

APPENDIX 'A'

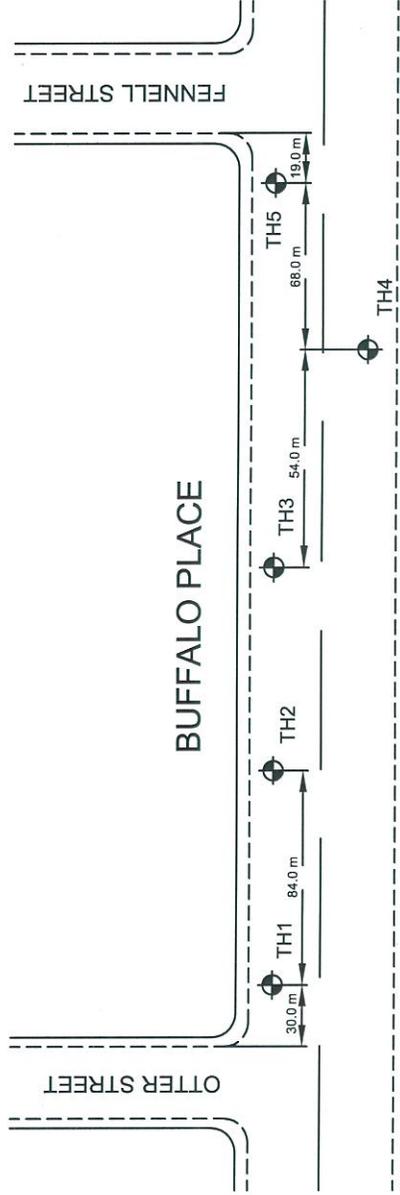
GEOTECHNICAL REPORT

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 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 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.



Test Hole
Location



Curb Line



#6 - 854 Marion Street
Winnipeg, MB R2J 0K4
Phone: (204) 233-1694
Fax: (204) 235-1579

ENG. STAMP:



Certificate of Authorization
ENG-TECH Consulting Limited
No.2475 Expiry: April 30, 2007

CLIENT:	CITY OF WINNIPEG C/O UMA ENGINEERING LTD.
PROJECT:	CITY OF WINNIPEG 2007 RESIDENTIAL STREET RENEWAL PROGRAM
DWG DESCRIPTION:	TEST HOLE LOCATION PLAN BUFFALO PLACE
SCALE:	NTS
DRAWN BY:	OB
DATE:	DECEMBER 2006
FILE No.:	06-027-05
ENG-TECH DWG/FIG. No.:	1
REV.:	0

**City of Winnipeg
2007 Residential Street Renewal Program
Buffalo Place**

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	Buffalo Place	Asphalt	50	Sand	50	Silty Clay	1.0	26.2	-	-	-	-	-	-	-
		Concrete	180												
2	Buffalo Place	Asphalt	40	Sand	50	Clayey Silt	0.9	19.3	0.0	13.8	64.7	21.5	28.3	16.7	11.6
		Concrete	160												
3	Buffalo Place	Asphalt	55	Sand	50	Silty Clay	0.4	29.1	0.0	-	-	-	-	-	-
		Concrete	165												
4	Buffalo Place	Asphalt	60	-	-	Silty Clay	0.5	34.5	-	-	-	-	-	-	-
		Concrete	200												
5	Buffalo Place	Asphalt	27	-	-	Silty Clay	0.5	28.4	-	-	-	-	-	-	-
		Concrete	180												

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: UMA Engineering Ltd.

Project: City of Winnipeg 2007 Residential Street Renewal Program

Site: Buffalo Place

Location: See Figure 1

Test Hole #: TH 1

File No: 06-027-05

Date Drilled: December 13, 2006

Grade Elevation: 100.0 m (local)

Water Elevation: - -

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	Clay
0		Ground Surface	100									
		Asphalt (50 mm)										
		Concrete (180 mm)										
		Sand (SP) (50 mm)		S1	Shelby Tube							
		- light brown, moist, medium to coarse grain sizes.		S2	Shelby Tube							
		Silty Clay (CH)										
		- dark brown, moist, high plastic, some medium sand sizes, occa. black pocket, with silt.										
		- below 0.8 m, trace sand, occa. silt pocket.										
1			99	S3	Shelby Tube							
				S4	Shelby Tube							
				S5	Shelby Tube							
		- below 1.5 m, grey, some silt.		S6	Shelby Tube							
2		End of Test Hole	98									
		- end of test hole at 2.0 m below grade.										
		- no groundwater or sloughing encountered.										
		- backfilled test hole with auger cuttings and topped with asphalt cold mix.										
3			97									

ENG-TECH Consulting Limited

Logged by: ERM

Reviewed by: *ERM*

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

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

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: UMA Engineering Ltd.

Project: City of Winnipeg 2007 Residential Street Renewal Program

Site: Buffalo Place

Location: See Figure 1

Test Hole #: TH 2

File No: 06-027-05

Date Drilled: December 13, 2006

Grade Elevation: 100.0 m (local)

Water Elevation: - -

SUBSURFACE PROFILE				SAMPLE DATA				Water Content (%)	GRAIN SIZE DISTRIBUTION %					
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	blows/300 mm		PL	LL	Gravel	Sand	Silt	Clay
0		Ground Surface	100											
		Asphalt (40 mm)												
		Concrete (160 mm)												
		Sand (SP) (50 mm)												
		- light brown, moist, medium to coarse grain sizes.												
		Silty Clay (CH)												
		- dark brown to black, moist, frozen, high plastic, trace sand, with silt.		S1	Split Barrel						0.0	8.5	31.2	60.3
		- below 0.6 m, grey, occa. silt pocket.		S2	Shelby Tube									
1		Clayey Silt (ML)	99	S3	Shelby Tube						0.0	13.8	64.7	21.5
		- light grey, damp to moist, low plastic, with clay.												
		Clay (CH)												
		- grey, moist, high plastic, some silt inclusions, some silt.		S4	Shelby Tube						0.0	2.1	15.5	82.4
		- below 1.9 m, medium brown, with to and silt, medium to high plastic.		S5	Shelby Tube									
2		End of Test Hole	98	S6	Shelby Tube									
		- end of test hole at 2.0 m below grade.												
		- test hole moved 4.0 m to north side of street.												
		- no groundwater or sloughing encountered.												
		- backfilled test hole with auger cuttings and topped with asphalt cold mix.												
3			97											

ENG-TECH Consulting Limited

Logged by: ERM

Reviewed by: *CHS*

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

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

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: UMA Engineering Ltd.

Project: City of Winnipeg 2007 Residential Street Renewal Program

Site: Buffalo Place

Location: See Figure 1

Test Hole #: TH 3

File No: 06-027-05

Date Drilled: December 13, 2006

Grade Elevation: 100.0 m (local)

Water Elevation: - -

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 (55 mm)											
		Concrete (165 mm)											
		Sand (SP) (50 mm)											
		- light brown, moist, medium to coarse grain sizes.		S1	Shelby Tube								
		Silty Clay (CH)											
		- greyish/dark brown, moist, high plastic, some sand, with silt.		S2	Shelby Tube								
		- below 0.5 m, trace sand, some silt inclusions.											
		- between 0.9 m to 1.1 m, black.											
1		- below 1.1 m, grey.	99	S3	Shelby Tube								
				S4	Shelby Tube								
				S5	Shelby Tube								
				S6	Shelby Tube								
		- below 1.5 m dark brown.		S7	Shelby Tube								
2		End of Test Hole	98										
		- end of test hole at 2.0 m below grade.											
		- no groundwater or sloughing encountered.											
		- backfilled test hole with auger cuttings and topped with asphalt cold mix.											
3			97										

ENG-TECH Consulting Limited

Logged by: ERM

Reviewed by: *ERM*

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

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

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: UMA Engineering Ltd.

