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 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.

CITY OF WINNIPEG
2009 STREET RENEWAL PROGRAM
TURNER AVENUE
MOUNT ROYAL ROAD TO MOUNT ROYAL ROAD

Prepared for
AECOM
99 COMMERCE DRIVE
WINNIPEG, MANITOBA
R3P 0Y7

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

February 6, 2009

THE NATIONAL TESTING LABORATORIES LIMITED *Established in 1923*	Project No.:EAR-811	Drawn by: KK	Figure: 1	Testhole Location Plan City of Winnipeg2009 Street Renewal Program Turner Avenue Mount Royal Road to Mount Royal Road
	Date: Jan. 26, 2009	Reviewed by: DF	Scale: NTS	

City of Winnipeg 2009 Street Renewal Program
Turner Avenue
Mount Royal Road to Mount Royal Road

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure Material		Sample Description	Sample Depth (m)	Moisture Content (%)	Particle Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH1	Along east property line of 94 Turner Ave., east bound lane, 1 m from south curb	Asphalt / Concrete	15 /162	-	-	-	-	-	-	-	-	-	-	-	-
TH2	Along east property line of 83 Turner Ave., west bound lane, 1.5 m from north curb	Asphalt / Concrete	31 / 170	-	-	Clay	0.6	30	0	11.0	20.8	68.2	63	22	41
TH3	Along west property line of 70 Turner Ave., east bound lane, 1.5 m from south curb	Asphalt / Concrete	25 / 140	-	-	-	-	-	-	-	-	-	-	-	-
TH4	Along east property line of 63 Turner Ave., west bound lane, 1.5 m from north curb	Asphalt / Concrete	40 / 168	-	-	-	-	-	-	-	-	-	-	-	-
TH5	Along south property line of 51 Turner Ave., north bound lane, 1.5 m from east curb	Asphalt / Concrete	32 / 155	-	-	-	-	-	-	-	-	-	-	-	-
TH6	Along south property line of 43 Turner Ave., south bound lane, 1.5 m from west curb	Asphalt / Concrete	38 / 180	-	-	Clayey Silt	0.9	29	0	8.1	59.2	32.7	31	17	14
TH7	Along east property line of 35 Turner Ave., east bound lane, 1.5 m from south curb	Asphalt / Concrete	28 / 174	-	-	-	-	-	-	-	-	-	-	-	-
TH8	Along east property line of 23 Turner Ave., west bound lane, 1.5 m from north curb	Asphalt / Concrete	35 / 157	-	-	-	-	-	-	-	-	-	-	-	-
TH9	Along east property line of 11 Turner Ave., east bound lane, 1.5 m from south curb	Asphalt / Concrete	33 / 140	-	-	-	-	-	-	-	-	-	-	-	-
TH10	Along east property line of 1 Turner Ave., west bound lane, 1.5 m from north curb	Asphalt / Concrete	51 / 154	-	-	-	-	-	-	-	-	-	-	-	-

Note: No granular fill material was encountered beneath the concrete pavement

TESTHOLE TH1

Project Name: 2009 Residential Street Renewal Program
Client: AECOM
Site: Turner Ave. Mount Royal Rd. to Mount Royal Rd.
Testhole Location: Along East Property Line of 94 Turner Ave, East Bound Lane, 1 m from south curb

Date Drilled: January 9, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	**Symbol**	**Description**	**Water Content (%)**
0.0		Ground Surface	
		Asphalt	
		Concrete	
		Clay - grey, stiff, moist, high plasticity, trace silt - brown below 1.2 m	47
0.5			41
			41
1.0			33
1.5			40
			39
2.0			40
		• Frost present to 1.4 m. • No water seepage or slough observed during or upon completion of drilling. • Testhole was terminated at 2.1 m.	
2.5			

Water Content (%): 0 20 40 60 80 100

TESTHOLE TH2

Project Name: 2009 Residential Street Renewal Program | **Date Drilled: January 9, 2009**
Client: AECOM | **Depth of Testhole: 2.1 m**
Site: Turner Ave. Mount Royal Rd. to Mount Royal Rd. | **Logged by: Kurtis Kulchyski**
Testhole Location: Along East Property Line of 83 Turner Ave, West Bound Lane, 1.5 m from north curb

