

APPENDIX 'A'

GEOTECHNICAL REPORT

APPENDIX 'A' - GEOTECHNICAL REPORT

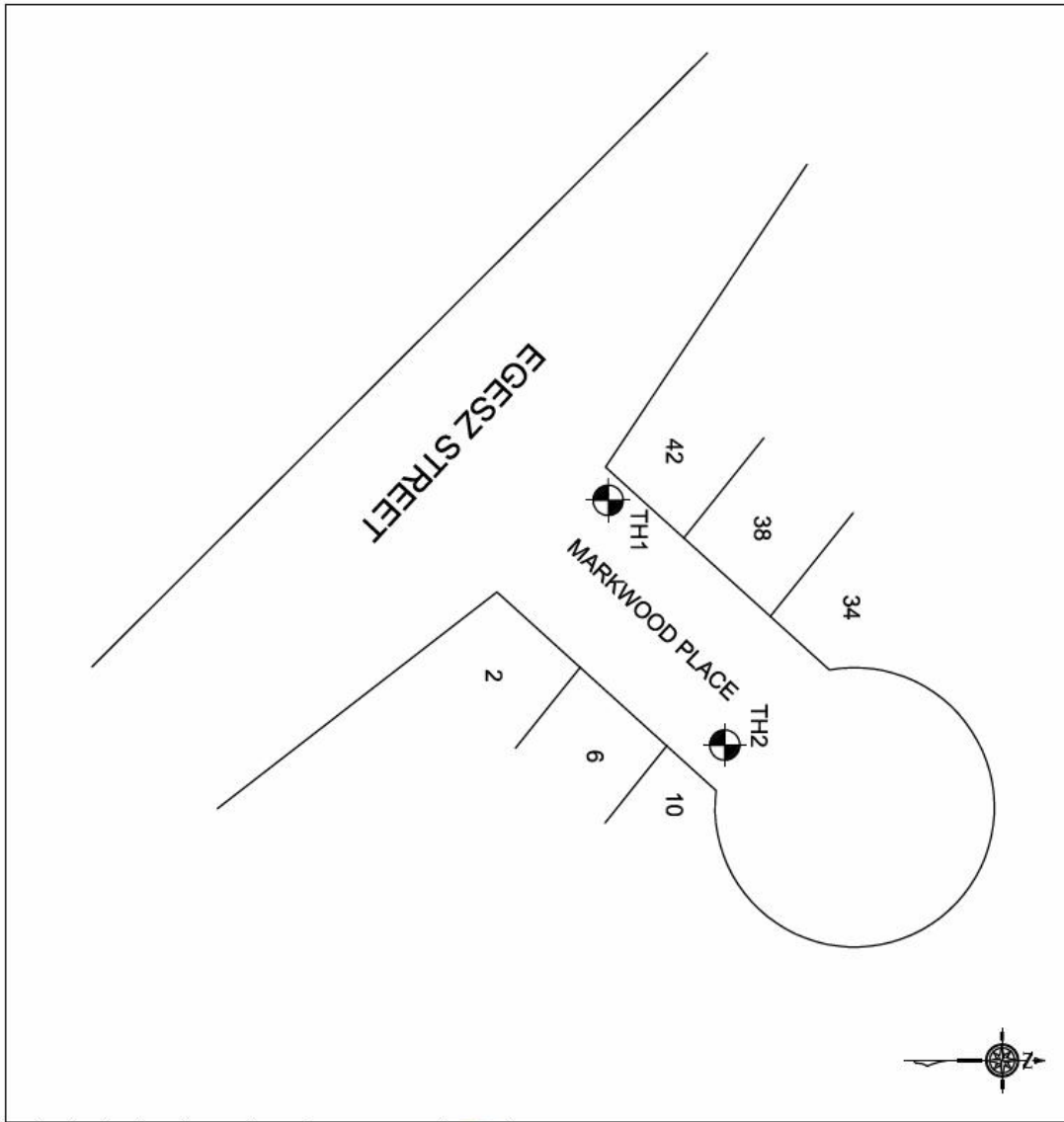
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The geotechnical report is provided to aid in the Contractor's evaluation of the existing pavement structure and/or soil conditions. The information presented is considered accurate at the locations shown on the Drawings and at the time of drilling.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

