APPENDIX ‘A’

GEOTECHNICAL REPORT

CITY OF WINNIPEG

2018 ALLEY RENEWALS - CONTRACT 1

GEOTECHNICAL REPORT

MARCH 28, 2018

2018 ALLEY RENEWALS CONTRACT 1

GEOTECHNICAL REPORT

CITY OF WINNIPEG

FINAL REPORT

PROJECT NO.: 17M-02283-00
DATE: MARCH 28, 2018

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SIGNATURES

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REVIEWED BY

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ENGINEERS
GEOSCIENTISTS
MANITOBA
Certificate of Authorization
WSP Canada Inc.
No. 5750 Date: 2018-03-28

This report was prepared by WSP Canada Inc. for the account of City of Winnipeg, in accordance with the professional services agreement. The disclosure of any information contained in this report is the sole responsibility of the intended recipient. The material in it reflects WSP Canada Inc.'s best judgement in light of the information available to it at the time of preparation. Any use which 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. WSP Canada Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. This limitations statement is considered part of this report.

The original of the technology-based document sent herewith has been authenticated and will be retained by WSP for a minimum of ten years. Since the file transmitted is now out of WSP's control and its integrity can no longer be ensured, no guarantee may be given with regards to any modifications made to this document.

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1 INTRODUCTION

A geotechnical investigation was conducted by WSP Canada Inc. for the proposed 2018 Alley Renewals – Contract 1 Project 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.

Six alleys were cored and drilled, which includes the following alleys:

A. Alleys bounded by Wellington Cres S (west leg), Academy Rd and Lanark St
B. Alleys bounded by Oak St and Elm St, Academy Rd and Wellington Cres
C. North/south alley between Oxford St and Cambridge St from Academy Rd to Kingsway
D. West/east alley between Parkville Dr and Arden Ave from Pulberry St to Dunkirk Dr
E. North/south alley between Beaverhill Blvd and Orchard Lane from Shoreview Bay to Shoreview Bay
F. Alleys bounded by Ellen St and Laura St, Logan Ave and Alexander Ave

2 SUB-SURFACE INVESTIGATION AND TESTING

The field investigation was undertaken on February 6, 2018 and was completed on February 15, 2018. A total of 19 test holes and cores were completed by Maple Leaf Drilling. The test holes were drilled to a depth of 3.05 m below the road surface using a truck-mounted B-40 rig equipped with a 125 mm auger as well as truck-mounted CME 55 also equipped with a 125 mm auger. The pavement was cored using a 150 mm diameter coring press. All test holes were backfilled with auger cuttings and bentonite after the completion of the drilling and patched with either cold mix asphalt or quick setting concrete. Testhole locations are noted on the testhole logs and within the testhole summary tables.

The soils encountered were visually classified to the full extent of the test hole. Representative soil samples were recovered at regular intervals, every 0.3 m to 2.1 m as well as one sample at 3.0 m. All of the soil samples were tested for their moisture contents and selected soil samples were submitted for grain size analysis (minimum one per alley). The pavement cores were measured for their thickness and each core was photographed. No groundwater seepage or sloughing was encountered in the test holes during drilling.

The photos of the pavement cores, detailed descriptions of the soil profiles for each test hole, the material test results and the testhole maps are included in Appendices, organized by alley.

3 TESTHOLE SUMMARY TABLES

Table 3-1 – Wellington Cres S / Lanark / Academy Alley

TEST HOLE NO.	TESTHOLE LOCATION	PAVEMENT SURFACE		PAVEMENT STRUCTURE MATERIAL		SOIL DESCRIPTION	BOREHOLE DEPTH (m)	No. of Samples Taken
		Type	Thickness (mm)	Type	Thickness (mm)			
A-TH1	629451.5 m E 5526262.2 m N Centre of Alley behind 1460 Wellington Cres S	Asphalt & Concrete	90 & 210	Fill (Clayey)	150	Clay/Silt/Clay	3.05	8
A-TH2	629524.5 m E 5526261.1 m N North side of Alley beside 75 Lanark	Asphalt & Concrete	100 & 150	Fill (Clayey)	200	Clay	3.05	8
A-TH3	629512.6 m E 5526306.2 m N Centre of Alley behind 1446 Wellington Cres S	Asphalt & Concrete	75 & 175	Fill (Clayey)	200	Clay/Silt/Clay	3.05	8

Table 3-2 – Oak / Elm Alley

TEST HOLE NO.	TESTHOLE LOCATION	PAVEMENT SURFACE		PAVEMENT STRUCTURE MATERIAL		SOIL DESCRIPTION	BOREHOLE DEPTH (m)	No. of Samples Taken
		Type	Thickness (mm)	Type	Thickness (mm)			
B-TH1	630749.8 m E 5526202.1 m N Centre of Alley behind 154 Oak St	Concrete	200	Fill (clayey)	700	Silt/Clay	3.05	8
B-TH2	630752.0 m E 5526282.1 m N Centre of Alley behind 136 Oak St	Concrete	150	Fill (clayey)	600	Silt/Clay	3.05	8
B-TH3	630754.2 m E 5526357.9 m N Centre of Alley behind 100 Oak St	Concrete	200	Fill (Clayey)	550	Clay	3.05	8
B-TH4	630734.5 m E 5526415.0 m N Centre of Alley behind 1000 Wellington Cres	Concrete	230	Fill (Clayey)	370	Clay	3.05	8

Table 3-3 – Oxford / Cambridge Alley

TEST HOLE NO.	TESTHOLE LOCATION	PAVEMENT SURFACE		PAVEMENT STRUCTURE MATERIAL		SOIL DESCRIPTION	BOREHOLE DEPTH (m)	No. of Samples Taken
		Type	Thickness (mm)	Type	Thickness (mm)			
C-TH1	631138.4 m E 5525803.9 m N West side of Alley behind 250 Oxford St	Concrete	180	Fill (clayey)	420	Silt/Clay	3.05	8
C-TH2	631142.4 m E 5525888.9 m N Centre of Alley behind 230 Oxford St	Concrete	170	Fill (clayey)	430	Silt/Clay	3.05	8
C-TH3	631146.1 m E 5526009.4 m N Centre of Alley behind 194 Oxford St	Concrete	160	Fill (clayey)	290	Clay	3.05	8
C-TH4	631148.6 m E 5526081.1 m N West side of Alley behind 170 Oxford St	Concrete	200	Fill (clayey)	250	Silt/Clay	3.05	8

Table 3-4 – Parkville / Arden Alley

TEST HOLE NO.	TESTHOLE LOCATION	PAVEMENT SURFACE		PAVEMENT STRUCTURE MATERIAL		SOIL DESCRIPTION	BOREHOLE DEPTH (m)	No. of Samples Taken
		Type	Thickness (mm)	Type	Thickness (mm)			
D-TH1	635272.1 m E 5521953.8 m N Centre of Alley beside 165 Pulberry St	Asphalt & Concrete	60 & 150	Fill (clayey)	690	Silt/Clay	3.05	8
D-TH2	635272.1 m E 5521953.8 m N Centre of Alley behind 58 Parkville Ave	Asphalt & Concrete	30 & 120	Fill (clayey)	600	Silt/Clay	3.05	8
D-TH3	635601.2 m E 5522081.1 m N South side of Alley behind 32 Parkville Ave	Asphalt & Concrete	30 & 160	Fill (clayey)	410	Clay	3.05	8

Table 3-5 – Beaverhill / Orchard Alley

TEST HOLE NO.	TESTHOLE LOCATION	PAVEMENT SURFACE		PAVEMENT STRUCTURE MATERIAL		SOIL DESCRIPTION	BOREHOLE DEPTH (m)	No. of Samples Taken
		Type	Thickness (mm)	Type	Thickness (mm)			
E-TH1	639162.3 m E 5523549.8 m N Centre of Alley behind 867 Beaverhill Blvd	Concrete	150	Granular fill	150	Fill/Clay	3.05	8
E-TH2	639176.4 m E 5523659.8 m N Centre of Alley behind 899 Beaverhill Blvd	Asphalt& Concrete	30 & 120	Fill (clayey)	1200	Clay	3.05	8

Table 3-6 – Laura / Ellen Alley

TEST HOLE NO.	TESTHOLE LOCATION	PAVEMENT SURFACE		PAVEMENT STRUCTURE MATERIAL		SOIL DESCRIPTION	BOREHOLE DEPTH (m)	No. of Samples Taken
		Type	Thickness (mm)	Type	Thickness (mm)			
F-TH1	633252.8 m E 5529703.7 m N Centre of Alley beside 265 Laura St	Asphalt	160	Fill (clayey)	440	Silt/Clay	3.05	8
F-TH2	633267.7 m E 5529686.3 m N Centre of Alley behind 261 Laura St	Asphalt	135	Fill (clayey)	465	Silt/Clay	3.05	8
F-TH3	633252.8 m E 5529703.7 m N Centre of Alley beside 443 Alexander Ave	Asphalt	100	Fill (clayey)	500	Silt/Clay	3.05	8

4 CLOSURE

The findings and recommendations provided in this report were prepared by WSP Canada 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 test hole(s) and/or excavation(s) examined. If conditions encountered during construction appear to be different than those shown by the test hole(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.

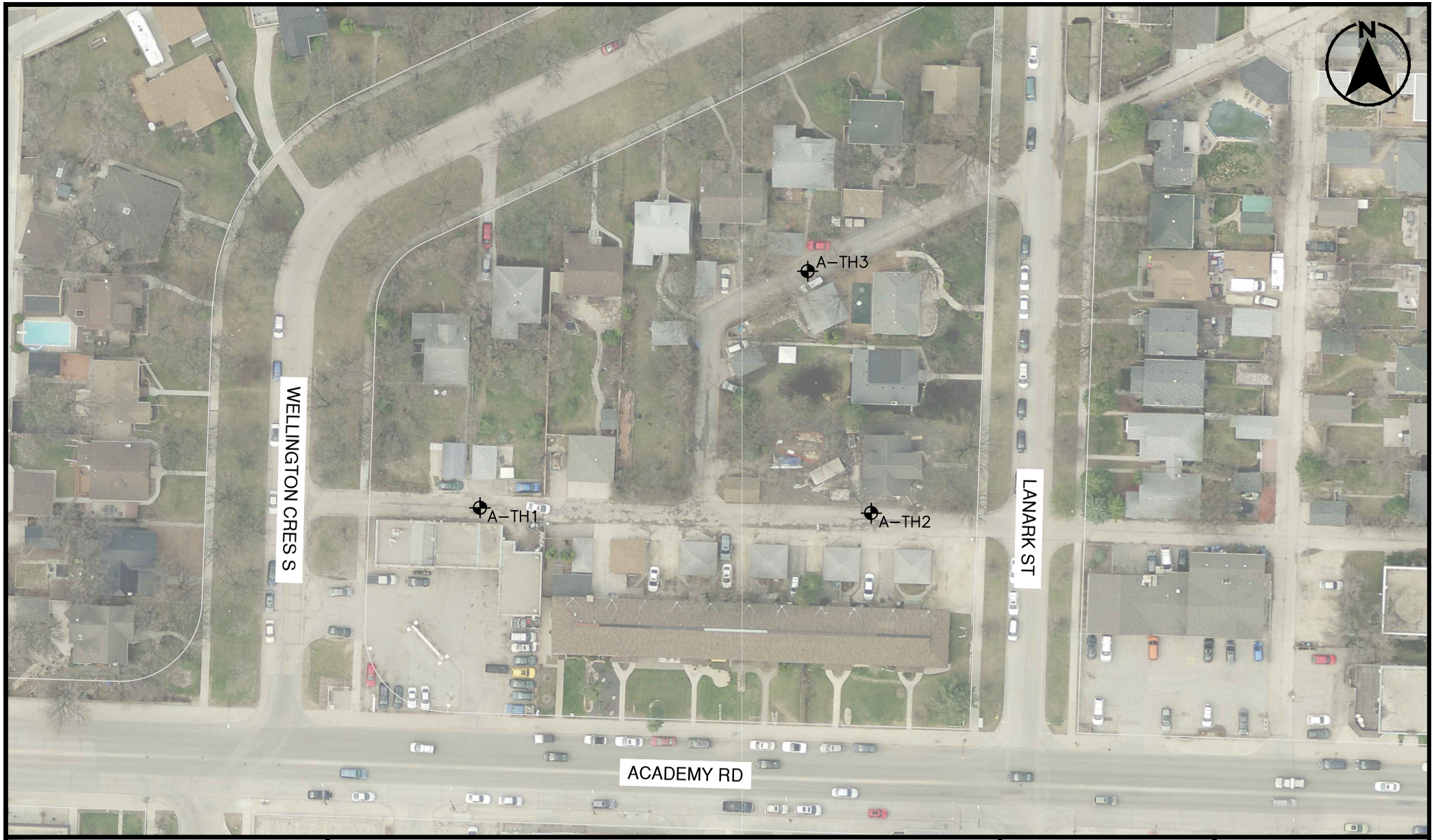
The report has been written to be read in its entirety, do not use any part of this report as a separate entity.

