

APPENDIX 'A'

GEOTECHNICAL REPORT

**GEOTECHNICAL STREET TESTING PROGRAM
MAIN ST. (EASTSIDE)/NORTH-SOUTH LANE BY ROYAL AVE. ALLEY,
MAIN ST. (EASTSIDE)/NORTH-SOUTH LANE BY BURRIN AVE. ALLEY
PERTH AVE. /JEFFERSON AVE. ALLEY, ST.ANTHONY AVE./JEFFERSON AVE.
ALLEY, FIFE ST. /MCPHILLIPS ST. ALLEY, GARFIELD ST. N/ SHERBURN ST.
ALLEY, VICTOR ST. /AGNES ST. ALLEY, YOUNG ST. / SPENCE ST. ALLEY,
NEWMAN ST. /BASSWOOD PL. ALLEY, CHESTNUT ST. /WALNUT ST. ALLEY
WINNIPEG, MANITOBA**

Prepared for:

**City of Winnipeg
Public Works Department**

**Project No: 151 13889 00
April 13, 2016**



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1.0 SUMMARY

A geotechnical investigation was conducted for the proposed back lane upgrade projects in Winnipeg, Manitoba. The purpose of this investigation was to assess the general subsurface conditions with respect to identifying the existing pavement structure and the underlying soil profile.

Ten Alleys (Main St. (Eastside) /North-South Lane Alley from Royal Ave. to Kingsbury Ave., Main St. (Eastside) /North-South Lane Alley from Burrin Ave. to Semple Ave., Perth Ave. /Jefferson Ave. Alley from Andrews St. to Powers St., St. Anthony Ave. /Jefferson Ave. Alley from McKenzie St. to McGregor St., Fife St. /McPhillips St. Alley from Chamberlain Ave. to Troy Ave., Garfield St. N /Sherburn St. Alley from Grundy Ave. to Notre Dame Ave., Victor St. /Agnes St. Alley from Ellice Ave. to Sargent Ave., Young St. /Spence St. Alley from Sargent Ave. to Cumberland Ave., Newman St. /Basswood Place Alley from Wolseley St. to Portage Ave. and Chestnut St. /Walnut St. Alley from Westminster Ave. to Preston Ave.) were cored and drilled to at least 2.13m depth in conjunction with City of Winnipeg (COW) geotechnical investigation guideline.

The subsurface conditions under the investigated streets are summarized in Appendix A to J consisting of a Table, Site Plan, Testhole Logs and Photographs.

2.0 INTRODUCTION

2.1 SCOPE OF WORK/ BACKGROUND

WSP Inc. was retained to undertake a soils investigation for a proposed alley reconstruction and upgrade in Winnipeg, Manitoba. The purpose of this work was to establish the soil and groundwater conditions at the sites, of which the pavement structure is identified and soil stratigraphy is profiled using the City of Winnipeg (COW) geotechnical investigation guideline. Authorization to proceed with the work was provided by City of Winnipeg.

2.2 PROPOSED ALLEY RECONSTRUCTION AND UPGRADES

The proposed alleys are from Main St. (Eastside) /North-South Lane Alley (Royal Ave. to Kingsbury Ave.), Main St. (Eastside) /North-South Lane Alley (Burrin Ave. to Semple Ave.),

Perth Ave. /Jefferson Ave. Alley (Andrews St. to Powers St.), St. Anthony Ave. /Jefferson Ave. Alley (McKenzie St. to McGregor St.), Fife St. /McPhillips St. Alley (Chamberlain Ave. to Troy Ave.), Garfield St. N /Sherburn St. Alley (Grundy Ave. to Notre Dame Ave.), Victor St. /Agnes St. Alley (Ellice Ave. to Sargent Ave.), Young St. /Spence St. Alley (Sargent Ave. to Cumberland Ave.), Newman St. /Basswood Place Alley (Wolseley St. to Portage Ave.) and from Chestnut St. /Walnut St. Alley (Westminster Ave. to Preston Ave).

3.0 FIELD METHODOLOGY

The subsoils encountered were visually classified to the full extent in the testhole and representative soil samples were recovered at regular depth intervals (every 300mm down to 2.13m). For confirmation, all of the soil samples are tested for moisture contents and selected soil samples (minimum one per street) between the depth of 0.3m and 0.9m were either submitted for Atterberg Limit test or Particle Size Analysis test (PSA). The asphalt and concrete cores were measured for thicknesses and assess its condition (poor or good). In addition, each core was photograph. Any groundwater seepage and sloughing encountered in the testholes were noted.

4.0 FIELD TESTING

The field investigation was undertaken between January 21, 2016 and January 28, 2016. A total of 27 testholes (TH16 to TH36, TH39 to TH44) were cored and drilled down to 2.13m depth using a truck-mounted CME rig equipped with 125mm auger. All testholes were backfilled with auger cuttings/bentonite and capped with cold mix asphalt after completion of drilling. The testhole locations and ground elevations were surveyed using a GPS and are shown on the site plan, attached with the Testhole Logs for every alleys.

Detailed descriptions of the soil profiles in each testhole are shown on the attached logs

5.0 TEST RESULTS

The subsurface conditions under the investigated streets are summarized using a Table,

Site Plan, Testhole Logs and Photographs. The test results which include a Table, Site Plan, Testhole Logs and Photographs for alley are arranged using Appendices A to F.

6.0 CLOSURE

The findings and recommendations provided in this report were prepared by WSP Inc. (the Consultant) in accordance with generally accepted professional engineering principles and practices. The recommendations are based on the results of field and laboratory investigations and are reflective only of the actual testhole(s) and/or excavation(s) examined.

If conditions encountered during construction appear to be different than those shown by the testhole(s) and/or excavation(s) at this site, the Consultant should be notified immediately in order that the recommendations can be reviewed and modified as necessary to address actual site conditions.

This report is limited in scope to only those items that are specifically referenced in this report. There may be existing conditions that were not recorded in this report. Such conditions were not apparent to the Consultant due to the limitations imposed by the scope of work. The Consultant, therefore, accepts no liability for any costs incurred by the Client for subsequent discovery, manifestation or rectification of such conditions.

This report is intended solely for the Client named as a general indication of the visible or reported physical condition of the items addressed in the report at the time of the geotechnical investigation. The material in this report reflects the Consultant's best judgment in light of the information available to it at the time of preparation.

This report and the information and data contained herein are to be treated as confidential and may be used only by the Client and its officers and employees in relation to the specific project that it was prepared for. Any use a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. The Consultant accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The report has been written to be read in its entirety, do not use any part of this report as a

separate entity.

All files, notes, source data, test results and master files are retained by the Consultant and remain the property of the Consultant.

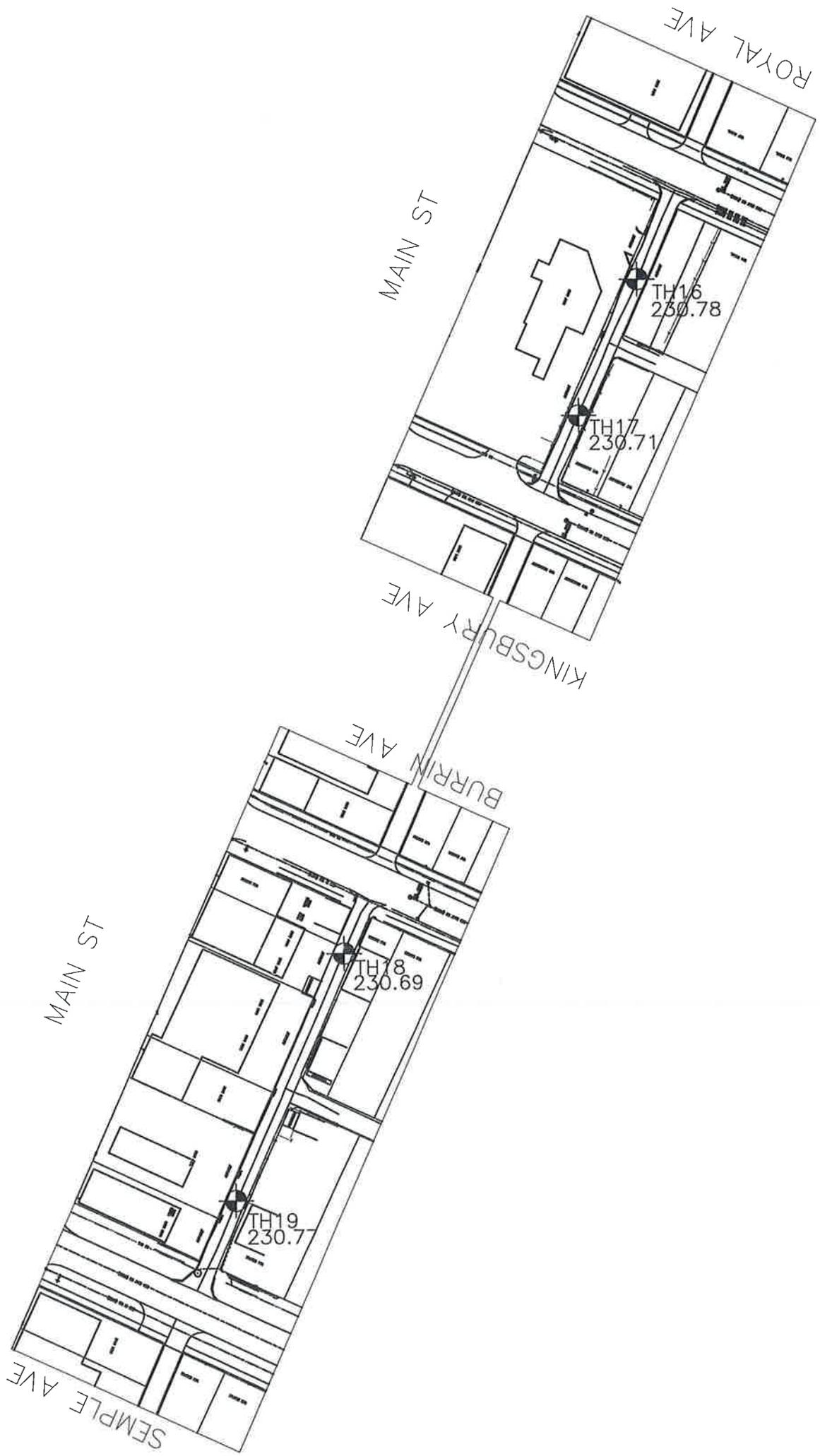
Prepared by: Silvestre S. Urbano Jr., P.Eng.

