APPENDIX 'A'

GEOTECHNICAL REPORT

APPENDIX 'A' - GEOTECHNICAL REPORT

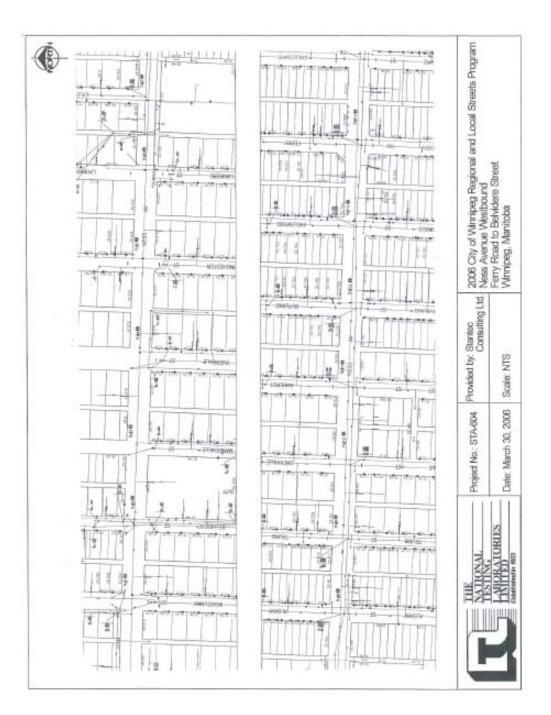
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The geotechnical report is provided to aid in the Contractor's evaluation of the existing pavement structure and/or soil conditions. The information presented is considered accurate at the locations shown on the Drawings and at the time of drilling. 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.

Geotechnical Report for Ness Avenue

Test Hole Locations



Summary of Core Samples

City of Winnipeg 2006 City of Winnipeg Regional and Local Streets Program Geotechnical Investigation Ness Avenue Westbound Ferry Road to Belvidere Street

Pavement Structure Materia Moisture ze Analys Atterberg Limits Pavement Surface Sample Silt (%) Clay (%) Plastic Limit Thickness Thickness Sample Depth Content Gravel Sand Liquid Plasticity Testhol Testhole Туре Type (mm) N/A (%) (%) Limit Limit No. Location (mm) Description (m) (%) Ness Avenue, Curb Lane Ness Avenue, Median Lane Ness Avenue, Curb Lane Asphalt/Concrete Asphalt/Concrete Asphalt/Concrete 85/205 N/A N/A N/A N/A N/A 67/190 42/208 50/215 40/200 59/201 0.0 12.0 87.6 110.0 26.0 N/A N/A N/A N/A Clay 38.7 0.4 84.0 Ness Avenue, Median Lane Asphalt/Concrete Ness Avenue, Curb Lane Ness Avenue, Median Lane Asphalt/Concrete Ness Avenue, Median Lane Asphalt/Concrete Ness Avenue, Curb Lane Asphalt/Concrete Granula N/A 335 N/A N/A N/A N/A N/A Ness Avenue, Median Lane Asphalt/Concrete 62/205 Ness Avenue, Curb Lane Asphalt/Concrete Ness Avenue, Median Lane Asphalt/Concrete 50/190 34/196 N/A N/A N/A N/A Ness Avenue, Median Lane Asphalt/Concrete Ness Avenue, Curb Lane Asphalt/Concrete Ness Avenue, Median Lane Asphalt/Concrete Ness Avenue, Median Lane Asphalt/Concrete 51/188 N/A N/A 16.0 97/208 57/192 N/A N/A 0.9 27.3 0.0 67.6 26.8 28.0 Clayey Silt 105/190 N/A 14

Notes:

A thin layer of clay fill was encountered underlying the concrete in TH1. Underlying the clay fill was a second layer of concrete. Auger refusal was encountered in TH1 within the second concrete layer at a depth of 675 mm below the top of the pavement.
 Detailed testhole locations are provided in the attached testhole logs.

3. Granular fill was only encountered underlying the concrete in TH6. No granular fill was encountered in the remaining testholes.