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

APPENDIX

A

WELLINGTON CRES S / LANARK / ACADEMY ALLEY



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TITLE:

2018 ALLEY RENEWALS – CONTRACT 1
LANARK/WELLINGTON CRES S/ACADEMY ALLEY
TESTHOLE LOCATIONS

SCALE: 1:1000

DATE: 2018/03/26

PROJECT NO: 17M-02283-00

REVISION:

DRAWING NO: GT–A

XREF

STAMP

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

A-TH1

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Lanark/Wellington Ave S
DATE STARTED 2/6/18 **COMPLETED** 2/6/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - B40 Truck Rig
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 629451.5 m E, 5526262.2 m N
AFTER DRILLING ---

DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
	ASPHALT - 90 mm thick				
	CONCRETE - 210 mm thick, intact				
	FILL - Grey, clayey, some sand and f. gravel	GB 1			17
0.5	CLAY (CH) - Grey, fissured				
		GB 2			34
1.0		GB 3			35
	SILT (ML) - Tan-brown, clayey - Frost to 1.35 m - Soft, moist below 1.35 m	GB 4			40
1.5	CLAY (CH) - Brown, stiff, moist, trace silt inclusions, trace oxidation	GB 5			33
		GB 6			39
2.0		GB 7			44
2.5					
3.0		GB 8			46

▲SPT N VALUE▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

- Testhole open to bottom after completion
- Backfilled with auger cuttings and patched with asphalt

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A-TH2

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Lanark/Wellington Ave S
DATE STARTED 2/6/18 **COMPLETED** 2/6/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - B40 Truck Rig
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES North side of alley: 629524.5 m E, 5526261.1 m N
AFTER DRILLING ---

DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
	ASPHALT - 100 mm thick				
	CONCRETE - 150 mm thick, deteriorated (no core)				
	FILL - Grey, clayey, some sand and f. gravel	GB 1			19
0.5	CLAY (CH) - Grey, fissured				
		GB 2			36
1.0		GB 3			37
	- Frost to 1.2 m - Stiff, moist below 1.2 m	GB 4			34
1.5		GB 5			34
	- Brown, cohesive, trace silt inclusions, below 1.8 m	GB 6			39
2.0		GB 7			40
2.5					
3.0		GB 8			50

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

- Testhole open to bottom after completion
- Backfilled with auger cuttings and patched with asphalt

GENERAL BH PLOTS - WSP ALLEY_RENEWALS_CONTRACT_1_LANARK.GPJ GINT STD CANADA.GDT 3/21/18

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A-TH3

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Lanark/Wellington Ave S
DATE STARTED 2/6/18 **COMPLETED** 2/6/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - B40 Truck Rig
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 629512.6 m E, 5526306.2 m N
AFTER DRILLING ---

DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
	ASPHALT - 75 mm thick				
	CONCRETE - 175 mm thick, intact				
	FILL - Clayey, some sand and f. gravel	GB 1			32
0.5	CLAY (CH) - Grey, fissured				
		GB 2			35
1.0		GB 3			37
	SILT (ML) - Clayey, tan-brown - 66.6% silt; 32.8% clay; 0.6% sand at 1.2 m - Frost to 1.35 m	GB 4			36
1.5	- Soft, moist below 1.35 m CLAY (CH) - Mottled grey and brown, stiff, moist	GB 5			39
	- Brown, trace silt inclusions below 1.8 m	GB 6			42
2.0		GB 7			44
2.5					
3.0		GB 8			50

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

- Testhole open to bottom after completion
- Backfilled with auger cuttings and patched with asphalt

Figure 1 – A-TH1 Wellington Cres S / Lanark / Academy Alley

Figure 2 – A-TH2 Wellington Cres S / Lanark / Academy Alley

Figure 3 – A-TH3 Wellington Cres S / Lanark / Academy Alley

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hmanalo@mts.net

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

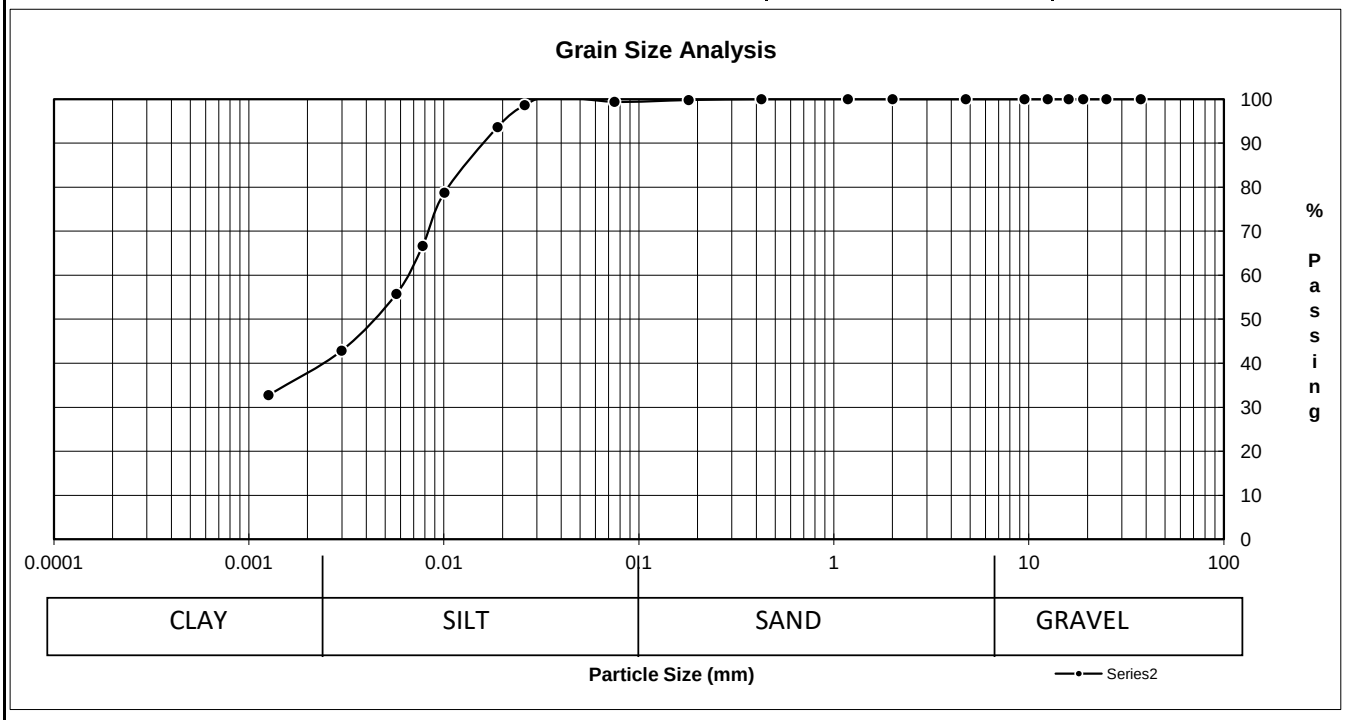
CLIENT: WSP Canada Group Limited
Suite 111-93 Lombard Avenue
Winnipeg, MB R3B 3B1
ATTENTION: Dana Bredin
PROJECT: 17M-02283-00
Lanark

PROJECT NO. 103-1804

Date Sampled: 12-Feb-18 Date Received: 12-Feb-18
Sampled By: Client Date Tested: 15-Feb-18

Material Identification
B.H./T.H. No. **TH 3 @4'**
Sample No. **3**
Sample Source
Specific Gravity of Material: 2.65

Sieve Analysis		Hydrometer Analysis	
Sieve (mm)	% Passing	Diameter	% Finer
50.00	100.0		
37.50	100.0		
25.00	100.0		
19.00	100.0		
16.00	100.0		
12.50	100.0	0.0363	100.7
9.50	100.0	0.0260	98.7
4.75	100.0	0.0189	93.7
2.00	100.0	0.0101	78.7
1.18	100.0	0.0078	66.7
0.425	100.0	0.0057	55.8
0.180	99.8	0.0030	42.8
0.075	99.4	0.0013	32.8



SOIL DESCRIPTION	% Composition		D10	
		Gravel	D30	
SILTY CLAY LOAM	0.6	Sand	D60	0.00571
	66.6	Silt	Cu	#DIV/0!
	32.8	Clay	Cc	#DIV/0!

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: GM

Reviewed by: Hermie Manalo

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MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT:	WSP	TEST NO:	18- 003	PROJECT NO:	103-1804
PROJECT:	17M-02283-00	DATE SAMPLED:	12-Feb-2018	SAMPLED BY:	Client
PROJECT CONTACT:	Dana Bredin	DATE TESTED:	13-Feb-2018	TESTED BY:	Greg Manalo
TEST LOCATION:	Lanark				

Description	TH1	TH1	TH1	TH1	TH1
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	135.60	150.70	172.20	152.80	160.40
Wt Dry Sample + Tare	117.00	113.20	128.60	109.80	121.40
Wt Water	18.60	37.50	43.60	43.00	39.00
Wt Tare	4.20	4.10	4.10	4.10	4.10
Wt Dry Sample	112.80	109.10	124.50	105.70	117.30
Moisture Content (%)	**16.5**	**34.4**	**35.0**	**40.7**	**33.2**

Description	TH1	TH1	TH1		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	151.90	170.20	166.30		
Wt Dry Sample + Tare	110.50	119.70	115.00		
Wt Water	41.40	50.50	51.30		
Wt Tare	4.10	4.10	4.20		
Wt Dry Sample	106.40	115.60	110.80		
Moisture Content (%)	**38.9**	**43.7**	**46.3**		

Description	TH2	TH2	TH2	TH2	TH2
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	167.10	132.60	148.00	171.00	151.20
Wt Dry Sample + Tare	141.70	98.70	109.10	129.10	113.80
Wt Water	25.40	33.90	38.90	41.90	37.40
Wt Tare	4.20	4.20	4.20	4.20	4.10
Wt Dry Sample	137.50	94.50	104.90	124.90	109.70
Moisture Content (%)	**18.5**	**35.9**	**37.1**	**33.5**	**34.1**

Description	TH2	TH2	TH2		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	147.70	131.80	163.80		
Wt Dry Sample + Tare	107.40	95.30	110.40		
Wt Water	40.30	36.50	53.40		
Wt Tare	4.20	4.10	4.20		
Wt Dry Sample	103.20	91.20	106.20		
Moisture Content (%)	**39.1**	**40.0**	**50.3**		

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MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT:	WSP	TEST NO:	18- 003	PROJECT NO:	103-1804
PROJECT:	17M-02283-00	DATE SAMPLED:	12-Feb-2018	SAMPLED BY:	Client
PROJECT CONTACT:	Dana Bredin	DATE TESTED:	13-Feb-2018	TESTED BY:	Greg Manalo
TEST LOCATION:	Lanark				