Project: City of Winnipeg 2007 Residential Street Renewal Program

Site: Buffalo Place

Location: See Figure 1

Test Hole #: TH 4

File No: 06-027-05

Date Drilled: December 13, 2006

Grade Elevation: 100.0 m (local)

Water Elevation: - -

SUBSURFACE PROFILE				SAMPLE DATA				GRAIN SIZE DISTRIBUTION %									
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	blows/300 mm	Water Content (%)									
								PL	LL	Gravel	Sand	Silt	Clay				
0		Ground Surface	100														
		Asphalt (60 mm)															
		Concrete (200 mm)															
		Silty Clay (CH) - greyish black, moist, high plastic, trace sand, with silt. - below 0.5 m grey.		S1													
				S2													
				S3													
1		- below 1.2 m medium brown.	99	S4													
				S5													
		- below 1.8 m, light brown, some with silt.		S6													
2		End of Test Hole - end of test hole at 2.0 m below grade. - no groundwater or sloughing encountered. - backfilled test hole with auger cuttings and topped with asphalt cold mix.	98														
3			97														

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Logged by: ERM

Reviewed by:

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

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

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: UMA Engineering Ltd.

Project: City of Winnipeg 2007 Residential Street Renewal Program

Site: Buffalo Place

Location: See Figure 1

Test Hole #: TH 5

File No: 06-027-05

Date Drilled: December 13, 2006

Grade Elevation: 100.0 m (local)

Water Elevation: - -

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 (27 mm)													
		Concrete (180 mm)													
		Silty Clay (CH) - black, moist, high plastic, with silt.		S1	Shelby Tube										
				S2	Shelby Tube										
		- below 0.8 m, grey.		S3	Shelby Tube										
1			99	S4	Shelby Tube										
				S5	Shelby Tube										
		- below 1.7 m, dark brown.		S6	Shelby Tube										
2		End of Test Hole - end of test hole at 2.0 m below grade. - no groundwater or sloughing encountered. - backfilled test hole with auger cuttings and topped with asphalt cold mix.	98												
3			97												

ENG-TECH Consulting Limited

Logged by: ERM

Reviewed by: *ERM*

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

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



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**PARTICLE SIZE
 ANALYSIS REPORT**

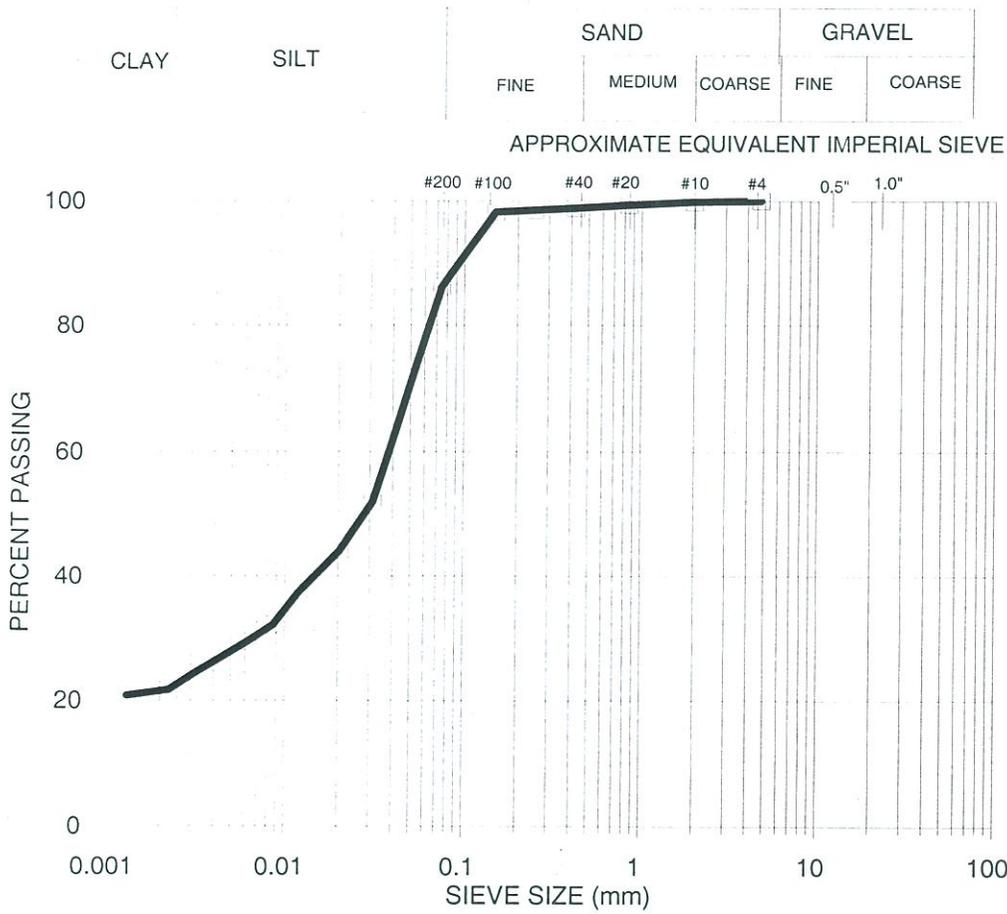
UMA Engineering Ltd.
 1479 Buffalo Place
 Winnipeg, Manitoba
 R3T 1L7

File No.: 06-027-05
Reference No.: 6-27-5-10

ATTENTION: Ron Bruce, P. Eng.

PROJECT: CITY OF WINNIPEG 2007 RESIDENTIAL STREET RENEWAL PROGRAM

Test Hole No. TH2 **Sample No.** S3 **Depth:** 0.9 m
Sampled By: ENG-TECH **Type of Sample:** Bag **Source:** Buffalo Pl.
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	99.9
0.8500	99.4
0.4250	98.9
0.2500	98.5
0.1500	98.2
0.0750	86.2
0.0312	51.9
0.0204	44.0
0.0120	37.4
0.0087	32.1
0.0062	29.4
0.0032	24.4
0.0023	21.7
0.0013	20.8

Percent of: GRAVEL (0.0%), SAND (13.8%), SILT (64.7%) and CLAY (21.5%)
 Sample Description: Clayey Silt

COMMENTS:

ENG-TECH Consulting Limited

per 
 Clark Hryhoruk, President
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**PARTICLE SIZE
 ANALYSIS REPORT**

