

APPENDIX 'A'

GEOTECHNICAL REPORT

CITY OF WINNIPEG

2017 ALLEY RENEWALS

GEOTECHNICAL REPORT

MAY 2017



**2017 ALLEY RENEWALS
GEOTECHNICAL REPORT
City of Winnipeg**

GEOTECHNICAL REPORT

Project: 171-01396-00
Date: May 2017

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REVISION HISTORY

VERSION	DATE	DESCRIPTION
1	MAY 18, 2017	Final Report

SIGNATURES

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1 INTRODUCTION

A geotechnical investigation was conducted by WSP Canada Inc. for the proposed 2017 Alley Renewals 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.

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

1. North/south alley between Chestnut St and Walnut St from Wolseley Ave to Westminster Ave
2. East/west alley between Dorchester Ave and McMillan Ave from Lilac St to Arbutnot St
3. North/south alley between Waverley St and Oxford St from Kingsway to Academy Rd
4. North/south alley between Waterloo St and Ash St from Kingsway to Academy Rd
5. North/South alley between Erin St and Clifton St from St. Matthews Ave to Ellice Ave
6. Alleys bounded by Ingersoll St and Lipton St, Yarwood Ave and Notre Dame Ave
7. Alleys bounded by Lipton St and Banning St, Yarwood Ave and Notre Dame Ave
8. Alleys bounded by Arlington St and Alverstone St, Adele Ave and Notre Dame Ave
9. Alley between Logan Ave and Alexander Ave from Patrick St to Laura St
10. East/west alley between Jefferson Ave and Seven Oaks Ave from McGregor St to Powers St
11. East/west alley between Willam Ave and Elgin Ave from Gertie St to Ellen St
12. East/west alley between by River Ave and Stradbrook Ave from Lewis St to Clarke St
13. East/west alley south of 1600 Taylor Ave, within the interior of Renfrew Bay

2 SUB-SURFACE INVESTIGATION AND TESTING

The field investigation was undertaken on February 28, 2017 and was completed on March 3, 2017. A total of 35 test holes and 36 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 CME 55 rig equipped with a 125 mm auger, as well as a track-mounted GeoProbe 7822DT rig 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 and capped with cold mix asphalt after the completion of the drilling. Test hole locations are noted on the test hole logs and within the test hole 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.

Detailed descriptions of the soil profiles for each test hole are included on the logs in Appendix A. The material test results are included in Appendix B. The photos of the pavement cores are included in Appendix C.

3 TEST HOLE SUMMARY TABLES

Table 3-1 - Walnut/Chestnut 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)			
TH1	5526933 m N 631867 m E Centre of Alley behind 797 Wolseley Ave	Asphalt	80	Concrete (deteriorated) & Granular fill	50 & 300	Clay/Silt	3.05	8
TH2	5527020 m N 631202 m E Centre of Alley behind 100 Walnut St	Concrete (deteriorated)	110	Sand Fill	1560	Sand Fill/Clay	3.05	8
TH3	5527108 m N 634205 m E Centre of Lane behind 128 Walnut St	Asphalt	30	Granular Fill	270	Clay	3.05	8

Table 3-2 - Dorchester/McMillan 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)			
TH4	5525895 m N 632373 m E Centre of Alley beside 167 Lilac St	Concrete (intact)	150	Granular fill	150	Clay/Silt	3.05	8
TH5	5525947 m N 632471 m E Centre of Alley behind 761A McMillan Ave	Concrete (cracked)	150	Clay Fill	460	Clay	3.05	8

Table 3-3 - Waverley/Oxford 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)			
TH6	5525800 m N 631039 m E Centre of Alley behind 259 Oxford St	Asphalt	50	Concrete (Intact)	150	Clay/Silt	3.05	8
TH7	5525927 m N 631045 m E Centre of Alley behind 217 Oxford St	Asphalt	30	Concrete (Intact)	150	Clay/Silt	3.05	8

TH8	5526013 m N 631047 m E Centre of Alley behind 203 Oxford St	Asphalt	50	Concrete (Deteriorated)	150	Clay	3.05	8
TH9	5526109 m N 631048 m E Centre of Alley behind 177 Oxford St	Concrete (Intact)	170	Clay Fill	440	Clay	3.05	8

