DJEC	BY: ED BY T EN(Ryar 7: Fa GINE	n Harr aris Al ER: 1	as obaidy Kevin F	, Rae		OMPLE	ETION DEPTH: 2.00 m ETION DATE: 1/17/19 Page	1 of 1

PROJ	IECT:	Local Streets Package - 19-R-04	T: C	ity o	Winn	ipeg						TES	STHOLE NO: TH19-1	8		
LOCA	TION	: Lanark St., 0.3 m E of W curb, 75 m S of Corydon Ave						-						PR	OJECT NO.: 6059631	2
CONT		TOR: Maple Leaf Drilling Ltd.	M	ETH	OD:	Can	terra (2-250) Tru	ck F	Rig <u>, 12</u>	<u>5 mm</u>	SSA	ELE	EVATION (m): N/A	
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	(N) LdS	◆ S 0	PENETR * B > Dyna PT (Stan (Blow 20 40 Tota (H 7 18 Plastic 20 40 (H	ATION ATION ATION ATION ACC ATION	ILK TESTS * en Tes nm) 80 Vt ■ 20 Liquid	it) ♦ 100 21		NED SHE + Torva × QU. □ Lab V Pocket P Field \ (kP)	AC RECO $AR STREM ane + /2 \timesane \squarePen. \triangle/ane ea)150$	JVEF IGTH		DEPTH
0		ASPHALT - 59 mm					20- 40	- 60	-80	100	50	10	<u> </u>	200		
-	\gg	CONCRETE - 151 mm SAND and GRAVEL (Fill) - 90 mm - aggregate < 15 mm diam. CLAY - trace sand - dark grey, frozen - high plasticity		G97			•				••••••					
- - -		- brown below 0.6 m		G98 G99			•								(G99): Gravel: 0.0%,	1 -
-		SILT - clayey, trace to some sand - light brown, firm, moist - intermediate plasticity CLAY - trace sand - brown, firm, moist - high plasticity		G100 G101											Sano: 4.2%, Slit: 17.1%, Clay: 78.7%	
		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.		G102												2 -
3 3																
5		ATCOM				LO RF	GGED	BY: F D RY	Ryan Fari	Harr is Al	as obaidv			/IPLE /IPI F	TION DEPTH: 2.00 m TION DATE: 1/17/19	
2						PR	OJECT	ENG	INEE	R: 1	Kevin R	ae		••• ••	Page	1_of 1

PROJ	IECT:	Local Streets Package - 19-R-04	LIEN	IT: C	ity of	[:] Wini	nipe	j					TE	STHOLE NO: TH19-1	9	
		: Lanark St., 2.0 m E of W curb, 33 m S of Corydon Ave).		•-			• •						PR	OJECT NO.: 6059631	2
CON	I KAC		N	1ETH 1.spi i	OD: T.SPC	Can	terra	<u>C-2</u> : □□□	50 Tr	uck I	Rig, 12	<u>25 mr</u> ┌∠	<u>n SSA</u> 1 NO PI		EVATION (m): N/A	
DEPTH (m)	SOIL SYMBOL		SAMPLE TYPE	SAMPLE #	SPT (N)	◆ SI 0	PENETI	RATIO Becke lamic (indard ws/30(to (tal Uni (kN/m) 8 1 MC 0 (N TEST r ★ Cone < Pen To Dmm) 50 t Wt ■ 1 9 2 Liqu 60	S ≥ est) ♦ 80 100 0 2 ⁻ iid 80 100		VINED SI + To × C □ Lab ● Field (H	HEAR ST rvane + QU/2 × o Vane C ket Pen d Vane 4 kPa)	RENGTH 2 150 200	COMMENTS	DEPTH
0		_ASPHALT - 33 mm CONCRETE - 127 mm						•	•	•		•				
-	\gg	SAND and GRAVEL (Fill) - 70 mm - aggregate < 15 mm diam. CLAY - trace to some sand - dark grey, frozen		G103 G104			•									
-				0104										· · ·		
- 1 -		SILT - clayey, trace to some sand - light brown, firm, moist - intermediate plasticity		G105			•		· · · · ·				· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	(Bulk) Soaked CBR: 1.6	1
-		CLAY - trace sand - brown, firm, moist - high plasticity		G106			•		· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
-				G107					· · · · · · · · · · · · · · · · · · ·					· · · · · · · · · · · · · · · · · · ·		
		END OF TEST HOLE AT 2.00 m IN CLAY		G108			· · · · · · · · · · · · · · · · · · ·	•					· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		2
		 Notes. No seepage observed during drilling. No sloughing observed during drilling. Two additional holes drilled at this location to collect bulk sample between 0.3 m and 1.5 m. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion. 					/	- - - - - - - - - - - - - -	-					· · · · · · · · · · · · · · · · · · ·		
							· · · · · · · · · · · · · · · · · · ·					· · · · · · · · · · · · · · · · · · ·				
3									<u> </u>	<u>.</u>						
5		AECOM				RE	JGED	ED B	- Куа Y: Fa	n Har aris Al	ras Iobaidv	/		COMPL	ETION DEPTH: 2.00 m ETION DATE: 1/17/19	
						PR	OJEC	T EN	GINE	ER:	Kevin I	Rae			Page	1 of 1