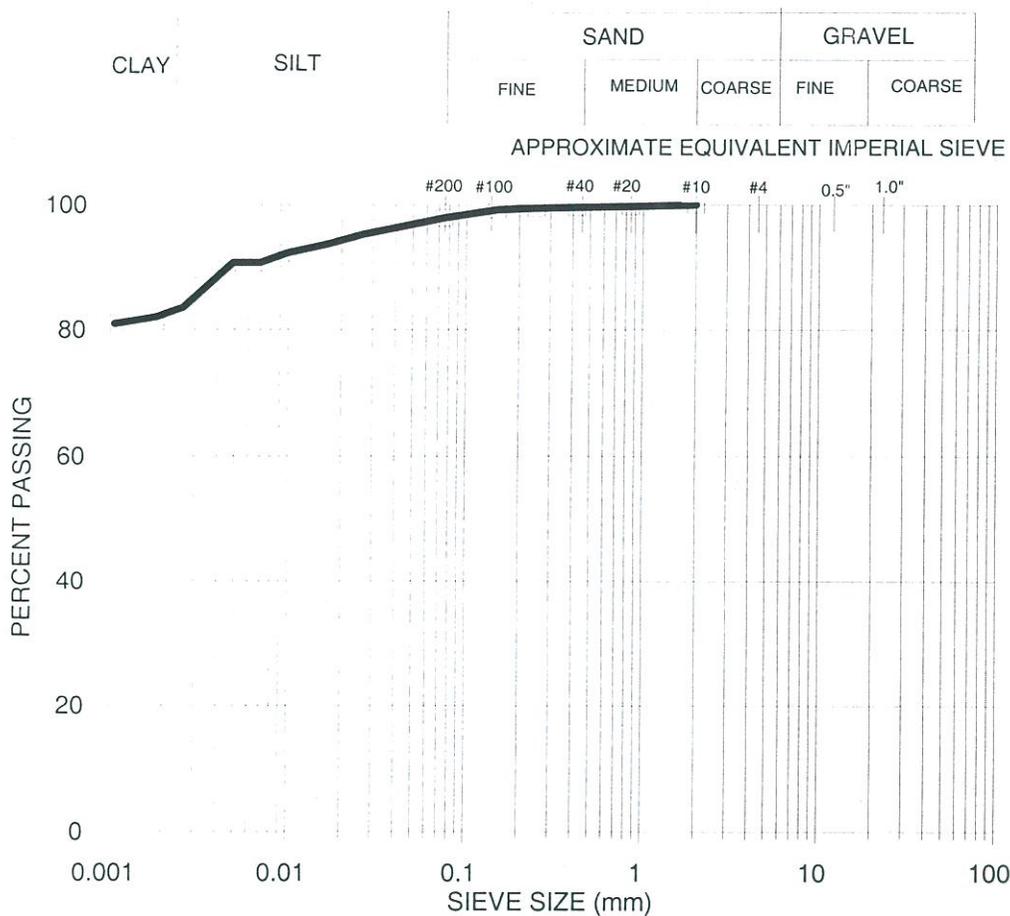
UMA Engineering Ltd.
 1479 Buffalo Place
 Winnipeg, Manitoba
 R3T 1L7

File No.: 06-027-05
Reference No.: 6-27-5-11

ATTENTION: Ron Bruce, P. Eng.

PROJECT: CITY OF WINNIPEG 2007 RESIDENTIAL STREET RENEWAL PROGRAM

Test Hole No.	TH2	Sample No.	S4	Depth:	1.2 m
Sampled By:	ENG-TECH	Type of Sample:	Bag	Source:	Buffalo Pl.
Date Sampled:	December 13/06	Date Received:	December 13/06	Date Tested:	December 20/06



SIEVE SIZE (mm)	PERCENT PASSING
2.0000	100.0
0.8500	99.8
0.4250	99.6
0.2500	99.4
0.1500	99.2
0.0750	97.9
0.0264	95.3
0.0167	93.8
0.0098	92.3
0.0069	90.8
0.0049	90.8
0.0026	83.5
0.0018	82.0
0.0011	81.0

Percent of: GRAVEL (0.0%), SAND (2.1%), SILT (15.5%) and CLAY (82.4%)
 Sample Description: Clay

COMMENTS:

ENG-TECH Consulting Limited

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



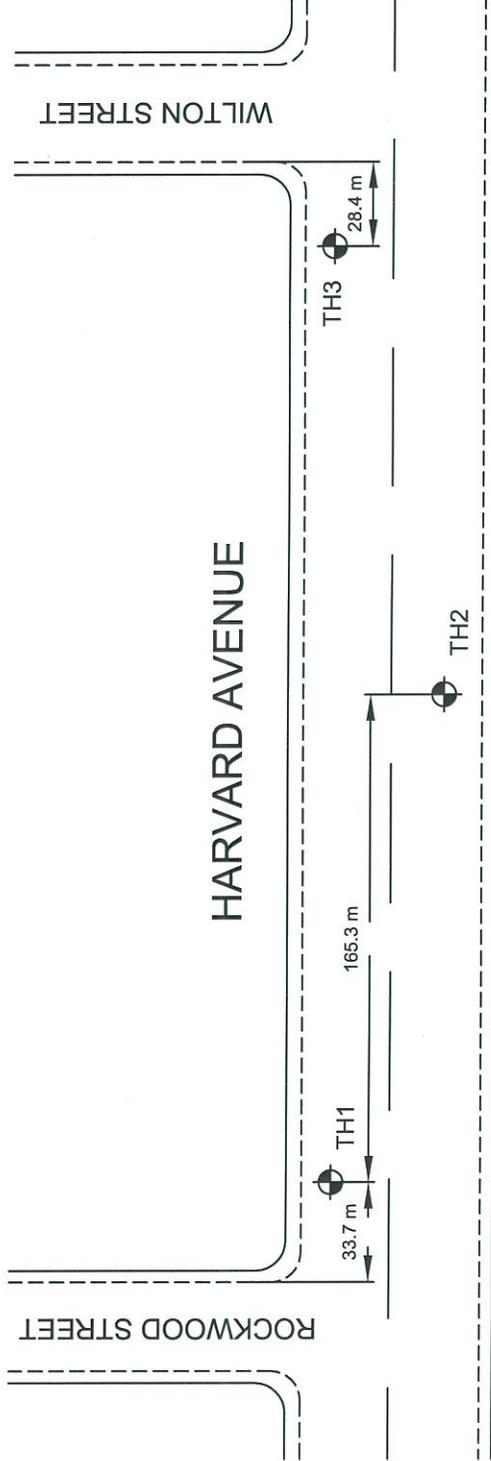
Buffalo Place



BUFFALO PLACE
TH#5
27 mm ASPHALT
180 mm CONCRETE

BUFFALO PLACE
TH#4
60 mm ASPHALT
200 mm CONCRETE

Buffalo Place



Test Hole Location

Curb Line

#6 - 854 Marion Street
Winnipeg, MB R2J 0K4
Phone: (204) 233-1694
Fax: (204) 235-1579



ENG. STAMP:



Certificate of Authorization
ENG-TECH Consulting Limited
No.2475 Expiry: April 30, 2007

CLIENT:	CITY OF WINNIPEG C/O UMA ENGINEERING LTD.
PROJECT:	CITY OF WINNIPEG 2007 RESIDENTIAL STREET RENEWAL PROGRAM
DWG DESCRIPTION:	TEST HOLE LOCATION PLAN HARVARD AVENUE
SCALE:	NTS
DRAWN BY:	OB
DATE:	DECEMBER 2006
FILE No.:	06-027-05
CLIENT DWG/FIG. No.:	
ENG-TECH DWG/FIG. No.:	
REV.:	0
	2

**City of Winnipeg
2007 Residential Street Renewal Program
Harvard Avenue**

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	Harvard Avenue	Asphalt	70	Sand	200	Silty Clay	0.5	26.9	0.5	13.6	40.6	45.3	59.2	22.6	36.6	
									0.1	13.2	49.5	37.2	50.1	17.4		32.7
2	Harvard Avenue	Asphalt	75	Sand	100	Clayey Silt	1.7	33.3	0.0	1.4	61.4	37.2	51.5	23.3	28.2	
									0.2	-	-	-	-	-		-
3	Harvard Avenue	Asphalt	80	Sand	50	Silty Clay	0.5	28.6	0.5	-	-	-	-	-	-	
									0.4	-	-	-	-	-		-
		Concrete	140	Silty Clay	0.8	24.5	Silty Clay	1.3	10.4	0.4	-	-	-	-	-	-
										1.6	29.8	-	-	-	-	

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: UMA Engineering Ltd.