Table 3-4 - Waterloo/Ash 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)			
TH10	5526149 m N 630546 m E Centre of Alley beside 400 Academy Rd	Asphalt	30	Concrete (Deteriorated)	150	Clay/Silt	3.05	8
TH11	5526027 m N 630543 m E Centre of Alley behind 187 Ash St	Concrete (Intact)	150	Clay Fill	460	Clay	3.05	8
TH12	5525933 m N 630540 m E Centre of Alley behind 225 Ash St	Concrete (Intact)	200	Clay Fill	410	Clay	3.05	8
TH13	5525822 m N 630535 m E West side of Alley behind 249 Ash St	Asphalt	30	Concrete (Cracked)	200	Clay	3.05	8

Table 3-5 - Erin/Clifton 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)			
TH14	5528075 m N 630353 m E Centre of Alley behind 831 Clifton St	Concrete (Intact)	210	Granular Fill	150	Clay/Silt	3.05	8
TH15	5528153 m N 630356 m E Centre of Alley behind 855 Clifton St	Asphalt	40	Concrete (Intact) & Granular Fill	200 & 150	Clay/Silt	3.05	8
TH16	5528262 m N 630359 m E Centre of Alley behind 887 Clifton St	Concrete (Intact)	250	Granular Fill	150	Clay	3.05	8
TH17	5528342 m N 630361 m E Centre of Alley behind 915 Clifton St	Concrete (Intact)	170	Granular Fill	150	Clay/Silt	3.05	8

Table 3-6 - Ingersoll/Lipton 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)			
TH18	5529393 m N 631197 m E Centre of Alley behind 1085 Ingersoll St	Concrete (Deteriorated)	150	Clay Fill	150	Clay/Silt	3.05	8
TH19	5529526 m N 631202 m E Centre of Alley behind 1123 Ingersoll St	Concrete (Deteriorated)	150	Clay Fill	150	Clay/Silt	3.05	8
TH20	5529698 m N 631220 m E Centre of Alley beside 972 Lipton St	Concrete (Intact)	220	Clay Fill	690	Clay/Silt	3.05	8

Table 3-7 - Lipton/Banning 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)			
TH21	5529392 m N 631277 m E East side of Alley behind 891 Banning St	Concrete (Deteriorated)	150	Granular Fill	150	Clay/Silt	3.05	8
TH22	5529507 m N 631280 m E Centre of Alley behind 976 Banning St	Asphalt	50	Concrete (Deteriorated) & Granular Fill	100 & 300	Clay/Silt	3.05	8
TH23	5529610 m N 631282 m E Centre of Alley behind 1008 Banning St	Asphalt	30	Concrete (Deteriorated) & Granular Fill	120 & 150	Clay/Silt	3.05	8

Table 3-8 - Arlington/Alverstone 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)			
TH24	5529545 m N 631499 m E West side of Alley behind 909 Alverstone St	Concrete (Intact)	200	Granular Fill	150	Clay/Silt	3.05	8
TH25	5529499 m N 631497 m E Centre of Alley behind 879 Alverstone St	Asphalt	100	Concrete (Intact) & Granular Fill	200 & 200	Clay/Silt	3.05	8
TH26	5529459 m N 631516 m E Centre of Alley south of 880 Arlington St	Concrete (Deteriorated)	180	Granular Fill	150	Clay/Silt	3.05	8

Table 3-9 – Logan/Alexander 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)			
TH27	5529736 m N 633182 m E Centre of Alley behind 452/450 Logan Ave	Concrete (Cracked)	150	Granular Fill	100	Clay/Silt	3.05	8
TH28	5529684 m N 633178 m E Centre of Alley behind 447 Alexander Ave	Concrete (Intact)	200	Clay Fill	570	Clay/Silt	3.05	8

Table 3-10 - Jefferson/Seven Oaks 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)			
TH29	5533357 m N 633984 m E Centre of Alley behind 460 Jefferson St	Concrete (Intact)	170	Granular Fill	150	Clay/Silt	3.05	8
TH30	5533308 m N 634090 m E Centre of Alley behind 434 Jefferson St	Concrete (Intact)	180	Clay Fill	430	Clay/Silt	3.05	8
TH31	5533252 m N 634205 m E Centre of Alley behind 400 Jefferson St	Asphalt	20	Concrete (Intact)	130	Clay/Silt	3.05	8

Table 3-11 - Elgin/William 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)			
TH32	5529351 m N 631113 m E Centre of Alley behind 421 William Ave	Concrete (Deteriorated)	200	Granular Fill	150	Clay/Silt	3.05	8
TH33	5529327 m N 633162 m E Centre of Alley behind 407 William Ave	Concrete (Intact)	220	Granular Fill	150	Clay/Silt	3.05	8