PROJECT: L	ocal Streets Package - 19-R-04	T: C	ity o	f Win	nipe	g					TE	STHOLE NO: TH19-2	0		
LOCATION:	131/135 McDowell Dr., 1.5 m W of E curb, 28 m N of V	Nes	tlund	Way									PR	OJECT NO.: 6059631	12
				OD:	Can	terra	C-2	50 TI	ruck F	Rig, 12	<u>25 mm</u>				
DEPTH (m) SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	◆ S 0	PENET * Opy PT (Sta 20 To 17 Plastic	RATIO Becke andard ows/30 40 tal Uni (kN/m 18 1 MC	N TES r # Cone < Pen T Omm) 50 t Wt 9 2 Liqu	TS > lest) ♦ 80 100 1 20 21	UNDRA	INED SH + Torv ∠ QL □ Lab ' △ Pocke ♥ Field (kF	EAR STR vane + J/2 × Vane □ vane Φ Pa)	ENGTH	COMMENTS	DEPTH
0 C	CONCRETE - 173 mm					20	40	5U		5	0 10	<u>10 19</u>	0 200		
	SAND and GRAVEL (Fill) - 80 mm aggregate < 15 mm diam. SILT and SAND dark grey, frozen low plasticity		G109			•		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·						-
			G110 G111					· · · · · · · · · · · · · · · · · · ·						(G110): Gravel: 0.8%, Sand: 41.0%, Silt: 45.0%, Clay: 13.3%	1 -
	firm, moist, high plasticity below 1.4 m		G112			· · · · · · · · · · · · · · · · · · ·	•	· · · · · · · · · · · · · · · · · · ·							
DT 3/12/19			G113 G114			•	•	· · · · · · · · · · · · · · · · · · ·							
ST HOLE TEST HOLE LOGS - LOCAL STREETS.GPJ UMA WINN.GI	END OF TEST HOLE AT 2.00 m IN CLAY Notes: I. No seepage observed during drilling. 2. No sloughing observed during drilling. 3. Test hole backfilled with drill cuttings and bentonite and watched with asphalt upon completion.														2 -
	AECOM				LO RE PR	ggei View Ojec) BY: ED B T EN	Rya Y: Fa GINE	n Hari aris Al ER:	ras obaidy Kevin F	Rae		omple	ETION DEPTH: 2.00 m ETION DATE: 1/21/19 Page	1 of 1