Reviewed by: Scott Minty, P.Eng.



APPENDIX A

Main Street (Eastside)/ North-South Lane Alley by Royal Avenue





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TH16

PAGE 1 OF 1

CLIENT City of Winnipeg PROJECT NAME 2016 Alley Reconstructions
 PROJECT NUMBER 151-13889-00 PROJECT LOCATION Winnipeg, MB
 DATE STARTED 1/21/16 COMPLETED 1/21/16 GROUND ELEVATION 100 m HOLE SIZE 125 mm
 DRILLING CONTRACTOR Maple Leaf Drilling GROUND WATER LEVELS:
 DRILLING METHOD Continuous Auger AT TIME OF DRILLING —
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES Alley east of Main St from Royal to Kingsbury AFTER DRILLING —

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							PL	LL
		CONCRETE - 131.5 mm thick					20	80
		CLAY FILL - 468.5 mm thick, black	MC = 38%			38	20	80
0.5		CLAY - grey-black, fissured; brown at 0.91 m, stiff below 0.91 m	MC = 39%			39	20	80
		Frost to 0.91 m	MC = 28%			28	20	80
1.0			MC = 29%			29	20	80
1.5			PP = 225 kPa MC = 24%		225	24	20	80
		SILT - tan-brown, very soft, moist to wet, slight seepage	MC = 22%			22	20	80
2.0			MC = 21%			21	20	80
2.5							20	80
3.0			PP = 25 kPa MC = 23%		25	23	20	80

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/6/16



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 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES Alley east of Main St from Royal to Kingsbury AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							PL	MC LL
							20	40 60 80
							20	40 60 80
							□ FINES CONTENT (%) □	
							20	40 60 80
0.0 - 0.1		CONCRETE - 130 mm thick						
0.1 - 0.5		CLAY FILL - 470 mm thick, mixed clay, dark brown and black	MC = 31%			31		
0.5 - 1.0		CLAY - brown, fissured, stiff below 0.9 m Frost to 0.9 m	MC = 38%			38		
1.0 - 1.5			MC = 29%			29		
1.5 - 2.0			MC = 31%			31		
2.0 - 2.5			PP = 225 kPa MC = 31%		225	31		
2.5 - 3.0		SILT - tan-brown, soft, moist to wet	MC = 35%			35		
3.0 - 3.05			MC = 33%			33		
3.05		Bottom of hole at 3.05 m.	PP = 25 kPa MC = 22%		25	22		

GENERAL BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ_GINT STD CANADA.GDT_4/13/16



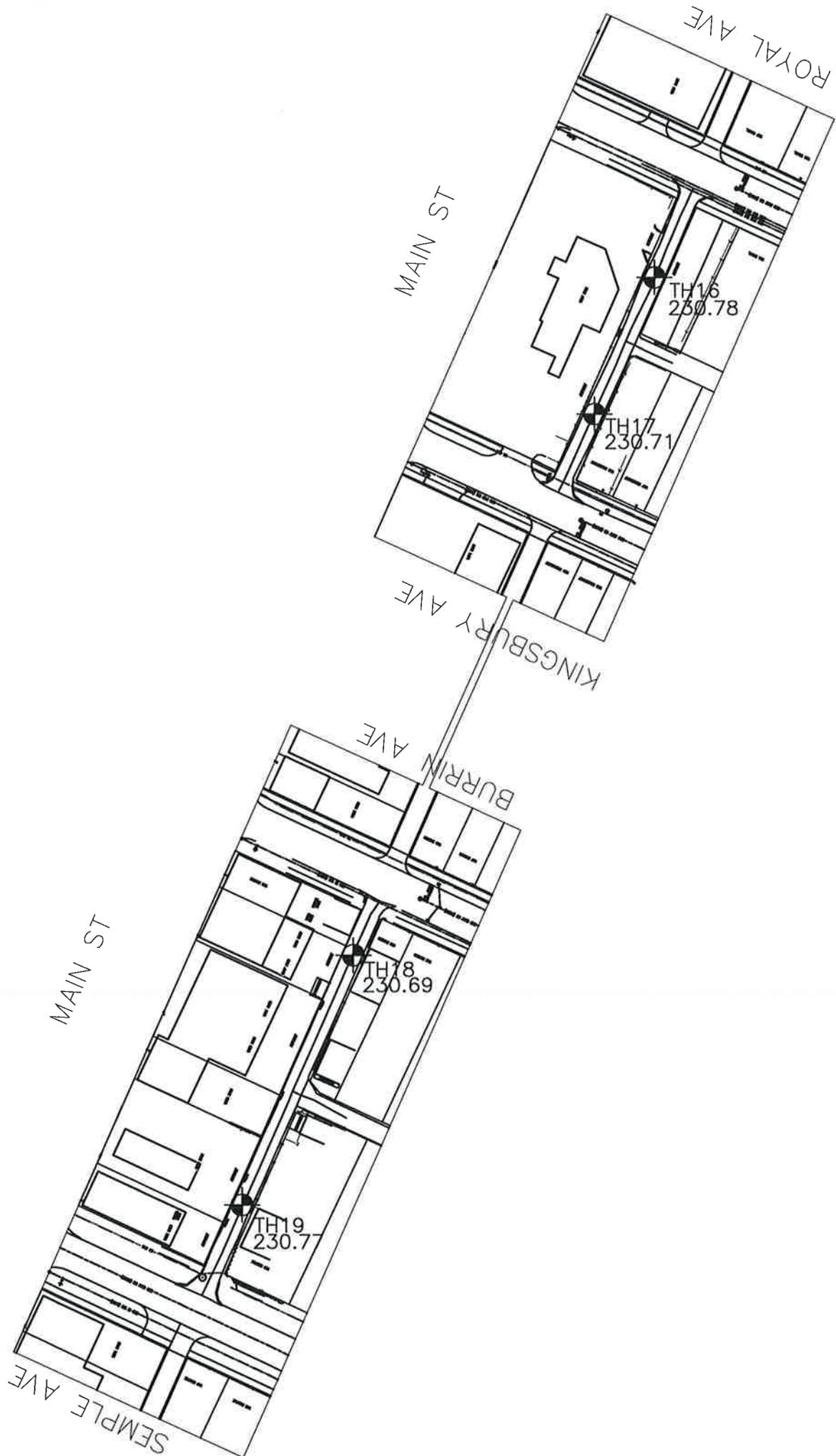
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APPENDIX B

Main Street (Eastside)/ North-South Lane Alley by Burrin Avenue



ROYAL AVE

MAIN ST

TH16
250.78

TH17
230.71

KINGSBURY AVE

BURRIN AVE

TH18
230.69

MAIN ST

TH19
230.77

SEMPL AVE



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 DRILLING METHOD Continuous Auger AT TIME OF DRILLING --
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES Alley east of Main St from Burrin to Semple AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲			
							20	40	60	80
							PL	MC	LL	
							20	40	60	80
							□ FINES CONTENT (%) □			
							20	40	60	80
0.0 - 0.1		CONCRETE - 150 mm thick, trace of fractures								
0.1 - 0.5		CLAY FILL - 450 mm thick, mixed, black and brown	MC = 37%			37				
0.5 - 1.0		CLAY - dark brown, fissured, stiff below 0.9 m; tan-brown, SILTY below 0.9 m Frost to 0.9 m	MC = 35%			35				
1.0 - 1.5			MC = 33%			33				
1.5 - 2.0			MC = 28%		275	28				
2.0 - 2.5		SILT - tan-brown, firm to soft, trace of clay	PP = 275 kPa PP = 50 kPa MC = 22%		50	22				
2.5 - 3.0		CLAY - grey-brown, stiff, fissured	MC = 22%			22				
3.0 - 3.05			MC = 21%			21				
3.05		Bottom of hole at 3.05 m.	PP = 225 kPa MC = 44%		225	44				

GENERAL_BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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 DRILLING CONTRACTOR Maple Leaf Drilling GROUND WATER LEVELS:
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 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES Alley east of Main St from Burrin to Semple AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							PL	MC
							20	40
							20	40
							□ FINES CONTENT (%) □	80
							20	80
0.0 - 0.1		CONCRETE - 150 mm thick						
0.1 - 0.5		CLAY FILL - 450 mm thick, black and brown, mixed	MC = 38%			38		
0.5 - 0.9		CLAY - brown, fissured, stiff below 0.9 m, grey-brown below 0.9 m Frost to 0.9 m	MC = 36%			36		
0.9 - 1.1			MC = 29%			29		
1.1 - 1.5			MC = 31%			31		
1.5 - 2.0			PP = 350 kPa MC = 27%		350	27		
2.0 - 2.2		SILT - olive-grey, soft, trace of clay	MC = 26%			26		
2.2 - 2.5			MC = 23%			23		
2.5 - 3.0		CLAY - grey-brown, stiff, fissured						
3.0 - 3.05			PP = 150 kPa MC = 44%		150	44		
		Bottom of hole at 3.05 m.						