Project: City of Winnipeg 2007 Residential Street Renewal Program

Site: Harvard Avenue

Location: See Figure 2

Test Hole #: TH 1

File No: 06-027-05

Date Drilled: December 13, 2006

Grade Elevation: 100.0 m (local)

Water Elevation: - -

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			
								Gravel	Sand	Silt	Clay		
0		Ground Surface	100										
		Asphalt (70 mm)											
		Sand (SP) (200 mm) - light brown, moist, medium grain sizes, trace gravel.		S1									
		Silty Clay (CH) - black, moist, high plastic, trace rootlets, trace sand & gravel, and silt.		S2						0.5	13.6	40.6	45.3
		Silty Clay (CH) - dark brown, moist, high plastic, and silt.		S3						0.1	13.2	49.5	37.2
1		- at 1.0 m, grey pockets. - below 1.1 m, light brown, medium plastic, with silt.	99	S4									
		- below 1.4 m, some silt & gypsum inclusions.		S5									
		Clayey Silt (ML) - medium brown, moist, high plastic, with clay.		S6						0.0	1.4	61.4	37.2
2		End of Test Hole - end of test hole at 2.0 m below grade. - no groundwater or sloughing encountered. - backfilled test hole with auger cuttings and topped with asphalt cold mix.	98										
3			97										

ENG-TECH Consulting Limited

Logged by: ERM

Reviewed by:

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

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

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: UMA Engineering Ltd.

Project: City of Winnipeg 2007 Residential Street Renewal Program

Site: Harvard Avenue

Location: See Figure 2

Test Hole #: TH 2

File No: 06-027-05

Date Drilled: December 13, 2006

Grade Elevation: 100.0 m (local)

Water Elevation: - -

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	Clay
0		Ground Surface	100									
		Asphalt (75 mm)										
		Sand (SP) (100 mm) - light brown, moist, medium grain sizes, trace gravel.		S1	Shelby Tube							
		Silty Clay (CH) - black, moist, high plastic, trace rootlets, with silt.		S2	Shelby Tube							
		Silty Clay (CH) - dark brown, moist, high plastic, some coarse sand sizes, and silt. - below 0.8 m medium brown.		S3	Shelby Tube							
1			99	S4	Shelby Tube							
		- below 1.4 m, occa. silt pocket.		S5	Shelby Tube							
				S6	Shelby Tube							
2		End of Test Hole - end of test hole at 2.0 m below grade. - no groundwater or sloughing encountered. - backfilled test hole with auger cuttings and topped with asphalt cold mix.	98									
3			97									

ENG-TECH Consulting Limited

Logged by: ERM

Reviewed by: CA

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

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

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: UMA Engineering Ltd.

Project: City of Winnipeg, 2007 Residential Street Renewal Program

Site: Harvard Avenue

Location: See Figure 2

Test Hole #: TH 3

File No: 06-027-05

Date Drilled: December 13, 2006

Grade Elevation: 100.0 m (local)

Water Elevation: - -

SUBSURFACE PROFILE				SAMPLE DATA				GRAIN SIZE DISTRIBUTION %									
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	blows/300 mm	Water Content (%)									
								PL	LL	Gravel	Sand	Silt	Clay				
0		Ground Surface	100														
		Asphalt (80 mm)															
		Concrete (140 mm)															
		Sand (SP) (50 mm)		S1	Split Barrel												
		- light brown, moist to wet, medium to coarse grain sizes, trace gravel.		S2	Split Barrel												
		Silty Clay (CH)															
		- black, moist, high plastic, trace rootlets, with silt.															
		Silty Clay (CH)		S3	Shelby Tube												
		- dark brown, moist to damp, high plastic, with to and silt, occa. silt inclusion & pocket.															
1		Silt (ML)	99	S4	Split Barrel												
		- light brown, damp, low plastic, trace clay.															
		Silty Clay (CH)		S5	Split Barrel												
		- grey, moist, high plastic, occa. silt inclusion, with silt.															
2		Silty Clay (CH)		S6	Split Barrel												
		- end of test hole at 2.0 m below grade.															
		- no groundwater observed.															
		- sloughing encountered at 1.2 m below grade.															
		- backfilled test hole with auger cuttings and topped with asphalt cold mix.															
3		End of Test Hole	98														
		- end of test hole at 2.0 m below grade.															
		- no groundwater observed.															
		- sloughing encountered at 1.2 m below grade.															
		- backfilled test hole with auger cuttings and topped with asphalt cold mix.															
			97														

ENG-TECH Consulting Limited

Logged by: ERM

Reviewed by: *ERM*

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

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



#6 - 854 Marion Street
 Winnipeg, Manitoba
 R2J 0K4
 eng_tech@mts.net
 www.eng-tech.ca

**PARTICLE SIZE
 ANALYSIS REPORT**

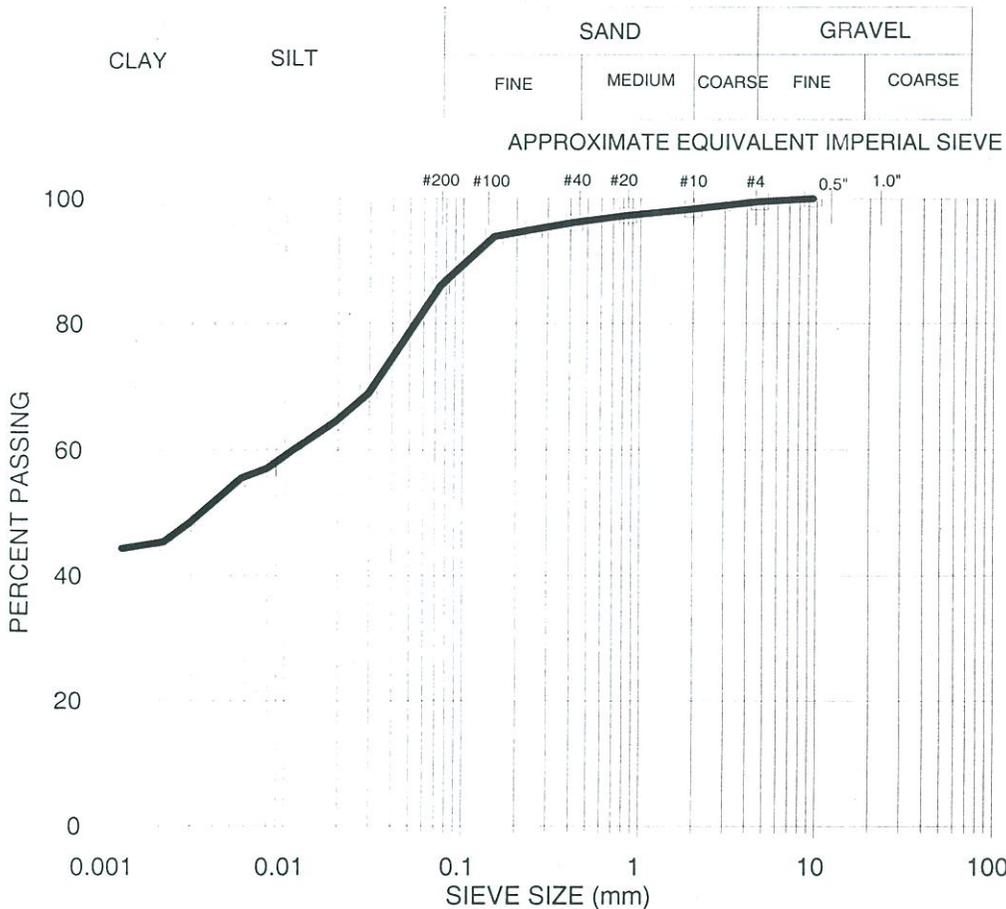
UMA Engineering Ltd.
 1479 Buffalo Place
 Winnipeg, Manitoba
 R3T 1L7

File No.: 06-027-05
Reference No.: 6-27-5-6

ATTENTION: Ron Bruce, P. Eng.

