APPENDIX ‘A’

GEOTECHNICAL REPORT

APPENDIX 'A' - GEOTECHNICAL REPORT

GEOTECHNICAL REPORT FOR:

i) Day Street from Larche Avenue to Gunn Road

ii) Harbison Avenue West from Brazier Street to Roch Street

iii) Leslie Avenue from Glenwood Crescent to Silvia Street

iv) Martin Avenue West from Glenwood Crescent to Beatrice Street

v) Stanier Street from Dearborn Avenue to Gordon Avenue

The geotechnical report is provided to aid in the Contractor's evaluation of the existing pavement structure and/or soil conditions. The information presented is considered accurate at the locations shown on the Drawings and at the time of drilling. However, variations in pavement structure and/or soil conditions may exist between test holes and fluctuations in groundwater levels can be expected seasonally and may occur as a result of construction activities. The nature and extent of variations may not become evident until construction commences.

GEOTECHNICAL INVESTIGATION
RESIDENTIAL STREETS RECONSTRUCTION
WINNIPEG, MANITOBA

Submitted to:

City of Winnipeg
Engineering Technology Services
106 – 1155 Pacific Avenue
Winnipeg, Manitoba
R3E 3P1

Attention: Mr. Brent Kellet

Submitted by:

AMEC Earth & Environmental
A Division of AMEC Americas Limited
440 Dovercourt Drive
Winnipeg, Manitoba
R3Y 1N4

12 January 2009

AMEC File No. WX10364

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1.0 INTRODUCTION

AMEC Earth and Environmental, a division of AMEC Americas Limited (AMEC), were retained by the City of Winnipeg (COW) to conduct a geotechnical investigation for a proposed upgrading project for several streets in Winnipeg, Manitoba. The investigation was conducted on sections of five residential Winnipeg streets, as follows:

- Day Street: Larche Ave. W. to Gunn Rd.,
- Harbison Avenue West: Brazier St. to Roch St.,
- Leslie Avenue: Glenwood Cres. to Silva St.,
- Martin Avenue West Glenwood Cres. to Beatrice St., and
- Stanier Street: Dearborn Ave. to Gordon Ave.

The purpose of the investigation was to determine the pavement condition and soil profile at selected locations along the subject section of each street. The test hole locations were determined by the City of Winnipeg prior to the investigation.

2.0 SITE CONDITIONS

At the streets investigated, the roadway surface consisted of either asphalt or concrete. All asphalt was underlain by concrete pavement. At the time of the investigation, the roadways were snow and ice covered and therefore a detailed review of the pavement condition was not possible. Typical of roads in the Winnipeg area, the roads were generally flat lying and level, with local slopes between catch basins to facilitate drainage.

3.0 FIELD INVESTIGATON

Prior to coring and drilling, AMEC had public underground utilities located. On November 26 to 28, 2008, following utility clearances, all test hole locations were cored prior to auger drilling in order to determine the asphalt and concrete thicknesses. All coring was completed with a 150 mm diameter diamond coring rig. Each of the cores was photographed and photos are presented in Appendix B.

On 1 and 2 December 2008, a total of twenty one (21) test holes were drilled on the streets noted, using a truck mounted Acker MP5T drill rig operated by Paddock Drilling Ltd. of Winnipeg, and equipped with 125 mm continuous flight solid stem augers. The test hole locations are shown on Figures 1 to 5.

Test hole logging and subcontractor supervision was provided on a full time basis by Mr. Blair Power, CET of AMEC. Traffic control during the coring and drilling operation was provided by Guardian Traffic Services.

All soils observed during test hole drilling were visually classified on site according to the Modified Unified Soil Classification System and in accordance with the City of Winnipeg geotechnical guidelines. Groundwater and drilling conditions, as well as any pertinent

subsurface observations, were also recorded at the time of the investigation.

Disturbed soil samples were taken at regular intervals from the auger flights in each test hole. All soil samples obtained during the field investigation were labelled, sealed in plastic bags to limit moisture loss and transported to AMEC's Soils Laboratory in Winnipeg for further examination and testing. The test hole logs are presented in Appendix A, Figures 6 to 26, and show the soil profile, results of the field and laboratory testing, and comments relative to groundwater and sloughing conditions encountered.

Each test hole was backfilled with the auger cuttings and topped with asphalt cold patch at the completion of drilling, with excess cuttings removed from site.

4.0 LABORATORY TESTING

Soil samples were returned to AMEC's Soils Laboratory in Winnipeg for geotechnical laboratory testing. The soil samples were visually classified and tested for in-situ moisture contents, and selected samples were tested for Atterberg limits and Hydrometer analysis to confirm the field classification of soils.

5.0 SUBSURFACE CONDITIONS

The generalized stratigraphy, as noted in the test holes for each investigated street is summarized in the following sections. It should be noted that the gravel sizes noted are inferred, since drilling in freezing conditions tended to break the gravel into finer particles.

5.1 Day Street – Test Holes D1 to D4

Asphalt pavement was present at the surface at test hole D3 only and was 67 mm thick. Below the asphalt, and at the surface at the remaining test holes, concrete pavement was observed and varied from 137 to 178 mm thick.

Granular fill was present below the concrete pavement at every test hole (D1 to D4) and was about 130 to 280 mm thick. The gravel consisted of 20 mm granular fill and was frozen, sandy, poorly graded and moist.

A 305 mm thick layer of clay fill was present below the gravel fill in test holes D1 and D2 and was generally silty, medium to high plastic, moist, stiff to very stiff and contained trace amounts of sand.

Native medium to high plastic clay was encountered below the clay fill or gravel fill at each test hole and extended to the depths explored at test holes D1 and D2. The clay was silty, moist and stiff to very stiff. At test holes D3 and D4 a silt layer was present within the high plastic clay layer, and varied from 213 to 457 mm thick, with high plastic clay present below the silt and extending to the depth explored (2.1 m). The silt was clayey, low to medium plastic, moist and firm to stiff.

5.2 Harbison Avenue W. – Test Holes H1 to H7

Asphalt pavement was present at the ground surface at every test hole (H1 to H7) and was 19 to 48 mm thick. Concrete pavement was encountered below the asphalt and varied from 140 to 206 mm thick.

A clay fill layer, 122 to 719 mm thick (averaging about 400 mm thick), was encountered below the concrete in each test hole and was generally silty, medium to high plastic, moist and stiff to very stiff, and contained trace to some sand

At every test hole, high plastic clay was present underlying the clay fill and was silty, moist and stiff to very stiff,. The clay extended to the depths explored in test holes H1, H6 and H7.

Silt was noted below the clay to the depths explored (1.8 m) at test holes H2 to H5 and was low plastic, moist to very moist and firm to stiff, with trace to some clay.

5.3 Leslie Avenue – Test Holes L1 to L4

Concrete pavement was present at the ground surface at each test hole (L1 to L4) and was 137 to 159 mm thick. At test hole L3, the concrete was underlain by 320 mm of clay fill that was silty, medium plastic, moist, stiff and contained trace sand. At the remaining test holes and below the clay fill , medium to high plastic clay was encountered below the concrete or clay fill, extended to the depths explored and was silty, moist and stiff to very stiff.

5.4 Martin Avenue W. – Test Holes M1 to M3

Asphalt pavement, 13 to 25 mm thick, underlain by concrete pavement that was 130 to 159 mm thick, was present at each test hole (M1 to M3). Below the concrete, medium to high plastic clay was present throughout the remaining depths and was silty, moist and stiff to very stiff.

5.5 Stanier Avenue – Test Holes S1 to S3

Asphalt pavement was present at each test hole (S1 to S3) and was about 41 to 52 mm thick. The asphalt was underlain by concrete that was about 170 to 210 mm thick.

The concrete pavement was underlain by high plastic clay that was generally silty, moist and stiff to very stiff. The clay extended throughout the test hole depth at S2 At test holes S1 and S3 the clay was underlain by silt that extended to the depths explored (1.8 to 2.1 m). The silt was low to non-plastic, moist to very moist and soft to stiff, with trace to some clay.

The odd-numbered tables below, summarize the thickness and types of pavements and soils encountered at each of the test hole locations. Even numbered tables summarize selected lab test data. Detailed soil stratigraphy is illustrated in the attached test hole logs in Appendix A.