Description	TH3	TH3	TH3	TH3	TH3
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	156.50	142.70	154.00	216.70	135.50
Wt Dry Sample + Tare	119.30	106.80	113.90	160.50	98.70
Wt Water	37.20	35.90	40.10	56.20	36.80
Wt Tare	4.10	4.10	4.20	4.20	4.10
Wt Dry Sample	115.20	102.70	109.70	156.30	94.60
Moisture Content (%)	**32.3**	**35.0**	**36.6**	**36.0**	**38.9**

Description	TH3	TH3	TH3		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	158.80	160.90	146.70		
Wt Dry Sample + Tare	113.10	112.90	99.10		
Wt Water	45.70	48.00	47.60		
Wt Tare	4.20	4.20	4.20		
Wt Dry Sample	108.90	108.70	94.90		
Moisture Content (%)	**42.0**	**44.2**	**50.2**		

Description					
Depth (ft)					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					

Description					
Depth (ft)					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					

MTR/Disptach No: -

APPENDIX

B OAK / ELM ALLEY

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TITLE:

2018 ALLEY RENEWALS – CONTRACT 1
OAK/ELM/WELLINGTON/ACADEMY ALLEY
TESTHOLE LOCATIONS

SCALE: 1:1250

DATE: 2018/03/20

PROJECT NO: 17M–02283–00

REVISION:

DRAWING NO: GT–B

XREF

STAMP

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

B-TH1

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Oak/Elm Alley
DATE STARTED 2/8/18 **COMPLETED** 2/8/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - B40 Truck Rig
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 630749.8 m E, 5526202.1 m N
AFTER DRILLING ---

DEPTH (m)	GRAPHIC LOG	ELEV. (m)	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
				CONCRETE - 200 mm thick, intact				
				FILL - Clayey, grey-black, trace sand and f. gravel - Trace organics above 0.6 m	GB 1			25
0.5					GB 2			22
1.0				SILT (ML) - Tan-brown, dry	GB 3			13
					GB 4			11
1.5				- Frost to 1.35 m - Clayey below 1.35 m				
				CLAY (CH) - Brown, stiff, moist, trace silt inclusions	GB 5			25
					GB 6			33
2.0					GB 7			37
2.5								
3.0					GB 8			46

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

- Testhole open to bottom after completion
- Backfilled with auger cuttings and patched with asphalt

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

B-TH2

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Oak/Elm Alley
DATE STARTED 2/8/18 **COMPLETED** 2/8/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - B40 Truck Rig
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 630752.0 m E, 5526282.1 m N
AFTER DRILLING ---

DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
	CONCRETE - 150 mm thick, broken				
	FILL - Clayey, grey-black, trace sand and f. gravel	GB 1			25
0.5	- Silt mixed with grey clay below 0.6 m - 66.7% silt; 24.7% clay; 8.6% sand at 0.6 m	GB 2			26
	SILT (ML) - Tan-brown, frozen	GB 3			23
1.0					
	CLAY (CH) - Brown, fissured to 1.5 m - Frost to 1.35 m - Stiff, moist, some silt inclusions below 1.35 m - Silty from 1.5 to 1.8 m	GB 4			29
1.5		GB 5			32
		GB 6			41
2.0		GB 7			46
2.5	-Silty, trace oxidation from 2.4 m to 2.55 m				
3.0		GB 8			52
	- Testhole open to bottom after completion - Backfilled with auger cuttings and patched with asphalt				

▲SPT N VALUE▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

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

B-TH3

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Oak/Elm Alley
DATE STARTED 2/8/18 **COMPLETED** 2/8/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - B40 Truck Rig
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 630754.2 m E, 5526357.9 m N
AFTER DRILLING ---

DEPTH (m)	GRAPHIC LOG	ELEV. (m)	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
				CONCRETE - 200 mm thick, intact				
				FILL - Clayey, grey-black, mixed with some silt, trace sand and f. gravel	GB 1			28
0.5					GB 2			26
				CLAY (CH) - Brown, fissured				
1.0					GB 3			38
					GB 4			37
				- Frost to 1.35 m - Stiff, moist, trace silt inclusions below 1.35 m				
1.5					GB 5			34
					GB 6			42
2.0								
					GB 7			44
				- Silty, trace oxidation from 2.25 m to 2.4 m				
2.5								
3.0					GB 8			50
				- Testhole open to bottom after completion - Backfilled with auger cuttings and patched with asphalt				

▲SPT N VALUE▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

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

B-TH4

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Oak/Elm Alley
DATE STARTED 2/8/18 **COMPLETED** 2/8/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - B40 Truck Rig
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 630734.5 m E, 5526415.0 m N
AFTER DRILLING ---

DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
	CONCRETE - 230 mm thick, intact				
	FILL - Clayey, grey-black, trace sand and f. gravel	GB 1			12
0.5					
	CLAY (CH) - Grey, fissured	GB 2			28
1.0		GB 3			26
		GB 4			28
1.5	- Frost to 1.5 m - Stiff, moist below 1.5 m	GB 5			30
		GB 6			39
2.0					
	- Silty, trace sand, trace oxidation from 2.25 m - 2.4 m	GB 7			38
	- Brown below 2.4 m				
2.5					
3.0		GB 8			47

▲SPT N VALUE▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

- Testhole open to bottom after completion
- Backfilled with auger cutting and patched with asphalt

Figure 4 – B-TH1 Oak / Elm Alley

Figure 5 – B-TH2 Oak / Elm Alley

Figure 6 – B-TH3 Oak / Elm Alley

Figure 7 – B-TH4 Oak / Elm Alley

H. MANALO CONSULTING LTD.
1402 Notre Dame Avenue, Winnipeg, MB R3E 3G5
Phone: 204 697 3854 Cell: 204 997-1355
hmanalo@mts.net

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

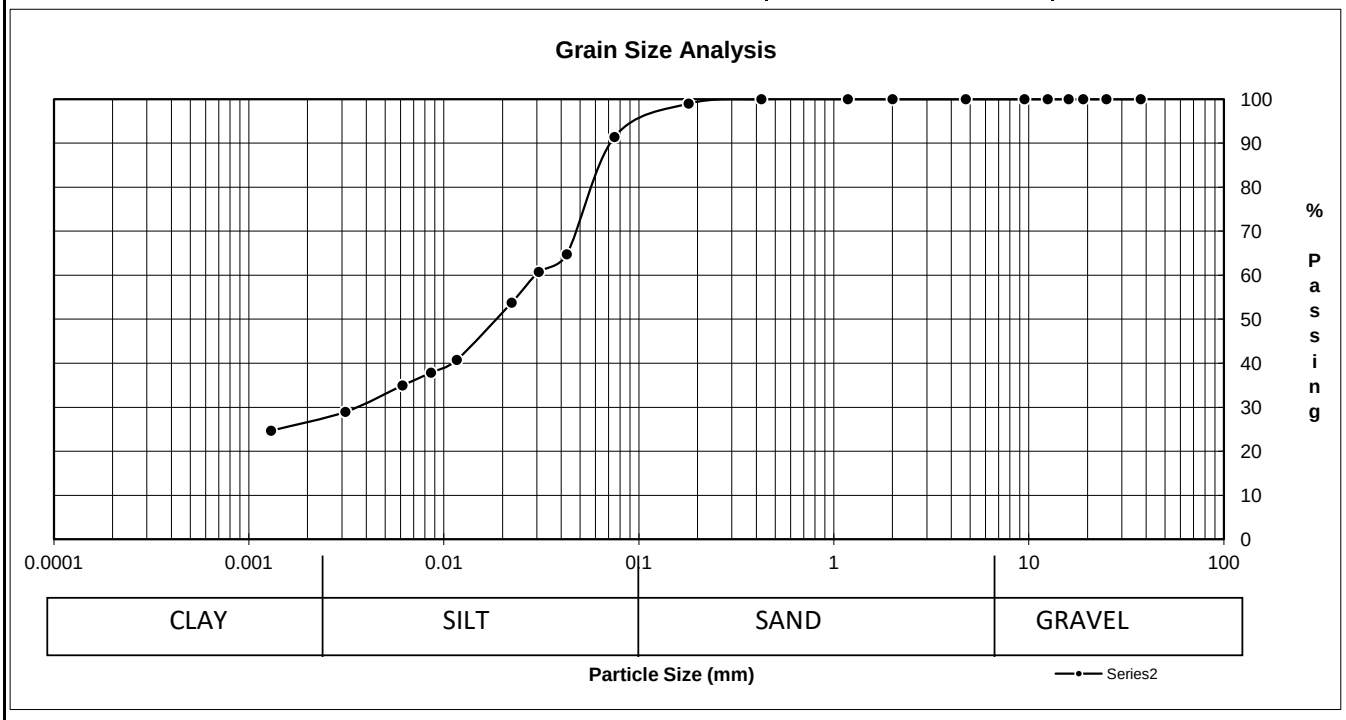
CLIENT: WSP Canada Group Limited
Suite 111-93 Lombard Avenue
Winnipeg, MB R3B 3B1
ATTENTION: Dana Bredin
PROJECT: 17M-02283-00
Oak

PROJECT NO. 103-1804

Date Sampled: 12-Feb-18 Date Received: 12-Feb-18
Sampled By: Client Date Tested: 15-Feb-18

Material Identification
B.H./T.H. No. **TH 2 @2'**
Sample No. **4**
Sample Source
Specific Gravity of Material: 2.65

Sieve Analysis		Hydrometer Analysis	
Sieve (mm)	% Passing	Diameter	% Finer
50.00	100.0		
37.50	100.0		
25.00	100.0		
19.00	100.0		
16.00	100.0		
12.50	100.0	0.0427	64.8
9.50	100.0	0.0307	60.8
4.75	100.0	0.0223	53.8
2.00	100.0	0.0116	40.8
1.18	100.0	0.0086	37.9
0.425	100.0	0.0061	34.9
0.180	99.0	0.0031	28.9
0.075	91.4	0.0013	24.7



SOIL DESCRIPTION	% Composition		D10	
		Gravel	D30	0.00312
SILT LOAM	8.6	Sand	D60	0.03067
	66.7	Silt	Cu	#DIV/0!
	24.7	Clay	Cc	#DIV/0!