GENERAL BH PLOTS - WSP COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16

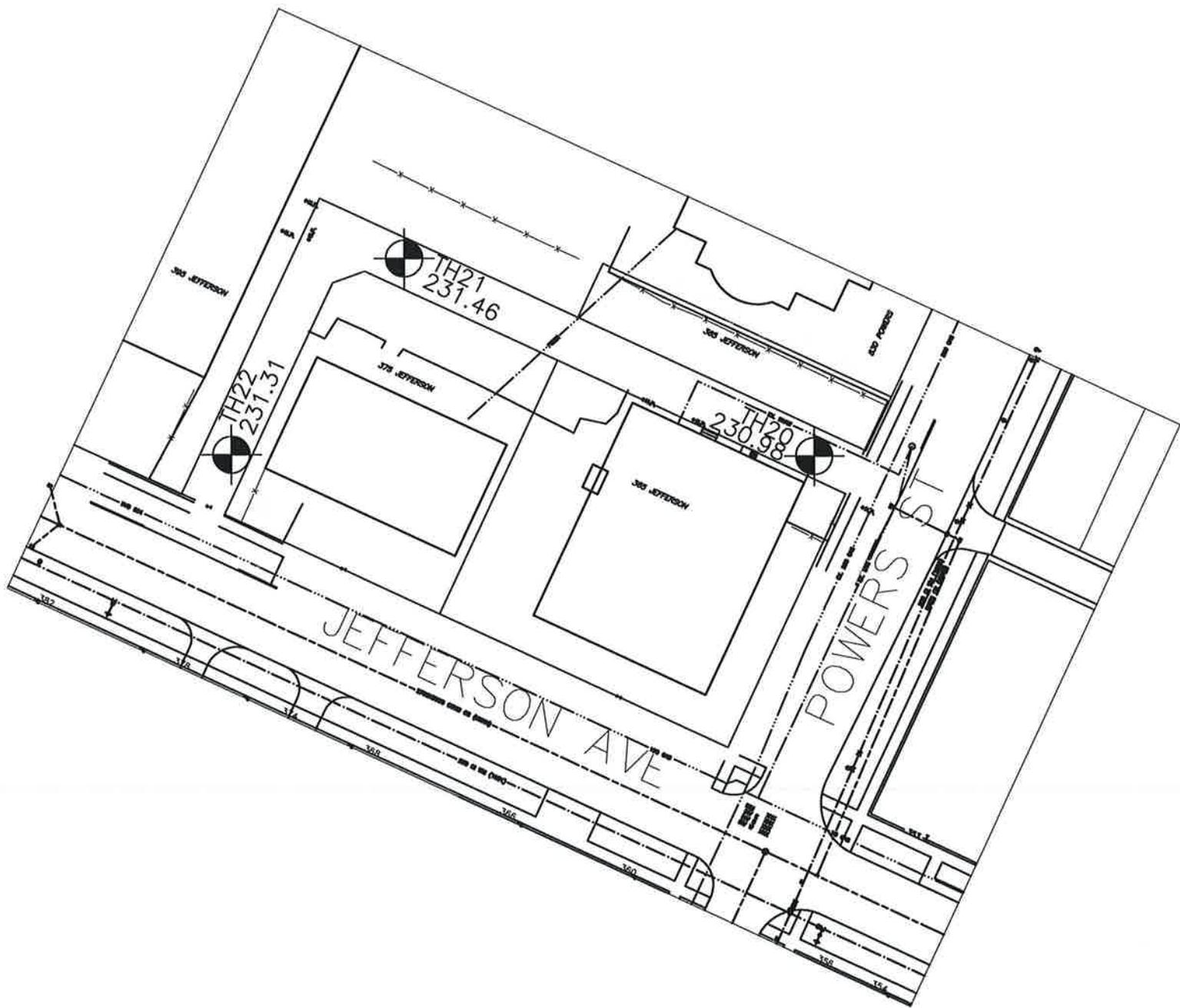


TAL8



APPENDIX C

Perth Avenue/ Jefferson Avenue Alley





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 PROJECT NUMBER 151-13889-00 PROJECT LOCATION Winnipeg, MB
 DATE STARTED 1/26/16 COMPLETED 1/26/16 GROUND ELEVATION 100 m HOLE SIZE 125 mm
 DRILLING CONTRACTOR Maple Leaf Drilling GROUND WATER LEVELS:
 DRILLING METHOD Continuous Auger AT TIME OF DRILLING --
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES Jefferson/Powers Alley AFTER DRILLING --

GENERAL BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ_GINT STD CANADA.GDT 4/13/16

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							PL	MC LL
							20 40 60 80	20 40 60 80
0.0 - 0.1		CONCRETE - 175 mm thick, intact						
0.1 - 1.0		CLAY FILL - 875 mm thick, mixed, brown and black Frost down to 1.05 m	MC = 33%			33		
1.0 - 1.5		CLAY - tan-brown, SILTY, stiff, fissured	MC = 33%			33		
1.5 - 2.5		SILT - tan-brown, stiff, dry, trace of clay	MC = 30%			30		
2.5 - 3.0		CLAY - grey-brown, stiff, fissured	MC = 24%		175	24		
			PP = 175 kPa MC = 26%			26		
			MC = 25%			25		
			MC = 22%			22		
3.0			PP = 175 kPa MC = 42%		175	42		

Bottom of hole at 3.05 m.



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 DRILLING METHOD Continuous Auger AT TIME OF DRILLING --
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES Jefferson/Powers Alley AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲										
							20	40	60	80							
0.0 - 0.1		CONCRETE - 150 mm thick, intact															
0.1 - 0.9		CLAY FILL - 750 mm thick, mixed, brown and black	MC = 36%			36											
0.9 - 1.0			MC = 35%			35											
1.0 - 1.05		CLAY - grey-brown, stiff, fissured, SILTY at 2.7 m	MC = 34%			34											
1.05 - 1.5		Frost down to 1.05 m	MC = 31%			31											
1.5 - 2.0			PP = 150 kPa MC = 30%		150	30											
2.0 - 2.7			MC = 26%			26											
2.7 - 3.0			MC = 23%			23											
3.0 - 3.05			PP = 100 kPa MC = 34%		100	34											

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES Jefferson/Powers Alley AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							PL	MC
0.0 - 0.1		CONCRETE - 125 mm thick, intact						
0.1 - 1.0		CLAY FILL - 775 mm thick, mixed, black and brown	MC = 36%			36		
0.5			MC = 35%			35		
1.0		CLAY - brown, fissured, stiff below 1.05 m Frost to 1.05 m	MC = 34%			34		
1.5			MC = 31%			31		
2.0		SILT - tan-brown, soft, moist to wet	PP = 200 kPa MC = 30%		200	30		
2.5			MC = 26%			26		
3.0		CLAY - brown, stiff, fissured	MC = 23%			23		
3.0			PP = 150 kPa MC = 34%		150	34		