Table 1: Day Street Pavement and Soil Thickness (mm)

Test Hole No.	D1	D2	D3	D4
Asphalt	N/A	N/A	67	N/A
Concrete	178	177	137	171
Fill – Gravel	280	280	131	165
Fill – Clay	305	305	N/A	N/A
High Plastic Clay	1372	N/A	1189	823
Medium Plastic Clay	N/A	762	N/A	N/A
Silt	N/A	N/A	457	213
Clay	N/A	610	152	762

Table 2: Day Street Lab Test Results

Test Hole No.	Sample Depth (m)	Moisture Content (%)	Atterberg Limits				Hydrometer Analysis			
			Liquid Limit	Plastic Limit	Plasticity Index	MUSCS Classification	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
D1	0.9	36	76	21	55	CH (Clay)	0	5	29	66
D3	1.8	27	37	15	22	CI (Clayey Silt)	0	2	69	29

Table 3: Harbison Avenue W. Pavement and Soil Thickness (mm)

Test Hole No.	H1	H2	H3	H4	H5	H6	H7
Asphalt	36	19	29	24	29	30	48
Concrete	150	165	165	140	206	156	165
Fill – Clay	271	122	719	597	527	271	244
High Plastic Clay	1372	914	457	457	914	1372	1372
Silt	N/A	610	457	610	152	N/A	N/A

Table 4: Harbison Avenue Lab Test Results

Test Hole No.	Sample Depth (m)	Moisture Content (%)	Atterberg Limits				Hydrometer Analysis			
			Liquid Limit	Plastic Limit	Plasticity Index	MUSCS Classification	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
H2	1.5	23	28	25	3	ML (Silt)	0	4	72	24
H7	0.9	41	90	23	67	CH (Clay)	0	2	22	76

Table 5: Leslie Avenue Pavement and Soil Thickness (mm)

Test Hole No.	L1	L2	L3	L4
Concrete	159	137	137	140
Fill – Clay	N/A	N/A	320	N/A
Medium Plastic Clay	1670	1692	1372	1689

Table 6: Leslie Avenue Lab Test Results

Test Hole No.	Sample Depth (m)	Moisture Content (%)	Atterberg Limits				Hydrometer Analysis			
			Liquid Limit	Plastic Limit	Plasticity Index	MUSCS Classification	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
L1	0.6	26	48	22	26	CI (Clay)	0	18	47	35

Table 7: Martin Avenue W. Pavement and Soil Thickness (mm)

Test Hole No.	M1	M2	M3
Asphalt	13	25	25
Concrete	159	130	140
High Plastic Clay	1658	1676	1676

Table 8: Martin Avenue Lab Test Results

Test Hole No.	Sample Depth (m)	Moisture Content (%)	Atterberg Limits				Hydrometer Analysis			
			Liquid Limit	Plastic Limit	Plasticity Index	MUSCS Classification	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
M1	0.9	34	72	22	50	CH (Clay)	0	4	45	51

Table 9: Stanier Street Pavement and Soil Thickness (mm)

Test Hole No.	S1	S2	S3
Asphalt	41	58	52
Concrete	187	210	168
High Plastic Clay	1143	1865	1000
Silt	762	N/A	610

Table 10: Stanier Street Lab Test Results

Test Hole No.	Sample Depth (m)	Moisture Content (%)	Atterberg Limits				Hydrometer Analysis			
			Liquid Limit	Plastic Limit	Plasticity Index	MUSCS Classification	Gravel (%)	Sand (%)	Silt (%)	Clay (%)
S1	0.6	38	75	25	50	CH (Clay)	0	4	35	61
S3	1.5	22	--	--	Non-Plastic	ML	0	3	84	13

6.0 CLOSURE

The findings of this report were based on the results of field and laboratory investigations at test hole locations as selected by the City of Winnipeg.

The site investigation was conducted for the sole purpose of profiling the pavement and subsurface conditions. Although no environmental issues were identified during the fieldwork, this does not indicate that no such issues exist. If the owner or other parties have any concern regarding the presence of environmental issues, then an appropriate level environmental assessment should be conducted.

Soil conditions, by their nature, can be highly variable across a site. The placement of fill and prior construction activities on a site can contribute to the variability especially near surface soil conditions. A contingency should always be included in any construction budget to allow for the possibility of variation in soil conditions, which may result in modification of any potential design and construction procedures which may arise from this factual investigative report.

This report was prepared exclusively for the City of Winnipeg, and their agents for the proposed development as described in the report. The data provided herein are presented in a factual manner only with no engineering interpretation provided, and should not be used for any other purpose, or by any other parties, without review and advice from a qualified geotechnical engineer. No other warranty, expressed or implied, is given.

Yours truly,

AMEC Earth & Environmental

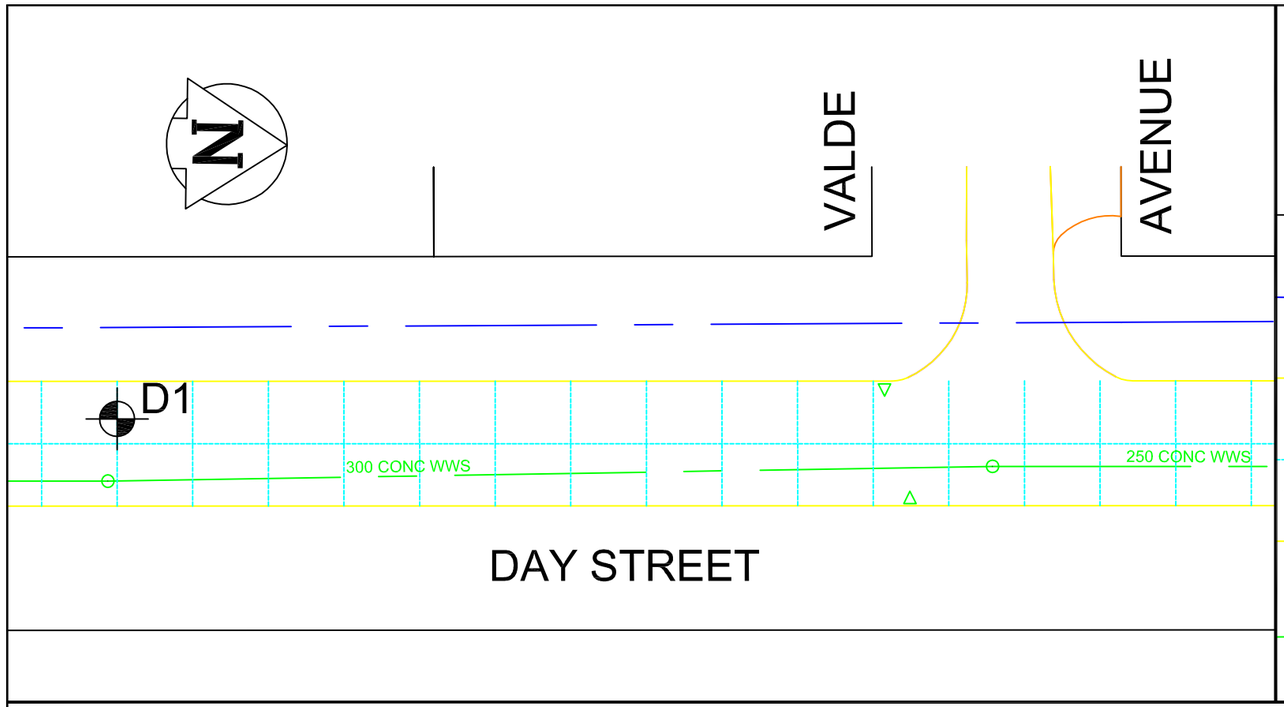
Robert Brown , P. Eng.
Geotechnical Engineer

