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.

Appendix 'A' Page 1 of 15



GEOTECHNICAL INVESTIGATION FOR WAVERLEY STREET TWINNING BISON DRIVE TO WARWICK AVENUE

Prepared for WARDROP ENGINEERING INC. 400-386 BROADWAY WINNIPEG MANITOBA R3C 4M8

Prepared by THE NATIONAL TESTING LABORATORIES LIMITED 199 HENLOW BAY WINNIPEG, MANITOBA R3Y 1G4

December 14, 2009



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DI	Soil Type	Soil Description	Depth (m)	(Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH4	Clay	black, firm, moist, high plasticity	0.75	35	0	1.8	19.9	78.3	91	26	65
TH6	Silty Clay	Silty Clay brown, firm, moist, medium plasticity	0:30	26	0	4.0	49.8	46.2	46	17	29
TH10	TH10 Clayey Silt	tan, soft, moist, low plasticity	0.75	23	0	8.6	65.1	26.3	30	21;	13

Clien Drilli	t: Wardrop ng Contrac	Engineering Inc. Dep tor: Active Drilling Ltd. Log	THE TATIONAL TESTING LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIS LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORIES LACORATORINES LACORATORIES LACORATORIES LACORATORIES LACORA
		Subsurface Profile	Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 10
0.0-		Ground Surface	
0.0-	$l_{l,l,l}^{l_ll_l}$	Topsoil	13
1.0- - - -		- brown, firm, moist, high plasticity	51
- - 2.0- - - - - - - - - - - - - - - - - - -		 No soil sloughing or groundwater seepage encountered during upon completion of drilling Testhole terminated at 1.5 m 	or
3.0-			

Clien Drilliı	t: Wardrop ng Contrac	TESTHOLE TH2 Waverley St. Twinning (Bison Dr. to Warwick Ave.) Dengineering Inc. Stor: Active Drilling Ltd. I: 150 mm auger	Date Drilled: Nov 24, 2009 Depth of Testhole: 3.0 m Logged by: Hilario Presado Reviewed by: Don Flatt
		Subsurface Profile	Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 10
0.0-		Ground Surface	
-	111111	Topsoil	38
-		Clay - brown, firm, moist, high plasticity - trace silt below 1.8 m	28
1.0			
			31
2.0-			33
3.0			45
-		 No soil sloughing or groundwater seepage encountered du upon completion of drilling Testhole terminated at 3.0 m 	

Clien Drilliı	t: Wardrop ng Contrac	e Engineering Inc. [ctor: Active Drilling Ltd. [Date Drilled: Nov 24, 2009 Depth of Testhole: 1.5 m Logged by: Hilario Presado Reviewed by: Don Flatt
		Subsurface Profile	Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 10
0.0-		Ground Surface Topsoil	
- - - 1.0- - - - - -	1111	Clay - brown, firm, moist, high plasticity	35
- - 2.0- - - - -		 No soil sloughing or groundwater seepage encountered dur upon completion of drilling Testhole terminated at 1.5 m 	ring or
- - 3.0- -			

Drillin	t: Wardro ng Contra	TESTHOLE TH6 Waverley St. Twinning (Bison Dr. to Wa p Engineering Inc. Inctor: Active Drilling Ltd. d: 150 mm auger	rwick Ave.)	Date Drilled: Depth of Test Logged By: H Reviewed By:	thole: lilario	4, 2009 3.0 m Presa		<u></u>
		Subsurface Profile		Laboratory	Testin	g		W.
Depth (m)	Symbol	Description	Water 0 PL 0 25	Content (%) LL 50 75 100	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
0.0-	~ ~	Ground Surface						
-	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Topsoil			1			
0.5		Silty Clay - brown, firm, moist, medium plasticity	26	4	ο	4.0	49.8	46.2
-			30					
1.0		Clay - brown, firm, moist, high plasticity - trace silt below 1.5 m						
1.5			39					
2.0-								
				7			×	
2.5								
3.0				52				
-		•No soil sloughing or groundwater seepage encountered during or upon completion of drilling •Testhole terminated at 3.0 m						