LOCATION: 107/111 McDowell Dr., 2.0 m W of E curb, Blc CONTRACTOR: Maple Leaf Drilling Ltd. SAMPLE TYPE GE GE F SOUL DESCRIPTION	DISSOM BAY		Sectior	n Cant ON	PENET			uck F	<u>Rig, 1</u> 2	25 mr	n SSA]NO RE	PR ECOVER	OJECT NO.: 605963 EVATION (m): N/A RY ■CORE	12
			HOD: IT SPO	Cant ON	PENETF				<u>Rig, 12</u>	25 mr	n <u>SS</u> A]NO RE	A ELE ECOVEF	<u>=VATION (m): N/A</u> RY	
	SAMPLE TYPE	」 # 日			PENET	RATION		<u>_</u>		Ľ	_			
		HAL # # # # # # Torvane QU2 2 QU2 2 QU2 2 Image: Cone <								NED SH + Tor × Q □ Lab △ Pock ♥ Field (k	HEAR ST vane + V/2 × Vane □ et Pen. 2 Vane € Pa)		COMMENTS	DEPTH
0 CONCRETE - 147 mm					20 4	0 6	08	0 100		<u>-</u>		150 200		
SAND and GRAVEL (Fill) - 132 mm - aggregate < 20 mm diam.										· · · · · · · · · · · · · · · · · · ·		•		
- dark grey, frozen		G11	5		٠						· · · ·	· · · · ·		
		G116	5		•							· · · · · · · · · · · · · · · · · · ·		
										· · · · · · · · · · · · · · · · · · ·	•	•		
		G117	7		٠						· · · ·	· · · · ·		1-
CLAY - trace to some sand - brown, firm, moist - high plasticity		G118	3		٠					· · · · ·	· · · · ·	· · · · ·		
										· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	· · · · · ·		
		G11	9			•					· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
		G120	þ			D					· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		2-
END OF LEST FIDLE AT 2.00 M IN CLAY										· · · · · · ·	· • • • • • • • • • • • • • • • • • • •	· • • • • • • • • • • • • • • • • • • •		
3. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion.	1									•	•	· · · · · ·		
										· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·		
										- - - - - - - - - - - - - - - - - - -		· • • • • • • • • • • • • • • • • • • •		
										· · · ·	·····			
				LO(GGED	BY:	Ryan (• Fa	n Harr	as nhaidu	,		COMPLE	TION DEPTH: 2.00 m	
				PR	OJEC		GINEI	ER: 1	Kevin I	Rae			Page	1 of 1

PROJ	ECT:	CLIENT: City of Winnipeg										TE	TESTHOLE NO: TH19-22						
		: 95/99 McDowell Dr., 1.6 m W of E curb, 45 m N of Sou TOR: Maple Leaf Drilling Ltd	uth L		f Blos	son	n Bay	0.00	-0 -			05			PROJECT NO.: 60596312				
SAMF	PLE T			<u>⊏ I H</u>]SPLI	UU: T SPO	Can ON	terra		<u>SULK</u>	UCK	<u>rig, 1</u>	<u>25 m</u> /	<u>n SS/</u> NO R	u ∣ EL ECOVEI					
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	♦ S 0 16	PENET	RATIO Becke andard ws/30 40 tal Uni (kN/m 8 1 MC	N TES er # Pen T Omm) 60 t Wt 9 Liq	TS ≥ Test) ♦ 80 10 1 20 2 uid 80 10		AINED S + Tc ∠ C □ Lat △ Pocl ♥ Fiel (COMMENTS	DEPTH			
0		CONCRETE - 145 mm					20	+0			U	5 <u>0</u>		150 200					
-	\gg	SAND and GRAVEL (Fill) - 96 mm - aggregate < 15 mm diam. CLAY - trace sand - brown, frozen to 1.2 m - high plasticity	-	G121			•												
- - 1				G122 G123			•	· · · · · · · · · · · · · · · · · · ·					· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	(G123): Gravel: 0.0%, Sand: 5.2% Silt: 24.9%	1 -			
-		- firm, moist below 1.2 m		G124					· · · · · · · · · · · · · · · · · · ·			· · · · · · · · · · · · · · · · · · ·			Clay: 69.9%				
101 3/12/19				G125 G126			· · · · · · · · · · · · · · · · · · ·	•											
		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 -			
	1	AECOM				LO RE	GGEI VIEW	D BY: ED B	Rya Y: F	n Har aris A	ras lobaid	y	. (COMPL	ETION DEPTH: 2.00 m				
5				PROJECT ENGINEER: Kevin Rae								Page	1 of 1						

