

APPENDIX 'A'

GEOTECHNICAL REPORT

APPENDIX 'A' - GEOTECHNICAL REPORT

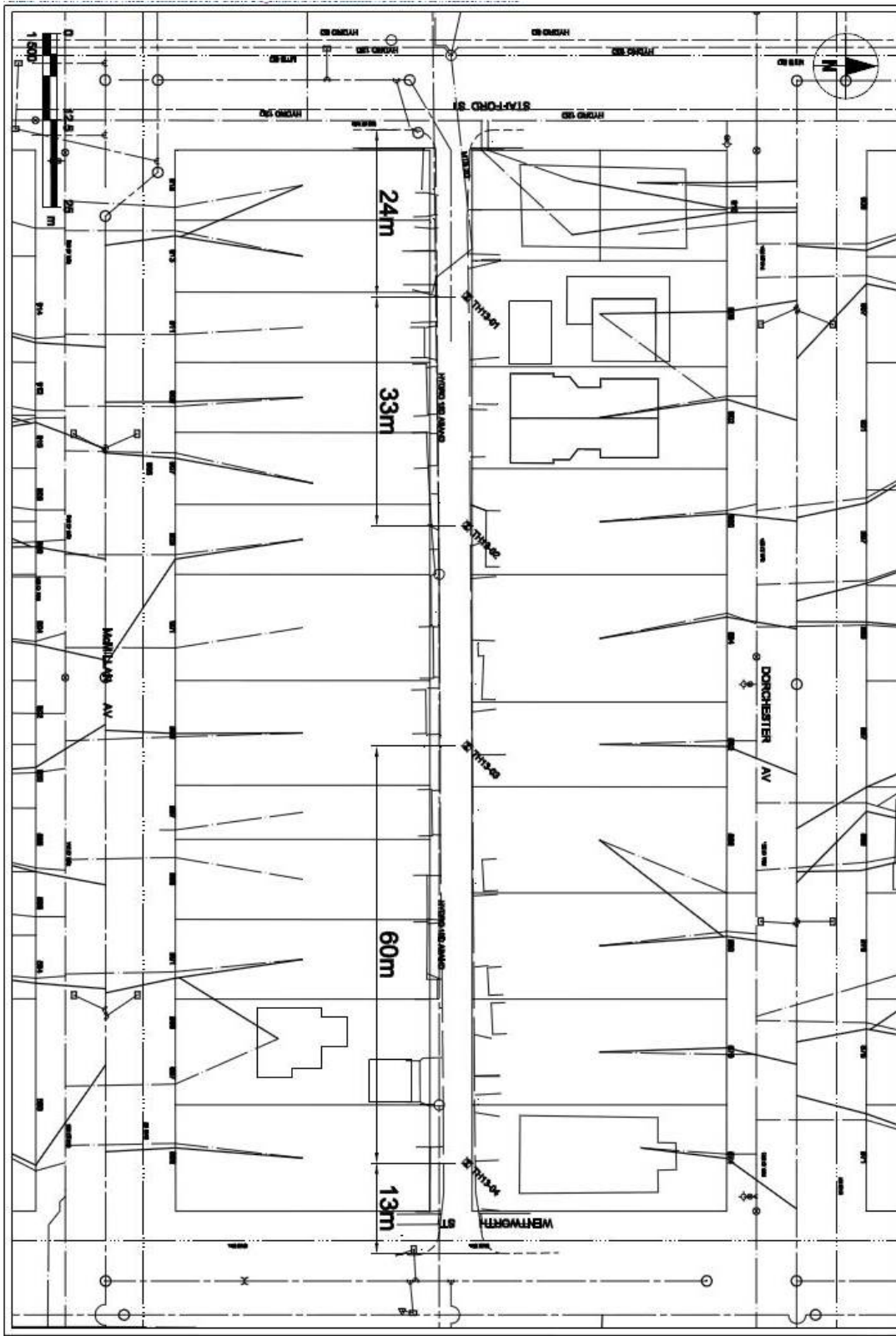
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The geotechnical report is provided to aid in the Contractor's evaluation of the soil conditions. The information presented is considered accurate at the locations shown on the Drawings and at the time of drilling. However, variations in pavement structure 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 Alley Renewal

Test Hole Locations



Alley Renewal
Lane Bounded by Stafford/Wentworth/McMillan/Dorchester
City of Winnipeg

