APPENDIX 'A'

GEOTECHNICAL REPORT

UMA | AECOM

City of Winnipeg
McGillivray Boulevard Widening
Geotechnical Investigation

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

UMA Project No: 0265 406 00 21 00 (4.4.2)

May, 2008

UMA | AECOM

UMA Engineering Ltd.
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May 23, 2008

UMA Project No.: 0265 406 00 (4.4.2)

Mr. Ron Bruce, P.Eng
UMA Engineering Ltd.
2 – 1600 Ness Avenue
Madison Square
Winnipeg, Manitoba
R3J 3W7

Dear Sir:

Re: McGillivray Boulevard Widening Field and Laboratory Investigation

UMA Engineering Ltd. (UMA) is pleased to present our report on the above referenced project. If you have any questions please do not hesitate to contact Nelson Ferreira or Ryan Belbas of our office.

Yours truly,

UMA Engineering Ltd.

Ron Typliski, P.Eng.
Regional Manager
Earth and Environmental
/dh

Disclaimer

The attached Report (the "Report") has been prepared by UMA Engineering Ltd. ("UMA") for the benefit of the City of Winnipeg ("Client") in accordance with the agreement between UMA and Client (the "Agreement") for the services described therein, and is subject to the budgetary, time and other constraints and limitations set forth therein.

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This Disclaimer is attached to and forms part of the Report.

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List of Appendices

1.0 Summary

This report summarizes the results of the subsurface investigation completed for the proposed McGillivray Boulevard Widening project between Waverley Street and Dunkley Street. The project consists of re-construction of the existing road and construction of a new north road embankment. Information regarding the concrete, asphalt, road base for the existing road embankment and the soil stratigraphy underneath the existing road and along the proposed north road embankment is provided.

2.0 Field Investigation and Laboratory Program

A total of 29 test holes were drilled. Nine of the test holes were drilled through the shoulder of the existing road embankment and twenty test holes were drilled along the proposed north embankment alignment. The original field program consisted of 22 test holes (TH-8-01 to TH08-22) with several optional test holes to be drilled if differing soil conditions were encountered. A total of 7 optional test holes (TH08-A, TH08-C to TH08-F, TH08-H and TH08-I) were drilled due to varying soil conditions, in particular at locations where a silt layer was present near ground surface. Since the shoulder test holes could not be drilled through the existing pavement due to traffic constraints, 8 pavement holes (PH08-01, PH08-03, PH08-05, PH08-10, PH08-15, PH08-17, PH08-19, PH08-21) were drilled near adjacent shoulder test holes to determine the condition and thickness of the road structure. The test hole and pavement hole locations are illustrated on Figures 01 to 08 and the associated logs are included in Appendix A.

The test holes were drilled to a depth between 2.3 m and 3.5 m by Paddock Drilling Ltd. using either a truck mounted CT-250 drill rig or a track mounted Yanmar C25R equipped with 150 mm diameter solid stem augers. The soils and subsurface conditions observed during drilling of the test holes were visually classified by Ryan Belbas, Geotechnical EIT of UMA. Other pertinent information such as groundwater and drilling conditions were recorded during drilling. Disturbed (auger cuttings) samples retrieved during the field investigation were transported to UMA's material testing laboratory for further testing.

The pavement holes were cored using a diamond core drill equipped with a 110 mm diameter core bit. The road base was drilled through the cored pavement using a Hilti hammer drill equipped with a 0.6 m long, 50mm diameter drill bit. Matt Lotecki of UMA supervised the coring of the road structure and drilling of the road base. Core samples and drill cuttings retrieved during the field investigation were transported to UMA's material testing laboratory for classification. The thickness of the road base could not determined at 5 of the 8 pavement hole locations as the base of the layer was beyond the reach of the drill bit used. In this regard, the maximum depth of the road base drilled is represented by a dashed line on the pavement hole logs at these locations. The photos of each core sample are included in Appendix B.

The laboratory testing program consisted of moisture content determination, Atterberg limits and hydrometer test. The laboratory information has been included on the test hole logs and a summary table of the laboratory testing results has been included in Appendix A.

Respectfully submitted,

UMA Engineering Ltd.

Ryan Belbas, B.Sc., EIT
Geotechnical Engineering
Earth and Environmental

Reviewed by:

Nelson Ferreira, M.Sc., P.Eng.
Geotechnical Engineer
Earth and Environmental

Figures

Test Hole Plan

B SIZE 11" x 17" (279.4mm x 431.8mm)

PLOT: 08/05/22 3:05:01 PM

ISS/REV: A
UMA FILE NAME: 0265-406-00_00-B-F001_RX.dwg Saved By: jviberg

N 5519954.772
E 628740.653
TH-08-01 (SHOULDER)

PAVEMENT HOLE (PH-08-01)
N 5519952.636
E 628742.122

TH-08-02
N 5520066.465
E 628916.134

McGILLIVRAY BV

DUNKLEY ST

SIGMA AV

POST ST

#2365

#2355

#2320

#2308

m
0 10 20

SCALE 1:1000

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Public Works Department-Transportation Engineering Division
McGillivray Blvd. Widening

McGillivray Boulevard-Testhole Locations
From 300mWest of Columbia Drive to Waverley Street
Figure - 1

B SIZE 11" x 17" (279.4mm x 431.8mm)

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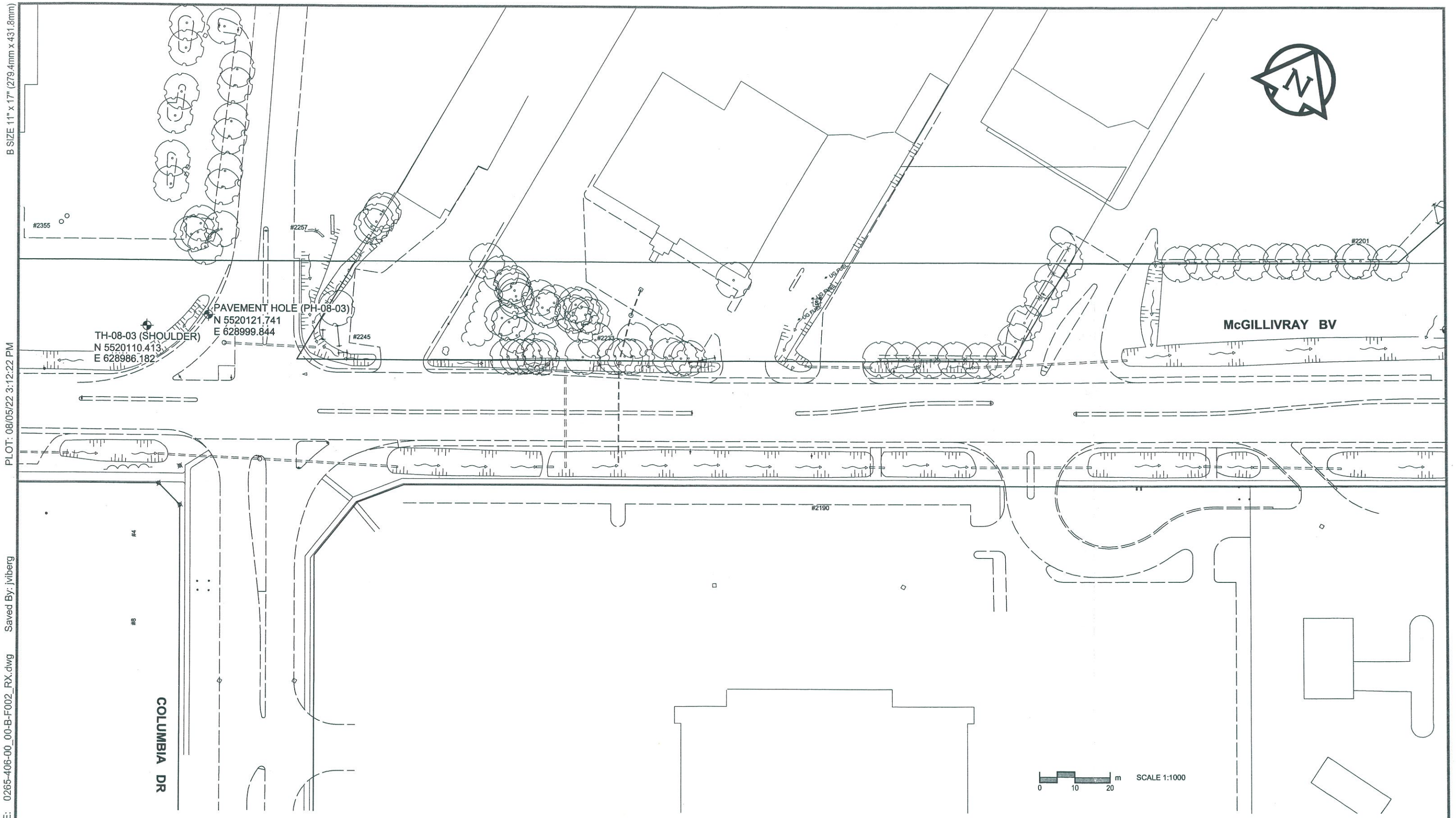

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McGillivray Blvd. Widening

McGillivray Boulevard-Testhole Locations
From 300mWest of Columbia Drive to Waverley Street

Figure - 2

B SIZE 11" x 17" (279.4mm x 431.8mm)

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0265-406-00_00-B-F003_RX.dwg

ISS/REV: A

UMA FILE NAME:

N 5520388.913
E 629368.985
TH-08-05 (SHOULDER)

PAVEMENT HOLE (PH-08-05)
N 5520387.296
E 629366.765

KENASTON BV

McGILLIVRAY BV

N 5520286.549
E 629305.516
TH-08-04

#2100

#1711

#1720

#2201

1650

1660

0 10 20 m SCALE 1:1000

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McGillivray Blvd. Widening

McGillivray Boulevard-Testhole Locations
From 300mWest of Columbia Drive to Waverley Street