PROJECT: Local Streets Package	e - 19-R-04	CLIENT: City of Winnipeg										TESTHOLE NO: TH19-23					
LOCATION: 78 McDowell Dr., 1.7	m E of W curb, 65 m S of North I	Leg	of Bl	ossor	n Ba	y							PROJECT NO.: 60596312				
	ng Ltd.	M	ETH		Cant	erra	C-25	<u>i0 Tr</u>	uck F	Rig, 12	<u>5 mm</u>						
GIVIPLE TIFE ■GIVE (() () () () () () () () () () () () ()	DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	◆ SF 0 2 16 1 [°]	PENETI	RATION Becker amic C ndard I ws/300 0 6 tal Unit (kN/m ³ 3 19 MC	V TEST x # Cone Pen Te mm) 0 8 Wt ■) 2 Liqu	S est) ♦ 30 100 0 21	UNDRAI	NED SHI + Torv × QU □ Lab \ △ Pocke • Field (kF	EAR STR rane + $J/2 \times$ $\sqrt{ane} \square$ $Lt Pen. \triangle$ Vane ④ Pa)	ENGTH	COMMENTS	DEPTH		
0 CONCRETE - 152 mm					2	20 ° 4	0 6	0 8	30 100	50	0 10	0 15	0 200				
SAND and GRAVEL (Fill) - aggregate < 20 mm dian - aggregate < 20 mm dian - light brown, frozen - low plasticity - low plasticity - classical diagonal	- 102 mm		G127 G128 G129 G130											(G128): Gravel: 0.0%, Sand: 44.8%, Silt: 43.0%, Clay: 12.2% (Bulk) Soaked CBR: 3.2	1 -		
PTOTECT ACTION AND ACTION ATTAICACTURA ATTAICAC	2.00 m IN CLAY during drilling. during drilling. illed at this location to collect bulk d 1.5 m. d rill cuttings and bentonite and a completion.		G132												2 -		
	AECOM					GED /IEWE DJEC	BY: Ed b' T en(Ryaı Y: Fa GINE	n Harr aris Al ER: I	as obaidy Kevin R	lae	C	OMPLE	ETION DEPTH: 2.00 m ETION DATE: 1/21/19 Page	1 of 1		

PROJE	ECT:	Local Streets Package - 19-R-04	CLIENT: City of Winnipeg										TE	TESTHOLE NO: TH19-24				
		: 63 McDowell Dr., 1.9 m W of E curb, Blossom Bay Int	erse	ectior				0.01	·• -		<u> </u>	05		PROJECT NO.: 60596312				
SAMPI				IETH Ispli	<u>OD:</u> T SPO	<u>Can</u> ON	terra	<u>С-2:</u> ⊟в	<u>ULK</u>	UCK	≺i <u>g</u> , 1.	<u>25 mr</u>	<u>n SSA</u> 1 No re	A ELI ECOVEF	EVATION (M): N/A			
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	◆ S 0	PENET	RATIOI Becke amic (andard ws/30(tal Uni (kN/m 8 1 MC	N TEST r X Cone < Pen To Omm) S0 a t Wt 9 2 Liqu	S ≥est) ♦ 30 100 0 21	UNDRA	L + Tor × C □ Lab △ Pock ● Field (H	HEAR ST rvane + U/2 × Vane □ tet Pen. 2 d Vane € (Pa)		COMMENTS	DEPTH		
0		CONCRETE - 162 mm					20 4	10 - 6	50 -	30 100		50 *		150 200				
	\sim	SAND and GRAVEL (Fill) - 54 mm - aggregate < 15 mm diam. / CLAY - trace to some sand - dark brown, frozen		G133														
-		CLAY - trace to some sand		G134				•	· · · · ·	· · · ·		· · · · · · · · · · · · · · · · · · ·	· · · · ·	· · · ·				
- 1 -		- brown, nozen to 1.2 m		G135			· · · · · · · · · · · · · · · · · · ·	•	<pre></pre>	· · · · · · · · · · · · · · · · · · ·						1 -		
-		- firm, moist, high plasticity below 1.2 m		G136				•	No. No. No. No. No. No.	· · · · · · · · · · · · · · · · · · ·								
				G137 G138			· · · · · · · · · · · · · · · · · · ·		X X	<pre></pre>								
		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 -		
3 100 01 IEST HOLE		AECOM				LO RE PR	gged View Ojec) BY: ED B T EN	Rya Y: Fa GINE	n Harr aris Al ER:	ras obaidy Kevin	/ Rae		Comple	ETION DEPTH: 2.00 m ETION DATE: 1/21/19 Page	1 of 1		