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: GM

Reviewed by: Hermie Manalo

H. MANALO CONSULTING LTD.

1402 Notre Dame Avenue, Winnipeg, MB R3E 3G5
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Email: hmanalo@mts.net

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT:	WSP	TEST NO:	18- 004	PROJECT NO:	103-1804
PROJECT:	17M-02283-00	DATE SAMPLED:	12-Feb-2018	SAMPLED BY:	Client
PROJECT CONTACT:	Dana Bredin	DATE TESTED:	13-Feb-2018	TESTED BY:	Greg Manalo
TEST LOCATION:	Oak				

Description	TH1	TH1	TH1	TH1	TH1
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	156.70	135.20	164.20	142.20	157.90
Wt Dry Sample + Tare	126.60	111.20	145.30	128.70	127.40
Wt Water	30.10	24.00	18.90	13.50	30.50
Wt Tare	4.20	4.20	4.10	4.20	4.10
Wt Dry Sample	122.40	107.00	141.20	124.50	123.30
Moisture Content (%)	**24.6**	**22.4**	**13.4**	**10.8**	**24.7**

Description	TH1	TH1	TH1		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	146.40	164.50	187.70		
Wt Dry Sample + Tare	111.10	121.60	130.30		
Wt Water	35.30	42.90	57.40		
Wt Tare	4.20	4.20	4.20		
Wt Dry Sample	106.90	117.40	126.10		
Moisture Content (%)	**33.0**	**36.5**	**45.5**		

Description	TH2	TH2	TH2	TH2	TH2
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	165.40	349.80	161.60	182.70	168.30
Wt Dry Sample + Tare	133.70	278.30	132.70	142.70	128.40
Wt Water	31.70	71.50	28.90	40.00	39.90
Wt Tare	4.60	4.30	4.40	4.40	4.40
Wt Dry Sample	129.10	274.00	128.30	138.30	124.00
Moisture Content (%)	**24.6**	**26.1**	**22.5**	**28.9**	**32.2**

Description	TH2	TH2	TH2		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	165.40	203.40	145.80		
Wt Dry Sample + Tare	118.50	141.10	97.40		
Wt Water	46.90	62.30	48.40		
Wt Tare	4.50	4.40	4.30		
Wt Dry Sample	114.00	136.70	93.10		
Moisture Content (%)	**41.1**	**45.6**	**52.0**		

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Phone: 204-697-3854 Cell: 204-997-1355
Email: hmanalo@mts.net

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT:	WSP	TEST NO:	18- 004	PROJECT NO:	103-1804
PROJECT:	17M-02283-00	DATE SAMPLED:	12-Feb-2018	SAMPLED BY:	Client
PROJECT CONTACT:	Dana Bredin	DATE TESTED:	13-Feb-2018	TESTED BY:	Greg Manalo
TEST LOCATION:	Oak				

Description	TH3	TH3	TH3	TH3	TH3
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	177.60	140.00	162.30	162.20	180.50
Wt Dry Sample + Tare	139.80	112.30	118.80	119.40	136.00
Wt Water	37.80	27.70	43.50	42.80	44.50
Wt Tare	4.20	4.10	4.30	4.30	4.20
Wt Dry Sample	135.60	108.20	114.50	115.10	131.80
Moisture Content (%)	**27.9**	**25.6**	**38.0**	**37.2**	**33.8**

Description	TH3	TH3	TH3		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	150.90	162.60	132.90		
Wt Dry Sample + Tare	107.90	114.50	90.00		
Wt Water	43.00	48.10	42.90		
Wt Tare	4.30	4.40	4.30		
Wt Dry Sample	103.60	110.10	85.70		
Moisture Content (%)	**41.5**	**43.7**	**50.1**		

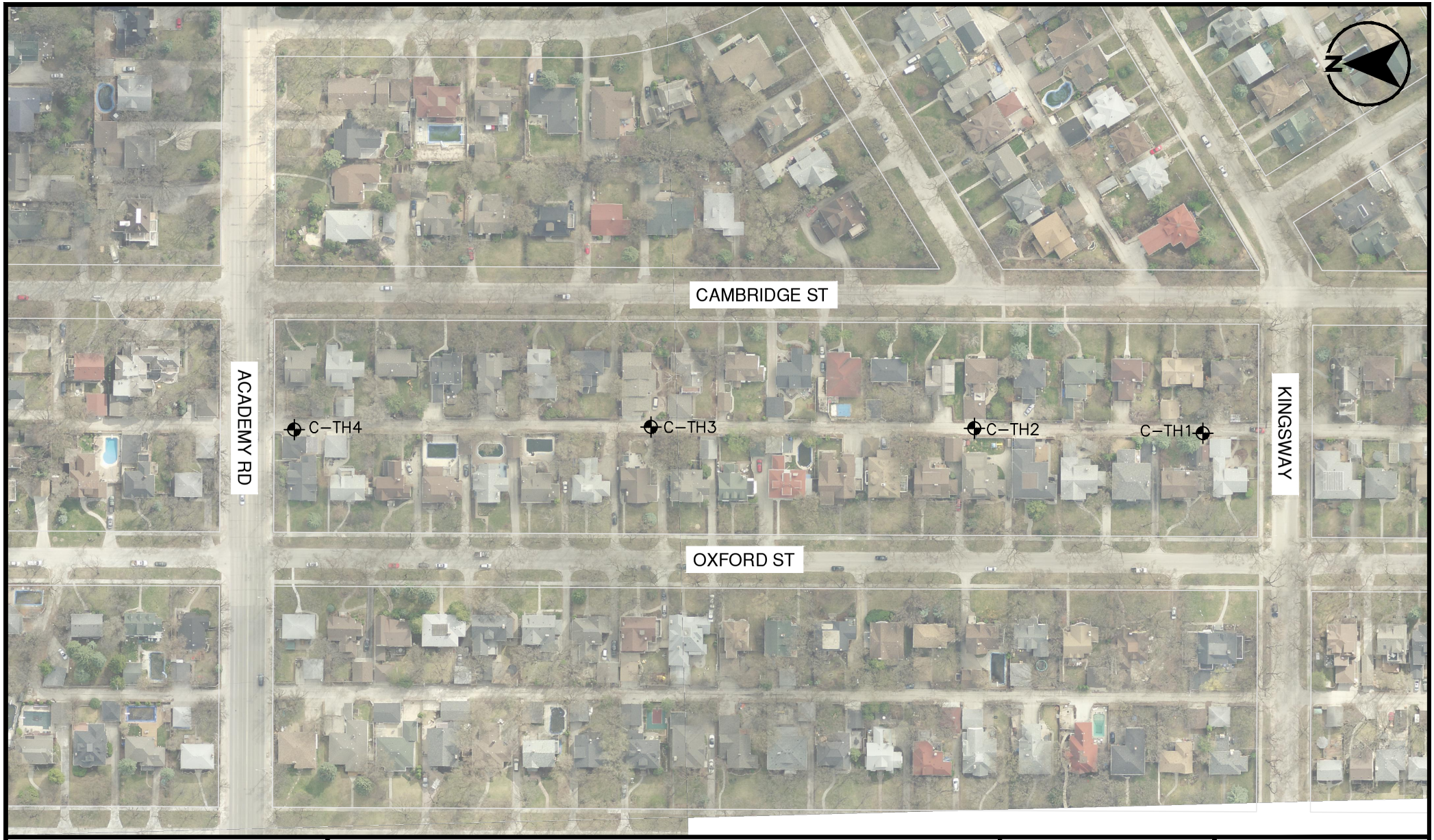
Description	TH4	TH4	TH4	TH4	TH4
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	142.90	135.10	165.20	172.90	150.40
Wt Dry Sample + Tare	127.70	106.90	132.20	136.40	116.30
Wt Water	15.20	28.20	33.00	36.50	34.10
Wt Tare	4.30	4.30	4.20	4.20	4.20
Wt Dry Sample	123.40	102.60	128.00	132.20	112.10
Moisture Content (%)	**12.3**	**27.5**	**25.8**	**27.6**	**30.4**

Description	TH4	TH4	TH4		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	160.50	172.50	154.10		
Wt Dry Sample + Tare	116.60	126.00	105.90		
Wt Water	43.90	46.50	48.20		
Wt Tare	4.20	4.20	4.20		
Wt Dry Sample	112.40	121.80	101.70		
Moisture Content (%)	**39.1**	**38.2**	**47.4**		

MTR/Disptach No: -

APPENDIX

C OXFORD / CAMBRIDGE ALLEY



wsp
1600 BUFFALO PLACE
WINNIPEG, MANITOBA
CANADA R3T 6B8
PHONE: 204–477–6650 FAX : 204–474–2864
WWW.WSPGROUP.COM

TITLE:

2018 ALLEY RENEWALS – CONTRACT 3
OXFORD/CAMBRIDGE/ACADEMY/KINGSWAY ALLEY
TESTHOLE LOCATIONS

SCALE: 1:2000

DATE: 2018/03/26

PROJECT NO: 17M–02283–00

REVISION:

DRAWING NO: GT–C

XREF

STAMP

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

C-TH1

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Oxford/Cambridge Alley
DATE STARTED 2/8/18 **COMPLETED** 2/8/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - B40 Truck Rig
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES West side of alley: 631138.4 m E, 5525803.9 m N
AFTER DRILLING ---

DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
	CONCRETE - 180 mm thick, intact				
	FILL - Clayey, grey-black, trace sand and f. gravel	GB 1			24
0.5					
	SILT (ML) - Tan-brown, frozen	GB 2			25
		GB 3			24
1.0	CLAY (CH) - Brown, silty, fissured				
		GB 4			30
1.5					
	- Frost to 1.5 m - Stiff, moist, cohesive, some silt inclusions below 1.5 m	GB 5			33
		GB 6			46
2.0	- Silty, trace oxidation from 1.95 m to 2.1 m				
		GB 7			41
2.5					
3.0		GB 10			55

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

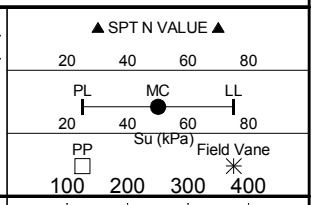
- Testhole open to bottom after completion
- Backfilled with auger cuttings and patched with asphalt

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

C-TH2

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Oxford/Cambridge Alley
DATE STARTED 2/8/18 **COMPLETED** 2/8/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - B40 Truck Rig
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 631142.4 m E, 5525888.9 m N
AFTER DRILLING ---

DEPTH (m)	GRAPHIC LOG	ELEV. (m)	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
				CONCRETE - 170 mm thick, intact				
				FILL - Clayey, grey-black, trace sand and f. gravel	GB 1			20
0.5								
				SILT (ML) - Tan-brown, some clay, frozen	GB 2			30
1.0					GB 3			30
				- Frost to 1.35 m	GB 4			26
				- Soft, moist below 1.35 m	GB 5			21
1.5				CLAY (CH) - Brown, stiff, moist, trace silt inclusions				
					GB 6			41
2.0								
					GB 7			44
2.5								
				- Silty, trace oxidation at 2.7 m				
				- Mottled brown and grey below 2.95 m				
3.0					GB 10			38
				- Testhole open to bottom after completion - Backfilled with auger cuttings and patched with asphalt				



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

C-TH3

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Oxford/Cambridge Alley
DATE STARTED 2/8/18 **COMPLETED** 2/8/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - B40 Truck Rig
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 631146.1 m E, 5526009.4 m N
AFTER DRILLING ---

DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
	CONCRETE - 160 mm thick, intact				
	FILL - Clayey, grey-black, trace sand and f. gravel	GB 1			28
0.5	CLAY (CH) - Mottled grey and brown, fissured	GB 2			28
1.0	- Brown, silty below 0.9 m	GB 3			20
		GB 4			29
1.5	- Frost to 1.35 m - Stiff, moist below 1.35 m	GB 5			31
		GB 6			42
2.0	- Trace silt inclusions below 2.1 m	GB 7			44
2.5	- Silty, trace oxidation from 2.55 m to 2.7 m				
3.0		GB 10			54

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

- Testhole open to bottom after completion
- Backfilled with auger cuttings and patched with asphalt

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

C-TH4

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Oxford/Cambridge Alley
DATE STARTED 2/8/18 **COMPLETED** 2/8/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - B40 Truck Rig
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES West side of alley: 631148.6 m E, 5526081.1 m N
AFTER DRILLING ---

DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
	CONCRETE - 200 mm thick, intact				
	FILL - Clayey, grey-black, trace sand and f. gravel	GB 1			31
0.5	SILT (ML) - Tan-brown, clayey above 0.9 m, frozen	GB 2			28
	- 74.5% silt; 22.7% clay; 2.8% sand at 0.9 m	GB 3			27
1.0	- Frost to 1.35 m	GB 4			17
1.5	CLAY (CH) - Mottled grey and brown, stiff, moist. fissured - Trace f. gravel at 1.5 m	GB 5			33
	- Brown, cohesive below 1.95 m	GB 6			31
2.0		GB 7			41
2.5					
3.0	- Slity, trace oxidation at 2.95 m	GB 10			46

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

- Testhole open to bottom after completion
- Backfilled with auger cutting and patched with asphalt

Figure 8 – C-TH1 Oxford / Cambridge Alley

Figure 9 – C-TH2 Oxford / Cambridge Alley

Figure 10 – C-TH3 Oxford / Cambridge Alley

Figure 11 – C-TH4 Oxford / Cambridge Alley

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PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