Test Hole Locations



Figure: 1

Summary of Core Samples



City of Winnipeg
 Green Back Lane Initiative
 Geotechnical Investigation

Test Hole No.	Test Hole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Depth (m)	Moisture Content (%)	Hydrometer Analysis				Atterberg Limits			
		Type	Thickness (mm)	Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index	
TH13-01	Westbound Lane, 24 m East of Stafford Street, 0.5 m South of North Edge of Lane	Asphalt	40	None	n/a	Clay	0.3	24.1								
						Clayey Silt	0.6	24.8								
						Clayey Silt	0.9	24.5	0.2	15.7	65.6	18.6	28.3	16.6	11.7	
		Concrete	160			Clay	1.2	31.4								
						Clay	1.5	37.9								
						Clay	1.8	37.5								
Clay	2.1	40.2														
TH13-02	Westbound Lane, 57 m East of Stafford Street, 0.5 m South of North Edge of Lane	Concrete	145	None	n/a	Clay Fill	0.3	26.1								
						Silty Clay	0.6	25.5								
						Silty Clay	0.9	27.1								
						Silty Clay	1.2	33.5								
						Clay	1.5	38.7								
						Clay	1.8	37.7								
Clay	2.1	46.5														
TH13-03	Westbound Lane, 73 m West of Wentworth Street, 0.5 m South of North Edge of Lane	Concrete	145	None	n/a	Clay Fill	0.3	24.9								
						Silty Clay	0.6	23.6	0.3	10.7	43.3	45.7	50.7	18.5	32.2	
						Silty Clay	0.9	23.8								
						Silty Clay	1.2	24.0								
						Silty Clay	1.5	28.5								
						Clay	1.8	36.4								
Clay	2.1	39.9														
TH13-04	Westbound Lane, 13 m West of Wentworth Street, 0.5 m South of North Edge of Lane	Concrete	185	None	n/a	Clay Fill	0.3	31.9								
						Clay	0.6	28.8								
						Clay	0.9	30.8	0.0	9.3	23.2	67.5	72.6	24.0	48.6	
						Clay	1.2	35.7								
						Clay	1.5	39.1								
						Clay	1.8	42.4								
Clay	2.1	48.4														

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Test Hole Log for TH13-01

PROJECT: Green Back Lane Initiative		CLIENT: City of Winnipeg		TESTHOLE NO: TH13-01		
LOCATION: Westbound Lane, 24 m East of Stafford Street, 0.5 m South of North Edge of Lane		METHOD: 125 mm SSA with 150 mm Coring		PROJECT NO.: 60300589		
CONTRACTOR: Maple Leaf Drilling Ltd		ELEVATION (m):				
SAMPLE TYPE		<input type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input checked="" type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE				
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	DEPTH (m)	COMMENTS	
0		ASPHALT (thickness = 40 mm) CONCRETE (thickness = 160 mm)				
		CLAY - trace silt, trace organics - dark grey, moist, firm - high plasticity	G1			
		CLAYEY SILT - some sand, trace gravel - light brown, moist, soft - low plasticity	G2			
			G3			
		CLAY - trace silt, trace sand - brown, moist, firm to stiff - high plasticity	G4			
			G5			
			G6			
			G7			
		END OF TEST HOLE AT 2.3 m in CLAY NOTES: 1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger cuttings, bentonite and asphalt cold patch to surface. 4. Drilled with 150 mm diamond core to 0.200 m, solid stem augers to 2.3 m.				
			PENETRATION TESTS * Becker * ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) ■ Total Ling WT (shales) Plastic MC Liquid 20 40 60 80 100 15 17 18 19 20 21		UNDRAINED SHEAR STRENGTH + Torvane + X QUX □ Lab Vane □ △ Pocket Pen △ ● Field Vane ● (kPa)	
			Gradation: Gravel = 0.2%, Sand = 15.7%, Silt = 65.6%, Clay = 18.6%			
AECOM		LOGGED BY: Stephen Petsche		COMPLETION DEPTH: 2.30 m		
		REVIEWED BY: Zeyad Shukri		COMPLETION DATE: 6/11/13		
		PROJECT ENGINEER: Kevin Rae		Page 1 of 1		

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Test Hole Log for TH13-02

PROJECT: Green Back Lane Initiative		CLIENT: City of Winnipeg		TESTHOLE NO: TH13-02	
LOCATION: Westbound Lane, 57 m East of Stafford Street, 0.5 m South of North Edge of Lane				PROJECT NO.: 60300589	
CONTRACTOR: Maple Leaf Drilling Ltd		METHOD: 125 mm SSA with 150 mm Coring		ELEVATION (m):	
SAMPLE TYPE <input checked="" type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE					
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	DEPTH
0		CONCRETE (thickness = 145 mm)			
		CLAY (FILL) - trace silt, trace sand, trace gravel (<10 mm diameter) - dark grey - high plasticity	<input checked="" type="checkbox"/>	G8	
		SILTY CLAY - trace sand - brown, moist, firm - intermediate to high plasticity	<input checked="" type="checkbox"/>	G9	
			<input checked="" type="checkbox"/>	G10	
			<input checked="" type="checkbox"/>	G11	
		CLAY - some silt, trace sand, trace gypsum - brown, moist, firm - high plasticity	<input checked="" type="checkbox"/>	G12	
			<input checked="" type="checkbox"/>	G13	
			<input checked="" type="checkbox"/>	G14	
		END OF TEST HOLE AT 2.3 m in CLAY NOTES: 1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger cuttings, bentonite and asphalt cold patch to surface. 4. Drilled with 150 mm diamond core to 0.145 m, solid stem augers to 2.3 m.			
AECOM			LOGGED BY: Stephen Petsche		COMPLETION DEPTH: 2.30 m
			REVIEWED BY: Zeyad Shukri		COMPLETION DATE: 6/11/13
			PROJECT ENGINEER: Kevin Rae		Page 1 of 1