PROJ	JECT:	Local Streets Package - 19-R-04	С		T: Ci	ty of V	Vinni	peg						TESTHOLE NO: TH19-25			
		. סד ועוכבסטיפוו ד., 2.0 m ב סד עי כערט, 55 m N סד North L TOR: Manle Leaf Drilling Ltd	_eg			п вау		050) T		0ia 40	5 ~~~			UJECT NO.: 6059631	12	
SAMF	PLE T			I <u>⊂ I H</u> SPLI	טט: T SPO	ON ON		-20 BU	J T FL ILK	ick þ	<u>uy, 12</u>	<u>o mm</u>	<u>1 334</u> NO RE				
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PE	NETRA * Be Dynan (Stand (Blows 40 Total (kt 18 stic	TION ecker anic Co and P /300n 60 Unit V V/m ³) 19 MC	TESTS # one ◇ en Te: nm) 8(Wt ■ 20 Liquic	st) ♦ 0 100 21	UNDRAII 2	NED SH + Torv ∠ QL □ Lab \ ⊇ Pocke € Field (kF	EAR STR vane + J/2 × Vane □ et Pen. △ Vane © Pa)	ENGTH	COMMENTS	DEPTH	
0		CONCRETE - 154 mm				20	40	60	8	0 100	50) 10	00 15	50 200			
-		SAND and GRAVEL (Fill) - 113 mm - aggregate < 15 mm diam. CLAY - some sand - dark brown, frozen to 1.4 m - high plasticity		G139												-	
-				G140											(G140): Gravel: 0.1%, Sand: 18.9%, Silt: 28.6%, Clay: 52.4%		
1 - -				G141												1 -	
-		- firm, moist below 1.4 m		G142 G143			•										
WINN.GDT 3/12/19		SILT - clayey, some sand - light brown, soft to firm, moist - intermediate plasticity END OF TEST HOLE AT 2.00 m IN SILT		G144			•		· · · · · · · · · · · · · · · · · · ·							2 -	
LOGS - LOCAL STREETS.GPJ UM		 No seepage observed during drilling. No sloughing observed during drilling. Test hole backfilled with drill cuttings and bentonite and patched with asphalt upon completion. 															
EEST HOLE TEST HOLE								<u> </u>	Rvan	Harr							
3 OF 1	AECOM					REVI	EWED	51. I DBY	: Fa	ris Ale	as obaidy		0		ETION DATE: 1/21/19		
DOL	ALCOM				PROJECT ENGINEER: Kevin Rae								Page 1 of 1				

City of Winnipeg

Local Streets Pkg 19-R-04 – Contract 2 - Lanark Street/ McDowell Drive/ Mountbatten Avenue/ Maurepas Crescent