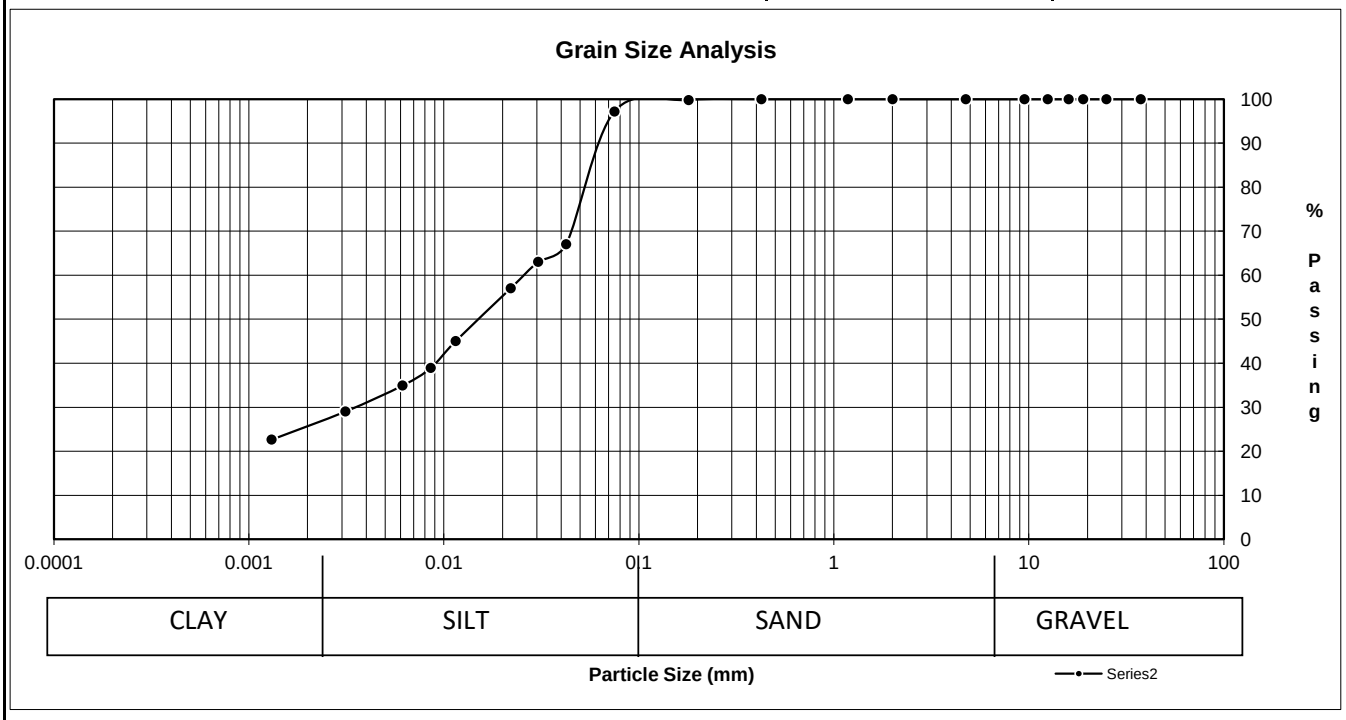
CLIENT: WSP Canada Group Limited
Suite 111-93 Lombard Avenue
Winnipeg, MB R3B 3B1
ATTENTION: Dana Bredin
PROJECT: 17M-02283-00
Oxford

PROJECT NO. 103-1804

Date Sampled: 12-Feb-18 Date Received: 12-Feb-18
Sampled By: Client Date Tested: 15-Feb-18

Material Identification
B.H./T.H. No. **TH 4 @3'**
Sample No. **5**
Sample Source
Specific Gravity of Material: 2.65

Sieve Analysis		Hydrometer Analysis	
Sieve (mm)	% Passing	Diameter	% Finer
50.00	100.0		
37.50	100.0		
25.00	100.0		
19.00	100.0		
16.00	100.0		
12.50	100.0	0.0424	67.0
9.50	100.0	0.0304	63.0
4.75	100.0	0.0220	57.0
2.00	100.0	0.0115	45.0
1.18	100.0	0.0086	38.9
0.425	100.0	0.0061	34.9
0.180	99.8	0.0031	29.0
0.075	97.2	0.0013	22.7



SOIL DESCRIPTION	% Composition		D10	
		Gravel	D30	
SILT LOAM	2.8	Sand	D60	0.00571
	74.5	Silt	Cu	#DIV/0!
	22.7	Clay	Cc	#DIV/0!

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: GM

Reviewed by: Hermie Manalo

H. MANALO CONSULTING LTD.

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Email: hmanalo@mts.net

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT:	WSP	TEST NO:	18- 005	PROJECT NO:	103-1804
PROJECT:	17M-02283-00	DATE SAMPLED:	12-Feb-2018	SAMPLED BY:	Client
PROJECT CONTACT:	Dana Bredin	DATE TESTED:	13-Feb-2018	TESTED BY:	Greg Manalo
TEST LOCATION:	Oxford				

Description	TH1	TH1	TH1	TH1	TH1
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	156.70	125.80	135.70	132.60	131.10
Wt Dry Sample + Tare	134.20	108.80	117.00	111.60	108.50
Wt Water	22.50	17.00	18.70	21.00	22.60
Wt Tare	40.60	40.70	40.50	40.90	40.90
Wt Dry Sample	93.60	68.10	76.50	70.70	67.60
Moisture Content (%)	**24.0**	**25.0**	**24.4**	**29.7**	**33.4**

Description	TH1	TH1	TH1		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	121.30	141.00	142.90		
Wt Dry Sample + Tare	96.00	111.80	106.50		
Wt Water	25.30	29.20	36.40		
Wt Tare	40.70	40.90	40.70		
Wt Dry Sample	55.30	70.90	65.80		
Moisture Content (%)	**45.8**	**41.2**	**55.3**		

Description	TH2	TH2	TH2	TH2	TH2
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	140.60	142.70	152.20	139.90	147.10
Wt Dry Sample + Tare	123.70	119.00	126.50	117.00	128.60
Wt Water	16.90	23.70	25.70	22.90	18.50
Wt Tare	40.90	41.00	41.10	29.20	41.30
Wt Dry Sample	82.80	78.00	85.40	87.80	87.30
Moisture Content (%)	**20.4**	**30.4**	**30.1**	**26.1**	**21.2**

Description	TH2	TH2	TH2		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	131.80	129.80	140.80		
Wt Dry Sample + Tare	105.40	102.80	113.60		
Wt Water	26.40	27.00	27.20		
Wt Tare	40.60	41.30	41.40		
Wt Dry Sample	64.80	61.50	72.20		
Moisture Content (%)	**40.7**	**43.9**	**37.7**		

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1402 Notre Dame Avenue, Winnipeg, MB R3E 3G5
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Email: hmanalo@mts.net

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT:	WSP	TEST NO:	18- 005	PROJECT NO:	103-1804
PROJECT:	17M-02283-00	DATE SAMPLED:	12-Feb-2018	SAMPLED BY:	Client
PROJECT CONTACT:	Dana Bredin	DATE TESTED:	13-Feb-2018	TESTED BY:	Greg Manalo
TEST LOCATION:	Oxford				

Description	TH3	TH3	TH3	TH3	TH3
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	151.20	158.30	152.10	153.50	150.10
Wt Dry Sample + Tare	119.30	124.30	126.70	125.60	124.60
Wt Water	31.90	34.00	25.40	27.90	25.50
Wt Tare	4.20	4.10	4.10	29.40	41.40
Wt Dry Sample	115.10	120.20	122.60	96.20	83.20
Moisture Content (%)	**27.7**	**28.3**	**20.7**	**29.0**	**30.6**

Description	TH3	TH3	TH3		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	182.80	164.70	137.20		
Wt Dry Sample + Tare	141.30	126.90	103.70		
Wt Water	41.50	37.80	33.50		
Wt Tare	41.30	40.50	41.10		
Wt Dry Sample	100.00	86.40	62.60		
Moisture Content (%)	**41.5**	**43.7**	**53.5**		

Description	TH4	TH4	TH4	TH4	TH4
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	143.70	150.70	295.90	192.60	167.20
Wt Dry Sample + Tare	119.30	126.60	233.90	165.50	136.00
Wt Water	24.40	24.10	62.00	27.10	31.20
Wt Tare	41.20	41.10	7.10	4.10	40.90
Wt Dry Sample	78.10	85.50	226.80	161.40	95.10
Moisture Content (%)	**31.2**	**28.2**	**27.3**	**16.8**	**32.8**

Description	TH4	TH4	TH4		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	196.80	178.20	177.10		
Wt Dry Sample + Tare	160.40	138.60	134.00		
Wt Water	36.40	39.60	43.10		
Wt Tare	40.90	41.10	40.70		
Wt Dry Sample	119.50	97.50	93.30		
Moisture Content (%)	**30.5**	**40.6**	**46.2**		

MTR/Disptach No: -

APPENDIX

D PARKVILLE / ARDEN ALLEY

wsp
1600 BUFFALO PLACE
WINNIPEG, MANITOBA
CANADA R3T 6B8
PHONE: 204–477–6650 FAX : 204–474–2864
WWW.WSPGROUP.COM

TITLE:

2018 ALLEY RENEWALS – CONTRACT 1
PARKVILLE/ARDEN/PULBERRY/DUNKIRK ALLEY
TESTHOLE LOCATIONS

SCALE: 1:1250

DATE: 2018/03/26

PROJECT NO: 17M–02283–00

REVISION:

DRAWING NO: GT–D

XREF

STAMP

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

D-TH1

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Parkville/Arden Alley
DATE STARTED 2/14/18 **COMPLETED** 2/14/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - CME
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 635372.1 m E, 5521953.8 m N
AFTER DRILLING ---

DEPTH (m)	GRAPHIC LOG	ELEV. (m)	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
				ASPHALT - 60 mm thick				
				CONCRETE - 150 mm thick, intact				
				FILL - Clay mixed with silt, grey, trace sand	GB 1			34
0.5					GB 2			37
1.0				SILT (ML) - Tan-brown, frozen - 72.7% silt; 25.5% clay; 1.8% sand at 0.9 m	GB 3			33
					GB 4			26
1.5				- Frost to 1.35 m - Clayey, firm to soft, moist below 1.35 m				
				CLAY (CH) - Brown, stiff, moist, some silt inclusions	GB 5			34
					GB 6			33
2.0					GB 7			45
2.5								
3.0					GB 10			49

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

- Testhole open to bottom after completion
- Backfilled with auger cuttings and bentonite, patched with concrete

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

D-TH2

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Parkville/Arden Alley
DATE STARTED 2/14/18 **COMPLETED** 2/14/18
GROUND ELEVATION _____ **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - CME
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 635441.9 m E, 5521993.5 m N
AFTER DRILLING ---

DEPTH (m)	GRAPHIC LOG	ELEV. (m)	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
				ASPHALT - 30 mm thick				
				CONCRETE - 120 mm thick, intact				
				FILL - Clay mixed with some silt, trace sand, grey	GB 1			30
0.5					GB 2			26
				SILT (ML) - Tan-brown, frozen	GB 3			22
1.0				- Clayey below 1.2 m - Frost to 1.35 m	GB 4			26
				CLAY (CH) - Brown, stiff, moist, high plastic - Silty from 1.35 m to 1.65 m	GB 5			36
1.5				- Trace silt inclusions below 1.65 m				
					GB 6			44
2.0								
					GB 7			50
2.5								
3.0					GB 10			51

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

- Testhole open to bottom after completion
- Backfilled with auger cuttings and bentonite, patched with concrete