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16

TH20



TH21

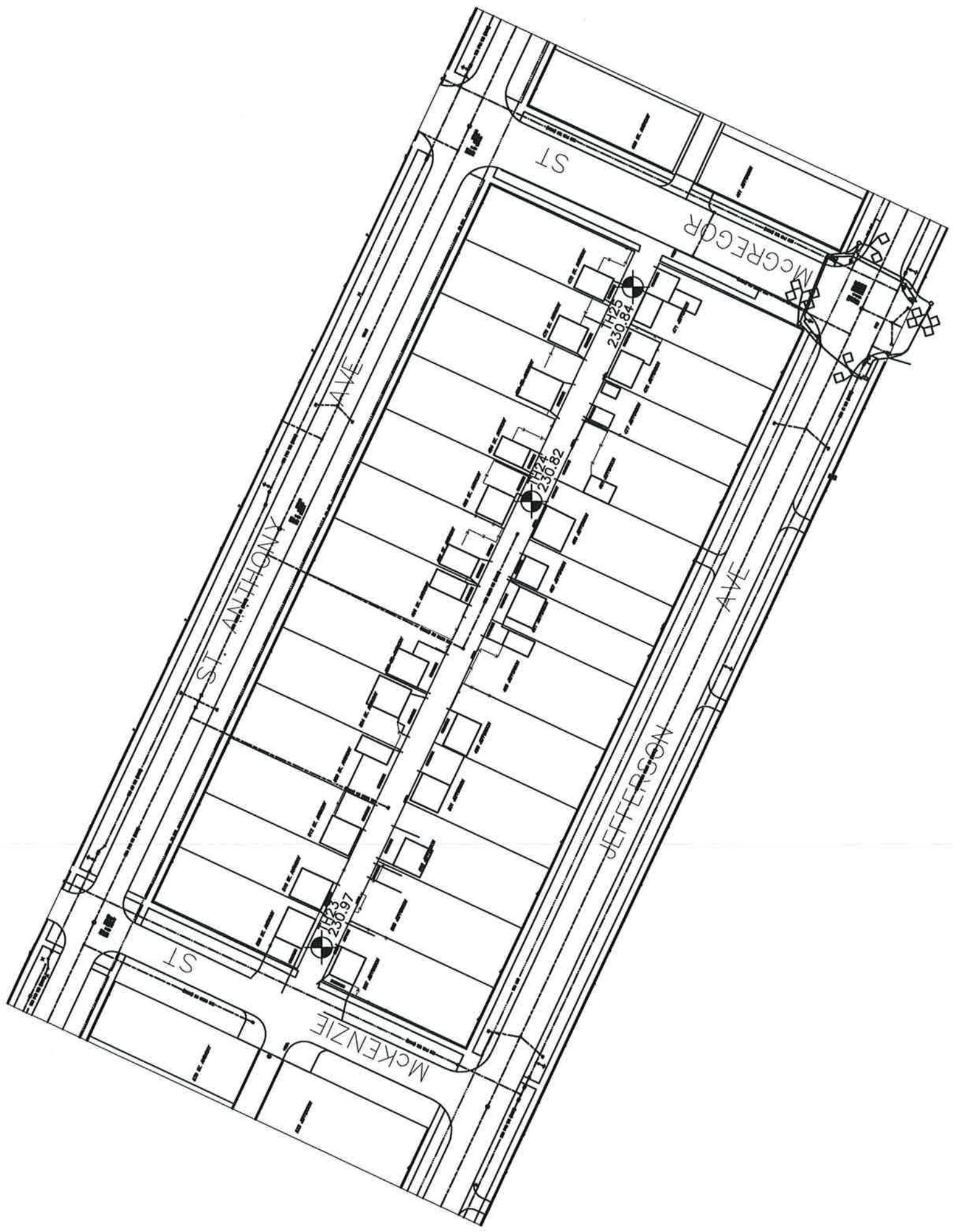


TH22



APPENDIX D

St. Anthony Avenue/ Jefferson Avenue Alley





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 DATE STARTED 1/26/16 COMPLETED 1/26/16 GROUND ELEVATION 100 m HOLE SIZE 125 mm
 DRILLING CONTRACTOR Maple Leaf Drilling GROUND WATER LEVELS:
 DRILLING METHOD Continuous Auger AT TIME OF DRILLING --
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES St Anthony/Jefferson Alley from McKenzie to McGregor AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							PL	MC
							20	40
							20	40
							20	40
0.0 - 0.1		CONCRETE - 90 mm thick, fractured						
0.1 - 1.0		CLAY FILL - 810 mm thick, mixed, black and brown	MC = 29%			29		
0.5			MC = 35%			35		
1.0		CLAY - brown, fissured, stiff below 1.05 m, grey-brown at 1.8 m SILTY at 2.4 m, tan-brown Frost to 1.05 m	MC = 31%			31		
1.5			MC = 34%			34		
1.5 - 1.6			PP = 300 kPa MC = 34%		300	34		
2.0			MC = 50%			50		
2.5			MC = 44%			44		
3.0			PP = 150 kPa MC = 43%		150	43		

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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 NOTES St Anthony/Jefferson Alley from McKenzie to McGregor AFTER DRILLING ---

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲							
							20	40	60	80				
0.0 - 0.1		CONCRETE - 135 mm thick, intact												
0.1 - 1.05		CLAY FILL - 915 mm thick, mixed, brown and black Frost to 1.05 m	MC = 44%			44								
1.05 - 1.5		SILT - tan-brown, firm to soft, moist to wet	MC = 41%			41								
1.5 - 1.8		SILT - tan-brown, firm to soft, moist to wet	MC = 37%			37								
1.8 - 2.0		CLAY - grey-brown, stiff, fissured	MC = 25%			25								
2.0 - 2.2		CLAY - grey-brown, stiff, fissured	PP = 50 kPa MC = 28%		50	28								
2.2 - 2.5		CLAY - grey-brown, stiff, fissured	MC = 45%			45								
2.5 - 2.8		CLAY - grey-brown, stiff, fissured	MC = 38%			38								
2.8 - 3.05		SILT - tan-brown, firm, moist to wet, trace of clay	PP = 75 kPa MC = 24%		75	24								

Bottom of hole at 3.05 m.

GENERAL_BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES St Anthony/Jefferson Alley from McKenzie to McGregor AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							PL	MC
0.0 - 0.1	[Concrete pattern]	CONCRETE - 150 mm thick, intact						
0.1 - 1.0	[Clay fill pattern]	CLAY FILL - 750 mm thick, mixed, brown and black, dry, fractured Frost to 0.9 m	MC = 45%			45		
0.5			MC = 40%			40		
1.0 - 1.5	[Silt pattern]	SILT - tan-brown, firm to soft, moist to wet	MC = 27%			27		
1.5			MC = 23%			23		
1.5 - 2.0			PP = 50 kPa MC = 27%		50	27		
2.0 - 2.7			MC = 36%			36		
2.7 - 3.0	[Clay pattern]	CLAY - brown, stiff, fissured, grey-brown at 2.7 m	MC = 45%			45		
3.0			PP = 100 kPa MC = 54%		100	54		

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP - COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



TH23



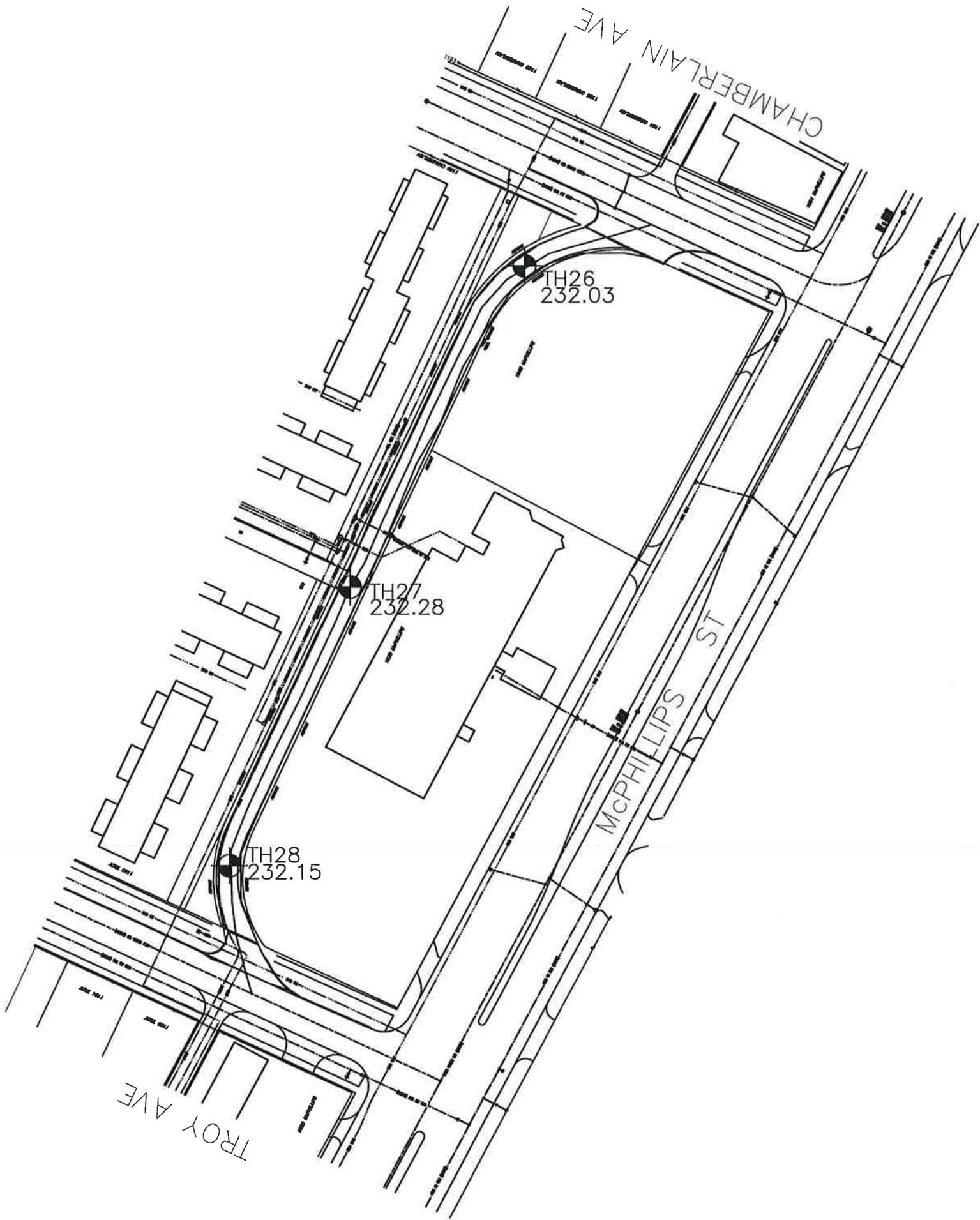
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APPENDIX E

Fife Street/ McPhillips Street Alley



CHAMBERLAIN AVE

McPHILLIPS ST

TROY AVE

TH26
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WSP Canada Inc.
 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
 Telephone: (204)-477-6650

TH26

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CLIENT City of Winnipeg PROJECT NAME 2016 Alley Reconstructions
 PROJECT NUMBER 151-13889-00 PROJECT LOCATION Winnipeg, MB
 DATE STARTED 1/26/16 COMPLETED 1/26/16 GROUND ELEVATION 100 m HOLE SIZE 125 mm
 DRILLING CONTRACTOR Maple Leaf Drilling GROUND WATER LEVELS:
 DRILLING METHOD Continuous Auger AT TIME OF DRILLING ---
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES West McPhillips Alley from Chamberlain to Troy AFTER DRILLING -

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲		
							20	40	60
		CONCRETE - 175 mm thick, intact							
0.5		CLAY FILL - 425 mm thick, mixed, brown and black	MC = 53%			53			
1.0		CLAY - tan-brown, SILTY, fissured, stiff below 1.05 m Frost to 1.05 m	MC = 38%			38			
			MC = 33%			33			
		SILT - tan-brown, soft, moist to wet	MC = 27%			27			
1.5		CLAY - grey-brown, stiff, trace of fine gravel inclusions	PP = 150 kPa MC = 25%		150	25			
			MC = 46%			46			
2.0			MC = 45%			45			
2.5									
3.0			PP = 100 kPa MC = 55%		100	55			