Geotechnical Investigation

Table 01- Summary of Laboratory Soil Test Results

Test Hole		Pavement Structure			Sample	Moisture		Hydromet	er Analysis		А	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	30	CLAY	0.3	37.4							
	Lanark Streat	Азрпан		CLAY	0.6	37.7							
TH10-11	1.6 m E of W curb 14 m N	Concrete	100	CLAY	0.9	33.4							
11119-14	of John Brebeuf Pl	Concrete	150	CLAY	1.2	35.7							
		Sand and Gravel (Fill)	0	CLAY	1.5	37.9							
		Sand and Graver (Fill)	0	SILT	1.8	35.3							
		Acabalt	80	CLAY	0.3	56.0							
	Lanark Street - 1.6 m E of W curb, 83 m N of John Brebeuf Pl.	Asphalt	69	CLAY	0.6	47.5							
TU10 15		Concepto	107	CLAY	0.9	32.4							
1019-12		Concrete	167	CLAY	1.2	38.9							
		Sand and Gravel (Fill)	0	CLAY	1.5	41.9							
		Sand and Graver (Fill)	0	CLAY	1.8	43.5							
	500 Lanark Street -	Asphalt	50	CLAY	0.3	37.0							
			50	CLAY	0.6	32.5	7.1	20.6	23.6	48.8	60.2	21.3	38.9
TU10.16		Concrete	200	CLAY	0.9	37.1							
1019-10	of John Brebeuf Pl	Concrete	200	CLAYEY SILT	1.2	40.3							
	or joint brebeur ri.	Sand and Gravel (Fill)	50	CLAY	1.5	38.2							
		Saliu aliu Gravel (Fili)	50	CLAY	1.8	40.8							
		Acabalt	45	CLAY	0.3	51.6							
	F29 Lanark Streat	Asphalt	45	CLAY	0.6	40.3							
TH10-17	1.8 m E of W curb 120 m S	Concrete	222	CLAY	0.9	40.9							
11113-17	of Corydon Ave	concrete		CLAY	1.2	35.4							
	or corydon / we.	Sand and Gravel (Fill)	33	CLAYEY SILT	1.5	42.2							
				CLAY	1.8	46.0							
		Asphalt	59	CLAY	0.3	36.7							
	Lanark Street -	Азрпан	55	CLAY	0.6	37.1							
TH19-18	0.3 m E of W curb 75 m S	Concrete	151	CLAY	0.9	37.5	0.0	4.2	17.1	78.7	85.1	24.9	60.2
11119-10	of Corvdon Ave		1.71	CLAY	1.2	41.9							
		Sand and Gravel (Fill)	90	CLAY	1.5	39.1							
			50	CLAY	1.8	39.6							



Test Hole No.		Pavement Structure		S	Sample	Moisture		Hydromet	er Analysis	Atterberg Limits			
	Test Hole Location	Туре	Thickness (mm)	Subgrade Description *	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
		Acabalt	22	CLAY	0.3	37.0							
	La na nh. Chua at	Asphalt	33	CLAY	0.6	36.0							
TU10 10	Lanark Street -	Concrete	107	CLAYEY SILT	0.9	36.2							
1019-19	2.0 III E OI W CUID, 33 III S	Concrete	127	CLAY	1.2	37.6							
	or corydon Ave.	Sand and Cravel (Fill)	70	CLAY	1.5	41.1							
		Sanu anu Graver (Fill)	70	CLAY	1.8	42.8							
		Δsnhalt	0	SILT AND SAND	0.3	25.6							
		Asphalt	0	SILT AND SAND	0.6	18.7	0.8	41.0	45.0	13.3	24.2	14.3	9.9
TU10 20	131/135 McDowell Drive -	Constant of	470	SILT AND SAND	0.9	35.9							
TH19-20	1.5 m W of E curb, 28 m N	Concrete	1/3	CLAY	1.2	41.7							
	of westigned way			CLAY	1.5	33.4							
		Sand and Gravel (Fill)	80	CLAY	1.8	45.7							
		Acabalt		CLAY	0.3	35.7							
		Asphalt	0	CLAY	0.6	34.9							
TU40.24	10//111 McDowell Drive -	Constant of	1.47	CLAY	0.9	35.0							
TH19-21	2.0 m W of E curb,	Concrete	147	CLAY	1.2	34.7							
	BIOSSOM Bay Intersection		122	CLAY	1.5	40.8							
		Sand and Gravel (Fill)	132	CLAY	1.8	41.5							
		Aanhalt	0	CLAY	0.3	28.2							
	95/99 McDowell Drive -	Asphalt	0	CLAY	0.6	28.2							
TU10 22	1.6 m W of E curb, 45 m N	Constato	145	CLAY	0.9	30.8	0.0	5.2	24.9	69.9	68.5	21.4	47.1
1819-22	of South Leg of Blossom	Concrete	145	CLAY	1.2	35.2							
	Вау	Sand and Cravel (Fill)	06	CLAY	1.5	41.4							
		Sanu anu Graver (Fili)	90	CLAY	1.8	42.4							
		Acabalt	0	SAND AND SILT	0.3	21.5							
	78 McDowell Drive -	Asphalt	0	SAND AND SILT	0.6	18.9	0.0	44.8	43.0	12.2	22.7	13.1	9.6
TU10 22	1.7 m E of W curb, 65 m S	Concrete	150	SAND AND SILT	0.9	15.5							
1019-23	of North Leg of Blossom	Concrete	152	CLAY	1.2	35.2							
	Вау	Sand and Gravel (Eill)	102	CLAY	1.5	38.4							
		Sanu anu Graver (Fill)	102	CLAY	1.8	40.7							