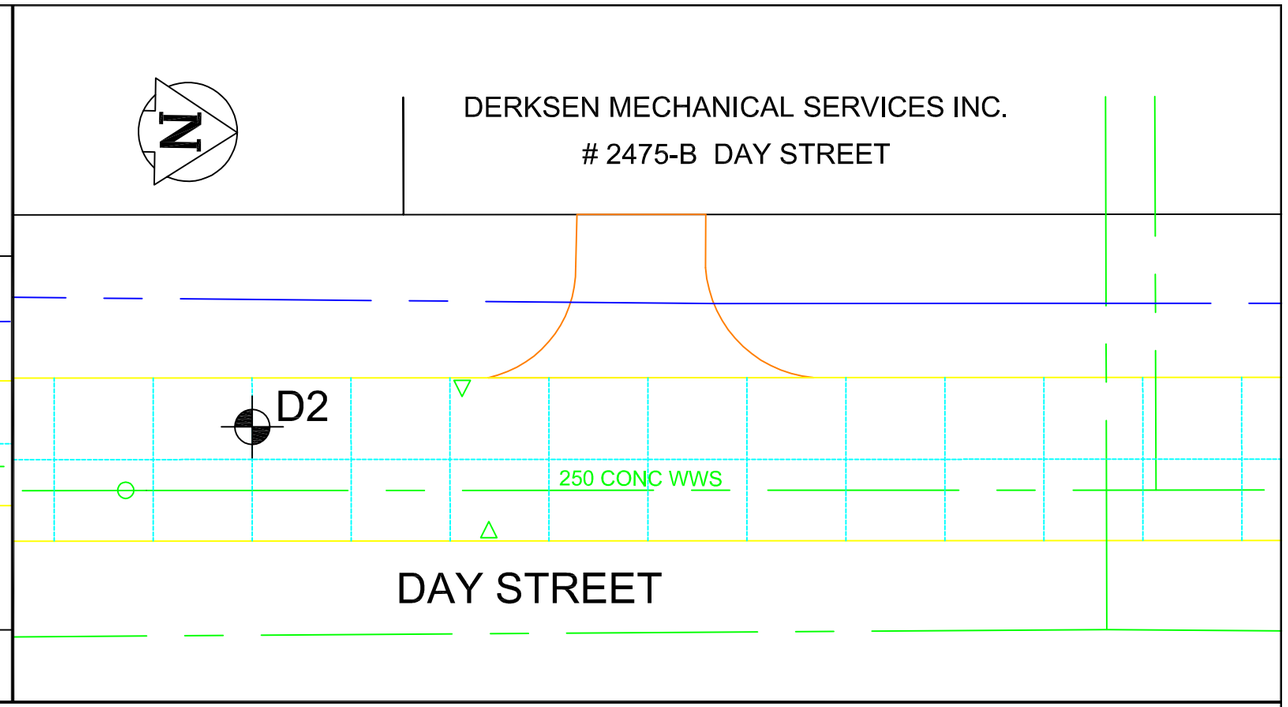
Reviewed By:

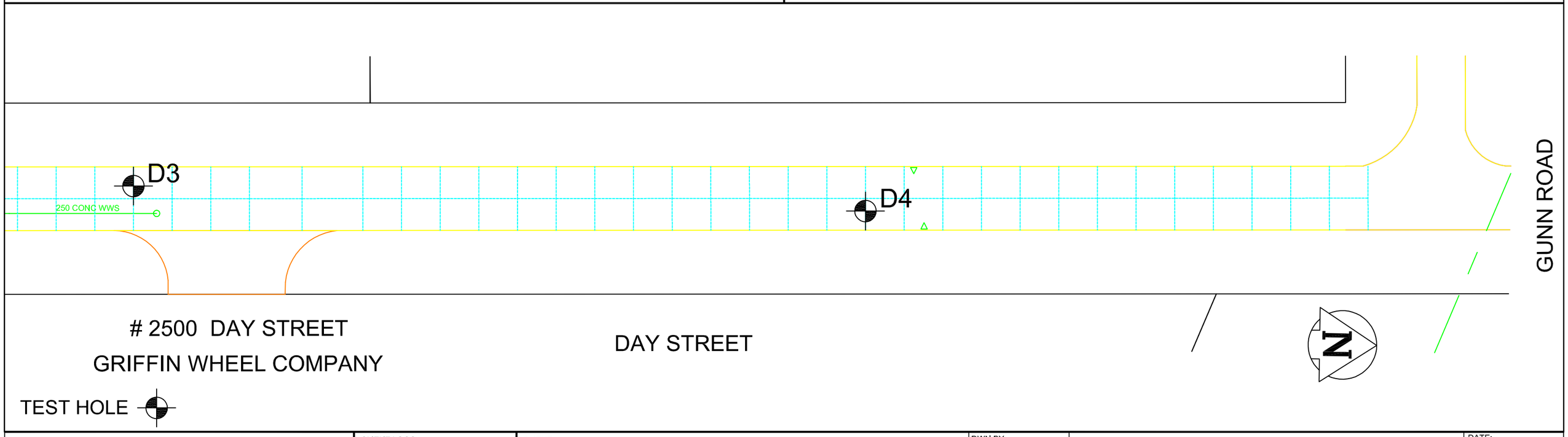
Trevor Gluck, P. Eng.
Staff Geotechnical Engineer

FIGURES 1 to 5

TEST HOLE LOCATION PLANS







NOTE: THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH AMEC EARTH & ENVIRONMENTAL REPORT No. 10364.

CLIENT LOGO

Winnipeg

CLIENT:

CITY OF WINNIPEG

ENGINEERING TECHNOLOGY SERVICES

AMEC Earth & Environmental
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amec

DWN BY:	MD
CHK'D BY:	TG
DATUM:	NA
PROJECTION:	NA
SCALE:	NTS

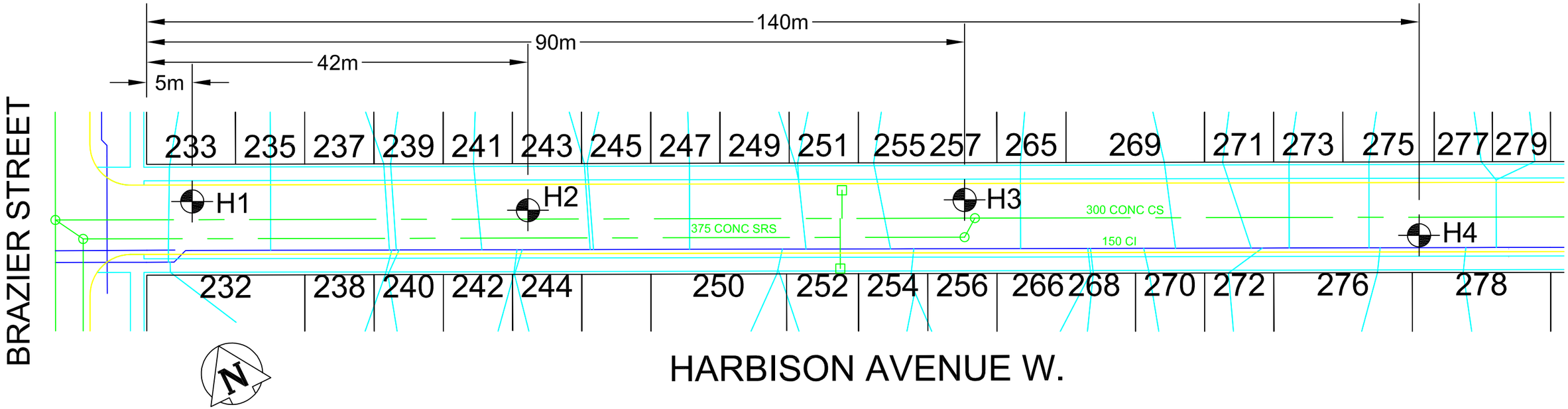
PROJECT

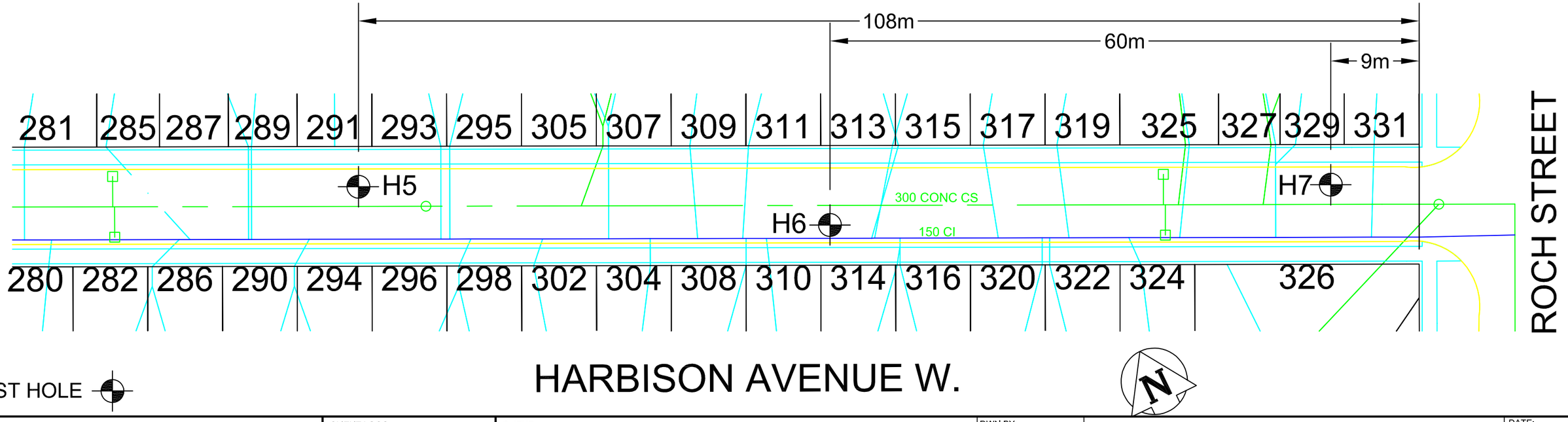
2009 RESIDENTIAL STREET RENEWALS

TITLE

TESTHOLE LOCATION PLAN
DAY STREET RECONSTRUCTION
LARCHE AVENUE W. TO GUNN ROAD

DATE:	DEC. 2008
PROJECT NO:	WX10364
REV. NO.:	A
FIGURE No.	FIGURE 1





TEST HOLE

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CHK'D BY:	TG
DATUM:	NA
PROJECTION:	NA
SCALE:	NTS