Figure - 3

TH-08-06
N 5520401.764
E 629477.587

TH-08-07
N 5520397.086
E 629496.934

TH-08-08
N 5520501.075
E 629654.389

TH-08-A
N 5520494.677
E 629675.402

McGILLIVRAY BV

TH-08-09
N 5520548.686
E 629774.606

PAVEMENT HOLE (PH-08-10)
N 5520536.242
E 629803.510

TH-08-10 (SHOULDER)
N 5520526.847
E 629808.035

0 10 20 m SCALE 1:1000

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McGillivray Blvd. Widening

McGillivray Boulevard-Testhole Locations
From 300mWest of Columbia Drive to Waverley Street
Figure - 4

UMA | AECOM

B SIZE (11" x 17" (279.4mm x 431.8mm)

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UMA FILE NAME: 0265-406-00_00-B-F005_RX.dwg

LINDENWOOD DR W

HUNTINGDALE RD

McGILLIVARY BV

DOVERCOURT DR

TH-08-B
N 5520578.835
E 629799.982

TH-08-C
N 5520616.359
E 629897.830

TH-08-11
N 5520662.266
E 629984.633

TH-08-12
N 5520687.688
E 630004.117

TH-08-D
N 5520713.048
E 630075.924

N

0 10 20 m SCALE 1:1000

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McGillivray Blvd. Widening

McGillivray Boulevard-Testhole Locations
From 300mWest of Columbia Drive to Waverley Street

Figure - 5

B SIZE 11" x 17" (279.4mm x 431.8mm)

PLOT: 08/05/22 3:52:30 PM

WESTCHESTER DR

TH-08-14
N 5520812.758
E 630226.286

TH-08-13
N 5520757.878
E 630165.066

TH-08-E
N 5520810.824
E 630252.603

McGILLIVARY BV

TH-08-16
N 5520858.708
E 630336.698

N 5520908.218
E 630426.875
TH-08-H

N 5520764.875
E 630228.886
PAVEMENT HOLE (PH-08-15)

TH-08-F (SHOULDER)
N 5520822.622
E 630314.938

TH-08-15 (SHOULDER)
N 5520763.469
E 630230.315

LINDENRIDGE DR

POWDER RIDGE DR

PHANTOM RIDGE DR

0 10 20 m SCALE 1:1000

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UMA FILE NAME:

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McGillivray Blvd. Widening

McGillivray Boulevard-Testhole Locations
From 300mWest of Columbia Drive to Waverley Street

Figure - 6

B SIZE 11" x 17" (279.4mm x 431.8mm)

PLOT: 08/05/22 3:58:00 PM

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ISS/REV: A

UMA FILE NAME:

FOXMEADOW DR

McGILLIVARY BV

TH-08-20
N 5521008.756
E 630565.436

TH-08-18
N 5520952.802
E 630507.542

N 5520913.936
E 630479.361
TH-08-17 (SHOULDER)

PAVEMENT HOLE (PH-08-17)
N 5520911.549
E 630480.683

TH-08-I
N 5521003.757
E 630600.226

N 5521076.411
E 630682.198
TH-08-21 (SHOULDER)

PAVEMENT HOLE (PH-08-21)
N 5521071.265
E 630689.325

N 5520959.239
E 630575.690
PAVEMENT HOLE (PH-08-19)

TH-08-19 (SHOULDER)
N 5520956.737
E 630577.258

0 10 20 m SCALE 1:1000

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McGillivray Boulevard-Testhole Locations
From 300mWest of Columbia Drive to Waverley Street

Figure - 7

UMA | AECOM

B SIZE 11" x 17" (279.4mm x 431.8mm)

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0265-406-00_00-B-F008_RX.dwg

ISS/REV: A

UMA FILE NAME:

FOXMEADOW DR

McGILLIVRAY BV

TH-08-22
N 5521239.446
E 630791.621

WAVERLEY ST

m
0 10 20
SCALE 1:1000

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McGillivray Blvd. Widening

McGillivray Boulevard-Testhole Locations
From 300mWest of Columbia Drive to Waverley Street

Figure - 8

Appendix A
Test Hole Logs

UMA ENGINEERING LTD.

GENERAL STATEMENT

NORMAL VARIABILITY OF SUBSURFACE CONDITIONS

The scope of the investigation presented herein is limited to an investigation of the subsurface conditions as to suitability for the proposed project. This report has been prepared to aid in the evaluation of the site and to assist the engineer in the design of the facilities. Our description of the project represents our understanding of the significant aspects of the project relevant to the design and construction of earth work, foundations and similar. In the event of any changes in the basic design or location of the structures as outlined in this report or plan, we should be given the opportunity to review the changes and to modify or reaffirm in writing the conclusions and recommendations of this report.

The analysis and recommendations presented in this report are based on the data obtained from the borings and test pit excavations made at the locations indicated on the site plans and from other information discussed herein. This report is based on the assumption that the subsurface conditions everywhere are not significantly different from those disclosed by the borings and excavations. However, variations in soil conditions may exist between the excavations and, also, general ground water levels and conditions may fluctuate from time to time. The nature and extent of the variations may not become evident until construction. If subsurface conditions different from those encountered in the exploratory borings and excavations are observed or encountered during construction or appear to be present beneath or beyond excavations, we should be advised at once so that we can observe and review these conditions and reconsider our recommendations where necessary.

Since it is possible for conditions to vary from those assumed in the analysis and upon which our conclusions and recommendations are based, a contingency fund should be included in the construction budget to allow for the possibility of variations which may result in modification of the design and construction procedures.

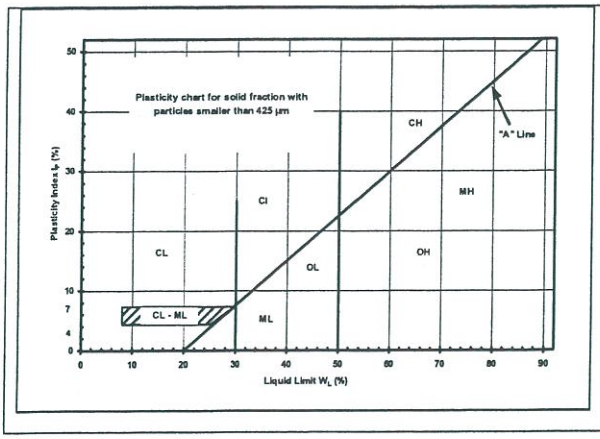
In order to observe compliance with the design concepts, specifications or recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated, we recommend that all construction operations dealing with earth work and the foundations be observed by an experienced soils engineer. We can be retained to provide these services for you during construction. In addition we can be retained to review the plans and specifications that have been prepared to check for substantial conformance with the conclusions and recommendations contained in our report.

EXPLANATION OF FIELD & LABORATORY TEST DATA

Description				UMA Log Symbols	USCS Classification	Laboratory Classification Criteria			
						Fines (%)	Grading	Plasticity	Notes
COARSE GRAINED SOILS	GRAVELS (More than 50% of coarse fraction of gravel size)	CLEAN GRAVELS (Little or no fines)	Well graded gravels, sandy gravels, with little or no fines		GW	0-5	$C_U > 4$ $1 < C_C < 3$		Dual symbols if 5-12% fines. Dual symbols if above "A" line and $4<W_P<7$ $C_U = \frac{D_{60}}{D_{10}}$ $C_C = \frac{(D_{30})^2}{D_{10} x D_{60}}$
			Poorly graded gravels, sandy gravels, with little or no fines		GP	0-5	Not satisfying GW requirements		
		DIRTY GRAVELS (With some fines)	Silty gravels, silty sandy gravels		GM	> 12		Atterberg limits below "A" line or $W_P<4$	
			Clayey gravels, clayey sandy gravels		GC	> 12		Atterberg limits above "A" line or $W_P<7$	
	SANDS (More than 50% of coarse fraction of sand size)	CLEAN SANDS (Little or no fines)	Well graded sands, gravelly sands, with little or no fines		SW	0-5	$C_U > 6$ $1 < C_C < 3$		
			Poorly graded sands, gravelly sands, with little or no fines		SP	0-5	Not satisfying SW requirements		
		DIRTY SANDS (With some fines)	Silty sands, sand-silt mixtures		SM	> 12		Atterberg limits below "A" line or $W_P<4$	
			Clayey sands, sand-clay mixtures		SC	> 12		Atterberg limits above "A" line or $W_P<7$	
FINE GRAINED SOILS	SILTS (Below 'A' line negligible organic content)	$W_L<50$	Inorganic silts, silty or clayey fine sands, with slight plasticity		ML			Classification is Based upon Plasticity Chart	
		$W_L>50$	Inorganic silts of high plasticity		MH				
	CLAYS (Above 'A' line negligible organic content)	$W_L<30$	Inorganic clays, silty clays, sandy clays of low plasticity, lean clays		CL				
		$30<W_L<50$	Inorganic clays and silty clays of medium plasticity		CI				
		$W_L>50$	Inorganic clays of high plasticity, fat clays		CH				
	ORGANIC SILTS & CLAYS (Below 'A' line)	$W_L<50$	Organic silts and organic silty clays of low plasticity		OL				
		$W_L>50$	Organic clays of high plasticity		OH				
HIGHLY ORGAINIC SOILS			Peat and other highly organic soils		Pt	Von Post Classification Limit		Strong colour or odour, and often fibrous texture	

	Asphalt		Till		
	Concrete		Bedrock (Undifferentiated)		UMA | AECOM
	Fill		Bedrock (Limestone)		

When the above classification terms are used in this report or test hole logs, the designated fractions may be visually estimated and not measured.