		TESTHOLE TH1
Clic	ent: Stantec e: Ness Ave	2006 Regional and Local Streets Program Date Drilled: March 23, 2006 Consulting Ltd. Depth of Testhole: 0.7 m nue WB - Ferry Rd. to Belvidere St. Resurfacing Logged by: Robert Brown on: 12 m W of Belvidere St Woodlawn St. Alley Centreline, 1.5 m S of curb
	1	Subsurface Profile
Depth (m)	Symbol	Description
0.0		Ground Surface ASPHALT - 85 mm thick, good condition CONCRETE - 205 mm thick, good condition
0.5		CLAY FILL - black CONCRETE - 371 mm thick
1.0-		
1.5	1	
2.0		Auger refusal at 0.7 m below grade in concrete.
2.5		

Clie Site	nt: Stante Ness Av	2006 Regional and Local Streets Program Date Drilled: March 2006 Regional and Local Streets Program Depth of Testhole: c Consulting Ltd. Depth of Testhole: enue WB - Ferry Rd. to Belvidere St. Resurfacing Logged by: Robert tion: 6.0 m W of east lot line at #395 Belvidere, 4.5 m S of curb	2.0	m	MITED MITED	8
		Subsurface Profile		Labo	pratory Te	sting
Depth	Symbol	Description	0	W	ater Conto (%) 40 60	ent 80 10
0.0		Ground Surface ASPHALT - 76 mm thick, good condition CONCRETE - 200 mm thick, good condition CLAY FILL - black, and organic clay CLAY - brown - moist, firm, high plasticity below 1.5 m				
2.0		Drilling stopped 2.0 m below grade. No water seepage encountered in testhole. No soil sloughing encountered in testhole. Soil was frozen to a depth of 1.5 m below				

Clie Site	ent: Stante e: Ness Av	2006 Regional and Local Streets Program Date Drilled: Marc 2006 Regional and Local Streets Program Date Drilled: Marc c Consulting Ltd. Depth of Testhole: enue WB - Ferry Rd. to Belvidere St. Resurfacing Logged by: Rober tion: 20.5 m E of Mandeville St. centreline, 1.3 m S of curb	2.0 n	n	
		Subsurface Profile		Laboratory Te	sting
Depth	Symbol	Description	0	Water Conto (%) 20 40 60	80 10
0.0		Ground Surface ASPHALT - 67 mm thick, good condition CONCRETE - 190 mm thick, good condition			
0.5-		- black, and organic clay	_		,
1.0		CLAY - brown - moist, firm, high plasticity below 1.5 m - and silt, 5 cm thick silt layer at 1.7 m below grade			
- 1.5~					
2.0					
		Drilling stopped 2.0 m below grade.			1
2.5		No water seepage encountered in testhole. No soil sloughing encountered in testhole. Soil was frozen to a depth of 1.5 m below grade.			

Clie Site	ent: Stante Ness Av	2006 Regional and Local Streets Program Date Drilled: March 2 c Consulting Ltd. Depth of Testhole: 2 enue WB - Ferry Rd. to Belvidere St. Resurfacing Logged by: Robert E tion: 20 m W of Winchester-Overdale Alley centreline, 4.5 m S of curb	.0 n	n		
		Subsurface Profile	1	Labo	oratory Te	sting
Depth	Symbol	Description	0	Wa 20	ater Conte (%) 40 60	ent 80 10
		Ground Surface	ł.		v	
0.0		ASPHALT - 42 mm thick, good condition CONCRETE - 208 mm thick, rubble				
0.5		CLAY FILL - brown			•	
1.0						
-		CLAY - brown - moist, firm, high plasticity below 1.5 m				
1.5						
2.0-					•	
		Drilling stopped 2.0 m below grade.				
		No water seepage encountered in testhole. No soil sloughing encountered in testhole. Soil was frozen to a depth of 1.5 m below grade.				

Clie	ent: Stante a: Ness Av	TESTHOLE TH5 2006 Regional and Local Streets Program to Consulting Ltd. Depth of Testhole: 2 enue WB - Ferry Rd. to Belvidere St. Resurfacing tion: 20 m W of Linwood-Winchester Alley centreline, 2 m S of curb	2.0 n	1	BORATORIE RITED	<u>s</u>
		Subsurface Profile		abo	ratory Te	sting
Depth	Symbol	Description	0	Wa 20	ter Conte (%) 40 60	ent 80 10
0.0		Ground Surface - 50 mm thick, good condition CONCRETE - 215 mm thick, good condition CLAY FILL - black, and organic clay - moist, firm, intermediate plasticity below 1.2 m				
1.5-		CLAY - brown, moist, firm, high plasticity - gray from 0.8 m to 1.4 m				
		Drilling stopped 2.0 m below grade. No water seepage encountered in testhole. No soil sloughing encountered in testhole. Soil was frozen to a depth of 1.2 m below grade.				