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

D-TH3

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Parkville/Arden Alley
DATE STARTED 2/14/18 **COMPLETED** 2/14/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - CME
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES South side of alley: 635601.2 m E, 5522081.1 m N
AFTER DRILLING ---

DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
	ASPHALT - 30 mm thick				
	CONCRETE - 160 mm thick, intact				
	FILL - Clayey, grey-black, trace sand and f. gravel	GB 1			22
0.5					
	CLAY (CH) - Brown, silty	GB 2			24
1.0		GB 3			27
		GB 4			29
	- Frost to 1.35 m - Stiff, moist, trace silt inclusions below 1.35 m				
1.5		GB 5			28
		GB 6			44
2.0					
		GB 7			44
2.5					
3.0		GB 10			48

▲SPT N VALUE▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

- Testhole open to bottom after completion
- Backfilled with auger cuttings and benonite, patched with concrete

GENERAL BH PLOTS - WSP ALLEY_RENEWALS_CONTRACT_1_PARKVILLE.GPJ GINT STD CANADA.GDT 3/21/18

Figure 12 – D-TH1 Parkville / Arden Alley

Figure 13 – D-TH2 Parkville / Arden Alley

Figure 14 – D-TH3 Parkville / Arden Alley

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PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

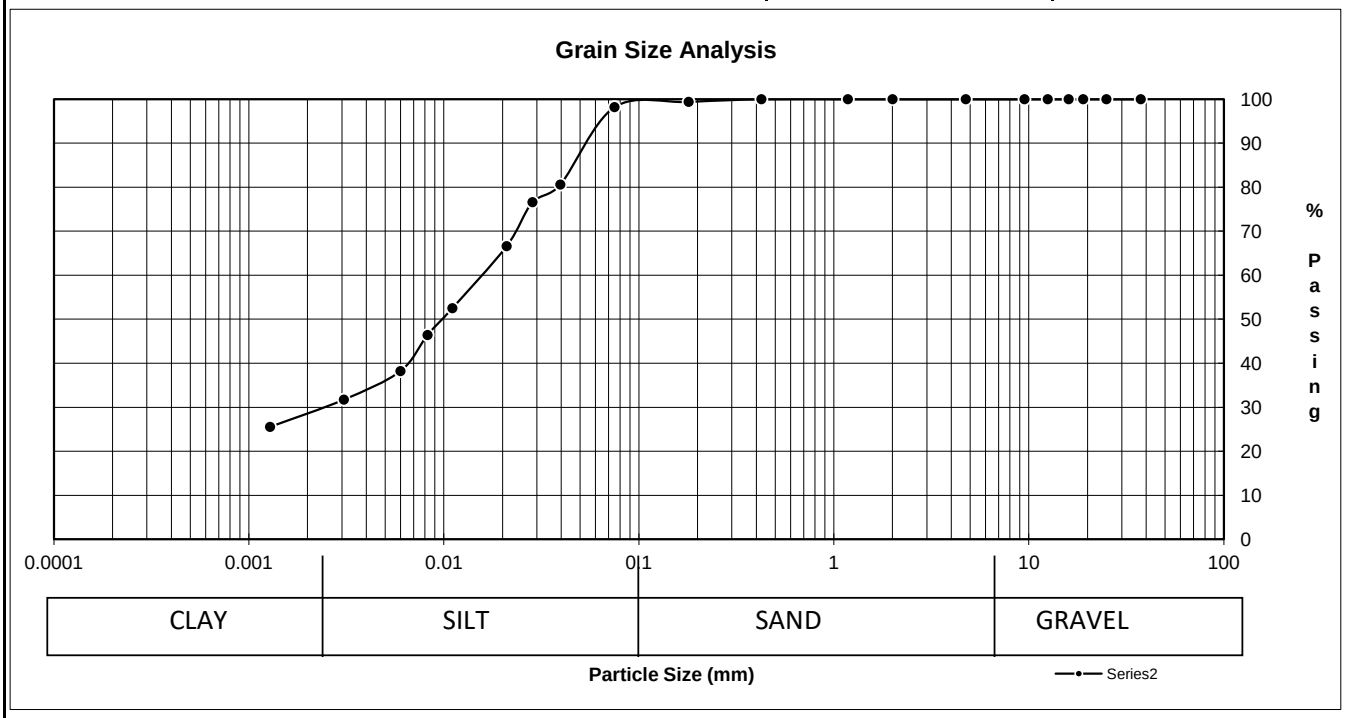
CLIENT: WSP Canada Group Limited
Suite 111-93 Lombard Avenue
Winnipeg, MB R3B 3B1
ATTENTION: Dana Bredin
PROJECT: 17M-02283-00
Parkville

PROJECT NO. 103-1804

Date Sampled: 20-Feb-18 Date Received: 20-Feb-18
Sampled By: Client Date Tested: 26-Feb-18

Material Identification
B.H./T.H. No. **TH 1 @3'**
Sample No. **1**
Sample Source
Specific Gravity of Material: 2.65

Sieve Analysis		Hydrometer Analysis	
Sieve (mm)	% Passing	Diameter	% Finer
50.00	100.0		
37.50	100.0		
25.00	100.0		
19.00	100.0		
16.00	100.0		
12.50	100.0	0.0396	80.6
9.50	100.0	0.0285	76.6
4.75	100.0	0.0210	66.6
2.00	100.0	0.0111	52.5
1.18	100.0	0.0082	46.4
0.425	100.0	0.0060	38.2
0.180	99.4	0.0031	31.7
0.075	98.2	0.0013	25.5



SOIL DESCRIPTION	% Composition		D10	
		Gravel	D30	0.00128
	1.8	Sand	D60	0.02098
SILT LOAM	72.7	Silt	Cu	#DIV/0!
	25.5	Clay	Cc	#DIV/0!

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: GM

Reviewed by: Hermie Manalo

H. MANALO CONSULTING LTD.

1402 Notre Dame Avenue, Winnipeg, MB R3E 3G5
Phone: 204-697-3854 Cell: 204-997-1355
Email: hmanalo@mts.net

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT:	WSP	TEST NO:	18- 010	PROJECT NO:	103-1804
PROJECT:	17M-02283-00	DATE SAMPLED:	20-Feb-2018	SAMPLED BY:	Client
PROJECT CONTACT:	Dana Bredin	DATE TESTED:	23-Feb-2018	TESTED BY:	Irvin Araquil
TEST LOCATION:	Parkville				

Description	TH1	TH1	TH1	TH1	TH1
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	157.40	152.00	318.80	183.50	159.80
Wt Dry Sample + Tare	118.80	112.40	240.30	147.10	120.50
Wt Water	38.60	39.60	78.50	36.40	39.30
Wt Tare	4.20	4.20	4.10	4.20	4.20
Wt Dry Sample	114.60	108.20	236.20	142.90	116.30
Moisture Content (%)	**33.7**	**36.6**	**33.2**	**25.5**	**33.8**

Description	TH1	TH1	TH1		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	158.30	155.30	167.00		
Wt Dry Sample + Tare	120.20	108.70	113.20		
Wt Water	38.10	46.60	53.80		
Wt Tare	4.30	4.20	4.20		
Wt Dry Sample	115.90	104.50	109.00		
Moisture Content (%)	**32.9**	**44.6**	**49.4**		

Description	TH2	TH2	TH2	TH2	TH2
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	162.10	154.80	153.20	161.10	156.40
Wt Dry Sample + Tare	125.70	123.80	126.00	129.10	116.20
Wt Water	36.40	31.00	27.20	32.00	40.20
Wt Tare	4.20	4.20	4.20	4.20	4.20
Wt Dry Sample	121.50	119.60	121.80	124.90	112.00
Moisture Content (%)	**30.0**	**25.9**	**22.3**	**25.6**	**35.9**

Description	TH2	TH2	TH2		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	157.90	167.70	157.20		
Wt Dry Sample + Tare	111.30	113.40	105.90		
Wt Water	46.60	54.30	51.30		
Wt Tare	4.20	4.20	4.20		
Wt Dry Sample	107.10	109.20	101.70		
Moisture Content (%)	**43.5**	**49.7**	**50.4**		

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MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT:	WSP	TEST NO:	18- 010	PROJECT NO:	103-1804
PROJECT:	17M-02283-00	DATE SAMPLED:	20-Feb-2018	SAMPLED BY:	Client
PROJECT CONTACT:	Dana Bredin	DATE TESTED:	23-Feb-2018	TESTED BY:	Irvin Araquil
TEST LOCATION:	Parkville				

Description	TH4	TH4	TH4	TH4	TH4
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	163.00	155.50	166.90	157.20	156.70
Wt Dry Sample + Tare	133.90	126.40	132.50	123.20	123.20
Wt Water	29.10	29.10	34.40	34.00	33.50
Wt Tare	4.20	4.20	4.20	4.20	4.20
Wt Dry Sample	129.70	122.20	128.30	119.00	119.00
Moisture Content (%)	**22.4**	**23.8**	**26.8**	**28.6**	**28.2**

Description	TH4	TH4	TH4		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	165.90	153.50	151.90		
Wt Dry Sample + Tare	116.90	107.80	104.00		
Wt Water	49.00	45.70	47.90		
Wt Tare	4.20	4.20	4.20		
Wt Dry Sample	112.70	103.60	99.80		
Moisture Content (%)	**43.5**	**44.1**	**48.0**		

Description					
Depth (ft)					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					

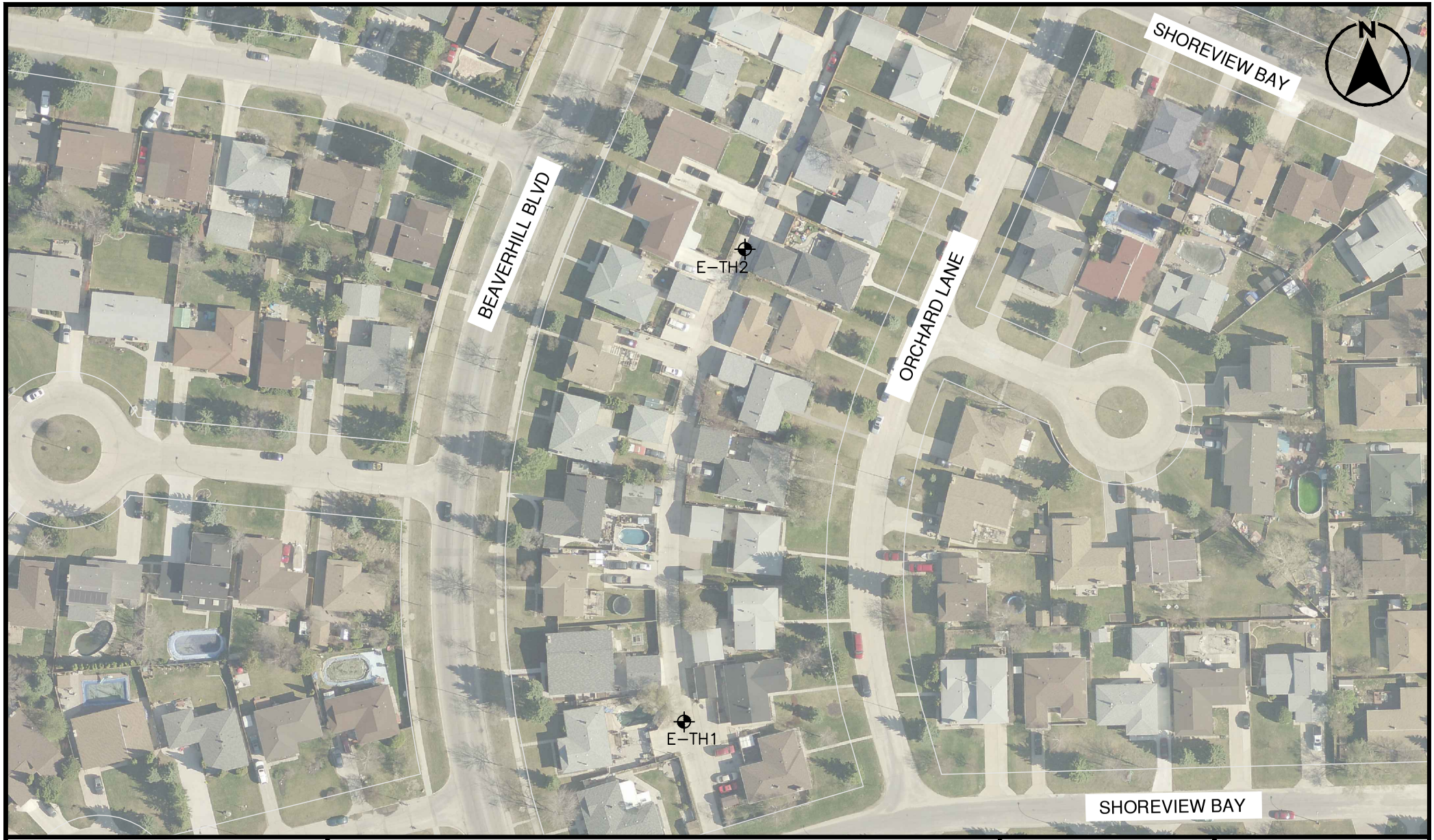
Description					
Depth (ft)					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					