Table 3-12 - Lewis/Clarke 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)			
TH34	5526982 m N 633703 m E South side of Alley beside 124 Lewis St	Asphalt	30	Concrete (Intact) & Granular Fill	160 & 250	Clay/Silt	3.05	8

Table 3-13 - Renfrew Bay 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)			
TH35	5523444 m N 629516 m E Centre of Alley behind 1600 Taylor Ave	Concrete (Intact)	190	Granular Fill	150	Clay/Silt	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

TEST HOLE LOGS



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CLIENT City of Winnipeg
 PROJECT NUMBER 171-01396-00
 DATE STARTED 2/28/17 COMPLETED 2/28/17
 DRILLING CONTRACTOR Maple Leaf Drilling
 DRILLING METHOD Continuous Auger
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano
 NOTES Alley btw Chestnut & Walnut from Westminster to Wolosey

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
0.0 - 0.05		ASPHALT - 80 mm layer							
0.05 - 0.15		CONCRETE - 50 mm layer, deteriorated							
0.15 - 0.5		GRANULAR FILL - 300 mm layer	MC = 8%			8			
0.5 - 1.0		CLAY FILL - Black-grey mixed, trace of fine gravel	MC = 27%			27			
1.0 - 1.5		CLAY - Grey, stiff below 1.2 m - Frost to 1.2 m	MC = 39%			39			
1.5 - 1.8			MC = 36%			36			
1.8 - 2.0		SILT - Tan-brown, soft	MC = 29%			29			
2.0 - 2.2		CLAY - Brown, stiff, cohesive	MC = 34%			34			
2.2 - 2.5			MC = 39%			39			
2.5 - 3.0			MC = 48%			48			
Bottom of hole at 3.05 m.									

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17

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	
		CONCRETE - 110 mm layer, deteriorated, thin asphalt layer at surface						
0.5		SAND FILL - Trace of fine to medium gravel - Trace organics at 0.3 m - Frost to 0.6 m - Moist to wet below 0.6 m	MC = 10%			10		
			MC = 11%			11		
1.0			MC = 12%			12		
			MC = 10%			10		
1.5			MC = 12%			12		
		CLAY - Brown, stiff, cohesive	MC = 43%			43		
2.0			MC = 45%			45		
2.5								
3.0			MC = 48%			48		
Bottom of hole at 3.05 m.								



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DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲		
							20	40	60
		ASPHALT - 30 mm layer							
		GRANULAR FILL - 270 mm layer							
0.5		CLAY FILL - Black-grey mixed - Trace of fine gravel	MC = 23%			23			
		CLAY - Grey - Frost to 0.9 m - Stiff, cohesive below 0.9 m - Brown below 2.1 m - Soft below 2.45 m	MC = 41%			41			
1.0			MC = 36%			36			
			MC = 36%			36			
1.5			MC = 33%			33			
			MC = 45%			45			
2.0			MC = 48%			48			
2.5									
3.0			MC = 48%			48			
Bottom of hole at 3.05 m.									

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PROJECT NAME 2017 Alley Renewals
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 AT TIME OF DRILLING ---
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 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
0.0 - 0.15		CONCRETE - 150 mm Intact							
0.15 - 0.3		GRANULAR FILL - 150 mm thick - Clayey, trace organics	MC = 12%			12			
0.3 - 0.9		CLAY FILL - Black-grey mixed	MC = 46%			46			
0.9 - 1.2		SILT - Tan-brown - Frost to 1.2 m - Moist, soft below 1.2 m	MC = 39%			39			
1.2 - 1.5			MC = 22%			22			
1.5 - 2.0		CLAY - Brown, stiff, cohesive	MC = 20%			20			
2.0 - 2.2			MC = 33%			33			
2.2 - 2.5			MC = 44%			44			
2.5 - 3.0			MC = 46%			46			

Bottom of hole at 3.05 m.

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DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲		
							20	40	60
0.0 - 0.15		CONCRETE - 150 mm, cracked							
0.15 - 0.6		CLAY FILL - Black, trace of fine gravel	MC = 22%			22			
0.6 - 1.0		CLAY - Grey - Frost to 1.35 m - Stiff below 1.35 m - SILTY from 1.5 m to 1.65 m, soft - Brown, stiff below 1.8 m	MC = 39%			39			
1.0 - 1.35			MC = 39%			39			
1.35 - 1.5			MC = 36%			36			
1.5 - 1.65			MC = 35%			35			
1.65 - 1.8			MC = 37%			37			
1.8 - 3.0			MC = 46%			46			
3.0			MC = 48%			48			

Bottom of hole at 3.05 m.