PROJECT: CITY OF WINNIPEG 2007 RESIDENTIAL STREET RENEWAL PROGRAM

Test Hole No.: TH1 **Sample No.:** S2 **Depth:** 0.5 m
Sampled By: ENG-TECH **Type of Sample:** Bag **Source:** Harvard Ave.
Date Sampled: December 13/06 **Date Received:** December 13/06 **Date Tested:** December 20/06



SIEVE SIZE (mm)	PERCENT PASSING
9.5000	100.0
4.7500	99.5
2.0000	98.4
0.8500	97.2
0.4250	96.1
0.2500	95.0
0.1500	93.8
0.0750	86.0
0.0296	69.0
0.0192	64.5
0.0112	60.0
0.0081	57.0
0.0057	55.5
0.0029	48.4
0.0021	45.4
0.0012	44.3

Percent of: GRAVEL (0.5%), SAND (13.6%), SILT (40.6%) and CLAY (45.3%)
 Sample Description: Silty Clay

COMMENTS:

ENG-TECH Consulting Limited

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



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**PARTICLE SIZE
 ANALYSIS REPORT**

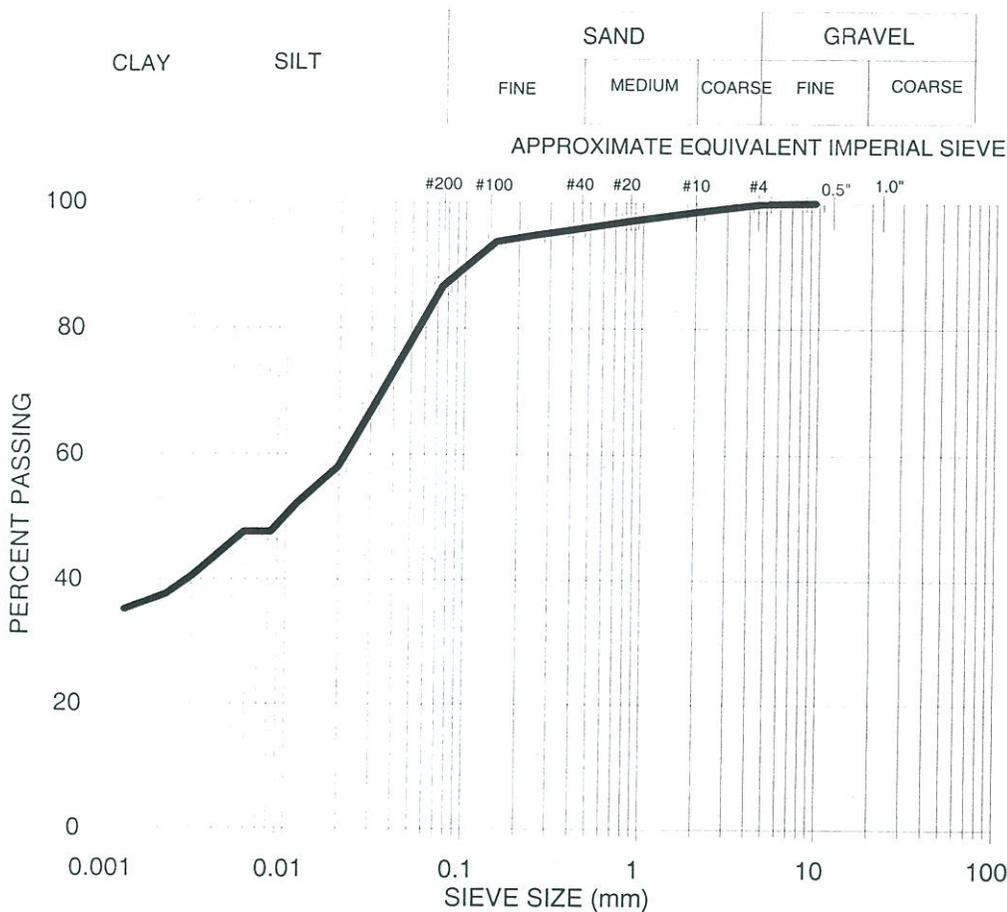
UMA Engineering Ltd.
 1479 Buffalo Place
 Winnipeg, Manitoba
 R3T 1L7

File No.: 06-027-05
Reference No.: 6-27-5-7

ATTENTION: Ron Bruce, P. Eng.

PROJECT: CITY OF WINNIPEG 2007 RESIDENTIAL STREET RENEWAL PROGRAM

Test Hole No. TH1 **Sample No.** S3 **Depth:** 0.7 m
Sampled By: ENG-TECH **Type of Sample:** Bag **Source:** Harvard Ave.
Date Sampled: December 13/06 **Date Received:** December 13/06 **Date Tested:** December 20/06



SIEVE SIZE (mm)	PERCENT PASSING
9.5000	100.0
4.7500	99.9
2.0000	98.6
0.8500	97.1
0.4250	95.8
0.2500	94.8
0.1500	93.7
0.0750	86.7
0.0301	66.9
0.0197	58.0
0.0116	52.1
0.0083	47.6
0.0059	47.6
0.0030	40.5
0.0022	37.6
0.0013	35.1

Percent of: GRAVEL (0.1%), SAND (13.2%), SILT (49.5%) and CLAY (37.2%)
Sample Description: Silty Clay

COMMENTS:

ENG-TECH Consulting Limited

per 
 Clark Hryhoruk, President
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**PARTICLE SIZE
 ANALYSIS REPORT**