Clien Drilli	it: Wardrop ng Contrac	b Engineering Inc. De btor: Active Drilling Ltd. Lo : 150 mm auger Re	ate Drilled: Nov 24, 2009 epth of Testhole: 1.5 m ogged by: Hilario Presado eviewed by: Don Flatt
		Subsurface Profile	Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 10
0.0-		Ground Surface	
0.0-	~~~	Topsoil	
	~~~~		42
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
		Clay	
		 black, firm, moist, high plasticity 	
			38
0			
1.0-			
1.0-			
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99 192			
		No soil cloudhing or groundwater and a solution	
		 No soil sloughing or groundwater seepage encountered durit upon completion of drilling 	ng or
-		•Testhole terminated at 1.5 m	
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3.0- -			
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Clien Drilli	it: Wardrop ng Contrac	TESTHOLE TH9 Naverley St. Twinning (Bison Dr. to Warwick Ave.) Engineering Inc. stor: Active Drilling Ltd. : 150 mm auger	Date Drilled: Nov 24, 2009 Depth of Testhole: 1.5 m Logged by: Hilario Presado Reviewed by: Don Flatt
		Subsurface Profile	Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 10
0.0		Ground Surface	
0.0-	~~~	Topsoil	
-	~~~~		
	~~~		37
- - - - - 1.0- - - - - - - - - - - - - - - - 		Clay - brown, soft, moist, high plasticity - trace organic material	36
2.0		<ul> <li>No soil sloughing or groundwater seepage encountere upon completion of drilling</li> <li>Testhole terminated at 1.5 m</li> </ul>	
- - - 3.0- - - - -			

Clien Drilli	it: Wardro ng Contra	TESTHOLE TH1 Waverley St. Twinning (Bison Dr. to Wa p Engineering Inc. Inctor: Active Drilling Ltd. d: 150 mm auger		Date Dril Depth of Logged E Reviewed	Testhole By: Hilari	: 3.0 m o Presa		8
		Subsurface Profile	1.63	Laborat	ory Test	ing		
Depth (m)	Symbol	Description	Wat PL_ 0 25	ter Content (%)	-00 Gravel (%)	Sand (%)	Silt (%)	Clay (%)
0.0-		Ground Surface Topsoil						-
- - - - -		Clayey Silt - tan, soft, moist, low plasticity	23	35 /		8.6	65.1	26.3
- - 1.0- - -		Clay - brown, stiff, moist, high plasticity - trace silt below 2.1 m				0.0	00.1	20.
- 1.5- - -				42			-	
2.0-		Silty Clay - brown, soft, moist, medium plasticity	3	3				
2.5-		Clay - brown, stiff, moist, high plasticity						
3.0		•No soil sloughing or groundwater seepage encountered during or upon completion of drilling •Testhole terminated at 3.0 m		48				

Clien Drilli	t: Wardrop ng Contrac	ctor: Active Drilling Ltd.	Date Drilled: Nov 24, 2009 Depth of Testhole: 1.5 m Logged by: Hilario Presado Reviewed by: Don Flatt
		Subsurface Profile	Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 11
0.0-		Ground Surface	
	1,1,1,1,1,1,1,1 1,1,1,1,1,1,1,1	Topsoil	31
- - 1.0- - - -		Clay - brown, firm, moist, high plasticity	35
		<ul> <li>No soil sloughing or groundwater seepage encountered duri upon completion of drilling</li> <li>Testhole terminated at 1.5 m</li> </ul>	
- - 3.0- - - -			

Drilli	nt: Wardroj ng Contrac	TESTHOLE TH12 Waverley St. Twinning (Bison Dr. to Warwick Ave.) D Engineering Inc. Ctor: Active Drilling Ltd. I: 150 mm auger	Date Drilled: Nov 24, 2009 Depth of Testhole: 3.0 m Logged by: Hilario Presado Reviewed by: Don Flatt
		Subsurface Profile	Laboratory Testing
Depth (m)	Symbol	Description	Water Content (%) 0 20 40 60 80 10
0.0-		Ground Surface	
-	22	Topsoil	
		<ul> <li>brown, stiff, moist, high plasticity</li> <li>trace silt below 1.8 m</li> <li>firm below 2.3 m</li> </ul>	42
3.0		•No soil sloughing or groundwater seepage encountered upon completion of drilling •Testhole terminated at 3.0 m	during or