PROJECT
2009 RESIDENTIAL STREET RENEWALS

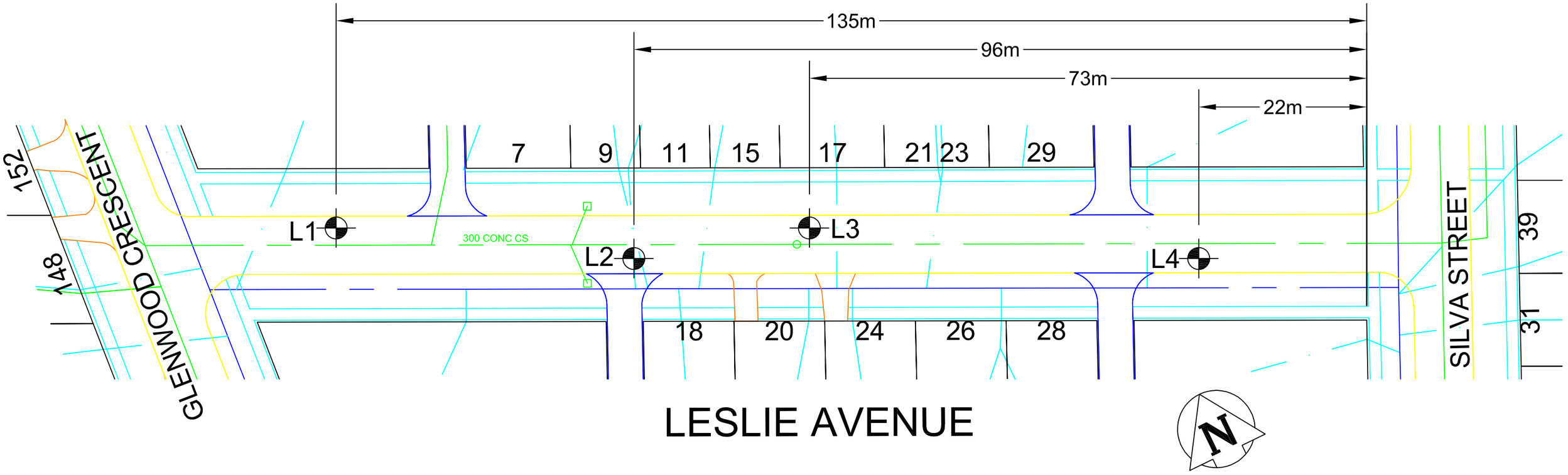
DATE: DEC. 2008

PROJECT NO: WX10364

TITLE
TESTHOLE LOCATION PLAN
HARBISON AVENUE WEST RECONSTRUCTION
BRAZIER STREET TO ROCH STREET

REV. NO.: A

FIGURE No. FIGURE 2



TEST HOLE

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amec

DWN BY:	MD
CHK'D BY:	TG
DATUM:	NA
PROJECTION:	NA
SCALE:	NTS

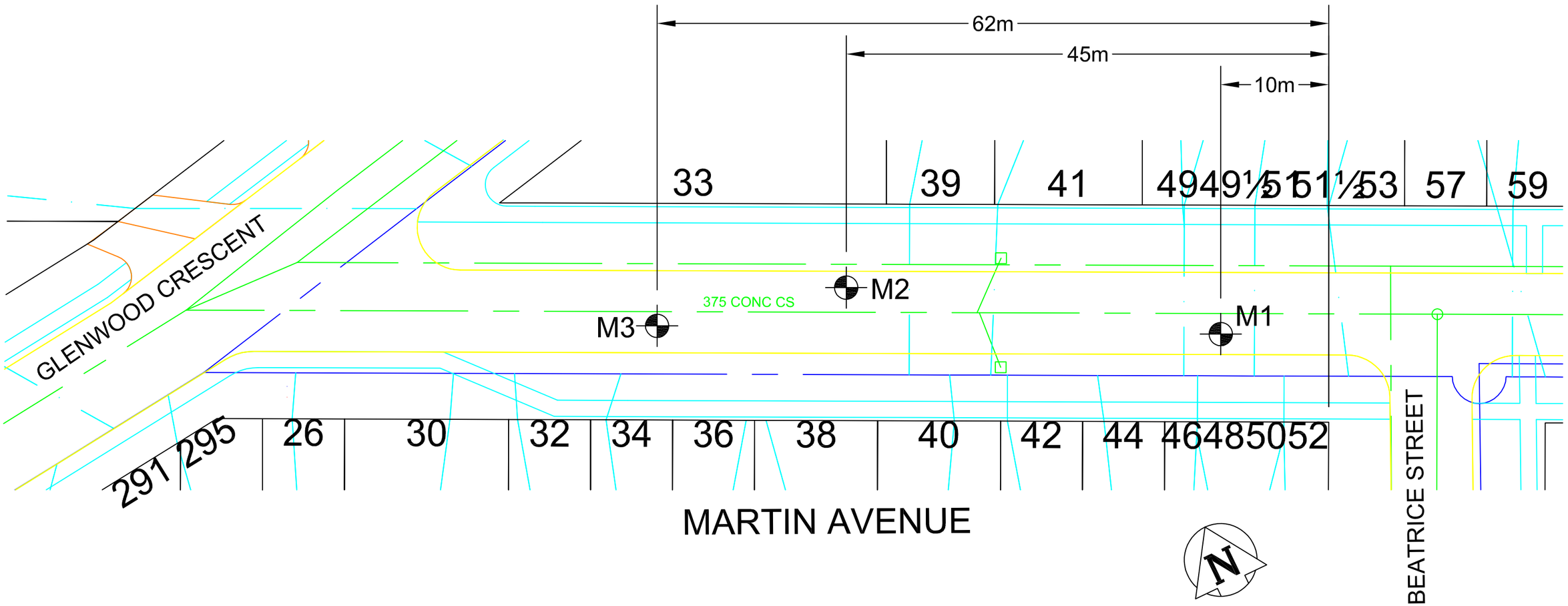
PROJECT

2009 RESIDENTIAL STREET RENEWALS

TITLE

TESTHOLE LOCATION PLAN
LESLIE AVENUE RECONSTRUCTION
GLENWOOD CRES. TO SILVA ST.