Test Hole Locations



 391 - 814 Markop Street Winnipeg, MB R2L 0K4 Phone: (204) 233-1894 Fax: (204) 233-1779		 Certificate of Authorization Eng.-Tech Consulting Limited No. 2479 Expiry April 30, 2007	
CLIENT: WARDROP ENGINEERING INC. PROJECT: CITY OF WINNIPEG 2007 RESIDENTIAL STREET RENEWAL PROGRAM DRAWING TITLE: TEST HOLE LOCATION PLAN			
SCALE:	NTS	DATE:	DECEMBER 2006
DESIGNED BY:	DATE:	DATE:	DECEMBER 2006
DATE:	09-07-03	DATE:	0
DATE:	0	DATE:	0

Summary of Core Samples

Table 1
Summary of Pavement Structure
City of Winnipeg
2007 Residential Street Renewal Program

Test Hole No.	Testhole 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
1	Markwood Place	Asphalt	95	Sand	500	Silt	0.75	22.2	0.0	17.5	73.1	9.4	21.3	16.8	4.5
						Clay	1.8	46.7	0.2	0.1	23.7	76.0	90.9	30.3	60.6
2	Markwood Place	Asphalt	105	Sand	500	Silt	0.75	17.1	-	-	-	-	-	-	-
						Clay	1.3	40.3	-	-	-	-	-	-	-

Notes:

20 mm G - 20 mm granular base
20 mm L - 20 mm limestone base

Test Hole Log for TH1

<p>ENG-TECH CONSULTING LIMITED GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING Client: Wardrop Engineering Inc. Project: City of Winnipeg 2007 Residential Street Renewal Program Site: Markwood Place Location: See Figure 1</p>	<p>Test Hole #: TH 1 File No: 06-071-03 Date Drilled: December 13, 2006 Grade Elevation: 100.0 m (local) Water Elevation: - -</p>
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SUBSURFACE PROFILE			SAMPLE DATA				GRAIN SIZE DISTRIBUTION %								
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	blows/300 mm	Water Content (%)							
								PL	0	LL					
0		Ground Surface	100												
		Asphalt (95 mm)													
		Sand Fill (SP) - light brown, damp, medium sand sizes, trace gravel.		S1											
				S2											
		Silt (ML) - medium brown, moist, low plastic, trace clay.		S3							0.0	17.5	73.1	9.4	
1			99	S4											
		- below 1.4 m, moist to wet.		S5											
		Clay (CH) - medium brown, moist, high plastic, some silt. - below 1.8 m, greyish.		S6							0.2	0.1	23.7	76.0	
2		End of Test Hole - end of test hole at 2.0 m below grade. - no groundwater, sloughing or seepage encountered. - test hole backfilled with auger cuttings & topped with asphalt cold mix.	98												
3			97												

ENG-TECH Consulting Limited Logged by: ERM Reviewed by:	Drilled By: Paddock Drilling Ltd. Drill Rig: Acker MP5-T Auger Size: 125 mm Solid Stem	Completion Depth: 2.0 m Completion Elevation: 98.0 m Sheet: 1 of 1
<p>Sample Type</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> Split Barrel </div> <div style="text-align: center;"> Shelby Tube </div> <div style="text-align: center;"> Auger Cuttings </div> <div style="text-align: center;"> Split Spoon </div> </div>		

Test Hole Log for TH2

ENG-TECH CONSULTING LIMITED		Test Hole #: TH 2
GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING		File No: 06-071-03
Client: Wardrop Engineering Inc.		Date Drilled: December 13, 2006
Project: City of Winnipeg 2007 Residential Street Renewal Program		Grade Elevation: 100.0 m (local)
Site: Markwood Place		Water Elevation: - -
Location: See Figure 1		