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP - COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
 Telephone: (204)-477-6650

TH27

PAGE 1 OF 1

CLIENT City of Winnipeg

PROJECT NAME 2016 Alley Reconstructions

PROJECT NUMBER 151-13889-00

PROJECT LOCATION Winnipeg, MB

DATE STARTED 1/26/16 COMPLETED 1/26/16

GROUND ELEVATION 100 m HOLE SIZE 125 mm

DRILLING CONTRACTOR Maple Leaf Drilling

GROUND WATER LEVELS:

DRILLING METHOD Continuous Auger

AT TIME OF DRILLING --

LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano

AT END OF DRILLING --

NOTES West McPhillips Alley from Chamberlain to Troy

AFTER DRILLING --

GENERAL BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							PL	MC LL
							20	40 60 80
							20	40 60 80
							□ FINES CONTENT (%) □	
							20	40 60 80
0.0 - 0.1		CONCRETE - 165 mm thick, intact						
0.1 - 0.5		CLAY FILL - 435 mm thick, mixed, brown and black	MC = 34%			34		
0.5 - 1.0		CLAY - brown, fissured Frost to 1.05 m	MC = 26%			26		
1.0 - 1.5		SILT - olive-grey, soft, moist to wet	MC = 22%			22		
1.5 - 2.0		CLAY - grey-brown, stiff, fissured, trace of fine gravel inclusions	PP = 50 kPa MC = 23%		50	23		
2.0 - 2.5			MC = 40%			40		
2.5 - 3.0			MC = 43%			43		
3.0 - 3.05			PP = 150 kPa MC = 52%		150	52		

Bottom of hole at 3.05 m.



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 Telephone: (204)-477-6650

CLIENT City of Winnipeg PROJECT NAME 2016 Alley Reconstructions
 PROJECT NUMBER 151-13889-00 PROJECT LOCATION Winnipeg, MB
 DATE STARTED 1/26/16 COMPLETED 1/26/16 GROUND ELEVATION 100 m HOLE SIZE 125 mm
 DRILLING CONTRACTOR Maple Leaf Drilling GROUND WATER LEVELS:
 DRILLING METHOD Continuous Auger AT TIME OF DRILLING --
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES West McPhillips Alley from Chamberlain to Troy AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲			
							PL	MC	LL	
0.0 - 0.1	[Concrete pattern]	CONCRETE - 175 mm thick, intact					20	40	60	80
0.1 - 1.0	[Clay fill pattern]	CLAY FILL - 725 mm thick, mixed, brown and black Frost to 1.05 m	MC = 34%			34				
0.5			MC = 26%			26				
1.0			MC = 26%			26				
1.0 - 1.5	[Silt pattern]	SILT - tan-brown, soft, moist to wet	MC = 22%			22				
1.5			PP = 200 kPa MC = 23%		200	23				
1.5 - 2.0	[Clay pattern]	CLAY - brown, stiff, fissured, trace of fine gravel inclusions	MC = 40%			40				
2.0			MC = 43%			43				
2.0 - 3.0										
3.0			PP = 125 kPa MC = 52%		125	52				

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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APPENDIX F

Garfield Street N/ Sherburn Street Alley



WSP Canada Inc.
1600 Buffalo Place
Winnipeg, MB R3T 6B8
Telephone: (204)-477-6650

CLIENT City of Winnipeg PROJECT NAME 2016 Alley Reconstructions
 PROJECT NUMBER 151-13889-00 PROJECT LOCATION Winnipeg, MB
 DATE STARTED 1/27/16 COMPLETED 1/27/16 GROUND ELEVATION 100 m HOLE SIZE 125 mm
 DRILLING CONTRACTOR Maple Leaf Drilling GROUND WATER LEVELS:
 DRILLING METHOD Continuous Auger AT TIME OF DRILLING --
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES All alleys bounded by Garfield St N, Sherburn, Notre Dame and Grundy AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲			
							PL	MC		
							□ FINES CONTENT (%) □			
							20	40	60	80
0.0 - 0.1	[Red hatched]	ASPHALT - 38 mm thick, fractured								
0.1 - 0.3	[Red hatched]	GRANULAR FILL - 212 mm thick, base course material								
0.3 - 0.5	[Brown hatched]	CLAY FILL - 350 mm thick, mixed, brown and black	MC = 19%			19				
0.5 - 1.0	[Blue hatched]	CLAY - brown, fissured Frost to 1.2 m	MC = 41%			41				
1.0 - 1.2	[Blue hatched]		MC = 34%			34				
1.2 - 1.5	[Orange hatched]	SILT - tan-brown, soft, moist to wet	MC = 30%			30				
1.5 - 1.6	[Orange hatched]		PP = 300 kPa MC = 24%		300	24				
1.6 - 2.0	[Blue hatched]	CLAY - grey brown, stiff, fissured	MC = 33%			33				
2.0 - 2.2	[Blue hatched]		MC = 38%			38				
2.2 - 3.0	[Blue hatched]									
3.0			PP = 100 kPa MC = 54%		100	54				

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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Telephone: (204)-477-6650

CLIENT City of Winnipeg PROJECT NAME 2016 Alley Reconstructions
 PROJECT NUMBER 151-13889-00 PROJECT LOCATION Winnipeg, MB
 DATE STARTED 1/27/16 COMPLETED 1/27/16 GROUND ELEVATION 100 m HOLE SIZE 125 mm
 DRILLING CONTRACTOR Maple Leaf Drilling GROUND WATER LEVELS:
 DRILLING METHOD Continuous Auger AT TIME OF DRILLING --
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES All alleys bounded by Garfield St N, Sherburn, Notre Dame and Grundy AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							PL	MC LL
							□ FINES CONTENT (%) □	
							20	40 60 80
		CONCRETE - 190 mm, trace of fractures						
0.5		CLAY - tan-brown, SILTY	MC = 29%			29		
			MC = 20%			20		
1.0		SILT - tan-brown, trace of clay, soft below 1.05 m, moist to wet Frost to 1.05 m	MC = 22%			22		
			MC = 17%			17		
1.5			MC = 16%			16		
2.0		CLAY - grey-brown, stiff, fissured, trace of fine gravel inclusions	PP = 300 kPa MC = 21%		300	21		
			MC = 23%			23		
2.5								
3.0			PP = 100 kPa MC = 23%		100	23		

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16





TH30

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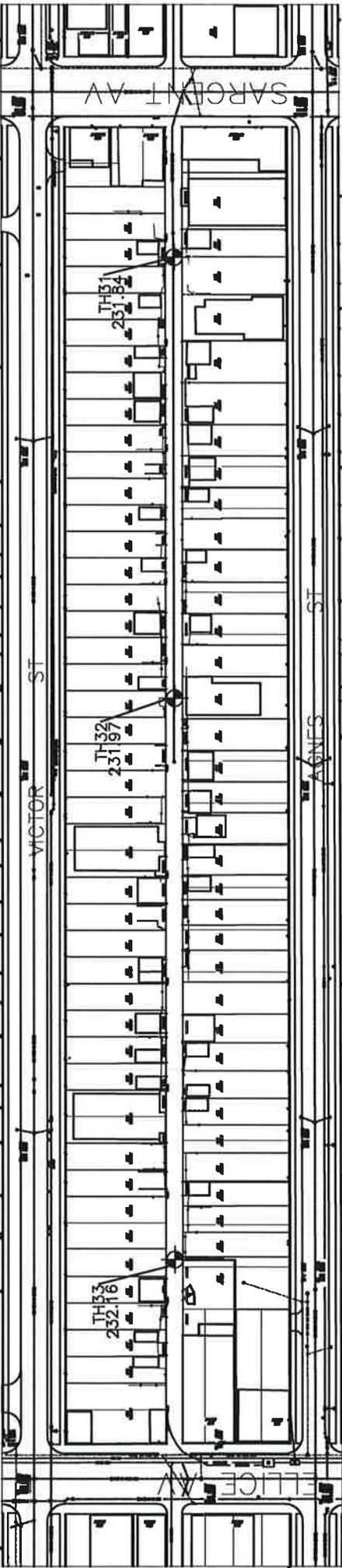
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APPENDIX G

Victor Street/ Agnes Street Alley





WSP Canada Inc.
 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
 Telephone: (204)-477-6650

CLIENT City of Winnipeg PROJECT NAME 2016 Alley Reconstructions
 PROJECT NUMBER 151-13889-00 PROJECT LOCATION Winnipeg, MB
 DATE STARTED 1/27/16 COMPLETED 1/27/16 GROUND ELEVATION 100 m HOLE SIZE 125 mm
 DRILLING CONTRACTOR Maple Leaf Drilling GROUND WATER LEVELS:
 DRILLING METHOD Continuous Auger AT TIME OF DRILLING —
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES Victor/Aqnes Alley from Sargent to Ellice AFTER DRILLING —

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							PL	MC LL
							20	40 60 80
							20	40 60 80
							20	40 60 80
0.0 - 0.1		CONCRETE - 150 mm thick, intact						
0.1 - 0.2		GRANULAR FILL - 100 mm thick, base course material						
0.2 - 0.5		CLAY FILL - 350 mm thick, mixed, brown and black	MC = 20%			20		
0.5 - 1.0		CLAY - brown, fissured; SILTY at 0.9 m, tan-brown; stiff below 1.05 m; grey-brown below 1.8 m Frost to 1.05 m	MC = 19%			19		
1.0 - 1.5			MC = 16%			16		
1.5 - 2.0			MC = 14%			14		
2.0 - 2.5			PP = 150 kPa MC = 16%		150	16		
2.5 - 3.0			MC = 13%			13		
3.0 - 3.05			MC = 18%			18		
3.0 - 3.05			PP = 100 kPa MC = 16%		100	16		

Bottom of hole at 3.05 m.