LOG OF TEST HOLE GREEN BACK LANE 0451 WESTBOUND LANE TH13-02

Test Hole Log for TH13-03

PROJECT: Green Back Lane Initiative		CLIENT: City of Winnipeg		TESTHOLE NO: TH13-03				
LOCATION: Westbound Lane, 73 m West of Wentworth Street, 0.5 m South of North Edge of Lane		METHOD: 125 mm SSA with 150 mm Coring		PROJECT NO.: 60300589				
CONTRACTOR: Maple Leaf Drilling Ltd		ELEVATION (m):						
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input checked="" type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE						
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE SAMPLE #	PENETRATION TESTS * Becker * ◆ Dynamic Cone ◆ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100 Total Living Wt (kN/m³) 15 17 18 19 20 21 Plastic MC Liquid 20 40 60 80 100	UNDRAINED SHEAR STRENGTH + Torvane + X QU X □ Lab Vane □ △ Pocket Pen △ ● Field Vane ● (kPa) 50 100 150 200	COMMENTS	DEPTH	
0		CONCRETE (thickness = 145 mm)						
		CLAY (FILL) - trace silt, trace sand, trace gravel (<10 mm diameter) - dark grey - high plasticity	G15					
		SILTY CLAY - some sand, trace gravel - light brown, moist, soft - intermediate to high plasticity	G16					
			G17					
			G18					
			G19					
		CLAY - silty - brown, moist, firm - high plasticity	G20					
			G21					
		END OF TEST HOLE AT 2.3 m in CLAY NOTES: 1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger cuttings, bentonite and asphalt cold patch to surface. 4. Drilled with 150 mm diamond core to 0.145 m, solid stem augers to 2.3 m.						
			LOGGED BY: Stephen Petsche		COMPLETION DEPTH: 2.30 m			
			REVIEWED BY: Zeyad Shukri		COMPLETION DATE: 6/11/13			
			PROJECT ENGINEER: Kevin Roe		Page 1 of 1			

LOG OF TEST HOLE GREEN BACK LANE 0401 URM WENTWORTH ST 040113



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Test Hole Log for TH13-04

PROJECT: Green Back Lane Initiative		CLIENT: City of Winnipeg		TESTHOLE NO: TH13-04		
LOCATION: Westbound Lane, 13 m West of Wentworth Street, 0.5 m South of North Edge of Lane		METHOD: 125 mm SSA with 150 mm Coring		PROJECT NO.: 60300589		
CONTRACTOR: Maple Leaf Drilling Ltd		ELEVATION (m):				
SAMPLE TYPE		<input checked="" type="checkbox"/> GRAB <input type="checkbox"/> SHELBY TUBE <input checked="" type="checkbox"/> SPLIT SPOON <input type="checkbox"/> BULK <input checked="" type="checkbox"/> NO RECOVERY <input type="checkbox"/> CORE				
DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	DEPTH (m)	DEPTH	
			PENETRATION TESTS * Becker * ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/30mm) ■ Total Unit Wt (kN/m³) Plastic MC Liquid 20 40 60 80 100 15 17 18 19 20 21	UNDRAINED SHEAR STRENGTH + Torvane + X QU X □ Lab Vane □ △ Pocket Pen △ ● Field Vane ● (kPa) 50 100 150 200	COMMENTS	
0		CONCRETE (thickness = 185 mm)				
		CLAY (FILL) - trace silt, trace sand, trace gravel (<10 mm diameter) - dark grey - high plasticity	G22			
		CLAY - some silt, trace sand - grey, moist, firm - high plasticity	G23			
1		- brown at 1.2 m	G24		Gradation: Sand = 9.3%, Silt = 23.2%, Clay = 67.5%	
			G25			
			G26			
		- silty below 1.8 m	G27			
			G28			
		END OF TEST HOLE AT 2.3 m in CLAY NOTES: 1. No sloughing observed. 2. No seepage observed. 3. Test hole backfilled with auger cuttings, bentonite and asphalt cold patch to surface. 4. Drilled with 150 mm diamond core to 0.185 m, solid stem augers to 2.3 m.				
AECOM			LOGGED BY: Stephen Petsche	COMPLETION DEPTH: 2.30 m		
			REVIEWED BY: Zeyad Shukri	COMPLETION DATE: 6/11/13		
			PROJECT ENGINEER: Kevin Rae		Page 1 of 1	

Pavement Core Photos



Photograph 1. TH13-01



Photograph 2. TH13-02



Photograph 3. TH13-03



Photograph 4. TH13-04