Subsurface Profile			Laboratory Testing				
Depth (m)	Symbol	Description	Water Content (%) PL ---------- LL 0 25 50 75 100	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
0.0		Ground Surface					
		Asphalt					
		Concrete					
		Clay - brown, stiff, moist, high plasticity, with layers of silt to 0.5 m	38 30 33 32 36 40 43	0	11.0	20.8	68.2
0.5							
1.0							
1.5							
2.0							
		• Frost present to 1.4 m. • No water seepage or slough observed during or upon completion of drilling. • Testhole was terminated at 2.1 m.					
2.5							

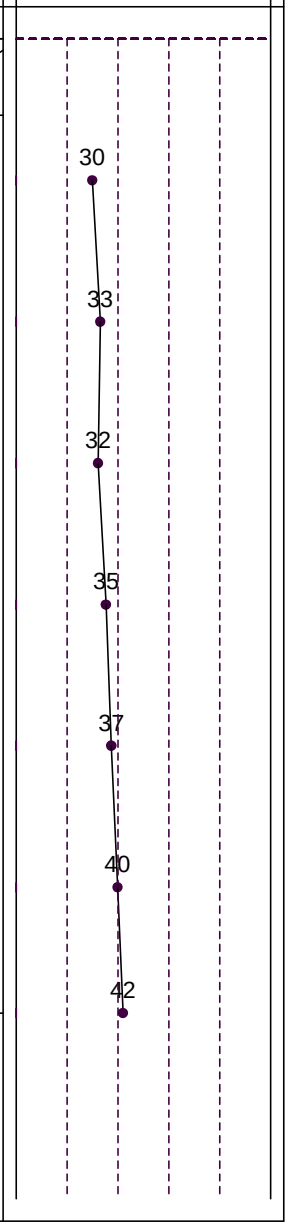
TESTHOLE TH3

Project Name: 2009 Residential Street Renewal Program
Client: AECOM
Site: Turner Ave. Mount Royal Rd. to Mount Royal Rd.
Testhole Location: Along West Property Line of 70Turner Ave, East Bound Lane, 1.5 m from south curb

Date Drilled: January 9, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Depth (m)	Symbol	Description
		Ground Surface
0.0		**Asphalt**
		Concrete
		Clay - grey, stiff, moist, high plasticity - brown below 1.4 m
2.1		• Frost present to 1.4 m. • No water seepage or slough observed during or upon completion of drilling. • Testhole was terminated at 2.1 m.

Laboratory Testing

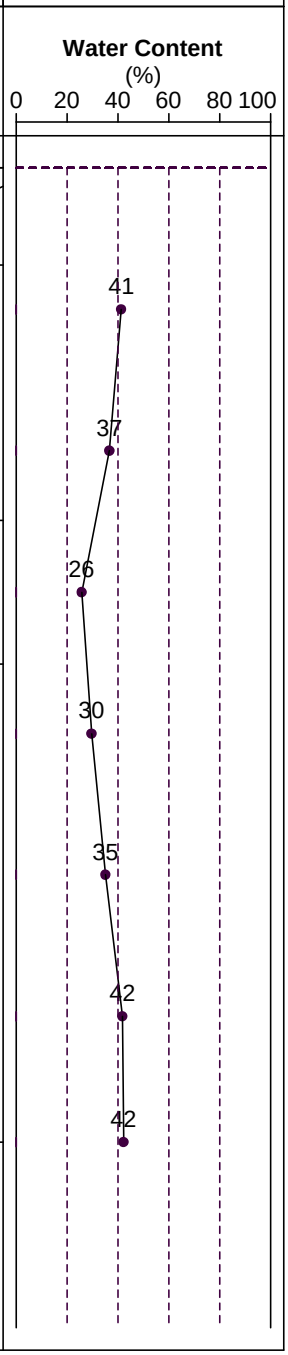


TESTHOLE TH4

Project Name: 2009 Residential Street Renewal Program | **Date Drilled: January 9, 2009**
Client: AECOM | **Depth of Testhole: 2.1 m**
Site: Turner Ave. Mount Royal Rd. to Mount Royal Rd. | **Logged by: Kurtis Kulchyski**
Testhole Location: Along East Property Line of 63 Turner Ave, West Bound Lane, 1.5 m from north curb