SUBSURFACE PROFILE			SAMPLE DATA				Water Content (%)	GRAIN SIZE DISTRIBUTION %			
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)		blows/300 mm	Gravel	Sand	Silt
0		Ground Surface	100								
		Asphalt (105 mm)									
		Sand Fill (SP) - light brown, damp, medium sand sizes, trace gravel.		S1							
		Silt (ML) - light brown, moist to wet, low plastic, trace clay.		S2							
		Clay (CH) - dark brown, moist, high plastic, occa. silt pocket, some silt.		S3							
1		Clay (CH) - dark brown, moist, high plastic, occa. silt pocket, some silt.	99	S4							
		- below 1.4 m, occa. grey pocket.		S5							
		- below 1.7 m greyish.		S6							
2		End of Test Hole - end of test hole at 2.0 m below grade. - no groundwater, sloughing or seepage encountered. - test hole backfilled with auger cuttings & topped with asphalt cold mix.	98								
3			97								
4			96								

ENG-TECH Consulting Limited		Drilled By: Paddock Drilling Ltd.	Completion Depth: 2.0 m
Logged by: ERM		Drill Rig: Acker MP5-T	Completion Elevation: 98.0 m
Reviewed by:		Auger Size: 125 mm Solid Stem	Sheet: 1 of 1
Sample Type	Split Barrel	Shelby Tube	Auger Cuttings
			Split Spoon

Particle Size Analysis for TH1



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PARTICLE SIZE ANALYSIS REPORT

Wardrop Engineering Inc.
400 - 386 Broadway
Winnipeg, Manitoba
R3C 4M8

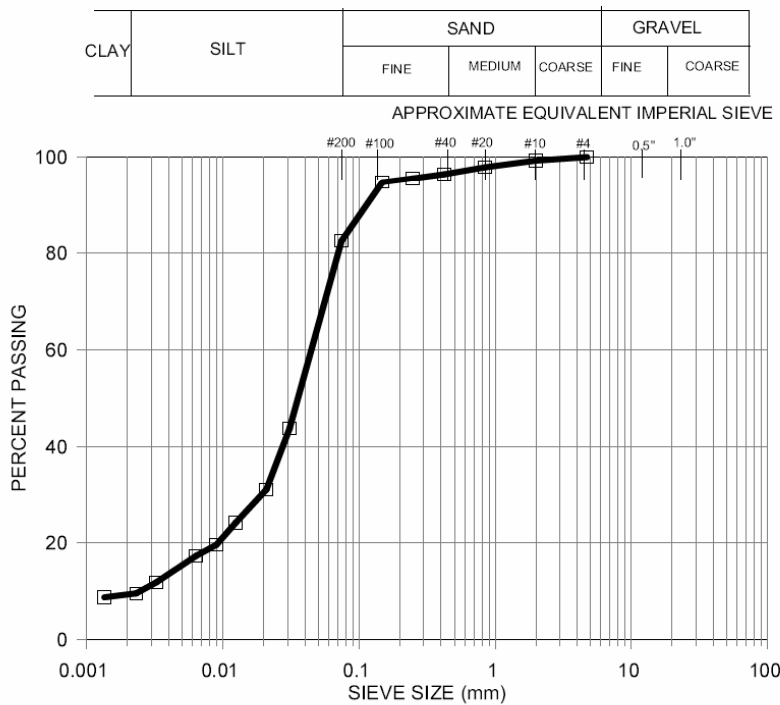
File No.: 06-071-03
Reference No.: 6-71-3-1

Fax: 957-5389

ATTENTION: Dean Lazaruk, C.E.T.