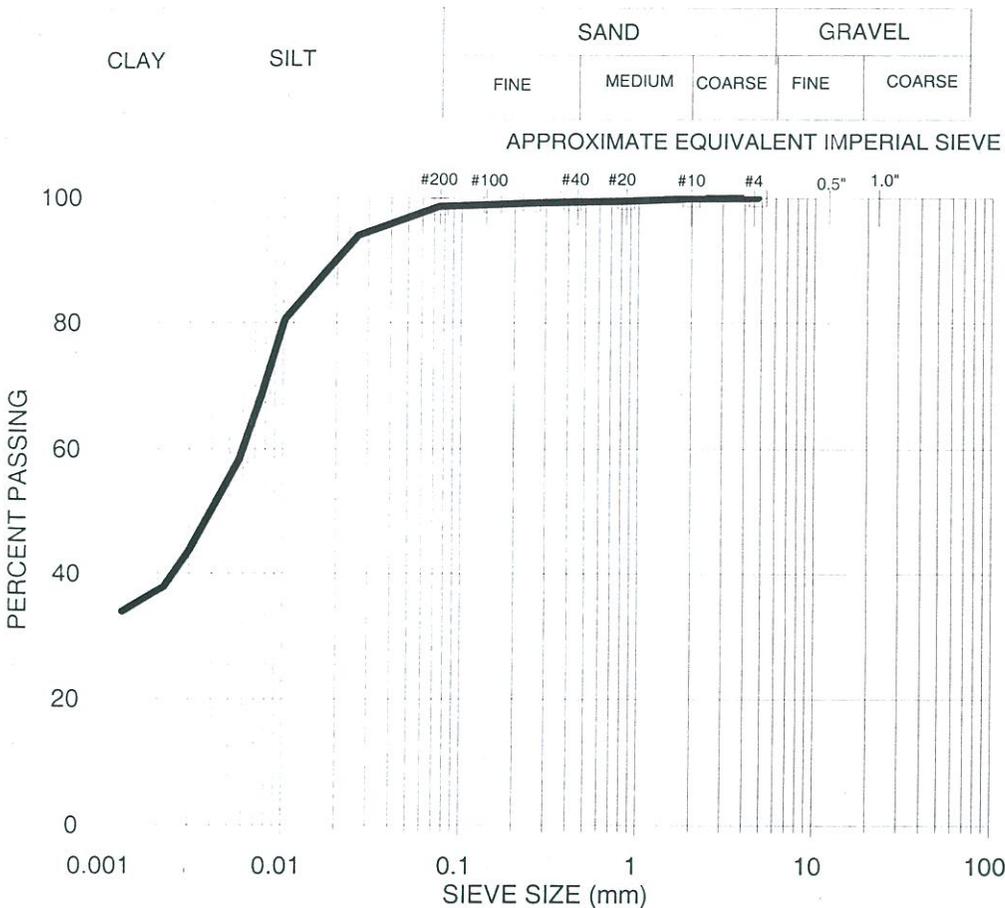
UMA Engineering Ltd.
 1479 Buffalo Place
 Winnipeg, Manitoba
 R3T 1L7

File No.: 06-027-05
Reference No.: 6-27-5-8

ATTENTION: Ron Bruce, P. Eng.

PROJECT: CITY OF WINNIPEG 2007 RESIDENTIAL STREET RENEWAL PROGRAM

Test Hole No.	TH1	Sample No.	S6	Depth:	1.7 m
Sampled By:	ENG-TECH	Type of Sample:	Bag	Source:	Harvard Ave.
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	99.9
0.8500	99.6
0.4250	99.4
0.2500	99.2
0.1500	99.0
0.0750	98.6
0.0264	94.0
0.0172	88.0
0.0103	80.6
0.0077	68.7
0.0057	58.3
0.0030	43.7
0.0022	37.8
0.0013	33.8

Percent of: GRAVEL (0.0%), SAND (1.4%), SILT (61.4%) and CLAY (37.2%)
 Sample Description: Clayey Silt

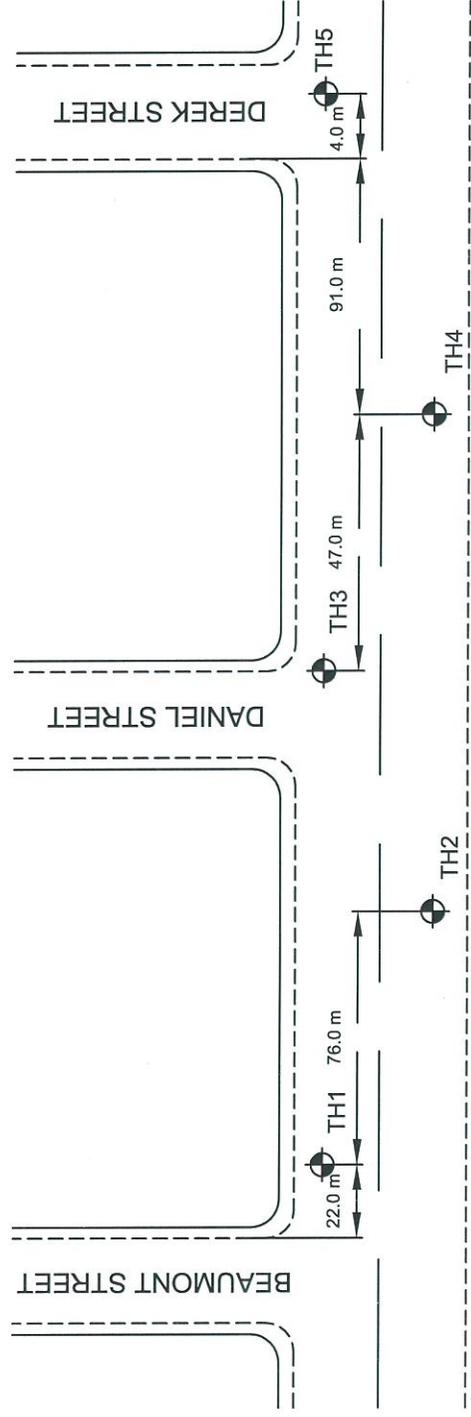
COMMENTS:

ENG-TECH Consulting Limited

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



Harvard Avenue



Test Hole
Location



Curb Line



ENG-TECH
Engineering Limited

#6 - 854 Marion Street
Winnipeg, MB R2J 0K4
Phone: (204) 233-1694
Fax: (204) 235-1579

APEGM
Certificate of Authorization
ENG-TECH Consulting Limited
No. 2475 Expiry: April 30, 2007

ENG. STAMP:

CLIENT:	CITY OF WINNIPEG C/O UMA ENGINEERING LTD.
PROJECT:	CITY OF WINNIPEG 2007 RESIDENTIAL STREET RENEWAL PROGRAM
DWG DESCRIPTION:	TEST HOLE LOCATION PLAN WINDERMERE AVENUE
SCALE:	NTS
DRAWN BY:	OB
DATE:	DECEMBER 2006
FILE No.:	06-027-05
CLIENT DWG/FIG. No.:	
ENG-TECH DWG/FIG. No.:	
REV.:	0

**City of Winnipeg
2007 Residential Street Renewal Program
Windermere Avenue**

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	Windermere Avenue	Asphalt	142			Clay Fill	0.4	17.0	-	-	-	-	-	-	-
						Clay	1.3	39.8	-	-	-	-	-	-	-
2	Windermere Avenue	Asphalt	140			Silty Clay Fill	0.6	26.1	1.2	17.8	37.5	43.5	61.1	21.2	39.9
						Clayey Silt	0.9	24.0	0.0	8.1	56.7	35.2	38.5	16.1	22.5
						Clay	1.2	34.9	0.1	2.6	18.9	78.4	87.5	29.5	58.0
3	Windermere Avenue	Asphalt	110			Silt	1.5	22.8	-	-	-	-	-	-	-
						Silty Clay Fill	0.2	27.3	-	-	-	-	-	-	-
						Clay	1.1	37.7	-	-	-	-	-	-	-
4	Windermere Avenue	Asphalt	130			Silty Clay Fill	0.2	24.8	-	-	-	-	-	-	-
						Clay	0.7	29.1	-	-	-	-	-	-	-
5	Windermere Avenue	Asphalt	137	Limestone (12 mm)	100	Silty Clay Fill	0.4	23.8	-	-	-	-	-	-	-

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: UMA Engineering Ltd.