Depth (m)	Symbol	Description
		Ground Surface
0.0		**Asphalt**
		Concrete
		Clay - grey, stiff, moist, high plasticity
0.5		
		Clayey Silt - grey, firm, moist, low to intermediate plasticity
1.0		
		Clay - brown, stiff, moist, high plasticity
1.5		
2.0		
		• Frost present to 1.4 m. • No water seepage or slough observed during or upon completion of drilling. • Testhole was terminated at 2.1 m.
2.5		

Laboratory Testing

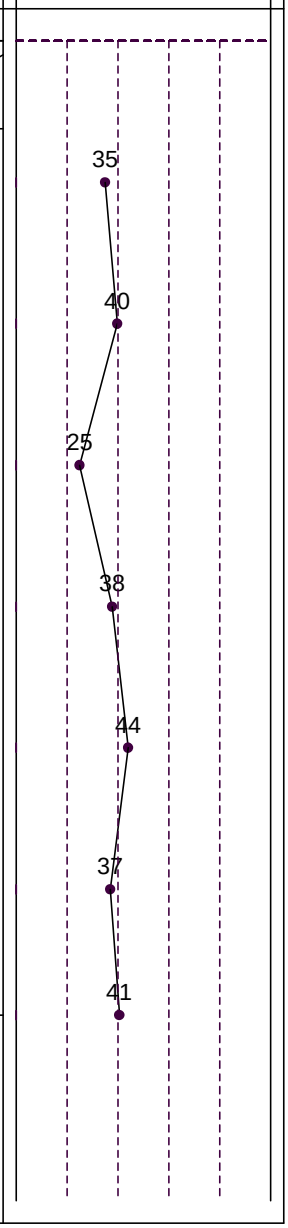


TESTHOLE TH5

Project Name: 2009 Residential Street Renewal Program | **Date Drilled: January 9, 2009**
Client: AECOM | **Depth of Testhole: 2.1 m**
Site: Turner Ave. Mount Royal Rd. to Mount Royal Rd. | **Logged by: Kurtis Kulchyski**
Testhole Location: Along South Property Line of 51 Turner Ave, North Bound Lane, 1.5 m from east curb

Depth (m)	Symbol	Description
0.0		Ground Surface
		Asphalt
		Concrete
		Clay - grey, stiff, moist, high plasticity - with layers of silt below 0.8 m - brown below 1.4 m
2.5		• Frost present to 1.4 m. • No water seepage or slough observed during or upon completion of drilling. • Testhole was terminated at 2.1 m.

Laboratory Testing



TESTHOLE TH6

Project Name: 2009 Residential Street Renewal Program | **Date Drilled: January 9, 2009**
Client: AECOM | **Depth of Testhole: 2.1 m**
Site: Turner Ave. Mount Royal Rd. to Mount Royal Rd. | **Logged by: Kurtis Kulchyski**
Testhole Location: Along South Property Line of 43 Turner Ave, South Bound Lane, 1.5 m from west curb

Subsurface Profile			Laboratory Testing				
Depth (m)	Symbol	Description	Water Content (%) PL ---------- LL (0 25 50 75 100)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
0.0		Ground Surface					
		Asphalt					
		Concrete					
		Clay - brown, stiff, moist, high plasticity, with layers of silt below 0.6 m	50 33				
0.5							
		Clayey Silt - tan, firm, moist, low to intermediate plasticity	29	0	8.1	59.2	32.7
1.0			21				
		Clay - brown, stiff, moist, high plasticity	33 41				
1.5							
2.0			36				
		• Frost present to 1.2 m. • No water seepage or slough observed during or upon completion of drilling. • Testhole was terminated at 2.1 m.					
2.5							

TESTHOLE TH7

Project Name: 2009 Residential Street Renewal Program | **Date Drilled: January 9, 2009**
Client: AECOM | **Depth of Testhole: 2.1 m**
Site: Turner Ave. Mount Royal Rd. to Mount Royal Rd. | **Logged by: Kurtis Kulchyski**
Testhole Location: Along East Property Line of 35 Turner Ave, East Bound Lane, 1.5 m from south curb