Test Hole		Pavement Structure			Sample	Moisture		Hydromet	er Analysis		Atterberg Limits		
No.	Test Hole Location	Туре	Thickness (mm)	Subgrade Description *	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
		Acabalt	0	CLAY	0.3	38.9							
		Asphalt	0	CLAY	0.6	41.1							
TH10.24	1.0 m W of E curb	Concrete	162	CLAY	0.9	42.9							
1019-24	Blossom Bay Intersection	Concrete	102	CLAY	1.2	45.3							
	blossom bay intersection	Sand and Gravel (Fill)	E A	CLAY	1.5	40.9							
		Saliu aliu Gravel (Fill)	54	CLAY	1.8	42.0							
		Acabalt	0	CLAY	0.3	22.4							
	51 McDowell Drive -	Asphalt	0	CLAY	0.6	20.9	0.1	18.9	28.6	52.4	55.6	17.0	38.6
TH19-25	2.0 m E of W curb, 55 m N	Concrete	454	CLAY	0.9	21.8							
	of North Leg of Blossom Bay		154	CLAY	1.2	24.7							
				CLAY	1.5	36.5							
		Sand and Gravel (Fill)	113	CLAYEY SILT	1.8	37.6							
	111 Maunthattan August	Asphalt	65										
0140.22	111 Mountbatten Avenue -												
CH19-33	2.4 m S of N curb, 7 m W of												
	Bower Biva.	Concrete	145										
	116 Mountbatten Avenue -	Asphalt	125										
CH10 24	1.3 m N of S curb, 60 m W												
СП19-54	of Bower Blvd.												
		Concrete	135										
	Mountbatten Avenue -	Asphalt	95										
CH10_25	1.0 m S of N curb, 20 m E of												
CU12-22	Shaftesbury Blvd.												
		Concrete 15	155										



Test Hole No.		Pavement Strue	cture		Sample	Moisture		Hydromet	er Analysis	Atterberg Limits			
	Test Hole Location	Туре	Thickness (mm)	Subgrade Description *	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
	Maurepas Crescent - 1.2 m from outer curb, 26	Asphalt	0										
СН19-45	with Edgeland Blvd.	Concrete	161										
	Maurepas Crescent - 1.0 m from inner curb, 80	Asphalt	0										
CH19-46	m E of North Intersection with Edgeland Blvd.	Concrete	215										
01140 47	Maurepas Crescent - 1.4 m from outer curb, 75	Asphalt	0										
CH19-47	with Edgeland Blvd.	Concrete	240										
	Maurepas Crescent - 1.1 m from inner curb, 28	Asphalt	0										
СН19-48	m E of South Intersection with Edgeland Blvd.	Concrete	224										





Photograph 1: Test Hole TH19-14 - Lanark Street - Asphalt not recovered



Photograph 2: Test Hole TH19-15 - Lanark Street



Photograph 3: Test Hole TH19-16 - Lanark Street - Concrete not recovered



Photograph 4: Test Hole TH19-17 - Lanark Street



Photograph 5: Test Hole TH19-18 - Lanark Street



Photograph 6: Test Hole TH19-19 - Lanark Street



Photograph 7: Test Hole TH19-20 - McDowell Drive



Photograph 8: Test Hole TH19-21 - McDowell Drive



Photograph 9: Test Hole TH19-22 - McDowell Drive



Photograph 10: Test Hole TH19-23 - McDowell Drive



Photograph 11: Test Hole TH19-24 - McDowell Drive



Photograph 12: Test Hole TH19-25 - McDowell Drive



Photograph 13: Test Hole CH19-33 - Mountbatten Avenue



Photograph 14: Test Hole CH19-34 - Mountbatten Avenue - Concrete not recovered



Photograph 15: Test Hole CH19-35 - Mountbatten Avenue



Photograph 16: Test Hole CH19-45 - Maurepas Crescent



Photograph 17: Test Hole CH19-46 - Maurepas Crescent



Photograph 18: Test Hole CH19-47 - Maurepas Crescent



Photograph 19: Test Hole CH19-48 - Maurepas Crescent