GENERAL_BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
 Telephone: (204)-477-6650

CLIENT City of Winnipeg PROJECT NAME 2016 Alley Reconstructions
 PROJECT NUMBER 151-13889-00 PROJECT LOCATION Winnipeg, MB
 DATE STARTED 1/27/16 COMPLETED 1/27/16 GROUND ELEVATION 100 m HOLE SIZE 125 mm
 DRILLING CONTRACTOR Maple Leaf Drilling GROUND WATER LEVELS:
 DRILLING METHOD Continuous Auger AT TIME OF DRILLING --
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES Victor/Agnes Alley from Sargent to Ellice AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲			
							PL	MC	LL	
							20	40	60	80
							20	40	60	80
							□ FINES CONTENT (%) □			
							20	40	60	80
0.0 - 0.1		CONCRETE - 125 mm thick, intact								
0.1 - 0.2		GRANULAR FILL - 175 mm thick, base course material								
0.2 - 0.5		CLAY FILL - 300 mm thick, mixed, brown and black	MC = 19%			19				
0.5 - 1.05		CLAY - brown, fissured, stiff below 1.05 m Frost to 1.05 m	MC = 15%			15				
1.05 - 1.4			MC = 18%			18				
1.4 - 1.6			MC = 18%		125	18				
1.6 - 1.8			PP = 125 kPa MC = 14%			14				
1.8 - 2.0			MC = 16%			16				
2.0 - 2.8			MC = 20%			20				
2.8 - 3.05			MC = 28%			28				

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
 Telephone: (204)-477-6650

CLIENT City of Winnipeg

PROJECT NAME 2016 Alley Reconstructions

PROJECT NUMBER 151-13889-00

PROJECT LOCATION Winnipeg, MB

DATE STARTED 1/27/16 COMPLETED 1/27/16

GROUND ELEVATION 100 m HOLE SIZE 125 mm

DRILLING CONTRACTOR Maple Leaf Drilling

GROUND WATER LEVELS:

DRILLING METHOD Continuous Auger

AT TIME OF DRILLING --

LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano

AT END OF DRILLING --

NOTES Victor/Agnes Alley from Sargent to Ellice

AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲			
							PL	MC	LL	
							20	40	60	80
							20	40	60	80
							□ FINES CONTENT (%) □			
							20	40	60	80
0.0 - 0.1		CONCRETE - 150 mm thick, intact								
0.1 - 0.4		GRANULAR FILL - 300 mm thick, base course material	MC = 11%			11				
0.4 - 1.5		CLAY - grey-brown, fissured, stiff below 1.05 m Frost to 1.05 m	MC = 25%			25				
1.0 - 1.5			MC = 25%			25				
1.5 - 1.6			MC = 26%			26				
1.6 - 1.8		SILT - tan-brown, soft, moist to wet	PP = 250 kPa MC = 23%		250	23				
1.8 - 2.0		CLAY - grey-brown, stiff, fissured; SILTY at 2.7 m, tan-brown	MC = 33%			33				
2.0 - 2.7			MC = 33%			33				
2.7 - 3.0			MC = 33%			33				
3.0 - 3.05		Bottom of hole at 3.05 m.	PP = 100 kPa MC = 33%		100	33				

GENERAL BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ_GINT STD CANADA.GDT_4/13/16



TH31



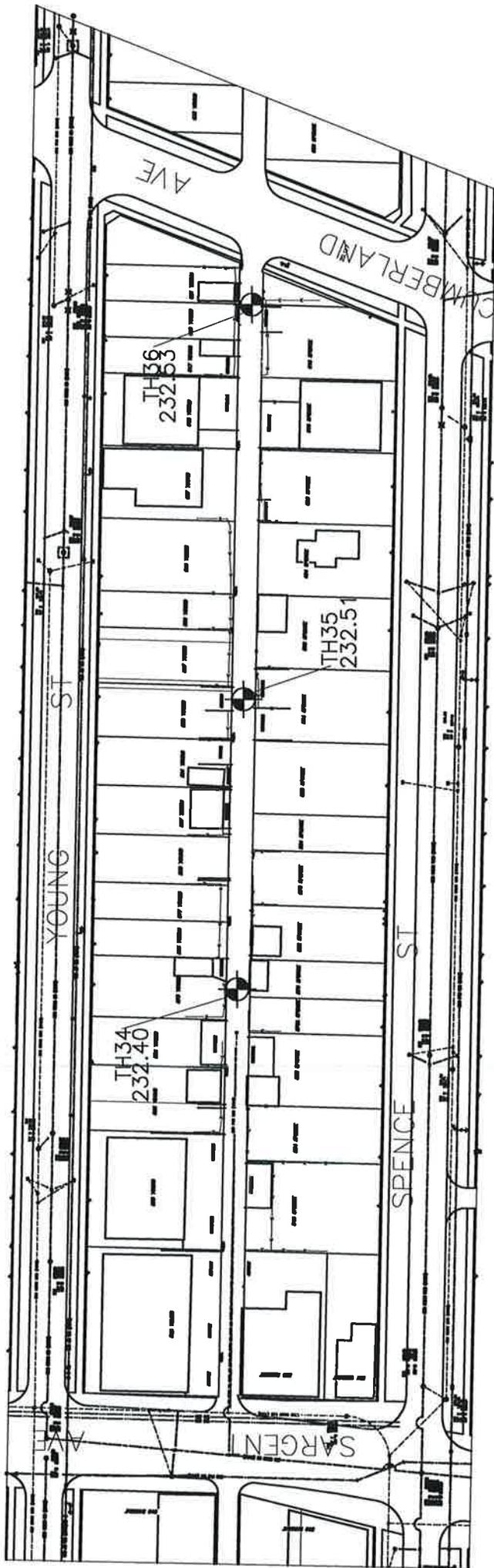
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APPENDIX H

Young Street/ Spence Street Alley





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 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
 Telephone: (204)-477-6650

TH34

PAGE 1 OF 1

CLIENT City of Winnipeg

PROJECT NAME 2016 Alley Reconstructions

PROJECT NUMBER 151-13889-00

PROJECT LOCATION Winnipeg, MB

DATE STARTED 1/27/16 COMPLETED 1/27/16

GROUND ELEVATION 100 m HOLE SIZE 125 mm

DRILLING CONTRACTOR Maple Leaf Drilling

GROUND WATER LEVELS:

DRILLING METHOD Continuous Auger

AT TIME OF DRILLING --

LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano

AT END OF DRILLING --

NOTES Young/Spence Alley from Cumberland to Sargent

AFTER DRILLING --

GENERAL BH PLOTS - WSP COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							20 40 60 80	20 40 60 80
							PL	MC LL
							20 40 60 80	20 40 60 80
							□ FINES CONTENT (%) □	20 40 60 80
		CONCRETE - 200 mm thick, intact						
0.5		CLAY - grey-black, fissured; stiff at 1.05 m, brown Frost to 1.05 m	MC = 28%			28		
1.0			MC = 24%			24		
1.5		SILT - tan-brown, soft, moist to wet	MC = 21%			21		
2.0			MC = 20%			20		
2.5		CLAY - grey-brown, stiff, fissured	PP = 175 kPa MC = 16%		175	16		
3.0			MC = 22%			22		
			MC = 24%			24		
			PP = 100 kPa MC = 30%		100	30		

Bottom of hole at 3.05 m.



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 Winnipeg, MB R3T 6B8
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TH35

PAGE 1 OF 1

CLIENT City of Winnipeg PROJECT NAME 2016 Alley Reconstructions
 PROJECT NUMBER 151-13889-00 PROJECT LOCATION Winnipeg, MB
 DATE STARTED 1/27/16 COMPLETED 1/27/16 GROUND ELEVATION 100 m HOLE SIZE 125 mm
 DRILLING CONTRACTOR Maple Leaf Drilling GROUND WATER LEVELS:
 DRILLING METHOD Continuous Auger AT TIME OF DRILLING —
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES Young/Spence Alley from Cumberland to Sargent AFTER DRILLING —

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲							
							20	40	60	80				
0.0 - 0.2		CONCRETE - 200 mm thick, broken												
0.2 - 0.4		CLAY FILL - 400 mm thick, mixed, brown and black	MC = 15%			15								
0.4 - 1.0		CLAY - grey-black, fissured; stiff below 1.05 m; grey-brown below 1.35 m Frost to 1.05 m	MC = 12%			12								
1.0 - 1.1			MC = 10%			10								
1.1 - 1.2			MC = 11%			11								
1.2 - 1.5			PP = 125 kPa MC = 13%		125	13								
1.5 - 2.0		SILT - tan-brown, soft, moist to wet	MC = 10%			10								
2.0 - 2.5			MC = 10%			10								
2.5 - 3.0		CLAY - grey-brown, stiff, fissured	PP = 150 kPa MC = 13%		150	13								

Bottom of hole at 3.05 m.