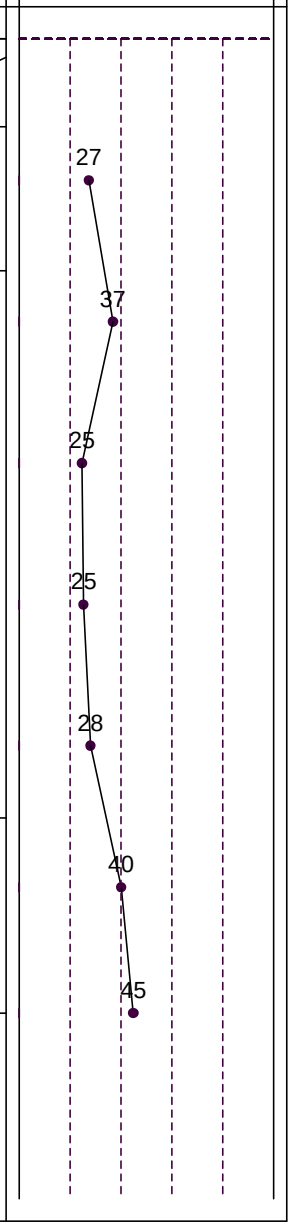
Subsurface Profile			Laboratory Testing
Depth (m)	**Symbol**	**Description**	**Water Content (%)** 0 20 40 60 80 100
0.0		Ground Surface	
		Asphalt	
		Concrete	
		Clay - grey, stiff, moist, high plasticity - brown below 1.2 m	34
0.5			35
			39
1.0			37
			43
1.5			41
2.0			45
		• Frost present to 1.4 m. • No water seepage or slough observed during or upon completion of drilling. • Testhole was terminated at 2.1 m.	
2.5			

TESTHOLE TH8

Project Name: 2009 Residential Street Renewal Program
Client: AECOM
Site: Turner Ave. Mount Royal Rd. to Mount Royal Rd.
Testhole Location: Along East Property Line of 23 Turner Ave, West Bound Lane, 1.5 m from north curb

Date Drilled: January 9, 2009
Depth of Testhole: 2.1 m
Logged by: Kurtis Kulchyski

Subsurface Profile			Laboratory Testing
Depth (m)	**Symbol**	**Description**	**Water Content (%)**
0.0		Ground Surface	
		Asphalt	
		Concrete	
		Clay Fill - brown, stiff, moist, high plasticity with some silt inclusions	27
0.5		**Clayey Silt** - tan/light brown, firm, moist, intermediate plasticity - with layers of clay below 1.2 m	37 25 25
1.0			
1.5		**Clay** - brown, stiff, moist, high plasticity, with layers of silt to 2.0 m	28 40
2.0			45
		• Frost present to 1.4 m. • No water seepage or slough observed during or upon completion of drilling. • Testhole was terminated at 2.1 m.	
2.5			



TESTHOLE TH9

Project Name: 2009 Residential Street Renewal Program | **Date Drilled: January 9, 2009**
Client: AECOM | **Depth of Testhole: 2.1 m**
Site: Turner Ave. Mount Royal Rd. to Mount Royal Rd. | **Logged by: Kurtis Kulchyski**
Testhole Location: Along East Property Line of 11 Turner Ave, East Bound Lane, 1.5 m from south curb

Depth (m)	Symbol	Description	Laboratory Testing: Water Content (%)
0.0		Ground Surface	
		Asphalt	
		Concrete	
		Clay - grey, firm to stiff, moist, high plasticity - brown below 1.5 m	58, 42, 35, 35, 38, 41, 46
0.5			
1.0			
1.5			
2.0			
		• Frost present to 1.2 m. • No water seepage or slough observed during or upon completion of drilling. • Testhole was terminated at 2.1 m.	
2.5			