Project: City of Winnipeg 2007 Residential Street Renewal Program

Site: Windermere Avenue

Location: See Figure 4

Test Hole #: TH 1

File No: 06-027-05

Date Drilled: December 14, 2006

Grade Elevation: 100.0 m (local)

Water Elevation: - -

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 Asphalt (142 mm)	100												
		Clay Fill (CH) - dark brown, moist, high plastic, some sand & gravel, with silt.		S1											
				S2											
1		Clay (CH) - dark brown, moist, high plastic, occa. silt pocket.	99	S3											
				S4											
		- below 1.4 m, medium brown.		S5											
				S6											
2		End of Test Hole - end of test hole at 2.0 m below grade. - no groundwater or sloughing encountered. - backfilled test hole with auger cuttings and topped with asphalt cold mix.	98												
3			97												

ENG-TECH Consulting Limited

Logged by: ERM

Reviewed by:

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

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

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: UMA Engineering Ltd.

Project: City of Winnipeg 2007 Residential Street Renewal Program

Site: Windermere Avenue

Location: See Figure 4

Test Hole #: TH 2

File No: 06-027-05

Date Drilled: December 14, 2006

Grade Elevation: 100.0 m (local)

Water Elevation: - -

SUBSURFACE PROFILE				SAMPLE DATA				GRAIN SIZE DISTRIBUTION %					
Depth (m)	Soil Symbol	Description	Elevation (m)	Number	Sample Type	Recovery (%)	blows/300 mm	Water Content (%)		Gravel	Sand	Silt	Clay
								PL	LL				
0		Ground Surface	100										
		Asphalt (140 mm)											
		Silty Clay Fill (CH) - dark brown, moist, high plastic, some sand & gravel, and silt.		S1	Shelby Tube								
				S2	Shelby Tube					1.2	17.8	37.5	43.5
		Clayey Silt (CI) - medium brown, moist, medium plastic, and clay.		S3	Shelby Tube					0.0	8.1	56.7	35.2
1		Clay (CH) - dark brown, moist, high plastic, some silt.	99	S4	Shelby Tube					0.1	2.6	18.9	78.4
		Silt (ML) - light brown, moist to damp, low plastic, some clay. - Note: sample S5 contaminated, not able to test.		S5	Shelby Tube								
		Clay (CH) - medium brown, moist, high plastic.		S6	Shelby Tube								
2		End of Test Hole - end of test hole at 2.0 m below grade. - no groundwater or sloughing encountered. - backfilled test hole with auger cuttings and topped with asphalt cold mix.	98										
3			97										

ENG-TECH Consulting Limited

Logged by: ERM

Reviewed by: *ERM*

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

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

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: UMA Engineering Ltd.

Project: City of Winnipeg 2007 Residential Street Renewal Program

Site: Windermere Avenue

Location: See Figure 4

Test Hole #: TH 3

File No: 06-027-05

Date Drilled: December 14, 2006

Grade Elevation: 100.0 m (local)

Water Elevation: - -

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 Asphalt (110 mm)	100												
		<i>Silty Clay Fill (CH)</i> - greyish, moist, high plastic, some sand, with silt. - below 0.4 m, some black pockets, trace silt inclusions, trace gravel.		S1											
				S2											
1		<i>Clay (CH)</i> - grey, moist, high plastic, occa. silt pocket, trace silt. - below 1.1 m, dark brown. - below 1.5 m, some silt, some oxide pockets.	99	S3											
				S4											
				S5											
				S6											
2		<i>End of Test Hole</i> - end of test hole at 2.0 m below grade. - no groundwater or sloughing encountered. - backfilled test hole with auger cuttings and topped with asphalt cold mix.	98												
3			97												

ENG-TECH Consulting Limited

Logged by: ERM

Reviewed by:

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

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

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: UMA Engineering Ltd.

Project: City of Winnipeg 2007 Residential Street Renewal Program

Site: Windermere Avenue

Location: See Figure 4

Test Hole #: TH 4

File No: 06-027-05

Date Drilled: December 14, 2006

Grade Elevation: 100.0 m (local)

Water Elevation: - -

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 Asphalt (130 mm)	100											
		Silty Clay Fill (CH) - dark brown, moist, medium to high plastic, occa. silt inclusions, some sand & gravel, with silt.		S1										
		Clay (CH) - dark brown, moist, high plastic, trace silt.		S2										
1			99	S3										
				S4										
		- below 1.5 m, medium brown, some silt, some silt inclusions. - below 1.7, grey.		S5										
2			98	S6										
		End of Test Hole - end of test hole at 2.0 m below grade. - no groundwater or sloughing encountered. - backfilled test hole with auger cuttings and topped with asphalt cold mix.												
3			97											

ENG-TECH Consulting Limited

Logged by: ERM

Reviewed by:

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

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

ENG-TECH CONSULTING LIMITED

GEOTECHNICAL • ENVIRONMENTAL • MATERIALS TESTING

Client: UMA Engineering Ltd.

Project: City of Winnipeg 2007 Residential Street Renewal Program

Site: Windermere Avenue

Location: See Figure 4

Test Hole #: TH 5

File No: 06-027-05

Date Drilled: December 14, 2006

Grade Elevation: 100.0 m (local)

Water Elevation: - -

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 Asphalt (137 mm)	100											
		Limestone (100 mm) - tan, damp, 12 mm size max.		S1										
		Silty Clay Fill (CH) - dark brown, moist, high plastic, some sand & gravel, with silt.		S2										
				S3										
1				99	S4									
					S5									
				S6										
2		End of Test Hole - end of test hole at 2.0 m below grade. - no groundwater or sloughing encountered. - backfilled test hole with auger cuttings and topped with asphalt cold mix.	98											
3			97											

ENG-TECH Consulting Limited

Logged by: ERM

Reviewed by:

Sample Type



Split Barrel



Shelby Tube



Auger Cuttings



Split Spoon

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



#6 - 854 Marion Street
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PARTICLE SIZE ANALYSIS REPORT