GENERAL_BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
 Telephone: (204)-477-6650

CLIENT City of Winnipeg PROJECT NAME 2016 Alley Reconstructions
 PROJECT NUMBER 151-13889-00 PROJECT LOCATION Winnipeg, MB
 DATE STARTED 1/27/16 COMPLETED 1/27/16 GROUND ELEVATION 100 m HOLE SIZE 125 mm
 DRILLING CONTRACTOR Maple Leaf Drilling GROUND WATER LEVELS:
 DRILLING METHOD Continuous Auger AT TIME OF DRILLING --
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES Young/Spence Alley from Cumberland to Sargent AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲			
							PL	MC		
							□ FINES CONTENT (%) □			
							20	40	60	80
		CONCRETE - 225 mm thick, intact								
0.5		CLAY FILL - 975 mm thick, mixed, brown and black Frost to 1.05 m	MC = 42%			42				
			MC = 33%			33				
1.0			MC = 41%			41				
			MC = 28%			28				
1.5		CLAY - tan-brown, stiff, SILTY, fissured; clayey below 1.5 m, grey-brown; SILTY at 2.7 m, tan-brown	PP = 125 kPa MC = 26%		125	26				
			MC = 31%			31				
2.0			MC = 31%			31				
2.5										
3.0			PP = 100 kPa MC = 40%		100	40				

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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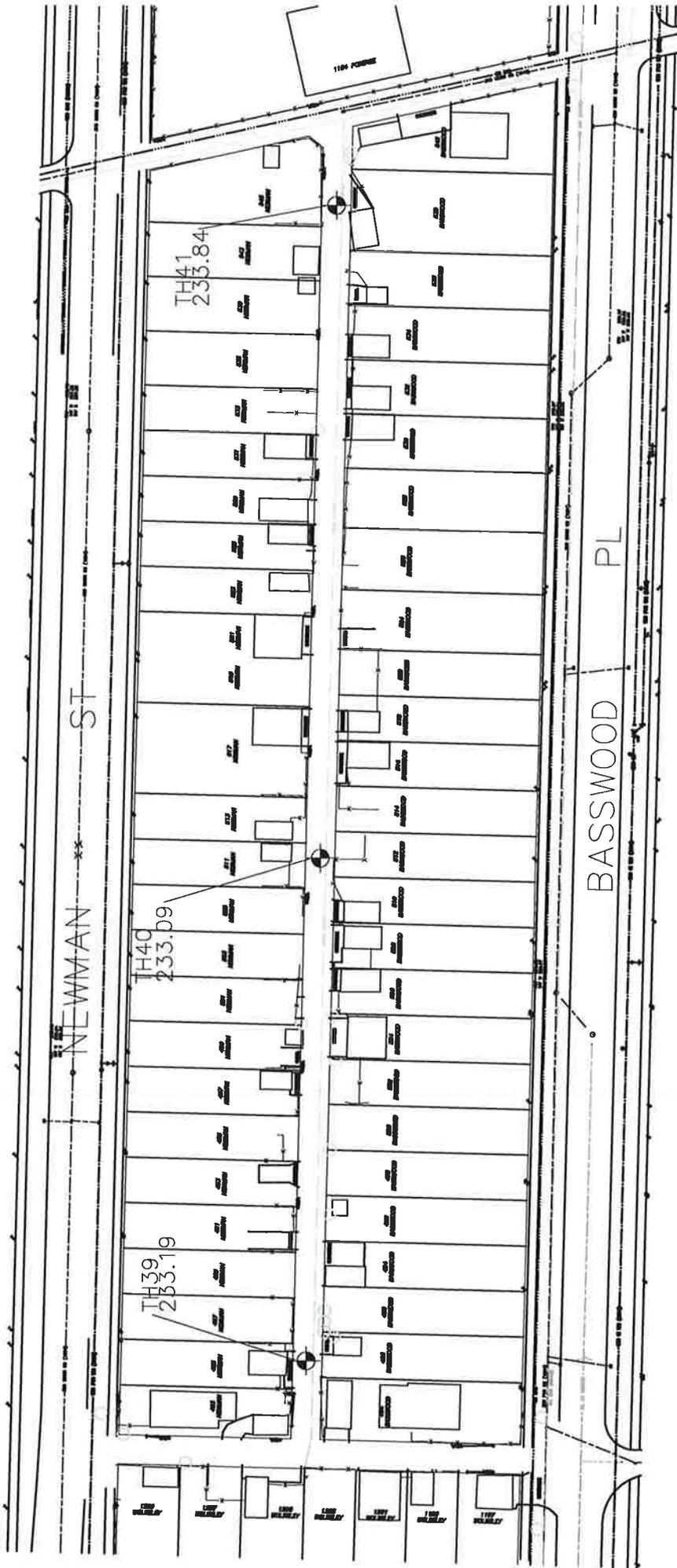
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APPENDIX I

Newman Street/ Basswood Place Alley





WSP Canada Inc.
 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
 Telephone: (204)-477-6650

CLIENT City of Winnipeg
 PROJECT NUMBER 151-13889-00
 DATE STARTED 1/28/16 COMPLETED 1/28/16
 DRILLING CONTRACTOR Maple Leaf Drilling
 DRILLING METHOD Continuous Auger
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano
 NOTES Newman/Basswood Alley from Portage to Wolseley

PROJECT NAME 2016 Alley Reconstructions
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION 100 m HOLE SIZE 125 mm
 GROUND WATER LEVELS:
 AT TIME OF DRILLING --
 AT END OF DRILLING --
 AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							PL	MC LL
							20	40 60 80
							20	40 60 80
							□ FINES CONTENT (%) □	
							20	40 60 80
0.0 - 0.2		CONCRETE - 200 mm thick, intact						
0.2 - 0.4		GRANULAR FILL - 250 mm thick, base course material	MC = 54%			54		
0.4 - 0.9		CLAY FILL - 450 mm thick, mixed, brown and black	MC = 35%			35		
0.9 - 1.5		CLAY - gery-black, fissured, stiff below 1.05 m Frost to 1.05 m	MC = 34%			34		
1.5 - 1.8			MC = 32%			32		
1.8 - 2.3		SILT - tan-brown, soft, moist to wet	PP = 100 kPa MC = 32%		100	32		
2.3 - 2.7			MC = 24%			24		
2.7 - 3.0		CLAY - grey-brown, stiff, fissured	MC = 28%			28		
3.0 - 3.05			PP = 125 kPa MC = 40%		125	40		

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP - COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
 Telephone: (204)-477-6650

TH40

PAGE 1 OF 1

CLIENT City of Winnipeg PROJECT NAME 2016 Alley Reconstructions
 PROJECT NUMBER 151-13889-00 PROJECT LOCATION Winnipeg, MB
 DATE STARTED 1/28/16 COMPLETED 1/28/16 GROUND ELEVATION 100 m HOLE SIZE 125 mm
 DRILLING CONTRACTOR Maple Leaf Drilling GROUND WATER LEVELS:
 DRILLING METHOD Continuous Auger AT TIME OF DRILLING --
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano AT END OF DRILLING --
 NOTES Newman/Basswood Alley from Portage to Wolseley AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							PL	MC LL
							20	40 60 80
							20	40 60 80
							□	20 40 60 80
0.0 - 0.5		ASPHALT - 50 mm thick, intact GRANULAR FILL - 400 mm thick, base course material	MC = 29%			29		
0.5 - 1.0		CLAY FILL - 450 mm thick, mixed, brown and black	MC = 36%			36		
1.0 - 1.5		CLAY - brown, fissured, stiff below 1.05 m Frost to 1.05 m	MC = 45%			45		
1.5 - 2.0		SILT - tan-brown, soft, moist to wet	MC = 48%			48		
2.0 - 2.5			PP = 25 kPa MC = 22%		25	22		
2.5 - 3.0			MC = 24%			24		
3.0 - 3.05		CLAY - grey-brown, fissured, stiff	MC = 23%			23		
3.05			PP = 75 kPa MC = 31%		75	31		

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP_COW ALLEY_RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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 NOTES Newman/Basswood Alley from Portage to Wolseley AFTER DRILLING —

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲			
							20	40	60	80
							PL	MC	LL	
							20	40	60	80
							□ FINES CONTENT (%) □			
							20	40	60	80
		CONCRETE - 175 mm thick, intact								
		GRANULAR FILL - 100 mm thick, base course material								
0.5		CLAY FILL - 300 mm thick, mixed, brown and black	MC = 50%			50				
		CLAY - brown, fissured	MC = 32%			32				
1.0		SILT - tan-brown, soft below 1.05 m, moist to wet Frost to 1.05 m	MC = 38%			38				
			MC = 23%			23				
1.5			MC = 23%		250	23				
		CLAY - grey-brown, stiff, fissured; SILTY at 2.7 m, tan-brown	PP = 250 kPa MC = 37%			37				
2.0			MC = 41%			41				
2.5										
3.0			PP = 100 kPa MC = 44%		100	44				

Bottom of hole at 3.05 m.