Clie	ent: Stante : Ness Av	2006 Regional and Local Streets Program Date Drilled: March c Consulting Ltd. Depth of Testhole: 2 enue WB - Ferry Rd. to Belvidere St. Resurfacing Logged by: Robert I tion: 14 m W of Lyle-Linwood Alley centreline, 4.5 m S of curb	2.0 n	n		
		Subsurface Profile		Labo	ratory Te	sting
Depth	Symbol	Description	0	Wa 20	ter Conto (%) 40 60	ent 80 10
		Ground Surface	+			
0.0	1000 Fr	ASPHALT - 40 mm thick, good condition CONCRETE - 200 mm thick, good condition GRANULAR BASE - brown, dense, fine to medium grained, and clay				
0.5-	20000000000000000000000000000000000000			N.	,	
1.0		CLAY FILL - black - moist, firm, intermediate plasticity, and organic clay below 1.4 m				
1.5						
2.0		-1				
		Drilling stopped 2.0 m below grade.				1
		No water seepage encountered in testhole. No soil sloughing encountered in testhole. Soil was frozen to a depth of 1.4 m below grade.				

Clic	ent: Stante E: Ness Av	2006 Regional and Local Streets Program c Consulting Ltd. enue WB - Ferry Rd. to Belvidere St. Resurfacing tion: 18 m W of Albany-Lyle Alley centreline, 2 m S of curb	2.0 n	n	ATORIE D . wa	5
		Subsurface Profile		Laborat	ory Te	sting
Depth	Symbol	Description	0	Water 20 40	(%)	80 100
0.0		Ground Surface - S9 mm thick, good condition CONCRETE - 201 mm thick, good condition CLAY FILL - black, and organic clay				
1.0		SILT - tan - moist, firm, low plasticity below 1.2 m				
2.0						
2.5	-	Drilling stopped 2.0 m below grade. No water seepage encountered in testhole. No soil sloughing encountered in testhole. Soil was frozen to a depth of 1.2 m below grade.				10 10 10 10 10 10 10 10 10 10 10 10 10

Clie	ent: Stante a: Ness Av	2006 Regional and Local Streets Program Date Drilled: March c Consulting Ltd. Depth of Testhole: 2 enue WB - Ferry Rd. to Belvidere St. Resurfacing Logged by: Robert P tion: 17.5 m W of Truro-Albany Alley centreline, 4.5 m S of curb	2.0 n	n	WITED	
		Subsurface Profile		Labo	oratory Te	sting
Depth	Symbol	Description	0	W a 20	ater Cont (%) 40 60	ent 80 100
0.0		Ground Surface - 62 mm thick, good condition CONCRETE - 205 mm thick, good condition				
0.5-		CLAY FILL - black, and organic clay				
1.0-		CLAY - brown - moist, firm, high plasticity below 1.2 m - and silt from 1.2 m to 1.4 m				
1.5						
2.0		Duilling stopped 2.0 m halou mode			•	
2.5		Drilling stopped 2.0 m below grade. No water seepage encountered in testhole. No soil sloughing encountered in testhole. Soil was frozen to a depth of 1.2 m below grade.				

		TESTHOLE TH9			TIONAL STING BORATORIE HITED	3
Clie Site	nt: Stante Ness Av	2006 Regional and Local Streets Program Date Drilled: March 2 Depth of Testhole: 2 Venue WB - Ferry Rd. to Belvidere St. Resurfacing Logged by: Robert E ation: 11.5 m W of Sackville-Truro Alley centreline, 2 m S of curb	n 0.	n		
		Subsurface Profile	1	Labo	ratory Te	sting
Depth	Symbol	Description	0	Wa 20	ter Conte (%) 40 60	ent 80 100
0.0		Ground Surface				
0.0		ASPHALT - 50 mm thick, good condition CONCRETE - 190 mm thick, top 20 mm rubble CLAY FILL - black, and organic clay		•		
0.5-						
1.0-		SILT - tan - moist, firm, low plasticity below 1.2 m				
1.5-						
2.0		CLAY - brown, moist, firm, high plasticity				
		Drilling stopped 2.0 m below grade.		-		
2.5		No water seepage encountered in testhole. No soil sloughing encountered in testhole. Soil was trozen to a depth of 1.2 m below grade.				-