FRACTION		SEIVE SIZE (mm)		DEFINING RANGES OF PERCENTAGE BY WEIGHT OF MINOR COMPONENTS	
		Passing	Retained	Percent	Identifier
Gravel	Coarse	76	19	35-50	and
	Fine	19	4.75		
Sand	Coarse	4.75	2.00	20-35	"y" or "ey" *
	Medium	2.00	0.425		
	Fine	0.425	0.075	10-20	some
Silt (non-plastic) or Clay (plastic)		< 0.075 mm		1-10	trace

* for example: gravelly, sandy clayey, silty

Definition of Oversize Material

COBBLES: 76mm to 300mm diameter
BOULDERS: >300mm diameter

LEGEND OF SYMBOLS

Laboratory and field tests are identified as follows:

- q_u - undrained shear strength (kPa) derived from unconfined compression testing.
- T_v - undrained shear strength (kPa) measured using a torvane
- pp - undrained shear strength (kPa) measured using a pocket penetrometer.
- L_v - undrained shear strength (kPa) measured using a lab vane.
- F_v - undrained shear strength (kPa) measured using a field vane.
- γ - bulk unit weight (kN/m^3).
- SPT - Standard Penetration Test. Recorded as number of blows (N) from a 63.5 kg hammer dropped 0.76 m (free fall) which is required to drive a 51 mm O.D. Raymond type sampler 0.30 m into the soil.
- DPPT - Drive Point Pentrometer Test. Recorded as number of blows from a 63.5 kg hammer dropped 0.76 m (free fall) which is required to drive a 50 mm drive point 0.30 m into the soil.
- w - moisture content (W_L, W_P)

The undrained shear strength (Su) of a cohesive soil can be related to its consistency as follows:

Su (kPa)	CONSISTENCY
<12	very soft
12 – 25	soft
25 – 50	medium or firm
50 – 100	stiff
100 – 200	very stiff
200	hard

The resistance (N) of a non-cohesive soil can be related to compactness condition as follows

N – BLOWS/0.30 m	COMPACTNESS
0 - 4	very loose
4 - 10	loose
10 - 30	compact
30 - 50	dense
50	very dense

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Test hole No.	Testhole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Location		Moisture Content (%)	Hydrometer Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Start	End		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Plastic Limit	Liquid Limit	Plasticity Index
TH-08-01	N 5519954.772 E 628740.653					Sand and Gravel (Fill)	0	0.5	-							
						Clay (Fill)	1.5	2	4.8							
						Clay (Fill)	2.5	3	24.5							
						Clay (Fill)	3.5	4	20.6							
						Clay (Fill)	4.5	5	25.5							
						Clay	5.5	6	36.7							
						Clay	6.5	7	37.9							
TH-08-02	N 5520066.465 E 628916.134					Clay (Fill)	0.5	1	30.7							
						Clay (Fill)	1.5	2	33.6							
						Silt	2.5	3	30.1							
						Silt	3.5	4	27.0							
						Clay	4.5	5	38.6							
						Clay	5.5	6	40.6							
						Clay	6.5	7	41.3							
TH-08-03	N 5520110.413 E 628986.182					Sand and Gravel (Fill)	0.5	1	-							
						Clay (Fill)	2.5	3	31.4							
						Clay (Fill)	3.5	4	33.9	0	4.1	11.3	84.6	26.1	96.6	70.5
						Clay (Fill)	4.5	5	37.6							
						Clay (Fill)	5.5	6	37.1							
						Clay	6.5	7	45.1							
TH-08-04	N 5520286.549 E 629305.516					Topsoil	0	0.5	31.6							
						Clay (organic)	-	-	-							
						Silt	1.5	2	25.9							
						Silt	2.5	3	25.1							
						Clay	3.5	4	39.5							
						Clay	4.5	5	41.0	0	0.9	11.1	88.1	27.6	96.7	69.1
						Clay	5.5	6	42.9							
						Clay	6.5	7	44.5							
TH-08-05	N 5520388.913 E 629368.985					Sand and Gravel (Fill)	0	1	-							
						Clay and Silt (fill)	2.5	3	24.6							
						Clay and Silt (fill)	3.5	4	20.8							
						Clay and Silt (fill)	4.5	5	35.9							
						Clay	5.5	6	41.8							
						Clay	6.5	7	42.4							
TH-08-06	N 5520401.764 E 629477.587					Topsoil	0	0.5	22.9							
						Clay	1.5	2	27.4							
						Clay	2.5	3	29.3							
						Clay	3.5	4	30.7							
						Clay	4.5	5	36.6							
						Clay	5.5	6	43.7							
						Silt	6.5	7	45.6							
TH-08-07	N 5520397.086 E 629496.934					Topsoil	-	-	-							
						Clay (organic)	0.5	1	29.6							
						Clay (organic)	1.5	2	25.2							
						Silt	2.5	3	28.5							
						Clay	3.5	4	33.4							
						Clay	4.5	5	38.3							
						Clay	5.5	6	45.3							
						Clay	6.5	7	49.3							
TH-08-08	N 5520501.075 E 629654.389					Topsoil	0	0.5	30.4							
						Silt	1.5	2	23.5							
						Silt	2.5	3	24.2							
						Clay	3.5	4	34.4							
						Clay	4.5	5	36.0							
						Clay	5.5	6	40.0							
						Clay	6.5	7	43.1							
TH-08-09	N 5520548.686 E 629774.606					Topsoil	-	-	-							
						Clay (organic)	0.5	1	42.8							
						Clay	1.5	2	35.2							
						Clay	2.5	3	34.9							
						Clay	3.5	4	37.5	0	0.9	11.1	88.1	29.9	94.5	64.6
						Clay	4.5	5	39.6							
						Clay	5.5	6	43.8							
						Clay	6.5	7	42.0							
						Silt	-	-	-							
						Clay	8	8.5	50.0							
TH-08-10	N 5520526.847 E 629808.035					Sand and Gravel (Fill)	0.5	1	-							
						Clay (Fill)	2.5	3	38.1	0.2	2.7	15.7	81.4	24.1	103.4	79.4
						Clay (Fill)	3.5	4	35.0							
						Clay (Fill)	4.5	5	32.7							

City of Winnipeg
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Test hole No.	Testhole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Location		Moisture Content (%)	Hydrometer Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Start	End		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Plastic Limit	Liquid Limit	Plasticity Index
						Clay (Fill)	5.5	6	34.4							
						Clay	6.5	7	35.8							
TH-08-11	N 5520662.266 E 629984.633					Topsoil	-	-	-							
						Clay	0.5	1	29.9							
						Clay	1.5	2	21.6							
						Silt	2.5	3	27.8							
						Clay	3.5	4	36.0							
						Clay	4.5	5	39.5							
						Clay	5.5	6	41.7							
						Clay	6.5	7	42.5							
TH-08-12	N 5520687.688 E 630004.117					Topsoil	0	0.5	30.8							
						Clay	1.5	2	30.5							
						Silt	2.5	3	24.2							
						Clay	3.5	4	34.4							
						Clay	4.5	5	40.6							
						Clay	5.5	6	41.1							
						Clay	6.5	7	46.4							
TH-08-13	N 5520757.878 E 630165.066					Topsoil	0	0.5	29.3							
						Silt	1.5	2	30.9							
						Silt	2.5	3	31.7							
						Silt	3.5	4	25.6							
						Silt	4.5	5	23.3	0	10.7	75.7	13.5	16.6	22.2	5.5
						Silt	5.5	6	35.2							
						Silt	6.5	7	24.0							
						Clay	8	8.5	47.2							
TH-08-14	N 5520812.758 E 630226.286					Topsoil	0	0.5	25.4							
						Topsoil	1.5	2	20.3							
						Silt	2.5	3	22.9							
						Clay	3.5	4	36.0							
						Clay	4.5	5	34.3							
						Clay	5.5	6	42.1							
						Clay	6.5	7	47.6							
TH-08-15	N 5520763.469 E 630230.315					Sand and Gravel (Fill)	0	0.5	-							
						Clay (Fill)	2.5	3	27.0							
						Clay (Fill)	3.5	4	24.5							
						Clay	4.5	5	28.6							
						Clay	5.5	6	27.5							
						Clay	6.5	7	29.3							
TH-08-16	N 5520858.708 E 630336.698					Topsoil	0	0.5	25.1							
						Silt	-	-	-							
						Clay	1.5	2	29.4							
						Clay	2.5	3	28.6							
						Clay	3.5	4	39.2	0	0.9	14.5	84.6	28.1	100.2	72.2
						Clay	4.5	5	39.5							
						Clay	5.5	6	44.0							
						Silt	6.5	7	45.5							
TH-08-17	N 5520913.936 E 630479.361					Clay (Fill)	0	1	-							
						Clay (Fill)	1.5	2	38.5	0	14.8	40.9	44.3	24.1	78	53.9
						Clay (Fill)	2.5	3	30.3							
						Clay (Fill)	3.5	4	33.2							
						Clay (Fill)	4.5	5	34.5							
						Clay	5.5	6	28.6							
						Silt	6.5	7	38.7							
						Clay	7	7.5	-							
TH-08-18	N 5520952.802 E 630507.542					Topsoil	0	0.5	26.4							
						Clay	1.5	2	32.4							
						Clay	2.5	3	33.5							
						Clay	3.5	4	39.1							
						Silt	4.5	5	38.3							
						Clay	5.5	6	43.8							
						Clay	6.5	7	48.6							
TH-08-19	N 5520956.737 E 630577.258					Sand and Gravel (Fill)	0	0.5	-							
						Clay (Fill)	2.5	3	37.4							
						Clay (Fill)	3.5	4	34.3							
						Clay	4.5	5	33.9							
						Clay	5.5	6	34.7							
						Clay	6.5	7	39.0							
TH-08-20	N 5521008.756 E 630565.436					Topsoil	0	0.5	25.4							
						Clay	1.5	2	33.1							
						Clay	2.5	3	42.1							

City of Winnipeg
2008 Street Renwal Program - McGillivray Boulevard
Geotechnical Investigation