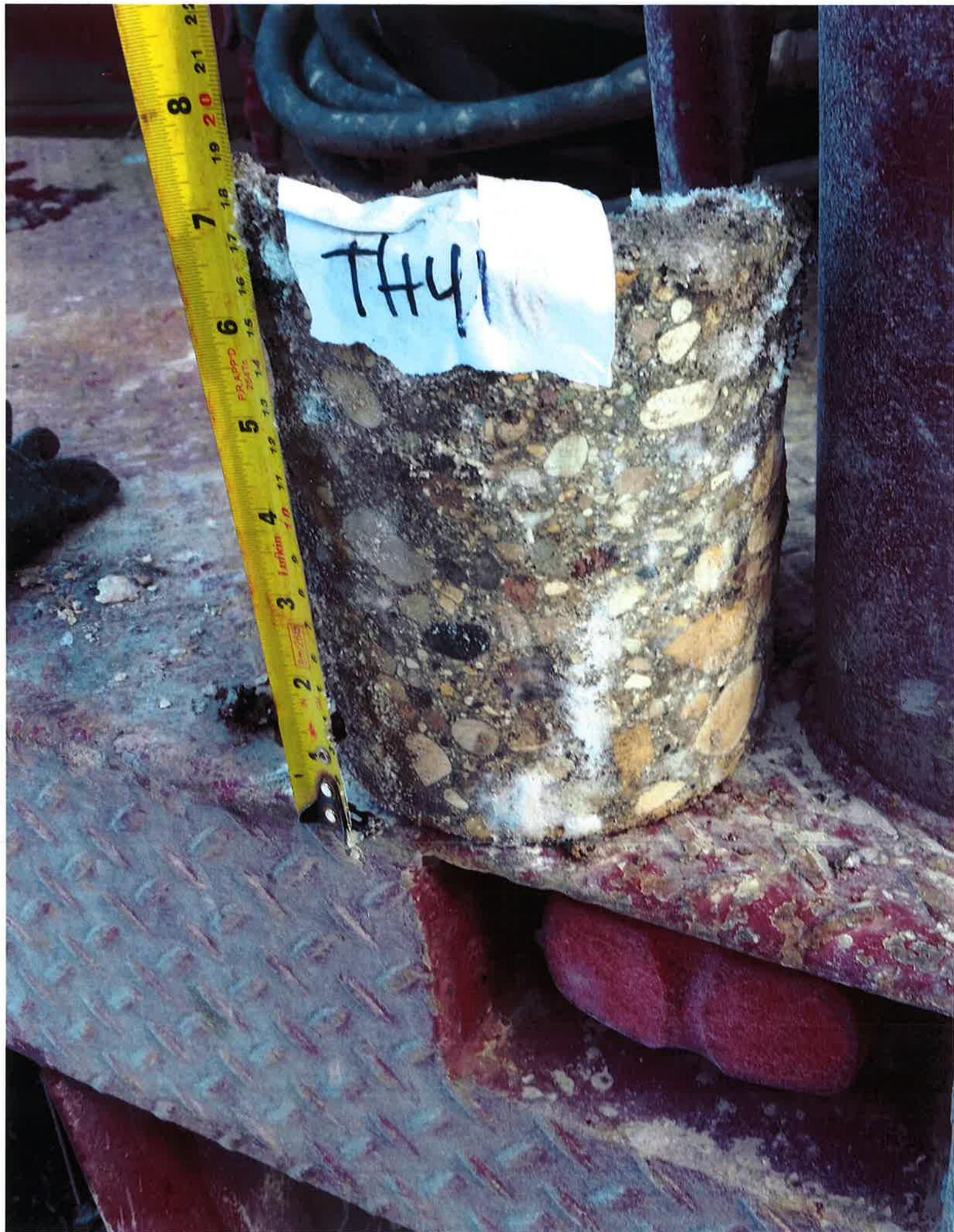
GENERAL_BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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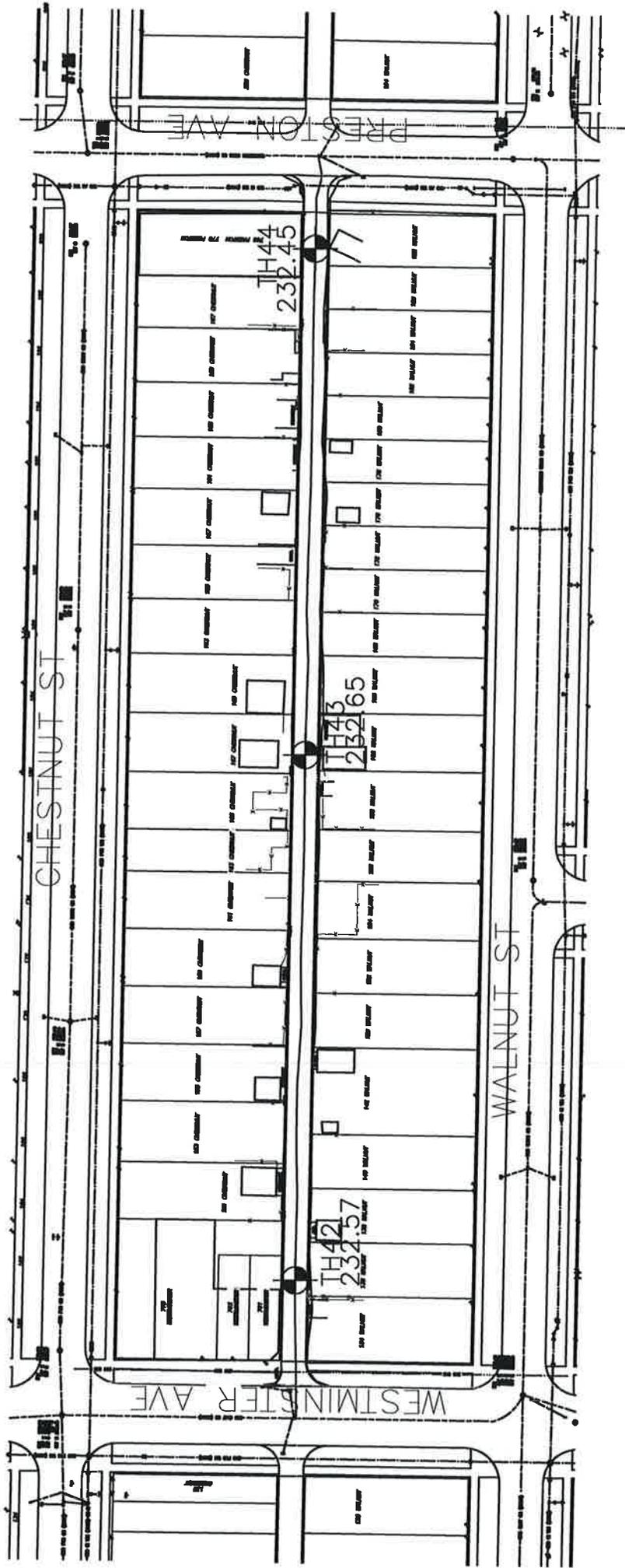


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APPENDIX J

Chestnut Street/ Walnut Street Alley





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GROUND ELEVATION 100 m HOLE SIZE 125 mm

DRILLING CONTRACTOR Maple Leaf Drilling

GROUND WATER LEVELS:

DRILLING METHOD Continuous Auger

AT TIME OF DRILLING --

LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano

AT END OF DRILLING --

NOTES Chestnut/Walnut Alley, from Preston to Westminster

AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							20	40 60 80
							PL	MC LL
							20	40 60 80
							□ FINES CONTENT (%) □	20 40 60 80
0.0 - 0.1		CONCRETE - 140 mm thick, intact						
0.1 - 0.5		GRANULAR FILL - 310 mm thick, base course material	MC = 19%			19		
0.5 - 1.0		CLAY FILL - 750 mm thick, mixed, brown and black, trace of fine gravel Frost to 1.05 m	MC = 32%			32		
1.0 - 1.5		CLAY - brown, stiff, fissured; SILTY at 2.35 m, tan-brown; clayey below 2.6 m, grey-brown	MC = 33%			33		
1.5 - 2.0			MC = 34%			34		
2.0 - 2.5			PP = 250 kPa MC = 31%		250	31		
2.5 - 3.0			MC = 34%			34		
3.0 - 3.05			MC = 42%			42		
3.05		Bottom of hole at 3.05 m.	PP = 125 kPa MC = 48%		125	48		

GENERAL BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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DRILLING CONTRACTOR Maple Leaf Drilling

GROUND WATER LEVELS:

DRILLING METHOD Continuous Auger

AT TIME OF DRILLING --

LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano

AT END OF DRILLING --

NOTES Chestnut/Walnut Alley, from Preston to Westminster

AFTER DRILLING --

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							PL	MC LL
							20	40 60 80
							20	40 60 80
							□ FINES CONTENT (%) □	
							20	40 60 80
0.0 - 0.1		CONCRETE - 150 mm thick, intact						
0.1 - 0.5		GRANULAR FILL - 450 mm thick, base course material	MC = 47%			47		
0.5 - 1.0		CLAY FILL - 450 mm thick, mixed, brown to black Frost to 1.05 m	MC = 30%			30		
1.0 - 1.5		CLAY - brown, stiff, fissured; SILTY at 1.5 m	MC = 31%			31		
1.5 - 2.0			MC = 30%			30		
2.0 - 2.5			PP = 300 kPa MC = 28%		300	28		
2.5 - 3.0		SILT - tan-brown, soft, moist to wet	MC = 30%			30		
3.0 - 3.05			MC = 28%			28		
3.05		Bottom of hole at 3.05 m.	PP = 10 kPa MC = 25%		10	25		

GENERAL BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16



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DRILLING CONTRACTOR Maple Leaf Drilling

GROUND WATER LEVELS:

DRILLING METHOD Continuous Auger

AT TIME OF DRILLING --

LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano

AT END OF DRILLING --

NOTES Chestnut/Walnut Alley, from Preston to Westminster

AFTER DRILLING --

GENERAL BH PLOTS - WSP_COW ALLEY RENEWALS.GPJ GINT STD CANADA.GDT 4/13/16

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲	
							20	40 60 80
							PL	MC LL
							20 40 60 80	20 40 60 80
							□ FINES CONTENT (%) □	20 40 60 80
		ASPHALT - 75 mm thick, intact						
		CONCRETE - 175 mm thick, intact						
0.5		GRANULAR FILL - 700 mm thick, base course material	MC = 31%			31		
			MC = 31%			31		
1.0		CLAY FILL - 600 mm thick, mixed, black and brown, trace of wood chips	MC = 32%			32		
		Frost to 1.05 m	MC = 40%			40		
1.5		SILT - tan-brown, soft, moist to wet	PP = 100 kPa MC = 26%		100	26		
		CLAY - grey-brown, stiff, fissured	MC = 44%			44		
2.0			MC = 45%			45		
2.5								
3.0			PP = 100 kPa MC = 45%		100	45		

Bottom of hole at 3.05 m.

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PRAPPO
264TC

Lufkin

8m/264

IN CM



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