DATE:	DEC. 2008
PROJECT NO:	WX10364
REV. NO.:	A
FIGURE No.	FIGURE 3



TEST HOLE

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amec

DWN BY:	MD
CHK'D BY:	TG
DATUM:	NA
PROJECTION:	NA
SCALE:	NTS

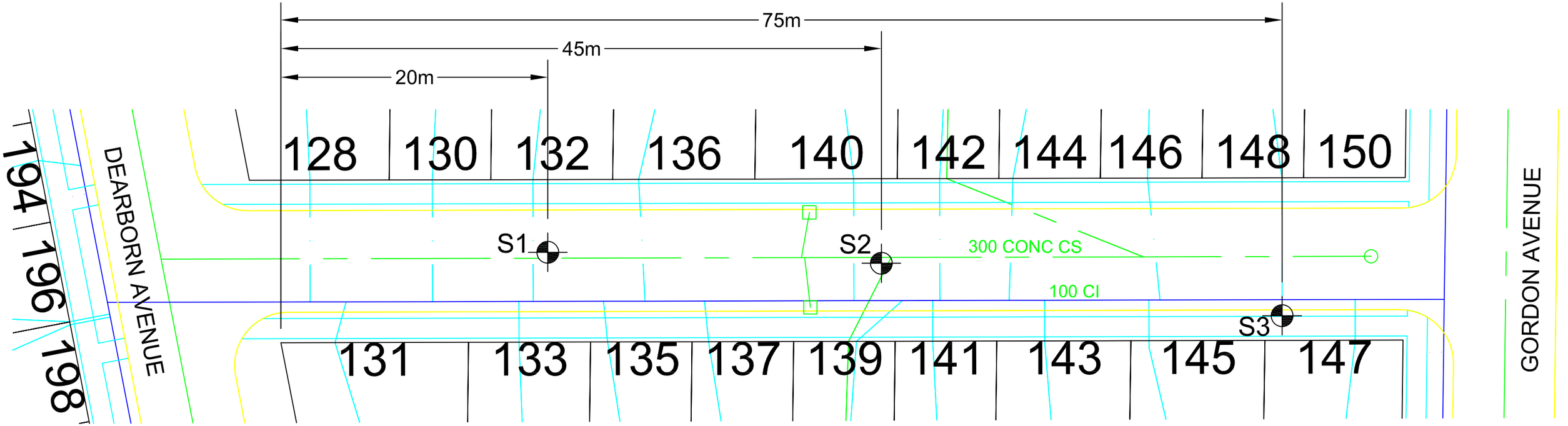
PROJECT

2009 RESIDENTIAL STREET RENEWALS

TITLE

TESTHOLE LOCATION PLAN
MARTIN AVENUE WEST RECONSTRUCTION
GLENWOOD CRESCENT TO BEATRICE ST

DATE:	DEC. 2008
PROJECT NO:	WX10364
REV. NO.:	A
FIGURE No.	FIGURE 4



STANIER STREET

N

TEST HOLE

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amec

DWN BY:	MD
CHK'D BY:	TG
DATUM:	NA
PROJECTION:	NA
SCALE:	NTS

PROJECT

2009 RESIDENTIAL STREET RENEWALS

TITLE

TESTHOLE LOCATION PLAN
STANIER STREET RECONSTRUCTION
DEARBORN AVENUE TO GORDON AVENUE

DATE:	DEC. 2008
PROJECT NO:	WX10364
REV. NO.:	A
FIGURE No.	FIGURE 5

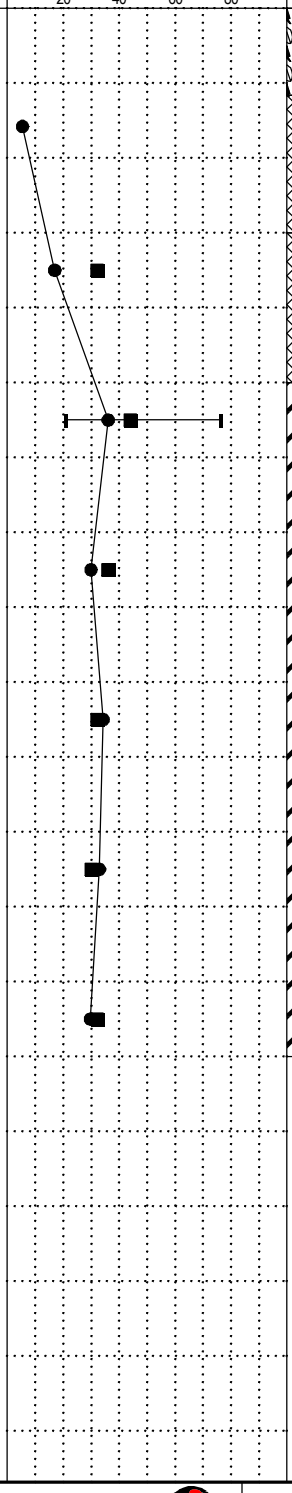
APPENDIX A

TEST HOLE LOGS

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **D1**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Day St.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand



Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS
0		CONC	CONCRETE - 178mm thick				
		GP	GRAVEL (20mm GRANULAR FILL) - 280mm thick, sandy, poorly graded, fine grained, moist, frozen, mottled grey		1		
		CH	CLAY (FILL) - silty, medium plastic, moist, stiff, dark grey, trace sand		2		
			CLAY - high plastic, moist, stiff to very stiff, grey		3		Sample #3 @ 0.9m: Hydrometer Results Gravel 0% Sand 5% Silt 29% Clay 66%
1			- stiff below 1.2m		4		
		CH			5		
			- brown below 1.5m		6		
2					7		
			TEST HOLE TERMINATED AT 2.1m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.				
3							

10364 HARBISON STANIER LESLIE MARTIN DAY.GPJ 08/12/22 06:23 PM (GEOTECHNICAL - VARIOUS SITES)

amec

AMEC Earth and Environmental
Winnipeg, Manitoba

LOGGED BY: BP	COMPLETION DEPTH: 2.1 m
REVIEWED BY: TG	COMPLETION DATE: December 2, 2008
Figure No. 6	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **D2**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Day St.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

▲ UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400

■ POCKET PENETROMETER (kPa) ■ 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		CONC	CONCRETE - 178mm thick					0
		GP	GRAVEL (20mm GRANULAR FILL) - 280mm thick, sandy, poorly graded, fine grained, moist, frozen, brown, some silt		1			
		CH	CLAY (FILL) - silty, high plastic, moist, stiff to very stiff, dark grey, trace sand		2			
1		CI	CLAY - silty, medium plastic, moist, stiff, brown		3			1
					4			
					5			
		CH	CLAY - high plastic, moist, stiff, dark greyish brown		6			
2					7			2
			TEST HOLE TERMINATED AT 2.1m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					
3								

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **D3**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Day St.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube | No Recovery | SPT (N) | Grab Sample | Split-Pen | Core

BACKFILL TYPE: Bentonite | Pea Gravel | Drill Cuttings | Grout | Slough | Sand

▲ UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400

■ POCKET PENETROMETER (kPa) ■ 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		ASPH	ASPHALT - 67mm thick					
		CONC	CONCRETE - 137mm thick					
		GP	GRAVEL (20mm GRANULAR FILL) - 131mm thick, sandy, poorly graded, medium grained, moist, frozen, brown, trace clay		1			
			CLAY - silty, high plastic, moist, very stiff, grey		2			
		CH			3			
1					4			1
					5			
			SILT - clayey, low to medium plastic, moist, firm, tan-brown		6		Sample #6 @ 1.8m: Hydrometer Results Gravel 0% Sand 2% Silt 69% Clay 29%	
2		CI						2
		CH	CLAY - high plastic, moist, stiff, brown		7			
3			TEST HOLE TERMINATED AT 2.1m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					

10364 HARBISON STANIER LESLIE MARTIN DAY.GPJ 08/12/22 06:24 PM (GEOTECHNICAL - VARIOUS SITES)

amec

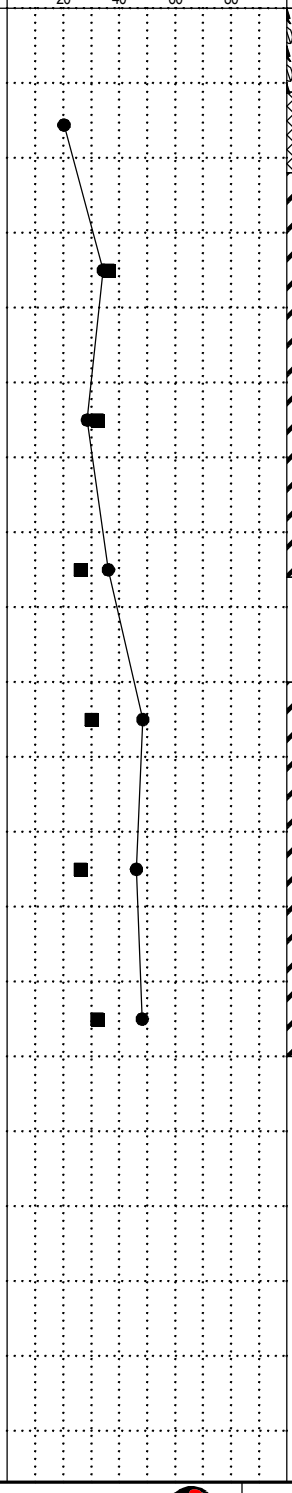
AMEC Earth and Environmental
Winnipeg, Manitoba

LOGGED BY: BP	COMPLETION DEPTH: 2.1 m
REVIEWED BY: TG	COMPLETION DATE: December 2, 2008
Figure No. 8	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **D4**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Day St.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand



Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		CONC	CONCRETE - 171mm thick					0
		GP	GRAVEL (20mm GRANULAR FILL) - 165mm thick, silty, sandy, poorly graded, fine grained, very moist, frozen, brown		1			
		CH	CLAY - high plastic, moist, stiff, grey		2			
1					3			1
		ML	SILT - clayey, low to medium plastic, moist, stiff, tan-brown		4			
		CH	CLAY - high plastic, moist, stiff, grey		5			
					6			
2					7			2
			TEST HOLE TERMINATED AT 2.1m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					
3								