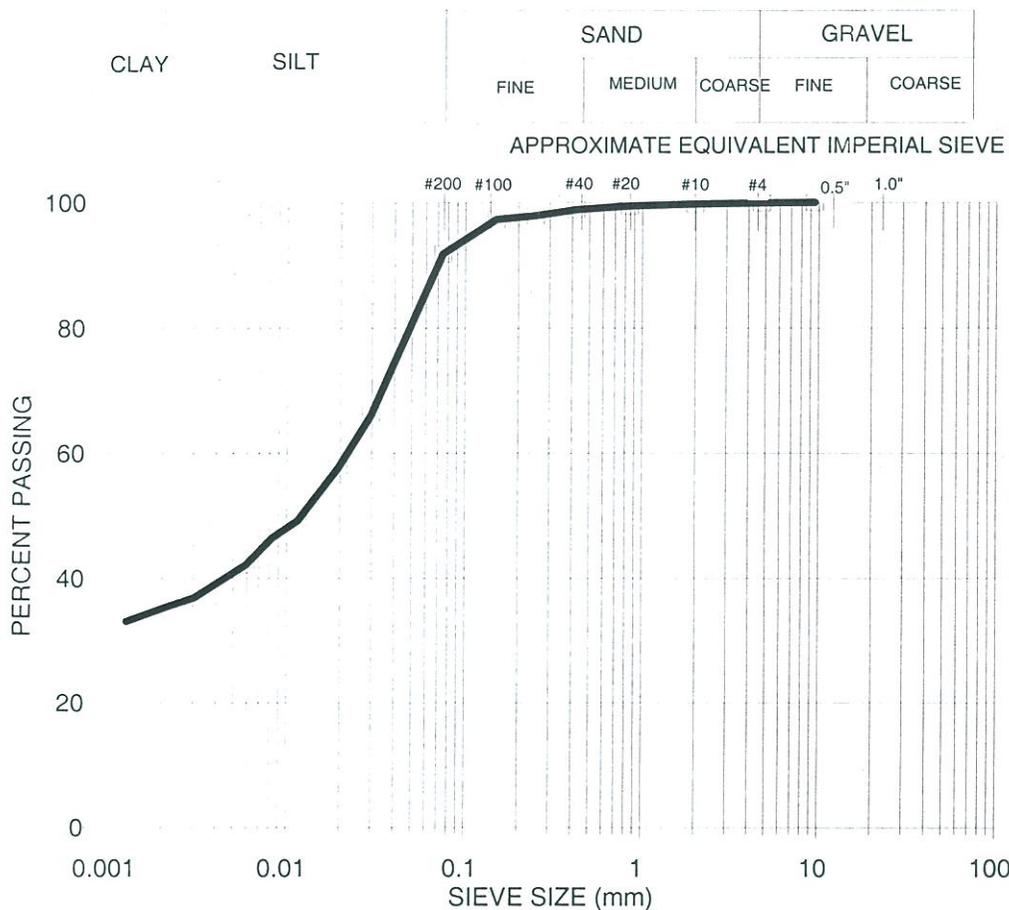
UMA Engineering Ltd.
 1479 Buffalo Place
 Winnipeg, Manitoba
 R3T 1L7

File No.: 06-027-05
Reference No.: 6-27-5-2

ATTENTION: Ron Bruce, P. Eng.

PROJECT: CITY OF WINNIPEG 2007 RESIDENTIAL STREET RENEWAL PROGRAM

Test Hole No. TH2	Sample No. S3	Depth: 0.9 m
Sampled By: ENG-TECH	Type of Sample: Bag	Source: Windermere Ave.
Date Sampled: December 14/06	Date Received: December 14/06	Date Tested: December 20/06



SIEVE SIZE (mm)	PERCENT PASSING
9.5000	100.0
4.7500	100.0
2.0000	99.8
0.8500	99.5
0.4250	98.9
0.2500	97.9
0.1500	97.4
0.0750	91.9
0.0296	66.0
0.0195	57.6
0.0116	49.2
0.0083	46.4
0.0059	42.2
0.0030	36.9
0.0022	35.5
0.0013	33.1

Percent of: GRAVEL (0.0%), SAND (8.1%), SILT (56.7%) and CLAY (35.2%)
 Sample Description: Clayey Silt

COMMENTS:

ENG-TECH Consulting Limited

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



#6 - 854 Marion Street
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**PARTICLE SIZE
 ANALYSIS REPORT**

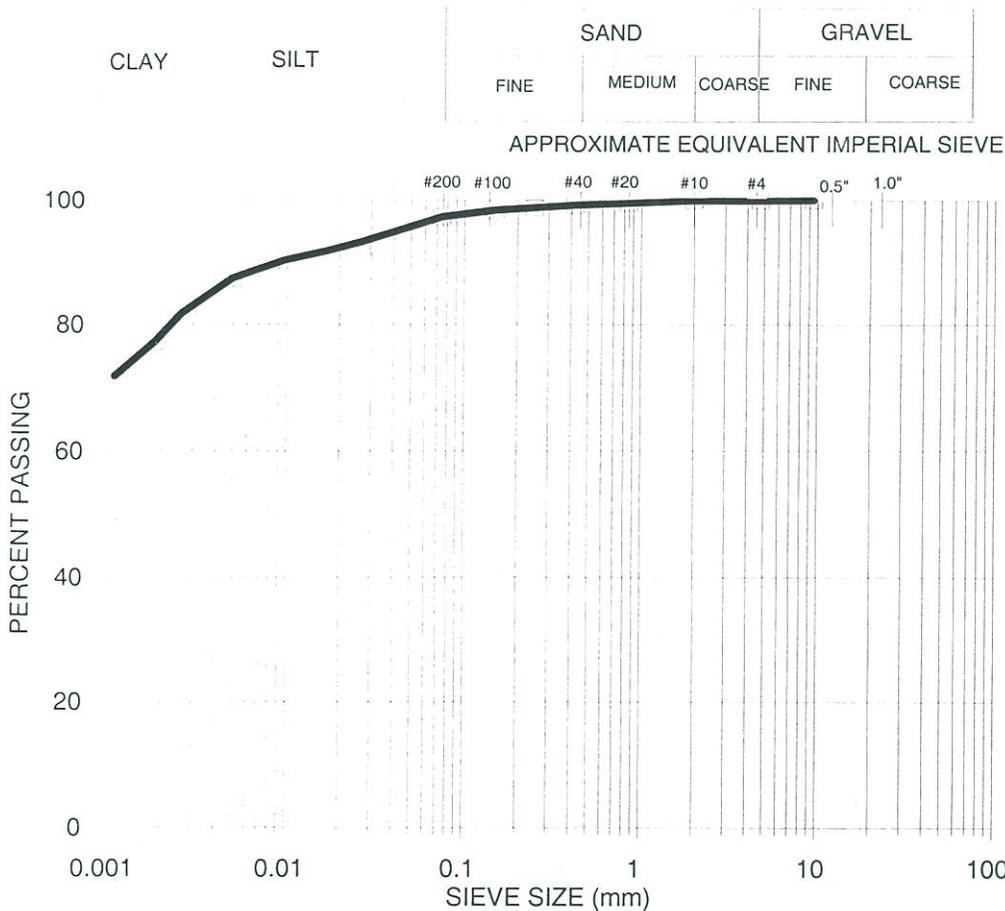
UMA Engineering Ltd.
 1479 Buffalo Place
 Winnipeg, Manitoba
 R3T 1L7

File No.: 06-027-05
Reference No.: 6-27-5-3

ATTENTION: Ron Bruce, P. Eng.

PROJECT: CITY OF WINNIPEG RESIDENTIAL 2007 STREET RENEWAL PROGRAM

Test Hole No. TH2 **Sample No.** S4 **Depth:** 1.2 m
Sampled By: ENG-TECH **Type of Sample:** Bag **Source:** Windermere Ave.
Date Sampled: December 14/06 **Date Received:** December 14/06 **Date Tested:** December 20/06

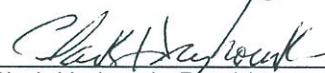


SIEVE SIZE (mm)	PERCENT PASSING
9.5000	100.0
4.7500	99.9
2.0000	99.9
0.8500	99.6
0.4250	99.2
0.2500	98.8
0.1500	98.4
0.0750	97.3
0.0264	93.2
0.0167	91.8
0.0098	90.3
0.0069	88.8
0.0050	87.3
0.0026	81.7
0.0018	77.3
0.0011	71.8

Percent of: GRAVEL (0.1%), SAND (2.6%), SILT (18.9%) and CLAY (78.4%)
 Sample Description: Clay

COMMENTS:

ENG-TECH Consulting Limited

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



Windermere Avenue



Windermere Avenue