Water Content (%): 0 20 40 60 80 100

TESTHOLE TH10

Project Name: 2009 Residential Street Renewal Program | **Date Drilled: January 9, 2009**
Client: AECOM | **Depth of Testhole: 2.1 m**
Site: Turner Ave. Mount Royal Rd. to Mount Royal Rd. | **Logged by: Kurtis Kulchyski**
Testhole Location: Along East Property Line of 1 Turner Ave, West Bound Lane, 1.5 m from north curb

Subsurface Profile			Laboratory Testing
Depth (m)	**Symbol**	**Description**	**Water Content (%)** 0 20 40 60 80 100
0.0		Ground Surface	
		Asphalt	
		Concrete	
		Clay - grey, firm to stiff, moist, high plasticity - brown below 1.7 m	55, 40, 41, 37, 42, 33, 39
0.5			
1.0			
1.5			
2.0			
		• Frost present to 1.1 m. • No water seepage or slough observed during or upon completion of drilling. • Testhole was terminated at 2.1 m.	
2.5			

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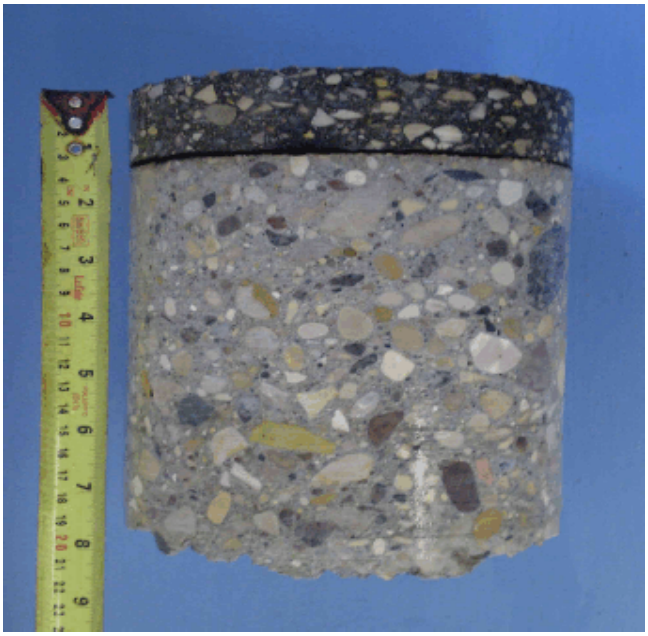
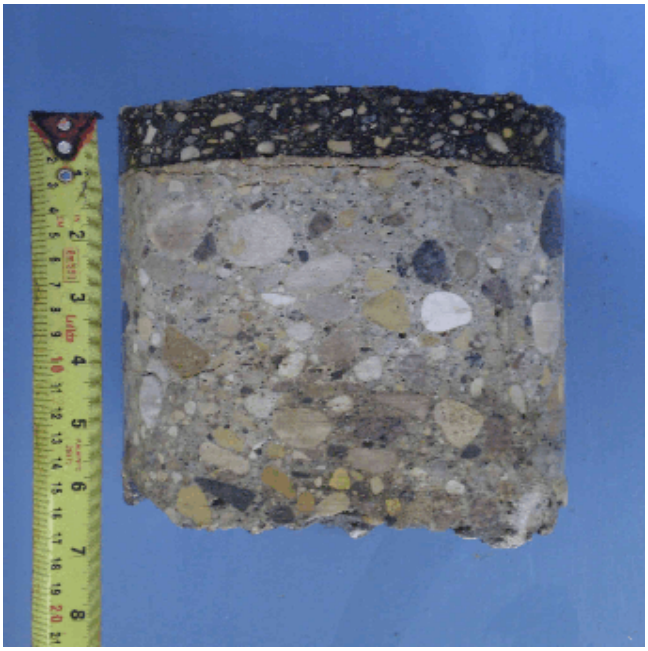
Pavement core from Testhole TH 1



Pavement core from Testhole TH 2



Pavement core from Testhole TH 3

Pavement core from Testhole TH 4

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Pavement core from Testhole TH 5

Pavement core from Testhole TH 6

Pavement core from Testhole TH 7

Pavement core from Testhole TH 8

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LIMITED

Pavement core from Testhole TH 9

Pavement core from Testhole TH 10