MTR/Disptach No: 359

APPENDIX

E

BEAVERHILL / ORCHARD ALLEY



wsp
1600 BUFFALO PLACE
WINNIPEG, MANITOBA
CANADA R3T 6B8
PHONE: 204-477-6650 FAX : 204-474-2864
WWW.WSPGROUP.COM

TITLE:

2018 ALLEY RENEWALS – CONTRACT 1
BEAVERHILL/ORCHARD/SHOREVIEW ALLEY
TESTHOLE LOCATIONS

SCALE: 1:1250

DATE: 2018/03/26

PROJECT NO: 17M-02283-00

REVISION:

DRAWING NO: GT-E

XREF

STAMP

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

E-TH1

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Beaverhill/Orchard Alley
DATE STARTED 2/14/18 **COMPLETED** 2/14/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - CME
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 639162.3 m E, 5523549.8 m N
AFTER DRILLING ---

DEPTH (m)	GRAPHIC LOG	ELEV. (m)	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
				CONCRETE - 150 mm thick, intact				
				GRANULAR FILL - Sand and gravel, frozen, brown				
				FILL - Clay mixed with some silt, trace sand, brown, frozen	GB 1			39
0.5					GB 2			32
1.0					GB 3			31
				-Silty below 1.2 m - Frost to 1.35 m	GB 4			29
1.5				CLAY (CH) - Silty, mottled brown and grey, stiff, moist - Trace silt inclusions below 1.5 m	GB 5			27
				- Brown below 1.8 m	GB 6			45
2.0					GB 7			47
2.5								
3.0					GB 10			56
				-Testhole open to bottom after completion - Backfilled with auger cuttings and bentonite, patched with concrete				

▲SPT N VALUE▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

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

E-TH2

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Beaverhill/Orchard Alley
DATE STARTED 2/14/18 **COMPLETED** 2/14/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - CME
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 639176.4 m E, 5523659.8 m N
AFTER DRILLING ---

DEPTH (m)	GRAPHIC LOG	ELEV. (m)	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
				ASPHALT - 30 mm thick				
				CONCRETE - 120 mm thick, intact				
				FILL - Clay mixed with some silt, grey, frozen - Trace sand and f. gravel above 0.3 m	GB 1			46
0.5				- 69.6% clay; 29.2% silt; 1.2% sand at 0.6 m	GB 2			47
1.0					GB 3			36
				- Frost to 1.35 m	GB 4			44
1.5				CLAY (CH) - Grey, stiff, moist	GB 5			37
				- Brown, trace silt inclusions below 1.8 m	GB 6			43
2.0					GB 7			48
2.5								
3.0					GB 10			50

▲SPT N VALUE▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

Figure 15 – E-TH1 Beaverhill / Orchard Alley

Figure 16 – E-TH2 Beaverhill / Orchard Alley

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1402 Notre Dame Avenue, Winnipeg, MB R3E 3G5
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hmanalo@mts.net

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

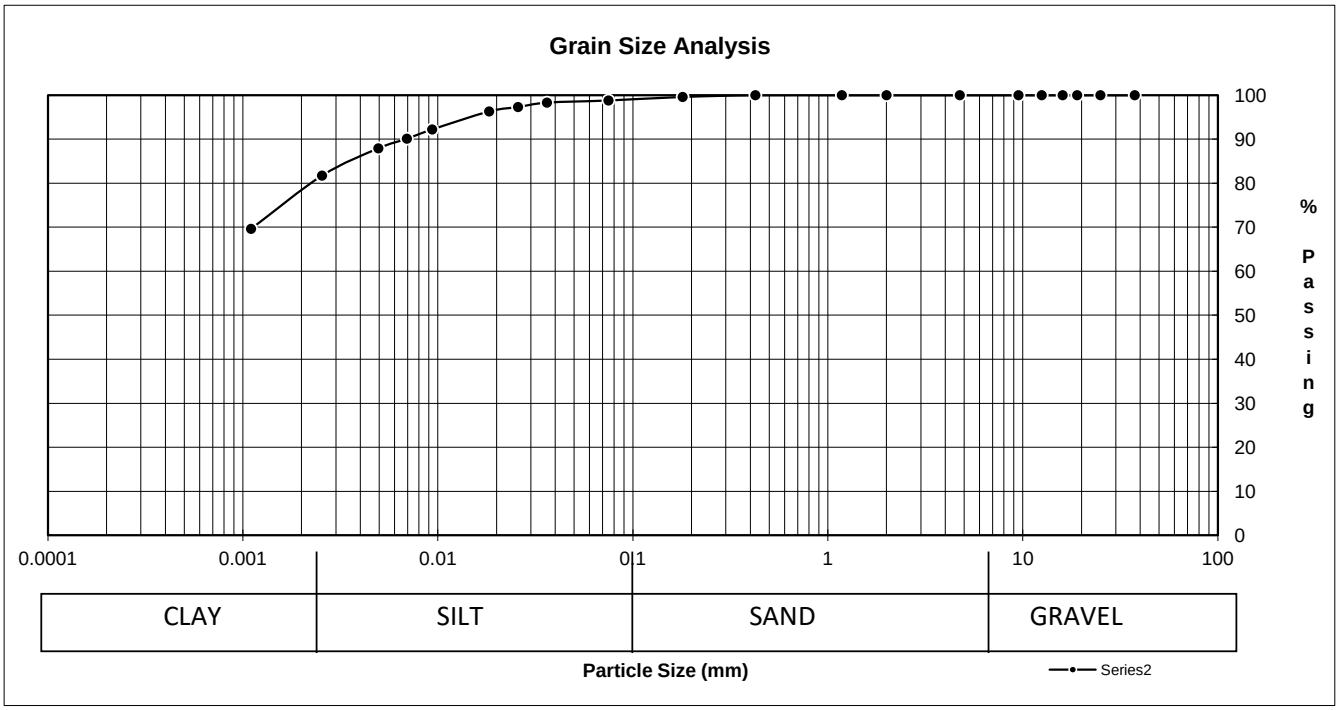
CLIENT: WSP Canada Group Limited
Suite 111-93 Lombard Avenue
Winnipeg, MB R3B 3B1
ATTENTION: Dana Bredin
PROJECT: 17M-02283-00
Beaverhill

PROJECT NO. 103-1804

Date Sampled: 20-Feb-18 Date Received: 20-Feb-18
Sampled By: Client Date Tested: 26-Feb-18

Material Identification
B.H./T.H. No. **TH 2 @2'**
Sample No. **2**
Sample Source
Specific Gravity of Material: 2.65

Sieve Analysis		Hydrometer Analysis	
Sieve (mm)	% Passing	Diameter	% Finer
50.00	100.0		
37.50	100.0		
25.00	100.0		
19.00	100.0		
16.00	100.0		
12.50	100.0	0.0363	98.3
9.50	100.0	0.0258	97.3
4.75	100.0	0.0183	96.3
2.00	100.0	0.0093	92.2
1.18	100.0	0.0069	90.1
0.425	100.0	0.0050	87.9
0.180	99.6	0.0025	81.7
0.075	98.8	0.0011	69.6



SOIL DESCRIPTION	% Composition		D10	
		Gravel	D30	
CLAY	1.2	Sand	D60	
	29.2	Silt	Cu	#DIV/0!
	69.6	Clay	Cc	#DIV/0!

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: GM

Reviewed by: Hermie Manalo

H. MANALO CONSULTING LTD.

1402 Notre Dame Avenue, Winnipeg, MB R3E 3G5
Phone: 204-697-3854 Cell: 204-997-1355
Email: hmanalo@mts.net

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT:	WSP	TEST NO:	18- 012	PROJECT NO:	103-1804
PROJECT:	17M-02283-00	DATE SAMPLED:	20-Feb-2018	SAMPLED BY:	Client
PROJECT CONTACT:	Dana Bredin	DATE TESTED:	23-Feb-2018	TESTED BY:	Greg Manalo
TEST LOCATION:	Beaver Hill				

Description	TH1	TH1	TH1	TH1	TH1
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	131.20	138.30	154.40	147.90	130.00
Wt Dry Sample + Tare	95.80	105.90	119.50	115.20	103.60
Wt Water	35.40	32.40	34.90	32.70	26.40
Wt Tare	4.30	4.20	4.10	4.10	4.10
Wt Dry Sample	91.50	101.70	115.40	111.10	99.50
Moisture Content (%)	**38.7**	**31.9**	**30.2**	**29.4**	**26.5**

Description	TH1	TH1	TH1		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	169.60	136.80	157.10		
Wt Dry Sample + Tare	118.60	94.10	102.20		
Wt Water	51.00	42.70	54.90		
Wt Tare	4.10	4.10	4.10		
Wt Dry Sample	114.50	90.00	98.10		
Moisture Content (%)	**44.5**	**47.4**	**56.0**		

Description	TH2	TH2	TH2	TH2	TH2
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	142.40	280.80	151.10	136.30	145.30
Wt Dry Sample + Tare	98.80	192.50	112.50	95.90	107.50
Wt Water	43.60	88.30	38.60	40.40	37.80
Wt Tare	4.10	4.10	4.10	4.20	4.10
Wt Dry Sample	94.70	188.40	108.40	91.70	103.40
Moisture Content (%)	**46.0**	**46.9**	**35.6**	**44.1**	**36.6**

Description	TH2	TH2	TH2		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	142.90	144.00	151.80		
Wt Dry Sample + Tare	100.90	99.00	102.80		
Wt Water	42.00	45.00	49.00		
Wt Tare	4.20	4.20	4.20		
Wt Dry Sample	96.70	94.80	98.60		
Moisture Content (%)	**43.4**	**47.5**	**49.7**		

MTR/Disptach No: 359

APPENDIX

F

LAURA / ELLEN ALLEY

wsp
1600 BUFFALO PLACE
WINNIPEG, MANITOBA
CANADA R3T 6B8
PHONE: 204-477-6650 FAX : 204-474-2864
WWW.WSPGROUP.COM

TITLE:

2018 ALLEY RENEWALS – CONTRACT 1
LAURA/ELLEN/LOGAN/ALEXANDER ALLEY
TESTHOLE LOCATIONS

SCALE: 1:1000

DATE: 2018/03/26

PROJECT NO: 17M-02283-00

REVISION:

DRAWING NO: GT-F

XREF

STAMP

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

F-TH1

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Laura/Ellen Alley
DATE STARTED 2/15/18 **COMPLETED** 2/15/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - B40 Truck Rig
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 633252.8 m E, 5529703.7 m N
AFTER DRILLING ---

DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
	ASPHALT - 160 mm thick				
	FILL - Grey, clayey, trace sand	GB 1			23
0.5		GB 2			31
	SILT (ML) - Tan-brown, clayey				
		GB 3			23
1.0		GB 4			24
	- Frost to 1.35 m - Soft, moist below 1.35m	GB 5			21
1.5	CLAY (CH) - Brown, stiff, moist, trace silt inclusions				
		GB 6			34
2.0		GB 7			46
2.5	- Silty, trace oxidation at 2.7 m				
3.0		GB 10			37

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

- Testhole open to bottom after completion
- Backfilled with auger cuttings and patched with concrete

GENERAL BH PLOTS - WSP ALLEY_RENEWALS_CONTRACT_1_LAURA.GPJ GINT STD CANADA.GDT 3/21/18

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

F-TH2

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Laura/Ellen Alley
DATE STARTED 2/15/18 **COMPLETED** 2/15/18
GROUND ELEVATION **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - B40 Truck Rig
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 633267.7 m E, 5529686.3 m N
AFTER DRILLING ---

DEPTH (m)	GRAPHIC LOG	ELEV. (m)	WATER LEVEL	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
				ASPHALT - 135 mm thick				
				FILL - Black-grey, clayey, trace sand and f. gravel	GB 1			18
0.5					GB 2			29
				SILT (ML) - Tan-brown, clayey				
				- 64.4 % silt, 29.6% clay, 6.0% sand at 0.9 m	GB 3			28
1.0					GB 4			25
				- Frost to 1.35 m - Soft, moist below 1.35 m	GB 5			20
1.5				CLAY (CH) - Brown, stiff, moist, trace silt inclusions				
					GB 6			32
2.0					GB 7			45
2.5				- Silty, light grey, trace oxidation at 2.7 m				
3.0					GB 10			54
				- Testhole open to 2.7 m after completion - Backfilled with auger cuttings and patched with asphalt				

▲ SPT N VALUE ▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

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

F-TH3

CLIENT City of Winnipeg
PROJECT NAME 2018 Alley Renewals - Contract 1
PROJECT NUMBER 17M-02283-00
PROJECT LOCATION Laura/Ellen Alley
DATE STARTED 2/15/18 **COMPLETED** 2/15/18
GROUND ELEVATION _____ **HOLE SIZE** 125 mm
DRILLING CONTRACTOR Maple Leaf Drilling
GROUND WATER LEVELS:
DRILLING METHOD Solid Stem Auger - B40 Truck Rig
AT TIME OF DRILLING ---
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
AT END OF DRILLING ---
NOTES CL of alley: 633268.6 m E, 5529656.0 m N
AFTER DRILLING ---

DEPTH (m)	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)
	ASPHALT - 100 mm thick				
	FILL - Grey, clayey, trace sand and f. gravel	GB 1			32
0.5		GB 2			29
	CLAY (CH) - Grey, silty	GB 3			27
1.0		GB 4			27
	- Frost to 1.35 m	GB 5			25
1.5	SILT (ML) - Tan-brown, soft, moist	GB 6			21
2.0		GB 7			20
2.5	CLAY (CH) - Brown, silty, stiff, moist				
3.0		GB 10			46

▲SPT N VALUE▲
20 40 60 80
PL MC LL
20 40 60 80
Su (kPa)
PP □ Field Vane ✳
100 200 300 400

Figure 17 – F-TH1 Laura / Ellen Alley

Figure 18 – F-TH2 Laura / Ellen Alley

Figure 19 – F-TH3 Laura / Ellen Alley

H. MANALO CONSULTING LTD.
1402 Notre Dame Avenue, Winnipeg, MB R3E 3G5
Phone: 204 697 3854 Cell: 204 997-1355
hmanalo@mts.net

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

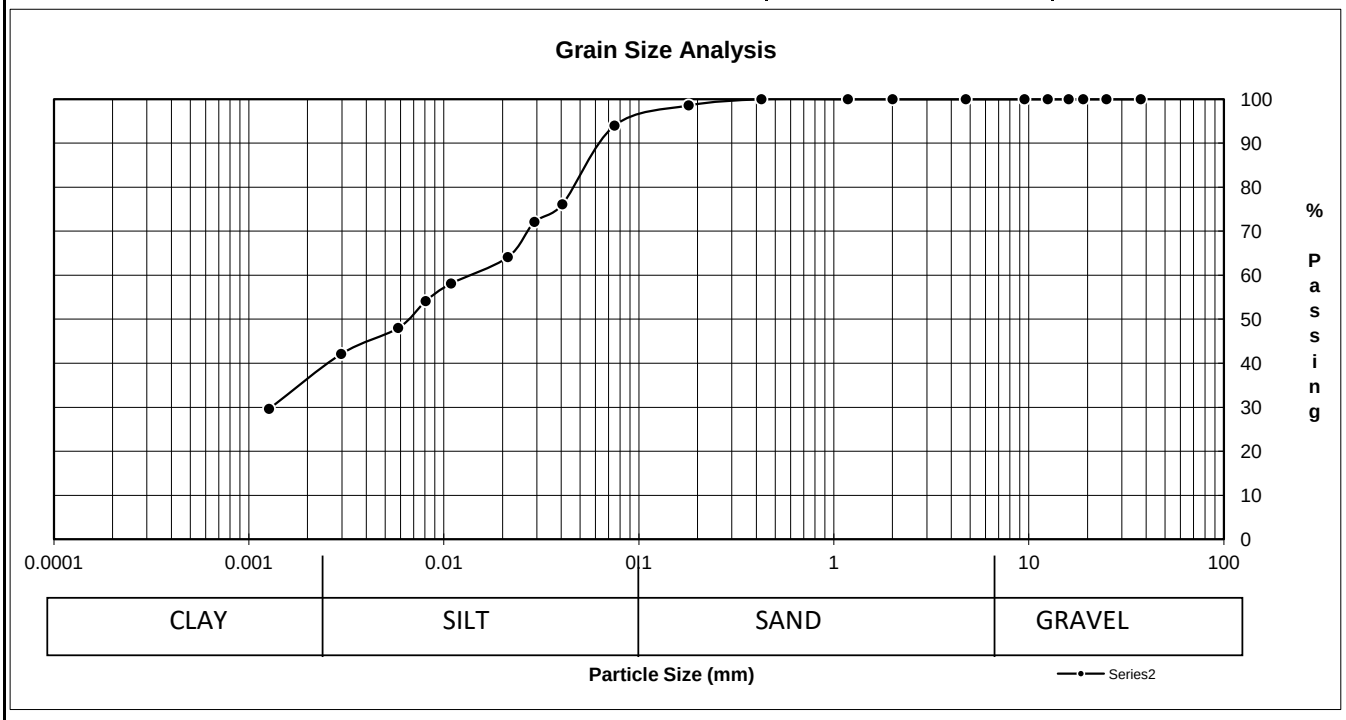
CLIENT: WSP Canada Group Limited
Suite 111-93 Lombard Avenue
Winnipeg, MB R3B 3B1
ATTENTION: Dana Bredin
PROJECT: 17M-02283-00
Laura

PROJECT NO. 103-1804

Date Sampled: 20-Feb-18 Date Received: 20-Feb-18
Sampled By: Client Date Tested: 26-Feb-18

Material Identification
B.H./T.H. No. **TH 2 @3'**
Sample No. **7**
Sample Source
Specific Gravity of Material: 2.65

Sieve Analysis		Hydrometer Analysis	
Sieve (mm)	% Passing	Diameter	% Finer
50.00	100.0		
37.50	100.0		
25.00	100.0		
19.00	100.0		
16.00	100.0		
12.50	100.0	0.0405	76.1
9.50	100.0	0.0291	72.1
4.75	100.0	0.0213	64.1
2.00	100.0	0.0109	58.1
1.18	100.0	0.0081	54.1
0.425	100.0	0.0058	48.0
0.180	98.6	0.0030	42.1
0.075	94.0	0.0013	29.6



SOIL DESCRIPTION	% Composition		D10	
		Gravel	D30	0.00127
SILTY CLAY LOAM	6.0	Sand	D60	0.01088
	64.4	Silt	Cu	#DIV/0!
	29.6	Clay	Cc	#DIV/0!

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: GM

Reviewed by: Hermie Manalo

H. MANALO CONSULTING LTD.

1402 Notre Dame Avenue, Winnipeg, MB R3E 3G5
Phone: 204-697-3854 Cell: 204-997-1355
Email: hmanalo@mts.net

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT:	WSP	TEST NO:	18- 016	PROJECT NO:	103-1804
PROJECT:	17M-02283-00	DATE SAMPLED:	20-Feb-2018	SAMPLED BY:	Client
PROJECT CONTACT:	Dana Bredin	DATE TESTED:	23-Feb-2018	TESTED BY:	Greg Manalo
TEST LOCATION:	Laura				

Description	TH1	TH1	TH1	TH1	TH1
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	164.50	177.40	143.30	149.50	187.40
Wt Dry Sample + Tare	134.10	136.40	117.40	121.90	155.70
Wt Water	30.40	41.00	25.90	27.60	31.70
Wt Tare	4.30	4.20	4.30	4.30	4.70
Wt Dry Sample	129.80	132.20	113.10	117.60	151.00
Moisture Content (%)	**23.4**	**31.0**	**22.9**	**23.5**	**21.0**

Description	TH1	TH1	TH1		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	133.40	161.30	167.00		
Wt Dry Sample + Tare	100.90	112.10	133.10		
Wt Water	32.50	49.20	33.90		
Wt Tare	4.20	4.40	41.20		
Wt Dry Sample	96.70	107.70	91.90		
Moisture Content (%)	**33.6**	**45.7**	**36.9**		

Description	TH2	TH2	TH2	TH2	TH2
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	130.50	128.40	290.60	185.60	183.10
Wt Dry Sample + Tare	111.40	100.70	228.50	149.80	153.10
Wt Water	19.10	27.70	62.10	35.80	30.00
Wt Tare	4.10	4.10	4.30	4.10	4.20
Wt Dry Sample	107.30	96.60	224.20	145.70	148.90
Moisture Content (%)	**17.8**	**28.7**	**27.7**	**24.6**	**20.1**

Description	TH2	TH2	TH2		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	190.10	161.30	151.80		
Wt Dry Sample + Tare	144.70	112.30	99.80		
Wt Water	45.40	49.00	52.00		
Wt Tare	4.30	4.20	4.10		
Wt Dry Sample	140.40	108.10	95.70		
Moisture Content (%)	**32.3**	**45.3**	**54.3**		

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Email: hmanalo@mts.net

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT:	WSP	TEST NO:	18- 016	PROJECT NO:	103-1804
PROJECT:	17M-02283-00	DATE SAMPLED:	20-Feb-2018	SAMPLED BY:	Client
PROJECT CONTACT:	Dana Bredin	DATE TESTED:	23-Feb-2018	TESTED BY:	Greg Manalo
TEST LOCATION:	Laura				

Description	TH3	TH3	TH3	TH3	TH3
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	182.20	157.30	245.70	207.80	206.50
Wt Dry Sample + Tare	139.40	123.80	195.60	165.70	167.40
Wt Water	42.80	33.50	50.10	42.10	39.10
Wt Tare	7.40	7.40	7.30	7.60	7.40
Wt Dry Sample	132.00	116.40	188.30	158.10	160.00
Moisture Content (%)	**32.4**	**28.8**	**26.6**	**26.6**	**24.4**

Description	TH3	TH3	TH3		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	184.70	245.40	156.80		
Wt Dry Sample + Tare	154.50	205.50	109.60		
Wt Water	30.20	39.90	47.20		
Wt Tare	7.40	7.30	7.70		
Wt Dry Sample	147.10	198.20	101.90		
Moisture Content (%)	**20.5**	**20.1**	**46.3**		

Description					
Depth (ft)					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					

Description					
Depth (ft)					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					

MTR/Disptach No: 359