Test hole No.	Testhole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Location		Moisture Content (%)	Hydrometer Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Start	End		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Plastic Limit	Liquid Limit	Plasticity Index
						Clay	3.5	4	44.5							
						Clay	4.5	5	46.4							
						Clay	5.5	6	48.8							
						Clay	6.5	7	46.7							
TH-08-21	N 5521076.411 E 630682.198					Sand and Gravel (Fill)	0	0.5								
						Clay (Fill)	1.5	2	18.6							
						Clay (Fill)	2.5	3	35.0							
						Clay (Fill)	3.5	4	31.8							
						Clay	4.5	5	32.0							
						Clay	5.5	6	36.3							
						Clay	6.5	7	41.3							
TH-08-22	N 5521239.446 E 630791.621					Topsoil	0.5	1	29.4							
						Silt	1	1.5	25.1							
						Clay	2	2.5	40.0							
						Clay	3	3.5	43.4							
						Clay	4	4.5	46.9							
						Clay	5	5.5	50.6							
						Clay	6	6.5	51.4							
TH-08-A	N 5520494.677 E 629675.402					Topsoil	-	-	-							
						Clay	0.5	1	19.8							
						Clay	1.5	2	23.2							
						Silt	2.5	3	18.4							
						Clay	3.5	4	30.8							
						Clay	4.5	5	34.3							
						Clay	5.5	6	36.5							
						Clay	6.5	7	40.4							
TH-08-C	N 5520616.359 E 629897.830					Topsoil	-	-	-							
						Silt	0.5	1	28.8							
						Clay (organic)	1.5	2	30.5							
						Clay (organic)	2.5	3	28.9							
						Clay	3.5	4	31.5							
						Clay	4.5	5	39.2							
						Clay	5.5	6	43.3							
						Clay	6.5	7	43.8							
TH-08-D	N 5520713.048 E 630075.924					Topsoil	0	0.5	22.8							
						Silt	1.5	2	21.2							
						Silt	2.5	3	25.7							
						Clay	3.5	4	36.5							
						Clay	4.5	5	34.3							
						Clay	5.5	6	37.6							
						Silt	6.5	7	35.6							
						Clay	-	-	-							
TH-08-E	N 5520810.824 E 630252.603					Topsoil	0	0.5	18.0							
						Silt			22.3							
						Clay	1.5	2	22.3							
						Clay	2.5	3	28.6							
						Clay	3.5	4	38.4							
						Clay	4.5	5	38.6							
						Clay	5.5	6	42.3							
						Clay	6.5	7	38.0							
						Silt	-	-	-							
						Clay	8	8.5	49.1							
TH-08-F	N 5520822.622 E 630314.938					Sand and Gravel (Fill)	0.5	1	11.1							
						Clay (Fill)	1.5	2	39.5							
						Clay (Fill)	2.5	3	30.5							
						Clay (Fill)	3.5	4	22.7							
						Clay (Fill)	4.5	5	23.6							
						Silt	5.5	6	27.2							
						Clay	6.5	7	33.9							
TH-08-H	N 5520908.218 E 630426.875					Topsoil	0	0.5	29.5							
						Silt	1.5	2	22.1							
						Clay	2.5	3	31.8							
						Clay	3.5	4	39.9							
						Clay	4.5	5	40.9							
						Clay	5.5	6	44.0							
						Silt	6.5	7	38.7							
						Clay	-	-	-							
TH-08-I	N 5519954.772 E 628740.653					Topsoil										
						Clay	0.5	1	26.0							
						Silt	1.5	2	17.8							

City of Winnipeg
2008 Street Renwal Program - McGillivray Boulevard
Geotechnical Investigation

Test hole No.	Testhole Location	Pavement Surface		Pavement Structure Material		Subgrade Description	Sample Location		Moisture Content (%)	Hydrometer Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)		Start	End		Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Plastic Limit	Liquid Limit	Plasticity Index
						Silt	2.5	3	38.0							
						Clay	3.5	4	39.3							
						Clay	4.5	5	42.0							
						Clay	5.5	6	41.9							
						Clay	6.5	7	42.5							
PH-08-01	N 5519952.636 E 628742.122	Asphalt	75	Asphalt	75											
				Concrete	200											
				Sand and Gravel (Base)	75											
PH-08-03	N 5520121.741 E 628999.844	Asphalt	75	Asphalt	75											
				Crushed Limestone (Base)	530 (min.)											
PH-08-05	N 5520387.296 E 629366.765	Asphalt	115	Asphalt	115											
				Crushed Limestone (Base)	495 (min.)											
PH-08-10	N 5520536.242 E 629803.510	Concrete	190	Concrete	190											
				Asphalt	150											
				Sand and Gravel (Base)	270 (min.)											
PH-08-15	N 5520764.875 E 630228.886	Concrete	190	Concrete	190											
				Asphalt	75											
				Sand and Gravel (Base)	340 (min.)											
PH-08-17	N 5520911.549 E 630480.683	Concrete	175	Concrete	175											
				Asphalt	50											
				Sand and Gravel (Base)	130											
PH-08-19	N 5520959.239 E 630575.690	Concrete	215	Concrete	215											
				Asphalt	90											
				Sand and Gravel (Base)	305 (min.)											
PH-08-21	N 5521071.265 E 630689.325	Concrete	150	Concrete	150											
				Asphalt	75											
				Sand and Gravel (Base)	150											

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **TH-08-01**
LOCATION: N 5519954.772 E 628740.653		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: CT-250, 150mm SSA	ELEVATION (m): 233.98

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS: Becker / Dynamic Cone / SPT (Standard Pen Test) (Blows/300mm); Total Unit Wt (kN/m³); Plastic MC Liquid	COMMENTS	ELEVATION
0		SAND AND GRAVEL (Fill) - dark brown - dense, dry to moist - fine grained sand to coarse grained gravel - poorly graded, sub angular		G36				
		CLAY (Fill) - some silt, trace sand, trace gravel, trace organics - dark brown and black - frozen - high plasticity		G37				
		- trace sand below 0.8 m		G38				
1				G39				233
				G40				
		CLAY - some silt, trace sand - mottled brown and dark brown - frozen - high plasticity		G41				
2				G42				232
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. Seepage at 0.3 m from sand and gravel fill. 2. No sloughing. 3. Test hole backfilled with auger cuttings to 0.9 m and bentonite chips to ground surface.						
3								231

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 4/28/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-02**
LOCATION: N 5520066.465 E 628916.134		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 233.788

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ▨ NO RECOVERY ▮ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS / Total Unit Wt / Plastic MC Liquid	COMMENTS	ELEVATION
0		CLAY (Fill) - some silt, trace sand, trace gravel, trace organics - black - stiff, moist - high plasticity		G200				
				G201				
		SILT - some clay, trace sand - brown - soft, wet - low plasticity		G202				233
1				G203				
		CLAY - some silt, trace sand, trace silt inclusions (< 5 mm dia.) - mottled brown and dark brown - firm, moist - high plasticity		G204				
				G205				232
2				G206				
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.						231
3								

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m³)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100

UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **TH-08-03**
LOCATION: N 5520110.413 E 628986.182		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: CT-250, 150mm SSA	ELEVATION (m): 233.924

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	COMMENTS	ELEVATION
0		SAND AND GRAVEL (Fill) - dark brown, dense, dry to moist - fine grained sand to coarse grained gravel - poorly graded, sub angular					
		CLAY (Fill) - some silt, trace sand, trace organics, dark brown and black, frozen, high plasticity		G29			
				G30			
				G31			233
1				G32		GRAIN SIZE DISTRIBUTION: CLAY 84.6% SILT 11.3% SAND 4.1%	
				G33			
				G34			
		SILT - some clay, trace sand, trace organics - brown - soft, moist, low plasticity					232
2		CLAY - some silt, trace sand - mottled brown and dark brown - firm, moist - high plasticity		G35			
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.					
3							231

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m³)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 4/28/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-04**
LOCATION: N 5520286.549 E 629305.516		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 233.167

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m³)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	COMMENTS	ELEVATION
0		TOPSOIL		G193			
		CLAY (Organic) - silty, trace sand - black - stiff, moist - high plasticity					233
		SILT - some clay, trace sand - brown - soft, moist - low plasticity		G194			
				G195			
		CLAY - some silt, trace sand, trace silt inclusions (< 5 mm dia.) - dark brown - stiff, moist - high plasticity					
1				G196			232
				G197		GRAIN SIZE DISTRIBUTION: CLAY 88.1% SILT 11.1% SAND 0.9%	
		- firm below 1.4 m		G198			
2				G199			231
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with bentonite chips and auger cuttings.					
3							

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **TH-08-05**
LOCATION: N 5520388.913 E 629368.985		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: CT-250, 150mm SSA	ELEVATION (m): 233.304

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m³)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	COMMENTS	ELEVATION
0		SAND AND GRAVEL (Fill) - dark brown - dense, dry to moist - fine grained sand to coarse grained gravel - poorly graded, sub angular		G22			
		CLAY AND SILT (Fill) - trace sand, trace gravel, trace organics - brown and black - stiff, moist - intermediate to high plasticity		G23			233
				G24			
1				G25			
				G26			232
		CLAY - some silt, trace sand - brown - stiff, moist - high plasticity		G27			
2				G28			
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.					231
3							

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 4/28/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-06**
LOCATION: N 5520401.764 E 629477.587		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: CT-250, 150mm SSA	ELEVATION (m): 232.636

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS / Total Unit Wt / Plastic MC Liquid	COMMENTS	ELEVATION
0		TOPSOIL		G64				
		CLAY - some silt, trace sand, trace silt inclusions (< 5 mm dia.) - dark brown - stiff, moist - high plasticity - frozen from 0.6 to 1.4 m		G65				232
				G66				
1				G67				
		- firm below 1.4 m		G68				231
				G69				
2		SILT - some clay, trace sand - light brown - soft, moist, low plasticity		G70				
		CLAY - some silt, trace sand, trace silt inclusions (< 5 mm dia.) - dark brown - stiff, moist, high plasticity						
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.						230
3								

PENETRATION TESTS: ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100; ■ Total Unit Wt ■ (kN/m³) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100

UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-07**
LOCATION: N 5520397.086 E 629496.934		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 232.555

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ▮ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS	COMMENTS	ELEVATION
0		TOPSOIL						
		CLAY (Organic) - some silt, trace sand - black - stiff, moist - high plasticity		G186				
		- firm below 0.5 m		G187				232
		SILT - some clay, trace sand - brown - firm, moist - low plasticity		G188				
1		CLAY - some silt, trace sand, trace silt inclusions (< 5 mm dia.) - dark brown - firm, moist - high plasticity		G189				
				G190				231
		- soft below 1.8 m		G191				
2				G192				
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with bentonite chips and auger cuttings.						230
3								

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m³)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100

UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-08**
LOCATION: N 5520501.075 E 629654.389		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 232.908