10364 HARBISON STANIER LESLIE MARTIN DAY.GPJ 08/12/22 06:24 PM (GEOTECHNICAL - VARIOUS SITES)

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LOGGED BY: BP	COMPLETION DEPTH: 2.1 m
REVIEWED BY: TG	COMPLETION DATE: December 2, 2008
Figure No. 9	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **H1**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Harbison Ave. W.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

▲ UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400

■ POCKET PENETROMETER (kPa) ■ 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		ASPH	ASPHALT - 36mm thick					0
		CONC	CONCRETE - 150mm thick					
		CI-CH	CLAY (FILL) - silty, medium to high plastic, moist, stiff, dark brown, some sand		1			
			CLAY - silty, high plastic, moist, stiff, dark brown		2			
1		CH			3			1
					4			
			- firm below 1.4m		5			
					6			
			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					
2								2
3								

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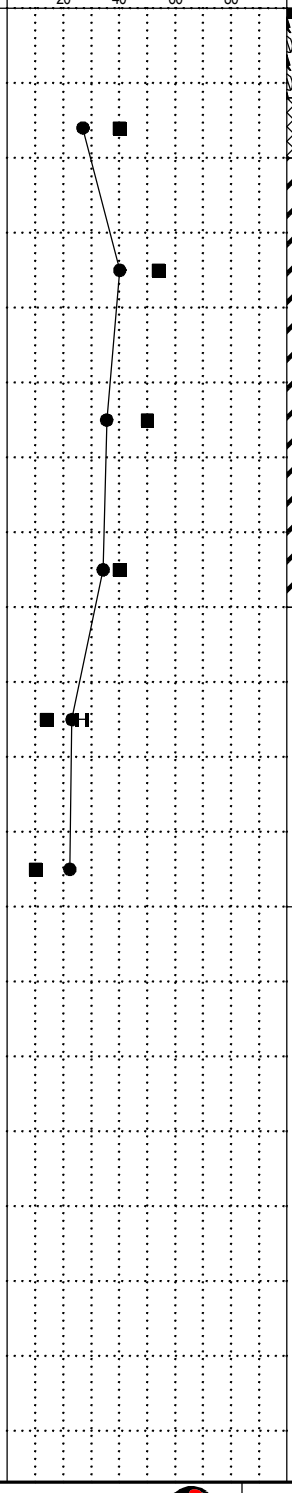
LOGGED BY: BP	COMPLETION DEPTH: 1.8 m
REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
Figure No. 10	Page 1 of 1

10364 HARBISON STANIER LESLIE MARTIN DAY.GPJ 08/12/22 06:24 PM (GEOTECHNICAL - VARIOUS SITES)

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **H2**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Harbison Ave. W.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand



Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		ASPH	ASPHALT - 19mm thick					0
		CONC	CONCRETE - 165mm thick					
		CH	CLAY (FILL) - silty, high plastic, moist, very stiff, dark grey, trace sand		1			
		CH	CLAY - silty, high plastic, moist, very stiff, dark grey		2			
		CH			3			
1		CH	- stiff below 1.1m		4			1
		ML	SILT - low plastic, moist, firm, tan-brown, trace clay		5		Sample #5 @ 1.5m: Hydrometer Results Gravel 0% Sand 4% Silt 72% Clay 24%	
					6			
2			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					2
3								

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LOGGED BY: BP	COMPLETION DEPTH: 1.8 m
REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
Figure No. 11	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **H3**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Harbison Ave. W.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

▲ UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400

■ POCKET PENETROMETER (kPa) ■ 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		ASPH	ASPHALT - 29mm thick					
		CONC	CONCRETE - 165mm thick					
			CLAY (FILL) - silty, high plastic, moist, very stiff, dark grey, trace sand		1			
		CH	- very silty below 0.6m		2			
					3			
1			CLAY - silty, high plastic, moist, stiff, dark grey					1
		CH	- greyish brown below 1.1m		4			
			SILT - low plastic, very moist, firm, tan-brown, some clay		5			
		ML			6			
2			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					2
3								

10364 HARBISON STANIER LESLIE MARTIN DAY.GPJ 08/12/22 06:24 PM (GEOTECHNICAL - VARIOUS SITES)

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LOGGED BY: BP	COMPLETION DEPTH: 1.8 m
REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
Figure No. 12	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **H4**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Harbison Ave. W.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

▲ UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400

■ POCKET PENETROMETER (kPa) ■ 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		ASPH	ASPHALT - 24mm thick					0
		CONC	CONCRETE - 140mm thick					
		CH	CLAY (FILL) - silty, high plastic, moist, very stiff, dark grey, trace sand		1			
					2			
		CH	CLAY - silty, high plastic, moist, stiff to very stiff, dark greyish brown		3			
1					4			1
		ML	SILT - low plastic, moist, stiff, tan-brown, some clay		5			
			- firm below 1.5m		6			
2			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					2
3								

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LOGGED BY: BP	COMPLETION DEPTH: 1.8 m
REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
Figure No. 13	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **H5**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Harbison Ave. W.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

▲ UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400

■ POCKET PENETROMETER (kPa) ■ 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		ASPH	ASPHALT - 29mm thick					0
		CONC	CONCRETE - 206mm thick					
		CH	CLAY (FILL) - silty, high plastic, moist, very stiff, mottled grey, trace sand		1			
					2			
			CLAY - silty, high plastic, moist, stiff, dark grey		3			
1		CH			4			1
			- very silty below 1.5m		5			
		ML	SILT - low plastic, moist, firm, tan-brown, some clay		6			
2			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					2
3								

10364 HARBISON STANIER LESLIE MARTIN DAY.GPJ 08/12/22 06:24 PM (GEOTECHNICAL - VARIOUS SITES)

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REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
Figure No. 14	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **H6**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Harbison Ave. W.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

▲ UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400

■ POCKET PENETROMETER (kPa) ■ 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		ASPH	ASPHALT - 30mm thick					0
		CONC	CONCRETE - 156mm thick					
		CH	CLAY (FILL) - high plastic, moist, very stiff, dark grey, trace sand		1			
			CLAY - high plastic, moist, very stiff, dark grey		2			
					3			
1			- greyish brown below 0.9m					1
		CH			4			
					5			
					6			
2			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					2
3								

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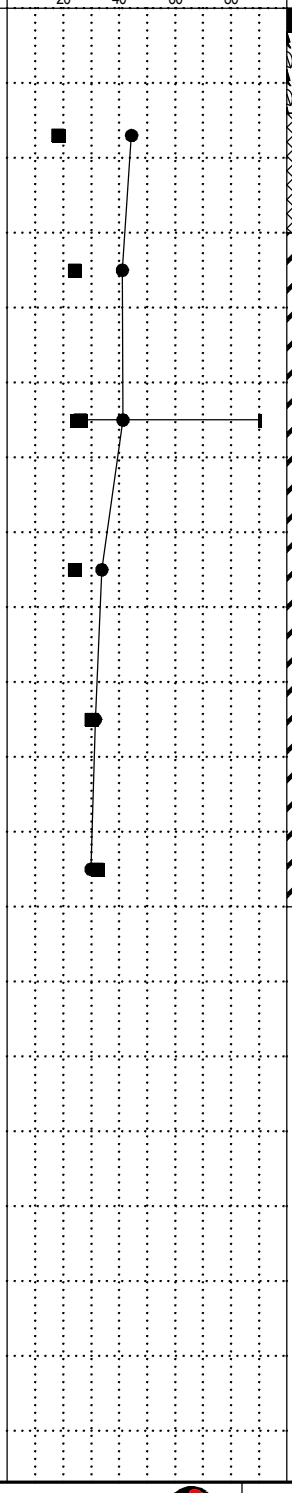
LOGGED BY: BP	COMPLETION DEPTH: 1.8 m
REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
Figure No. 15	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **H7**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Harbison Ave. W.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand



Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		ASPH	ASPHALT - 48mm thick					
		CONC	CONCRETE - 165mm thick					
		CH	CLAY (FILL) - silty, high plastic, moist, firm to stiff, dark grey		1			
			CLAY - silty, high plastic, moist, stiff, grey		2			
					3		Sample #3 @ 0.9m: Hydrometer Results Gravel 0% Sand 2% Silt 22% Clay 76%	
1		CH			4			1
					5			
					6			
2			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					2
3								

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LOGGED BY: BP	COMPLETION DEPTH: 1.8 m
REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
Figure No. 16	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **L1**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Leslie Ave.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