PROJECT: CITY OF WINNIPEG 2007 RESIDENTIAL STREET RENEWAL PROGRAM

Test Hole No.	TH1	Sample No.	S3	Depth:	0.75 m
Sampled By:	ENG-TECH	Type of Sample:	Grab	Source:	Markwood Place
Date Sampled:	December 13/06	Date Received:	December 13/06	Date Tested:	December 20/06



SIEVE SIZE (mm)	PERCENT PASSING
4.7500	100.0
2.0000	99.3
0.8500	97.9
0.4250	96.5
0.2500	95.6
0.1500	94.7
0.0750	82.5
0.0312	43.7
0.0211	31.1
0.0125	24.2
0.0090	19.7
0.0064	17.4
0.0033	11.9
0.0023	9.6
0.0014	8.8

Percent of: GRAVEL (0.0%), SAND (17.5%), SILT (73.1%) and CLAY (9.4%)
Sample Description: Silt

ENG-TECH Consulting Limited

COMMENTS:

per _____
Clark Hryhoruk, President
Ph: (204) 233-1694 Fax: (204) 235-1579

Particle Size Analysis for TH1



#6 - 854 Marion Street
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PARTICLE SIZE ANALYSIS REPORT

Wardrop Engineering Inc.
400 - 386 Broadway
Winnipeg, Manitoba
R3C 4M8

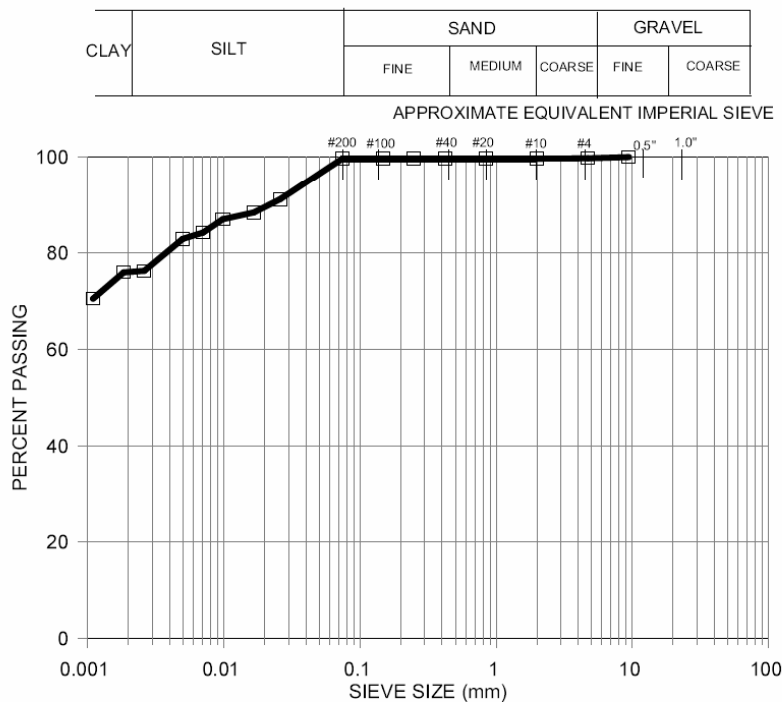
File No.: 06-071-03
Reference No.: 6-71-3-3

Fax: 957-5389

ATTENTION: Dean Lazaruk, C.E.T.

PROJECT: CITY OF WINNIPEG 2007 RESIDENTIAL STREET RENEWAL PROGRAM

Test Hole No.	TH1	Sample No.	S6	Depth:	1.8 m
Sampled By:	ENG-TECH	Type of Sample:	Grab	Source:	Markwood Place
Date Sampled:	December 13/06	Date Received:	December 13/06	Date Tested:	December 27/06



SIEVE SIZE (mm)	PERCENT PASSING
9.5000	100.0
4.7500	99.8
2.0000	99.7
0.8500	99.7
0.4250	99.7
0.2500	99.7
0.1500	99.7
0.0750	99.7
0.0262	91.1
0.0168	88.4
0.0099	87.0
0.0071	84.2
0.0050	82.8
0.0026	76.2
0.0019	76.0
0.0011	70.5

Percent of: GRAVEL (0.2%), SAND (0.1%), SILT (23.7%) and CLAY (76.0%)
Sample Description: Clay

ENG-TECH Consulting Limited

COMMENTS:

per _____
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Ph: (204) 233-1694 Fax: (204) 235-1579

Pavement Core Photos



Markwood Place