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS / Total Unit Wt / Plastic MC Liquid	COMMENTS	ELEVATION
0		TOPSOIL		G172				
		SILT - some clay, trace sand - brown - soft, moist - low plasticity		G173				
				G174				232
1		CLAY - some silt, trace sand - mottled brown and dark brown - firm, moist - high plasticity		G175				
				G176				
				G177				231
2				G178				
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.						230
3								

PENETRATION TESTS: ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100; ■ Total Unit Wt ■ (kN/m³) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100

UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-09**
LOCATION: N 5520548.686 E 629774.606		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 233.042

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

PENETRATION TESTS: ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100 | ■ Total Unit Wt ■ (kN/m³) 16 17 18 19 20 21 | Plastic MC Liquid 20 40 60 80 100

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	COMMENTS	ELEVATION
0		TOPSOIL					233
		CLAY (Organic) - silty, trace sand, trace rootlets - black - firm, moist - Intermediate to high plasticity		G164			
		CLAY - some silt, trace sand, trace organics - dark brown - stiff, moist - high plasticity		G165			
				G166			
1		- firm below 1.1 m		G167		GRAIN SIZE DISTRIBUTION: CLAY 88.1% SILT 11.1% SAND 0.9%	232
				G168			
				G169			
2				G170			231
		SILT - some clay, trace sand - brown - soft, wet, low plasticity					
		CLAY - some silt, trace sand - dark brown - firm, moist - high plasticity		G171			
3							

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

UMA | AECOM

LOGGED BY: R. Belbas | COMPLETION DEPTH: 3.51 m
REVIEWED BY: N. Ferreira | COMPLETION DATE: 5/5/08
PROJECT ENGINEER: Nelson Ferreira

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-09**
LOCATION: N 5520548.686 E 629774.606		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 233.042

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100 ■ Total Unit Wt ■ (kN/m³) 16 17 18 19 20 21 Plastic MC Liquid 20 40 60 80 100	COMMENTS	ELEVATION
3								230
		END OF TEST HOLE AT 3.5 m IN CLAY Notes: 1. Seepage at 2.1 m from silt layer. 2. No sloughing. 3. Test hole backfilled with bentonite chips and auger cuttings.						
4								229
5								228
6								

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 3.51 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
PROJECT ENGINEER: Nelson Ferreira	Page 2 of 2

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **TH-08-10**
LOCATION: N 5520526.847 E 629808.035		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: CT-250, 150mm SSA	ELEVATION (m): 233.546

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ▨ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS / Total Unit Wt / Plastic MC Liquid	COMMENTS	ELEVATION
0		SAND AND GRAVEL (Fill) - dark brown - dense, moist - fine grained sand to coarse grained gravel - poorly graded, sub angular		G43				
		CLAY (Fill) - some silt, trace sand, trace gravel, trace organics - dark brown and black - firm, moist to 0.6 m, frozen below 0.6 m - high plasticity		G44				233
				G45		108.2	GRAIN SIZE DISTRIBUTION: CLAY 81.4% SILT 15.7% SAND 2.7% GRAVEL 0.2%	
1				G46				
				G47				232
				G48				
		CLAY - some silt, trace sand - brown - frozen to 2.0 m, stiff, moist below 2.0 m - high plasticity		G49				
2								
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.						231
3								

PENETRATION TESTS: ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100 ■ Total Unit Wt ■ (kN/m³) 16 17 18 19 20 21 Plastic MC Liquid 20 40 60 80 100

UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 4/28/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

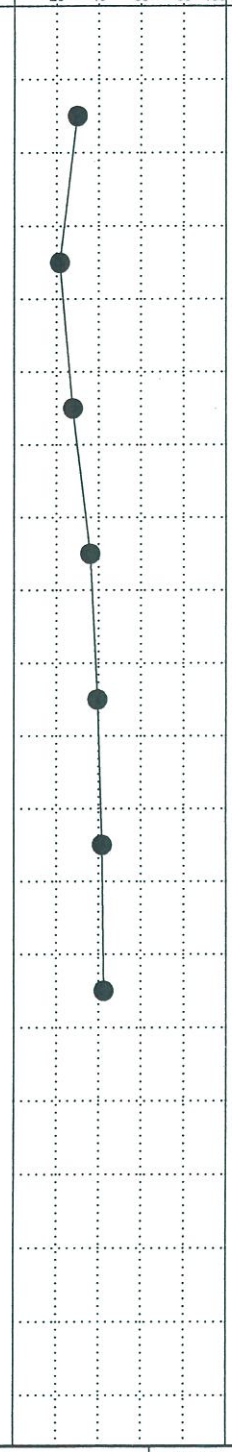
LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-11**
LOCATION: N 5520662.266 E 629984.633		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 233.006

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	COMMENTS	ELEVATION
0		TOPSOIL					
		CLAY - some silt, trace sand, trace gravel, trace organics - dark brown and black - stiff, moist - high plasticity		G150			
				G151			
		SILT - some clay, trace sand - brown - soft, moist - low plasticity - clayey and dark brown below 0.7 m		G152			
1		CLAY - some silt, trace sand, trace silt inclusions (< 5 mm dia.) - mottled brown and dark brown - firm, moist - high plasticity		G153			232
				G154			
				G155			
2		- soft below 2.1 m		G156			231
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.					
3							

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m³)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100



UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-12**
LOCATION: N 5520687.688 E 630004.117		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 233.095

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ▨ NO RECOVERY ▮ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS	COMMENTS	ELEVATION
0		TOPSOIL		G143				233
		CLAY - some silt, trace sand, trace silt inclusions (< 5 mm dia.) - mottled brown and dark brown - stiff, moist, - high plasticity		G144				
		SILT - some clay, trace sand - brown - soft, moist - low plasticity		G145				
1		CLAY - some silt, trace sand, trace silt inclusions (< 5 mm dia.), - mottled brown and dark brown - firm, moist, - high plasticity		G146				232
				G147				
				G148				
2				G149				231
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.						
3								

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m^3)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100

UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-13**
LOCATION: N 5520757.878 E 630165.066		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 232.635

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS / Total Unit Wt / Plastic MC Liquid	COMMENTS	ELEVATION
0		TOPSOIL (300 mm)		G128				
		SILT - some clay, some sand - brown - firm, moist - low plasticity		G129				232
				G130				
1		- soft below 0.9 m		G131				
				G132			GRAIN SIZE DISTRIBUTION: CLAY 13.5% SILT 75.7% SAND 10.7%	231
		- wet below 1.8 m		G133				
2				G134				
		CLAY - some silt, trace sand, trace silt inclusions (< 5 mm dia.) - dark brown - firm, moist - high plasticity		G135				230
3								

PENETRATION TESTS: ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100 ■ Total Unit Wt ■ (kN/m^3) 16 17 18 19 20 21 Plastic MC Liquid 20 40 60 80 100

UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 3.05 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 2

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-13**
LOCATION: N 5520757.878 E 630165.066		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 232.635

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS / Total Unit Wt / Plastic MC Liquid	COMMENTS	ELEVATION
3		END OF TEST HOLE AT 3.0 m IN CLAY Notes: 1. No seepage at 1.8 m from silt layer. 2. No sloughing. 3. Test hole backfilled with bentonite chips and auger cuttings.				✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100 ■ Total Unit Wt ■ (kN/m³) 16 17 18 19 20 21 Plastic MC Liquid 20 40 60 80 100		229
4								228
5								227
6								

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 3.05 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
PROJECT ENGINEER: Nelson Ferreira	Page 2 of 2

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-14**
LOCATION: N 5520812.758 E 630226.286		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 232.712

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS	COMMENTS	ELEVATION
0		TOPSOIL		G113				
				G114				
		SILT - some clay, trace sand - brown - soft, moist, low plasticity - wet below 0.8 m		G115				232
1		CLAY - some silt, trace sand, trace silt inclusions (< 10 mm dia.) - mottled brown and dark brown - stiff, moist - high plasticity		G116				
		- firm below 1.4 m		G117				
				G118				231
2				G119				
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.						230
3								

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m³)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100

UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **TH-08-15**
LOCATION: N 5520763.469 E 630230.315		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: CT-250, 150mm SSA	ELEVATION (m): 233.344

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS	COMMENTS	ELEVATION
0		SAND AND GRAVEL (Fill) - dark brown - dense, dry to moist - fine grained sand to coarse grained gravel - poorly graded, sub angular		G50				
		CLAY (Fill) - some silt, trace sand, trace gravel, trace organics - dark brown and black - firm, moist to 0.9 m, frozen below 0.9 m - high plasticity		G51				233
1				G52				
				G53				
		CLAY - some silt, trace sand - brown - frozen to 2.0 m, stiff, moist below 2.0 m - high plasticity		G54				232
2				G55				
				G56				
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.						231
3								

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m³)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100

UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 4/28/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-16**
LOCATION: N 5520858.708 E 630336.698		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 232.751

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS / COMMENTS	ELEVATION
0		TOPSOIL		G106			
		SILT - some clay, trace sand, trace gravel - brown, soft, moist - low plasticity					
		CLAY - some silt, trace sand - mottled brown and dark brown - firm, moist - high plasticity		G107			
				G108			232
1				G109		GRAIN SIZE DISTRIBUTION: CLAY 84.6% SILT 14.5% SAND 0.9%	
		- soft below 1.4 m		G110			
				G111			231
2		SILT - some clay, trace sand - brown (oxidized) - soft, moist, low plasticity		G112			
		CLAY - some silt, trace sand - mottled brown and dark brown - stiff, moist, high plasticity					
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.					230
3							

PENETRATION TESTS: ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100; ■ Total Unit Wt ■ (kN/m³) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **TH-08-17**
LOCATION: N 5520913.936 E 630479.361		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: CT-250, 150mm SSA	ELEVATION (m): 233.302

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	COMMENTS	ELEVATION
0		SAND AND GRAVEL (Fill) - dark brown - dense, moist - fine grained sand to coarse grained gravel - poorly graded, sub angular		G8			233
		CLAY AND SILT (Fill) - some sand, trace gravel, trace organics - dark brown and black - firm, moist to 0.6 m, frozen below 0.6 m - high plasticity		G9		GRAIN SIZE DISTRIBUTION: CLAY 44.3% SILT 40.9% SAND 14.8%	
1				G10			
				G11			232
				G12			
		CLAY - some silt, trace sand - brown - frozen - high plasticity		G13			
2		SILT - some clay, sandy - brown - soft, moist - low plasticity		G14			
		CLAY - some silt, trace sand - mottled brown and dark brown - stiff, moist, high plasticity					231
3		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.					