▲ UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400

■ POCKET PENETROMETER (kPa) ■ 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		CONC	CONCRETE - 159mm thick					
			CLAY - silty, medium plastic, moist, very stiff, brown		1			
					2		Sample #2 @ 0.6m: Hydrometer Results Gravel 0% Sand 18% Silt 47% Clay 35%	
			- abundant fissures from 0.8 to 1.4m		3			
1		CI-CH			4			1
					5			
			- stiff, high plastic below 1.5m		6			
2			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					2
3								

10364 HARBISON STANIER LESLIE MARTIN DAY.GPJ 08/12/22 06:24 PM (GEOTECHNICAL - VARIOUS SITES)

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LOGGED BY: BP	COMPLETION DEPTH: 1.8 m
REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
Figure No. 17	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **L2**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Leslie Ave.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

▲ UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400

■ POCKET PENETROMETER (kPa) ■ 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		CONC	CONCRETE - 137mm thick					
			CLAY - silty, medium to high plastic, moist, stiff, dark grey		1			
					2			
					3			
1		CI-CH			4			1
			- brown below 1.2m		5			
					6			
2			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					2
3								

10364 HARBISON STANIER LESLIE MARTIN DAY.GPJ 08/12/22 06:24 PM (GEOTECHNICAL - VARIOUS SITES)

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LOGGED BY: BP	COMPLETION DEPTH: 1.8 m
REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
Figure No. 18	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **L3**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Leslie Ave.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

▲ UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400

■ POCKET PENETROMETER (kPa) ■ 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		CONC	CONCRETE - 137mm thick					0
		CI	CLAY (FILL) - silty, medium plastic, moist, stiff, mottled brown, trace sand		1			
			CLAY - silty, high plastic, moist, stiff, dark grey		2			
1					3			1
		CI-CH	- dark brown below 1.2m		4			
					5			
					6			
2			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					2
3								

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LOGGED BY: BP	COMPLETION DEPTH: 1.8 m
REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
Figure No. 19	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **L4**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Leslie Ave.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

▲ UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400

■ POCKET PENETROMETER (kPa) ■ 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		CONC	CONCRETE - 140mm thick					
			CLAY - silty, high plastic, moist, stiff, brown		1			
					2			
					3			
1		CI-CH	- trace sand below 1.1m		4			1
					5			
					6			
2			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					2
3								

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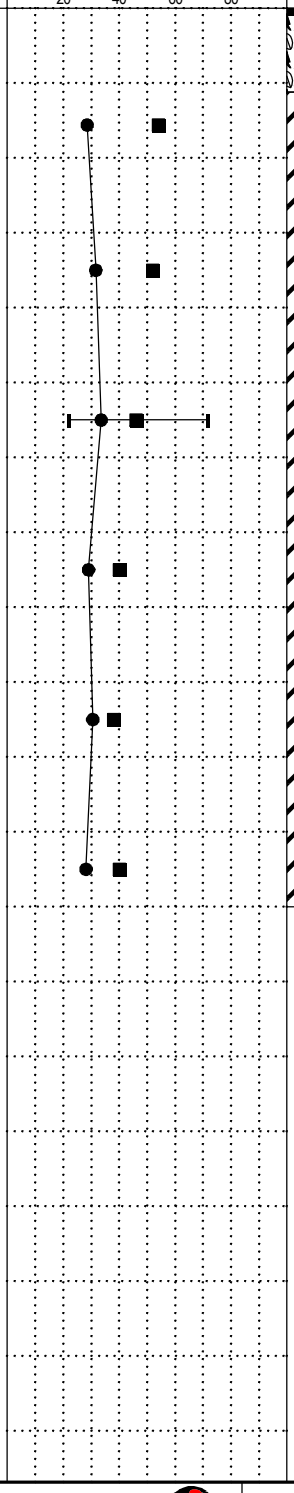
LOGGED BY: BP	COMPLETION DEPTH: 1.8 m
REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
Figure No. 20	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **M1**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Martin Ave. W.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand



Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		ASPH	ASPHALT - 13mm thick					
		CONC	CONCRETE - 159mm thick					
			CLAY - silty, high plastic, moist, very stiff, brown, trace to some clay		1			
					2			
					3		Sample #3 @ 0.9m: Hydrometer Results Gravel 0% Sand 4% Silt 45% Clay 51%	
1		CH						1
			- stiff below 1.2m		4			
					5			
					6			
			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					
2								2
3								

10364 HARBISON STANIER LESLIE MARTIN DAY.GPJ 08/12/22 06:24 PM (GEOTECHNICAL - VARIOUS SITES)

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LOGGED BY: BP	COMPLETION DEPTH: 1.8 m
REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
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PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **M2**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Martin Ave. W.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

▲ UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400

■ POCKET PENETROMETER (kPa) ■ 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		ASPH	ASPHALT - 25mm thick					
		CONC	CONCRETE - 130mm thick					
		CI-CH	CLAY - silty, medium to high plastic, moist, very stiff, dark brown		1			
					2			
			SILT - low to medium plastic, moist, stiff, brown, some clay		3			
1		ML			4			1
					5			
					6			
2			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					2
3								

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LOGGED BY: BP	COMPLETION DEPTH: 1.8 m
REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
Figure No. 22	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **M3**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Martin Ave. W.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

▲ UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400

■ POCKET PENETROMETER (kPa) ■ 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		ASPH	ASPHALT - 25mm thick					
		CONC	CONCRETE - 140mm thick					
			CLAY - silty, high plastic, moist, stiff, dark grey		1			
					2			
					3			
1		CH						1
			- dark brown below 1.2m		4			
					5			
					6			
			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE.					
2			NOTES:					2
			No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					
3								

10364 HARBISON STANIER LESLIE MARTIN DAY.GPJ 08/12/22 06:24 PM (GEOTECHNICAL - VARIOUS SITES)

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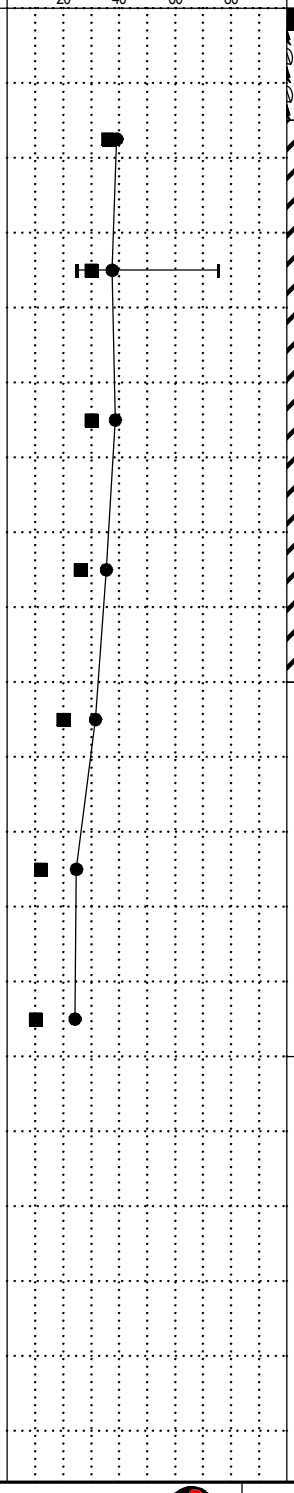
Winnipeg, Manitoba

LOGGED BY: BP	COMPLETION DEPTH: 1.8 m
REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
Figure No. 23	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **S1**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Stanier St.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand



Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		ASPH	ASPHALT - 41mm thick					
		CONC	CONCRETE - 187mm thick					
			CLAY - silty, high plastic, moist, stiff, dark brownish grey		1			
					2		Sample #2 @ 0.6m: Hydrometer Results Gravel 0% Sand 4% Silt 35% Clay 61%	
		CH	- brown below 0.8m		3			
1					4			1
			SILT - low plastic, moist, firm to stiff, tan-brown, some clay		5			
		ML	- firm, trace clay below 1.7m		6			
2					7			2
			TEST HOLE TERMINATED AT 2.1m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					
3								

amec	**AMEC Earth and Environmental** **Winnipeg, Manitoba**	LOGGED BY: BP	COMPLETION DEPTH: 2.1 m
		REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
		Figure No. 24	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **S2**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Stanier St.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand

▲ UNCONFINED COMPRESSION (kPa) ▲ 100 200 300 400

■ POCKET PENETROMETER (kPa) ■ 100 200 300 400

PLASTIC M.C. LIQUID 20 40 60 80

Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		ASPH	ASPHALT - 57mm thick					
		CONC	CONCRETE - 210mm thick					
			CLAY - high plastic, moist, very stiff, dark greyish brown				No sample at 0.3m	
					1			
			- stiff below 0.8m		2			
1								1
		CH	- brown below 1.2m		3			
					4			
					5			
2					6			2
			TEST HOLE TERMINATED AT 2.1m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					
3								