Clie	nt: Stante Ness Av	2006 Regional and Local Streets Program Date Drilled: March c Consulting Ltd. Depth of Testhole: 2 enue WB - Ferry Rd. to Belvidere St. Resurfacing Logged by: Robert 1 tion: 12 m W of Amherst-Sackville Alley centreline, 4.5 m S of curb	2.0 n	n	DORATO MITED	u <u>c</u> s
		Subsurface Profile		.abo	ratory	Testing
Depth	Symbol	Description	0	W :	100 (%)	
		Ground Surface	÷È	<u>5</u>		
0.0-		ASPHALT - 34 mm thick, good condition, debonded from concrete CONCRETE - 195 mm thick, good condition		L'our su su su su su su		
0.5		CLAY FILL - black, and organic clay				
1.0		SILT - tan				
1.5		CLAY - brown, moist, firm, high plasticity		•		
2.0		SILT - tan, moist, firm, low plasticity		ĺ		
		Drilling stopped 2.0 m below grade. No water seepage encountered in testhole. No soil sloughing				

	TESTHOLE TH11		TEONAL TING BORATORI HITED	35
ent: Stant : Ness A	ec Consulting Ltd. Depth of Testhole: 2 venue WB - Ferry Rd. to Belvidere St. Resurfacing Logged by: Robert B	.0 m		
	Subsurface Profile	Labo	ratory Te	sting
Symbol	Description			
	Ground Surface			
	ASPHALT - 51 mm thick, good condition CONCRETE - 188 mm thick, good condition CLAY FILL - brown, some fine sand			
	SILT - tan, wet, soft, low plasticity, and clay Drilling stopped 2.0 m below grade. No water seepage encountered in testhole. No soil sloughing encountered in testhole. Soil was frozen to a depth of 1.4 m below grade.			
	nt: Stant : Ness A thole Loc Symbol	Just Consulting Ltd. Date Drilled: March 2 In: Stantec Consulting Ltd. Depth of Testhole: 2 In: Stantec Consulting Ltd. Logged by: Robert E thole Location: 12.5 m W of Rutland-Amherst Alley centreline, 1.7 m S of curb Subsurface Profile Symbol Description ASPHALT -S1 mm thick, good condition CONCRETE -188 mm thick, good condition CLAY FILL - brown, some fine sand SILT - tan, wet, soft, low plasticity, and clay Drilling stopped 2.0 m below grade. No water seepage encountered in testhole. No soil sloughing encountered in testhole. Soil was frozen to a depth of 1.4 m below	Joint Stantec Consulting Ltd. Date Drilled: March 23, 2005 In Stantec Consulting Ltd. Depth of Testhole: 2.0 m In Sea Avenue WB - Ferry Rd. to Belvidere St. Resurfacing Logged by: Robert Brown thole Location: 12.5 m W of Rutland-Amherst Alley centreline, 1.7 m S of curb Subsurface Profile Labo Symbol Description Orall Int Mick, good condition CONCRETE -188 mm thick, good condition CONCRETE -188 mm thick, good condition CLAY FILL - brown, some fine sand - brown, some fine sand SILT - tan, wet, soft, low plasticity, and clay Drilling stopped 2.0 m below grade. No water seepage encountered in testhole. No soil sloughing encountered in testhole. No soil sloughing encountered in testhole. No soil sloughing	Joint States 2006 Regional and Local Streets Program Date Drilled: March 23, 2006 Lest Name: 2006 Regional and Local Streets Program Date Drilled: March 23, 2006 Lest Name: 2006 Regional and Local Streets Program Date Drilled: March 23, 2006 Lest Name: 2006 Regional and Local Streets Program Depth of Testhole: 2.0 m Lest Name: 2006 Regional and Local Streets Program Laboratory Te Lest Name: 21.5 m W of Rutland-Amherst Alley controlline, 1.7 m S of curb Laboratory Te Symbol Description Water Control CONCRETE - 51 mm thick, good condition CLAY FILL - 188 mm thick, good condition CLAY FILL - brown, some fine sand Image: Clay Street S