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m³)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100

UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 4/28/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-18**
LOCATION: N 5520952.802 E 630507.542		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 232.46

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS	COMMENTS	ELEVATION
0		TOPSOIL		G92				
		CLAY - some silt, trace sand, trace organics - dark brown and black - stiff, moist - high plasticity						232
				G93				
		- mottled brown and dark brown below 0.6 m						
				G94				
		- firm below 0.8 m						
1				G95				
		SILT - some clay, trace sand, trace gravel - brown - soft, moist to wet - low plasticity		G96				231
		CLAY - some silt, trace sand - mottled brown and dark brown - firm, moist - high plasticity		G97				
2				G98				
		- soft below 2.1 m						
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.						230
3								

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m³)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100

UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **TH-08-19**
LOCATION: N 5520956.737 E 630577.258		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: CT-250, 150mm SSA	ELEVATION (m): 233.864

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ▨ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS: ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100; ■ Total Unit Wt ■ (kN/m³) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100	COMMENTS	ELEVATION
0		SAND AND GRAVEL (Fill) - dark brown, dense, moist - fine grained sand to coarse grained gravel - poorly graded, sub angular		G57				
		CLAY (Fill) - some silt, trace sand, trace gravel, trace organics - dark brown and black - stiff, moist to 0.6 m, frozen below 0.6 m - high plasticity		G58				
				G59				233
1				G60				
		CLAY - some silt, trace sand - brown - frozen to 2.0 m, stiff, moist below 2.0 m - high plasticity		G61				
				G62				232
2				G63				
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.						231
3								

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 4/28/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-20**
LOCATION: N 5521008.756 E 630565.436		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 232.471

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS / Total Unit Wt (kN/m³) / Plastic MC Liquid	COMMENTS	ELEVATION
0		TOPSOIL	■	G78				
		CLAY - some silt, trace sand, trace silt inclusions (< 5 mm dia.), trace sulfide inclusions (< 5 mm dia.), trace organics - dark brown - stiff, moist - high plasticity						232
			■	G79				
		- firm below 0.6 m						
			■	G80				
		- soft below 0.8 m						
1			■	G81				
			■	G82				231
			■	G83				
2			■	G84				
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.						230
3								

PENETRATION TESTS: ✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100 — ■ Total Unit Wt ■ (kN/m³) 16 17 18 19 20 21 — Plastic MC Liquid 20 40 60 80 100

UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **TH-08-21**
LOCATION: N 5521076.411 E 630682.198		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: CT-250, 150mm SSA	ELEVATION (m): 233.688

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS	COMMENTS	ELEVATION
0		SAND AND GRAVEL (Fill) - trace to some silt - brown - dense, moist - fine grained sand to coarse grained gravel - poorly graded, sub angular		G1				
		CLAY (Fill) - some silt, trace sand, trace gravel, trace organics - dark brown and black - stiff, moist to 0.6 m, frozen below 0.6 m - high plasticity		G2				233
1				G3				
				G4				
		CLAY - some silt, trace sand - brown - frozen to 2.0 m, stiff, moist below 2.0 m - high plasticity		G5				232
				G6				
2				G7				
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.						231
3								

PENETRATION TESTS: ✳ Becker ✳ | ◇ Dynamic Cone ◇ | ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100 | ■ Total Unit Wt ■ (kN/m^3) 16 17 18 19 20 21 | Plastic MC Liquid 20 40 60 80 100

UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 4/28/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-22**
LOCATION: N 5521239.446 E 630791.621		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 232.23

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS: Becker / Dynamic Cone / SPT (Standard Pen Test) (Blows/300mm) 0 20 40 60 80 100; Total Unit Wt (kN/m³) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100	COMMENTS	ELEVATION
0		TOPSOIL		G71				
		SILT - some clay, trace sand - brown - soft, moist - low plasticity		G72				232
		CLAY - some silt, trace sand - mottled brown and dark brown - firm, moist - high plasticity		G73				
1				G74				
				G75				231
		- firm below 1.5 m		G76				
				G77				
2		- soft below 2.1 m						230
		END OF TEST HOLE AT 2.4 m IN CLAY Notes: 1. Seepage at 0.6 m from silt layer. 2. No sloughing. 3. Test hole backfilled with auger cuttings.						
3								

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.44 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-A**
LOCATION: N 5520494.677 E 629675.402		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 233.266

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS: Becker / Dynamic Cone / SPT (Standard Pen Test) (Blows/300mm) 0 20 40 60 80 100; Total Unit Wt (kN/m³) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100	COMMENTS	ELEVATION
0		TOPSOIL						
		CLAY (Organic) - some silt, trace sand - black - stiff, moist - high plasticity		G179				233
				G180				
		SILT - some clay, trace sand - brown - soft, moist - low plasticity		G181				
1		CLAY - some silt, trace sand, trace silt inclusions (< 20 mm dia.) - dark brown - stiff, moist - high plasticity		G182				232
		- firm below 1.4 m		G183				
				G184				
2				G185				231
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.						
3								

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-C**
LOCATION: N 5520616.359 E 629897.83		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 233.148

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ▨ NO RECOVERY ◧ CORE

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m³)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	COMMENTS	ELEVATION
0		TOPSOIL					
		SILT (Organic) - some clay, trace sand, trace gravel, black, soft, moist, low plasticity	■	G157			233
		CLAY (Organic) - some silt, trace sand, trace gravel - black - firm, moist - intermediate to high plasticity	■	G158			
			■	G159			
1		CLAY - some silt, trace sand - dark brown - stiff, moist - high plasticity 25 to 50 mm dia. brown silt lense below 1.1 m	■	G160			232
		25 to 50 mm dia. brown silt lense below 1.4 m	■	G161			
		- firm below 1.8 m	■	G162			
2			■	G163			231
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.					
3							

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-D**
LOCATION: N 5520713.048 E 630075.924		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 233.116

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS: Becker / Dynamic Cone / SPT (Standard Pen Test) (Blows/300mm) 0 20 40 60 80 100; Total Unit Wt (kN/m³) 16 17 18 19 20 21; Plastic MC Liquid 20 40 60 80 100	COMMENTS	ELEVATION
0		TOPSOIL		G136				233
		SILT - some clay, trace sand - brown - soft, moist - low plasticity		G137				
				G138				
1		CLAY - some silt, trace sand - mottled brown and dark brown - stiff, moist - high plasticity		G139				232
		- firm below 1.4 m		G140				
				G141				
2		SILT - brown - soft, moist, low plasticity		G142				231
		CLAY - some silt, trace sand - mottled brown and dark brown - stiff, moist, high plasticity						
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.						
3								

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-E**
LOCATION: N 5520810.824 E 630252.603		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 232.494

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS	COMMENTS	ELEVATION
0		TOPSOIL		G120				
		SILT - some clay, trace sand - brown - soft, moist - low plasticity						
		CLAY - some silt, trace sand - dark brown - stiff, moist - high plasticity		G121				232
		- firm below 0.8 m		G122				
1				G123				
				G124				231
				G125				
2				G126				
		SILT - some clay, trace sand - brown (oxidized) - soft, wet, low plasticity						
		CLAY - some silt, trace sand - dark brown - firm, moist - high plasticity		G127				230
3								

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m³)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 3.20 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 2

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-E**
LOCATION: N 5520810.824 E 630252.603		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 232.494

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS / Total Unit Wt / Plastic MC Liquid	COMMENTS	ELEVATION
3		END OF TEST HOLE AT 3.2 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.				✳ Becker ✳ ◇ Dynamic Cone ◇ ◆ SPT (Standard Pen Test) ◆ (Blows/300mm) 0 20 40 60 80 100 ■ Total Unit Wt ■ (kN/m³) 16 17 18 19 20 21 Plastic MC Liquid 20 40 60 80 100		229
4								228
5								227
6								

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 3.20 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
PROJECT ENGINEER: Nelson Ferreira	Page 2 of 2

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-F**
LOCATION: N 5520822.622 E 60314.938		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: CT-250, 150mm SSA	ELEVATION (m): 233.343

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	PENETRATION TESTS	COMMENTS	ELEVATION
0		SAND AND GRAVEL (Fill) - brown - loose to compact, moist - fine grained sand to coarse grained gravel - poorly graded		G15				233
		CLAY (Fill) - some silt, trace sand, trace gravel, trace organics - dark brown and black - firm to stiff, moist to 0.6 m, frozen below 0.6 m - high plasticity		G16				
1				G17				
				G18				232
				G19				
		SILT - some clay, trace sand - brown - soft, moist - low plasticity		G20				
2		CLAY - some silt, trace sand, trace silt inclusions (< 10 mm dia.) - mottled brown and dark brown - stiff, moist, - high plasticity		G21				
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.						231
3								

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m³)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100

UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 4/28/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

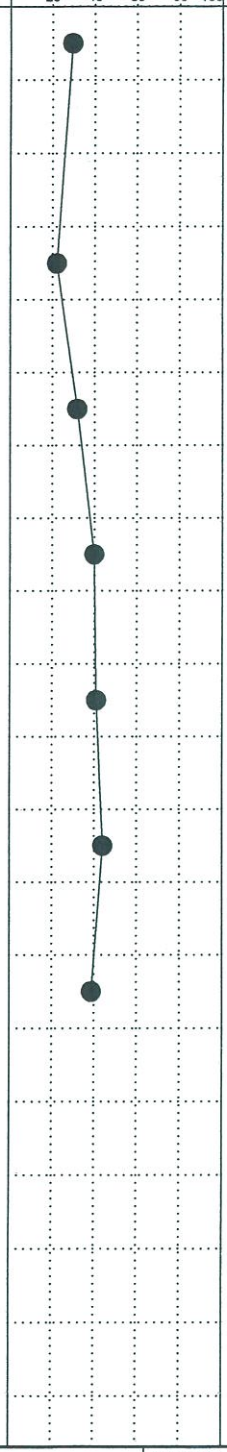
LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-H**
LOCATION: N 5520908.218 E 630426.875		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 232.603