10364 HARBISON STANIER LESLIE MARTIN DAY.GPJ 08/12/22 06:24 PM (GEOTECHNICAL - VARIOUS SITES)

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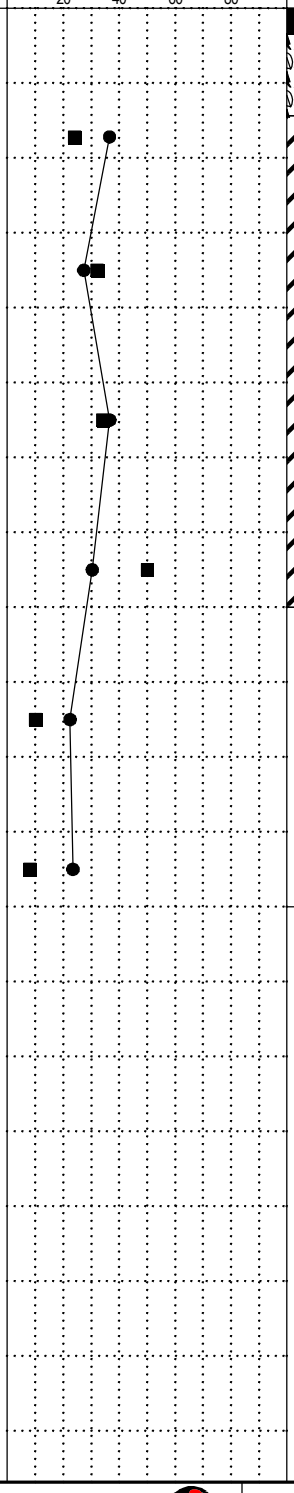
AMEC Earth and Environmental
Winnipeg, Manitoba

LOGGED BY: BP	COMPLETION DEPTH: 2.1 m
REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
Figure No. 25	Page 1 of 1

PROJECT: Geotechnical Investigation	DRILLED BY: Paddock Drilling Ltd.	BORE HOLE NO: **S3**
CLIENT: City of Winnipeg	DRILL TYPE: Truck Mounted Acker MP5T	PROJECT NO: WX10364
LOCATION: Stanier St.	DRILL METHOD: 125mm Solid Stem Auger	ELEVATION:

SAMPLE TYPE: Shelby Tube; No Recovery; SPT (N); Grab Sample; Split-Pen; Core

BACKFILL TYPE: Bentonite; Pea Gravel; Drill Cuttings; Grout; Slough; Sand



Depth (m)	SOIL SYMBOL	MUSCS	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NO	SPT (N)	COMMENTS	Depth (m)
0		ASPH	ASPHALT - 50mm thick					0
		CONC	CONCRETE - 170mm thick					
		CH	CLAY - silty, high plastic, moist, stiff, dark brown		1			
					2			
					3			
1			- very stiff below 1.0m		4			1
		ML	SILT - low to non-plastic, very moist, firm to soft, tan-brown, trace clay		5		Sample #5 @ 1.5m: Non-Plastic Hydrometer Results Gravel 0% Sand 3% Silt 84% Clay 13%	
					6			
2			TEST HOLE TERMINATED AT 1.8m BELOW EXISTING GROUND SURFACE. NOTES: No sloughing or seepage during drilling. Test hole backfilled with auger cuttings and surface repaired with cold mix asphalt.					2
3								

amec	**AMEC Earth and Environmental** **Winnipeg, Manitoba**	LOGGED BY: BP	COMPLETION DEPTH: 1.8 m
		REVIEWED BY: TG	COMPLETION DATE: December 1, 2008
		Figure No. 26	Page 1 of 1

10364 HARBISON STANIER LESLIE MARTIN DAY.GPJ 08/12/22 06:24 PM (GEOTECHNICAL - VARIOUS SITES)

APPENDIX B

CORE PHOTOS

Photo 1: Testhole D1: Southbound Lane between Valde & RR Tracks

Photo 2: Testhole D2: Southbound Lane at 2475B Day

amec Earth & Environmental		**GEOTECHNICAL INVESTIGATION DAY STREET WINNIPEG, MANITOBA**		
CITY OF WINNIPEG				
Drawn: N/A	Scale: N/A	December 2008	Project No.: WX10364	Figure: B1

Photo 3: Testhole 3: Southbound Lane at 2500/2485 Day

Photo 4: Testhole D4: Northbound Lane at 2500 Day

amec Earth & Environmental		**GEOTECHNICAL INVESTIGATION DAY STREET WINNIPEG, MANITOBA**		
CITY OF WINNIPEG				
Drawn: N/A	Scale: N/A	December 2008	Project No.: WX10364	Figure: B2

Photo 5: Testhole H1: Westbound Lane at 233 Harbison

Photo 6: Testhole H2: Eastbound Lane at 244 Harbison

amec Earth & Environmental		**GEOTECHNICAL INVESTIGATION HARBISON AVENUE W. WINNIPEG, MANITOBA**		
CITY OF WINNIPEG				
Drawn: N/A	Scale: N/A	December 2008	Project No.: WX10364	Figure: B3

Photo 7: Testhole H3: Westbound Lane at 255 Harbison

Photo 8: Testhole H4: Eastbound Lane at 273 Harbison

amec Earth & Environmental		**GEOTECHNICAL INVESTIGATION HARBISON AVENUE W. WINNIPEG, MANITOBA**		
CITY OF WINNIPEG				
Drawn: N/A	Scale: N/A	December 2008	Project No.: WX10364	Figure: B4

Photo 9: Testhole H5: Westbound Lane at 293 Harbison

Photo 10: Testhole H6: Eastbound Lane at 310/314 Harbison

amec Earth & Environmental		**GEOTECHNICAL INVESTIGATION HARBISON AVENUE W. WINNIPEG, MANITOBA**		
CITY OF WINNIPEG				
Drawn: N/A	Scale: N/A	December 2008	Project No.: WX10364	Figure: B5

Photo 11: Testhole H7: Eastbound Lane at 329/331 Harbison

amec Earth & Environmental		**GEOTECHNICAL INVESTIGATION HARBISON AVENUE W. WINNIPEG, MANITOBA**		
CITY OF WINNIPEG				
Drawn: N/A	Scale: N/A	December 2008	Project No.: WX10364	Figure: B6

Photo 12: Testhole L1: Westbound Lane, South of 153 Glenwood

Photo 13: Testhole L2: Eastbound Lane at 9/11 Leslie

amec Earth & Environmental		**GEOTECHNICAL INVESTIGATION LESLIE AVENUE WINNIPEG, MANITOBA**		
CITY OF WINNIPEG				
Drawn: N/A	Scale: N/A	December 2008	Project No.: WX10364	Figure: B7

Photo 14: Testhole L3: Westbound Lane at 20 Leslie

Photo 15: Testhole L4: Eastbound Lane at 32 Silvia

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WINNIPEG, MANITOBA

CITY OF WINNIPEG

Drawn: N/A	Scale: N/A	December 2008	Project No.: WX10364	Figure: B8

Photo 16: Testhole M1: Southbound Lane at 49 Martin

Photo 17: Testhole M2: Southbound Lane at 39 Martin

amec Earth & Environmental		**GEOTECHNICAL INVESTIGATION MARTIN AVENUE W. WINNIPEG, MANITOBA**		
CITY OF WINNIPEG				
Drawn: N/A	Scale: N/A	December 2008	Project No.: WX10364	Figure: B9

Photo 18: Testhole M3: Northbound Lane at 34 Martin

amec Earth & Environmental		**GEOTECHNICAL INVESTIGATION MARTIN AVENUE W. WINNIPEG, MANITOBA**		
CITY OF WINNIPEG				
Drawn: N/A	Scale: N/A	December 2008	Project No.: WX10364	Figure: B10

Photo 19: Testhole S1: Northbound Lane at 133 Stanier

Photo 20: Testhole S2: Southbound Lane at 140 Stanier

amec Earth & Environmental		**GEOTECHNICAL INVESTIGATION STANIER STREET WINNIPEG, MANITOBA**		
CITY OF WINNIPEG				
Drawn: N/A	Scale: N/A	December 2008	Project No.: WX10364	Figure: B11

Photo 21: Testhole S3: Northbound Lane at 145 Stanier

amec Earth & Environmental		**GEOTECHNICAL INVESTIGATION STANIER STREET WINNIPEG, MANITOBA**		
CITY OF WINNIPEG				
Drawn: N/A	Scale: N/A	December 2008	Project No.: WX10364	Figure: B12