Pro	iect Name:	2006 Regional and Local Streets Program Date Drilled: Marc	L.		STING HORATORIE MITED	8
Clie Site	ent: Stante Ness Av	c Consulting Ltd. Depth of Testhole: enue WB - Ferry Rd. to Belvidere St. Resurfacing Logged by: Rober tion: 14.5 m W of Inglewood-Rutland Alley centreline, 4.5 m S of curt	2.0 n t Brov	n		
168	anoie Loca	Subsurface Profile		Labo	oratory Te	sting
Depth	Symbol	Description	0	W 20	ater Conto (%) 40 60	ent 80 100
		Ground Surface			1	
0.0	202252	ASPHALT		- T -		
	E-DECORDE-	- 97 mm thick, good condition	-	Ì		
-	8 8 8 1 8 8 8 8 8 8 8 8 8 8 8	 208 mm thick, good condition, fractures in top 60 mm 				
	3 3 3 3					
	149	CLAY FILL - black, and organic clay			Ţ. j	
	1194	- woord, eine organise oray				
0.5	111 A					-
	in the second second	SILT		1	1	
-		- tan			1 1	
					\square	
				i		
1.0-						
				1		
				- L		
		CLAY	· · · ·			
-		 brown, moist, firm, high plasticity 				
-						
1.5-						
-					1 1	
				÷		i
				1		
			- 11		4	
-				÷	1	
2.0	<u>7///////A</u>					
		Drilling stopped 2.0 m below grade.				
		No water seepage encountered in testhole. No soil sloughing encountered in testhole. Soil was frozen to a depth of 1.2 m below				
		grade.				
			1.8		- 1 T	

Clie	nt: Stante Ness Av	TESTHOLE TH13 Date Drilled: March 2 2006 Regional and Local Streets Program Date Drilled: March 2 ac Consulting Ltd. Depth of Testhole: 2 renue WB - Ferry Rd. to Belvidere St. Resurfacing Logged by: Robert E ation: 16 m W of Ferry-Inglewood Alley centreline, 1.6 m S of curb	.0 m
		Laboratory Testing	
Depth	Symbol	Description	Water Content (%) 0 20 40 60 80 100
		Ground Surface	
0.0-		ASPHALT - 57 mm thick, good condition CONCRETE - 192 mm thick, good condition	
0.5-		CLAY FILL - black, and organic clay	
- 1.0- -			
- 1.5- -		CLAY - brown, moist, firm, high plasticity	· · · · · · · · · · · · · · · · · · ·
2.0-			•
- - 2.5-		Drilling stopped 2.0 m below grade. No water seepage encountered in testhole. No soil sloughing encountered in testhole. Soil was frozen to a depth of 1.4 m below grade.	

Clie	ant: Stante a: Ness Av	TESTHOLE TH14 Date Drilled: March 2 2006 Regional and Local Streets Program Date Drilled: March 2 c Consulting Ltd. Depth of Testhole: 2 renue WB - Ferry Rd. to Belvidere St. Resurfacing Logged by: Robert B tion: 6 m W of Collegiate-Ferry Alley centreline, 4.5 m S of curb	.0 m
		Subsurface Profile	Laboratory Testing
Depth	Symbol	Description	Water Content (%) 0 20 40 50 80 100
		Ground Surface	
0.0-		ASPHALT - 105 mm thick, good condition CONCRETE - 190 mm thick, good condition	
0.5-		CLAY FILL - black, and organic clay	
1.0-			
1.5-		CLAY - brown, moist, firm, high plasticity	
2.0-		Drilling stopped 2.0 m below grade.	
2.5-		No water seepage encountered in testhole. No soll sloughing encountered in testhole. Soli was frozen to a depth of 1.2 m below grade.	

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Pavement Core Photos

2006 Regional and Local Streets Program Ness Avenue Westbound Ferry Road to Belvidere Street





TH5

TH6

TH7

TH8

2006 Regional and Local Streets Program Ness Avenue Westbound Ferry Road to Belvidere Street





TH9

TH10

TH11

TH12



TH13

TH14