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ▮ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	COMMENTS	ELEVATION
0		TOPSOIL		G99			
		SILT - some clay, trace sand - brown - soft, moist - low plasticity		G100			232
1		CLAY - some silt, trace sand - mottled brown and dark brown - stiff, moist - high plasticity		G101			
				G102			
		- firm below 1.4 m		G103			231
				G104			
2		SILT - some clay, trace sand - brown (oxidized) - soft, moist, low plasticity		G105			
		CLAY - some silt, trace sand - mottled brown and dark brown - stiff, moist, high plasticity					
3		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.					230

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m³)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100



UMA | AECOM	LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
	REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
	PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnpeg	TESTHOLE NO: **TH-08-I**
LOCATION: N 5521003.757 E 630600.226		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: YANMAR C25R, 150mm SSA	ELEVATION (m): 233.024

SAMPLE TYPE: GRAB | SHELBY TUBE | SPLIT SPOON | BULK | NO RECOVERY | CORE

PENETRATION TESTS
✳ Becker ✳
◇ Dynamic Cone ◇
◆ SPT (Standard Pen Test) ◆
(Blows/300mm)
0 20 40 60 80 100
■ Total Unit Wt ■
(kN/m^3)
16 17 18 19 20 21
Plastic MC Liquid
20 40 60 80 100

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE #	SPT (N)	COMMENTS	ELEVATION
0		TOPSOIL					233
		CLAY - some silt, trace sand, trace organics - dark brown - stiff, moist - high plasticity		G85			
		SILT - some clay, trace sand - brown - soft, moist - low plasticity		G86			
				G87			
1		CLAY - some silt, trace sand, trace silt inclusions (< 5 mm dia.), trace sulfide inclusions (< 5 mm dia.) - mottled brown and dark brown - stiff, moist - high plasticity		G88			232
		- firm below 1.4 m		G89			
				G90			
2				G91			231
		END OF TEST HOLE AT 2.3 m IN CLAY Notes: 1. No seepage or sloughing. 2. Test hole backfilled with auger cuttings.					
3							

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 2.29 m
REVIEWED BY: N. Ferreira	COMPLETION DATE: 5/5/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE THLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **PH-08-01**
LOCATION: N 5519952.636 E 628742.122		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: Diamond Core Drill and Hammer Drill	ELEVATION (m): 234.118

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ☰ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	COMMENTS	ELEVATION
0		ASPHALT (75 mm)		
		CONCRETE (200 mm)		234
		SAND AND GRAVEL (Base) - dark brown - dense, dry to moist - fine grained sand to coarse grained gravel - poorly graded, sub angular		
		CLAY (Fill)		
		END OF PAVEMENT HOLE AT 0.6 m IN CLAY FILL Notes: 1. Pavement hole cored with a diamond core drill equipped with a 110 mm core bit. Road base drilled with a 0.6 m long Hilti hammer drill equipped with a 50 mm drill bit. 2. Pavement hole cored and drilled 0.2 m from edge of pavement. 3. Core samples of asphalt and concrete obtained and transported to UMA's material testing laboratory. 4. Pavement hole backfilled with cold patch.		
1				

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 0.36 m
REVIEWED BY: Nelson Ferreira	COMPLETION DATE: 4/27/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE PHLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **PH-08-03**
LOCATION: N 5520121.741 E 628999.844		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: Diamond Core Drill and Hammer Drill	ELEVATION (m): 233.873

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	COMMENTS	ELEVATION
0		ASPHALT (75 mm)		
		CRUSHED LIMESTONE (Base) - some silt - light brown - dense, moist - fine grainded sand to coarse grained gravel - poorly graded, sub angular		
		END OF PAVEMENT HOLE AT 0.6 m IN CRUSHED LIMESTONE BASE Notes: 1. Pavement hole cored with a diamond core drill equipped with a 110 mm core bit. Road base drilled with a 0.6 m long Hilti hammer drill equipped with a 50 mm drill bit. 2. Pavement hole cored and drilled 1.0 m from edge of pavement. 3. Core samples of asphalt and concrete obtained and transported to UMA's material testing laboratory. 4. Pavement hole backfilled with cold patch.	Minimum road base depth 0.6 m	233
1				

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 0.61 m
REVIEWED BY: Nelson Ferreira	COMPLETION DATE: 4/27/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE PHLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **PH-08-05**
LOCATION: N 5520387.296 E 629366.765		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: Diamond Core Drill and Hammer Drill	ELEVATION (m): 233.455

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	COMMENTS	ELEVATION
0		ASPHALT (115 mm)		
		CRUSHED LIMESTONE (Base) - some silt - light brown - dense, moist - fine grainded sand to coarse grained gravel - poorly graded, sub angular		233
		END OF PAVEMENT HOLE AT 0.6 m IN CRUSHED LIMESTONE BASE Notes: 1. Pavement hole cored with a diamond core drill equipped with a 110 mm core bit. Road base drilled with a 0.6 m long Hilti hammer drill equipped with a 50 mm drill bit. 2. Asphalt and road base cored and drilled 0.4 m from edge of pavement. 3. Core samples of asphalt and concrete obtained and transported to UMA's material testing laboratory. 4. Pavement hole backfilled with cold patch.	Minimum road base depth 0.6 m	
1				

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 0.61 m
REVIEWED BY: Nelson Ferreira	COMPLETION DATE: 4/27/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE PHLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **PH-08-10**
LOCATION: N 5520536.242 E 629803.510		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: Diamond Core Drill and Hammer Drill	ELEVATION (m): 233.876

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	COMMENTS	ELEVATION
0		CONCRETE (190 mm)		
		ASPHALT (150 mm)		
		SAND AND GRAVEL (Base) - dark brown - dense, dry to moist - fine grained sand to coarse grained gravel - poorly graded, sub angular		
		END OF PAVEMENT HOLE AT 0.6 m IN SAND AND GRAVEL BASE Notes: 1. Pavement hole cored with a diamond core drill equipped with a 110 mm core bit. Road base drilled with a 0.6 m long Hilti hammer drill equipped with a 50 mm drill bit. 2. Concrete, asphalt and road base cored and drilled 0.2 m from edge of pavement. 3. Core samples of asphalt and concrete obtained and transported to UMA's material testing laboratory. 4. Pavement hole backfilled with cold patch.	Minimum road base depth 0.6 m	233
1				

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 0.61 m
REVIEWED BY: Nelson Ferreira	COMPLETION DATE: 4/27/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE PHLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **PH-08-15**
LOCATION: N 5520764.875 E 630228.886		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: Diamond Core Drill and Hammer Drill	ELEVATION (m): 233.592

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	COMMENTS	ELEVATION
0		CONCRETE (190 mm)		
		ASPHALT (75 mm)		
		SAND AND GRAVEL (Base) - dark brown - dense, dry to moist - fine grained sand to coarse grained gravel - poorly graded, sub angular		233
		END OF PAVEMENT HOLE AT 0.6 m IN SAND AND GRAVEL BASE Notes: 1. Pavement hole cored with a diamond core drill equipped with a 110 mm core bit. Road base drilled with a 0.6 m long Hilti hammer drill equipped with a 50 mm drill bit. 2. Concrete, asphalt and road base cored and drilled 0.30 m from edge of pavement. 3. Core samples of asphalt and concrete obtained and transported to UMA's material testing laboratory. 4. Pavement hole backfilled with cold patch.	Minimum road base depth 0.6 m	
1				

LOG OF TEST HOLE PHLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 0.61 m
REVIEWED BY: Nelson Ferreira	COMPLETION DATE: 4/27/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **PH-08-17**
LOCATION: N 5520911.549 E 630480.683		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: Diamond Core Drill and Hammer Drill	ELEVATION (m): 233.644

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	COMMENTS	ELEVATION
0		CONCRETE (175 mm)		
		ASPHALT (50 mm)		
		SAND AND GRAVEL (Base) - dark brown - dense, dry to moist - fine grained sand to coarse grained gravel - poorly graded, sub angular		
		CLAY (Fill)		
		END OF PAVEMENT HOLE AT 0.6 m IN CLAY FILL Notes: 1. Pavement hole cored with a diamond core drill equipped with a 110 mm core bit. Road base drilled with a 0.6 m long Hilti hammer drill equipped with a 50 mm drill bit. 2. Concrete, asphalt and road base cored and drilled 0.2 m from edge of pavement. 3. Core samples of asphalt and concrete obtained and transported to UMA's material testing laboratory. 4. Pavement hole backfilled with cold patch.		233
1				

LOG OF TEST HOLE PHLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 0.36 m
REVIEWED BY: Nelson Ferreira	COMPLETION DATE: 4/27/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **PH-08-19**
LOCATION: N 5520959.239 E 630575.690		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: Diamond Core Drill and Hammer Drill	ELEVATION (m): 233.933

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	COMMENTS	ELEVATION
0		CONCRETE (215 mm)		
		ASPHALT (90 mm)		
		SAND AND GRAVEL (Base) - dark brown - dense, dry to moist - fine grained sand to coarse grained gravel - poorly graded, sub angular		
		END OF PAVEMENT HOLE AT 0.6 m IN SAND AND GRAVEL BASE Notes: 1. Pavement hole cored with a diamond core drill equipped with a 110 mm core bit. Road base drilled with a 0.6 m long Hilti hammer drill equipped with a 50 mm drill bit. 2. Concrete, asphalt and road base cored and drilled 0.3 m from edge of pavement. 3. Core samples of asphalt and concrete obtained and transported to UMA's material testing laboratory. 4. Pavement hole backfilled with cold patch.	Minimum road base depth 0.6 m	233
1				

UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 0.61 m
REVIEWED BY: Nelson Ferreira	COMPLETION DATE: 4/27/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE PHLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

PROJECT: McGillivray Boulevard Widening	CLIENT: City of Winnipeg	TESTHOLE NO: **PH-08-21**
LOCATION: N 5521071.265 E 630689.325		PROJECT NO.: 0265-40600-2100
CONTRACTOR: Paddock Drilling Ltd.	METHOD: Diamond Core Drill and Hammer Drill	ELEVATION (m): 233.688

SAMPLE TYPE ■ GRAB ▥ SHELBY TUBE ☒ SPLIT SPOON ▤ BULK ⊘ NO RECOVERY ◧ CORE

DEPTH (m)	SOIL SYMBOL	SOIL DESCRIPTION	COMMENTS	ELEVATION
0		CONCRETE (150 mm)		
		ASPHALT (75 mm)		
		SAND AND GRAVEL (Base) - dark brown - dense, dry to moist - fine grained sand to coarse grained gravel - poorly graded, sub angular		
		CLAY (Fill)		
		END OF PAVEMENT HOLE AT 0.4 m IN CLAY FILL Notes: 1. Pavement hole cored with a diamond core drill equipped with a 110 mm core bit. Road base drilled with a 0.6 m long Hilti hammer drill equipped with a 50 mm drill bit. 2. Concrete, asphalt and road base cored and drilled 0.3 m from edge of pavement. 3. Core samples of asphalt and concrete obtained and transported to UMA's material testing laboratory. 4. Pavement hole backfilled with cold patch.		233
1				

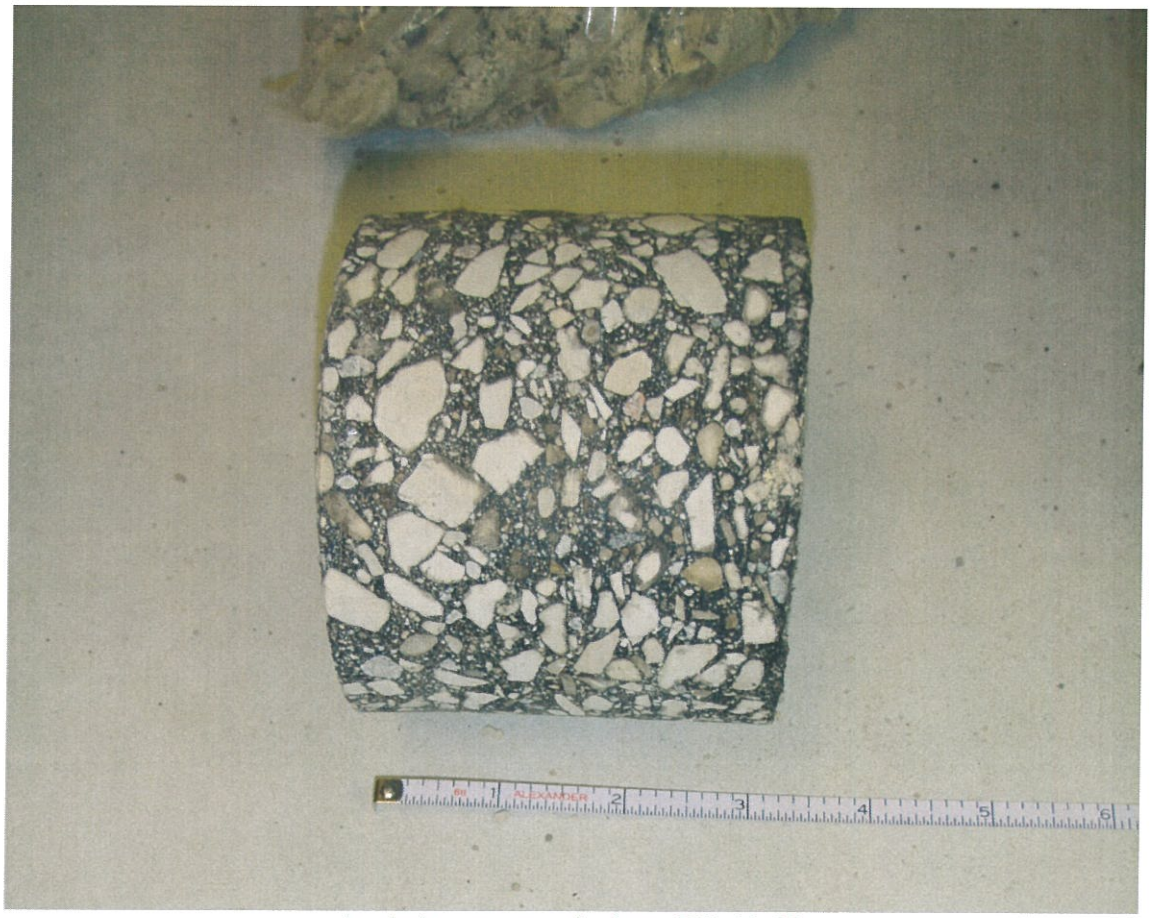
UMA | AECOM

LOGGED BY: R. Belbas	COMPLETION DEPTH: 0.38 m
REVIEWED BY: Nelson Ferreira	COMPLETION DATE: 4/27/08
PROJECT ENGINEER: Nelson Ferreira	Page 1 of 1

LOG OF TEST HOLE PHLOGS_MCGILLIVRAYBLVD.GPJ UMA WINN.GDT 5/22/08

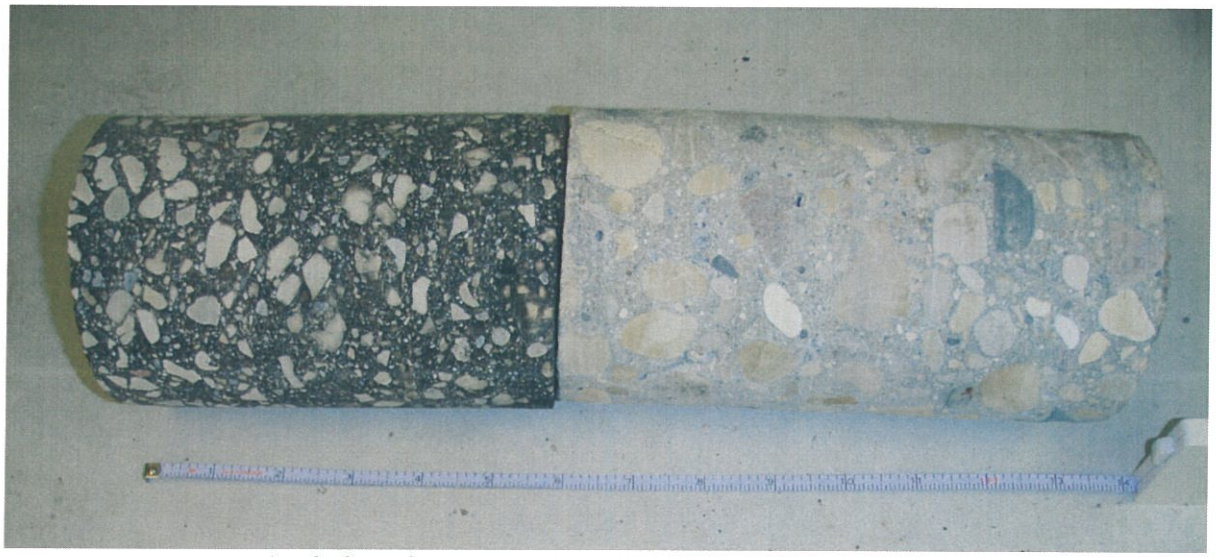
Appendix B
Photos of Core Samples

Asphalt and concrete core sample from PH-08-01

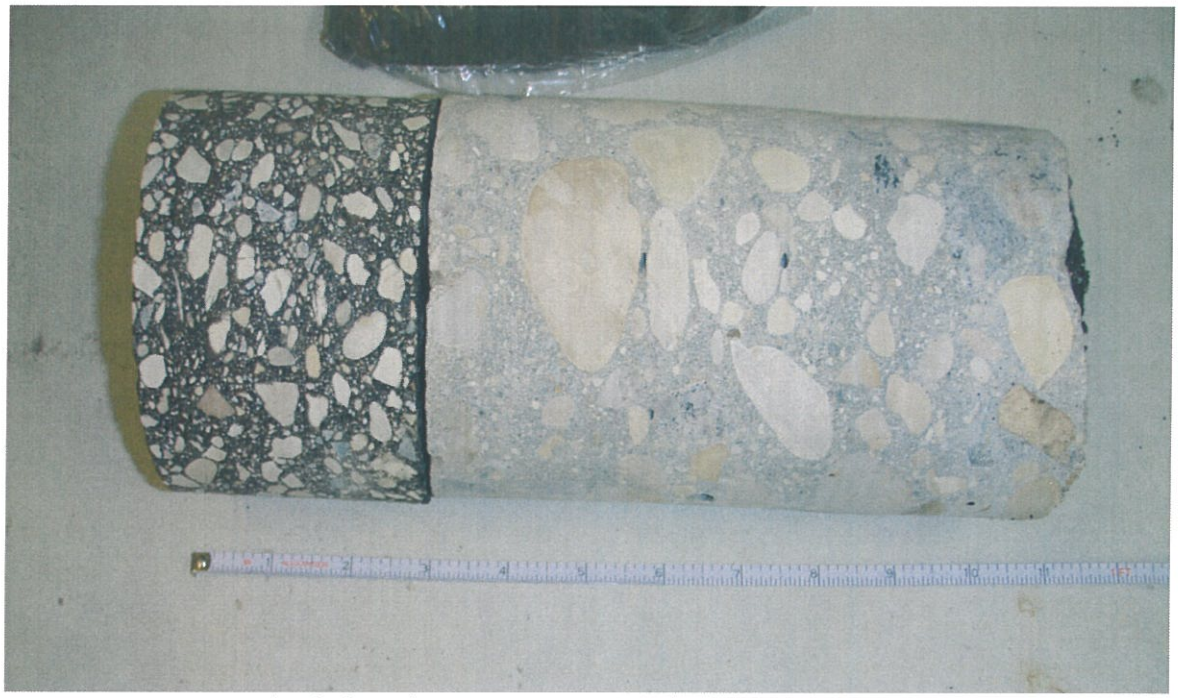


Asphalt core sample from PH-08-03

Asphalt core sample from PH-08-05



Asphalt and concrete core sample from PH-08-10



Asphalt and concrete core sample from PH-08-15

Asphalt and concrete core sample from PH-08-17

Asphalt and concrete core sample from PH-08-19

Asphalt and concrete core sample from PH-08-21