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							20	40	60
0.0 - 0.05		ASPHALT - 50 mm layer							
0.05 - 0.15		CONCRETE - 150 mm layer, intact							
0.15 - 0.5		CLAY FILL - Black, trace organics above 0.3 m - Grey-black mixed below 0.3 m	MC = 23%			23			
0.5 - 1.0		SILT - Tan-brown - Frost to 1.2 m	MC = 24%			24			
1.0 - 1.5		CLAY - Brown, stiff	MC = 9%			9			
1.5 - 1.8		CLAY - Brown, stiff	MC = 30%			30			
1.8 - 2.0		SILT - Tan-brown, soft, moist	MC = 18%			18			
2.0 - 2.55		CLAY - Brown, stiff, cohesive - SILTY from 2.55 m to 2.7 m	MC = 40%			40			
2.55 - 2.7		CLAY - Brown, stiff, cohesive - SILTY from 2.55 m to 2.7 m	MC = 43%			43			
2.7 - 3.0		CLAY - Brown, stiff, cohesive - SILTY from 2.55 m to 2.7 m	MC = 45%			45			

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ GINT STD CANADA.GDT 4/19/17



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 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 ▲		
							20	40	60
0.0 - 0.05		ASPHALT - 30 mm layer							
0.05 - 0.1		CONCRETE - 150 mm layer, deteriorated							
0.1 - 0.3		CLAY FILL - Black-grey mixed, trace of gravel above 0.3 m	MC = 13%			13			
0.3 - 0.9		CLAY - Grey - Frost to 0.9 m	MC = 50%			50			
0.9 - 1.2		SILT - Tan-brown, soft, moist - Clayey below 1.2 m	MC = 32%			32			
1.2 - 1.8		CLAY - Brown, stiff, cohesive - SILTY from 1.8 m - 1.95 m	MC = 24%			24			
1.8 - 2.0			MC = 22%			22			
2.0 - 2.2			MC = 38%			38			
2.2 - 2.5			MC = 47%			47			
2.5 - 3.0			MC = 45%			45			

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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CLIENT City of Winnipeg
 PROJECT NUMBER 171-01396-00
 DATE STARTED 2/28/17 COMPLETED 2/28/17
 DRILLING CONTRACTOR Maple Leaf Drilling
 DRILLING METHOD Continuous Auger
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano
 NOTES Alley btw Waverley & Oxford, from Kingsway to Academy

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
0.0 - 0.05		ASPHALT - 50 mm layer							
0.05 - 0.15		CONCRETE - 150 mm layer, deteriorated							
0.15 - 0.5		CLAY FILL - Black-grey mixed, trace of gravel	MC = 27%			27			
0.5 - 3.0		CLAY - Grey - Frost to 1.2 m - Brown, stiff, cohesive below 1.2 m	MC = 35%			35			
			MC = 31%			31			
			MC = 35%			35			
			MC = 38%			38			
			MC = 40%			40			
			MC = 44%			44			
			MC = 49%			49			

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



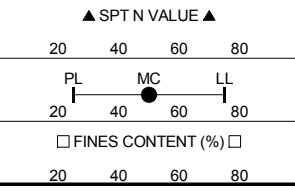
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 GROUND ELEVATION _____ HOLE SIZE 125 mm
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 AT TIME OF DRILLING ---
 AT END OF DRILLING ---
 AFTER DRILLING ---

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲		
							20	40	60
0.0 - 0.17		CONCRETE - 170 mm layer, intact							
0.17 - 0.6		CLAY FILL - Black-brown mixed, trace of gravel	MC = 41%			41			
0.6 - 1.0		CLAY - Brown - Frost to 1.2 m - Stiff below 1.2 m - Trace of silt inclusions below 1.2 m - Soft below 1.8 m	MC = 29%			29			
1.0 - 1.3			MC = 33%			33			
1.3 - 1.5			MC = 32%			32			
1.5 - 1.8			MC = 34%			34			
1.8 - 2.0			MC = 45%			45			
2.0 - 2.5			MC = 53%			53			
2.5 - 3.0			MC = 55%			55			
Bottom of hole at 3.05 m.									





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CLIENT City of Winnipeg
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 NOTES Alley btw Waterloo & Ash, from Kingsway to Academy

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ HOLE SIZE 125 mm
 GROUND WATER LEVELS:
 AT TIME OF DRILLING ---
 AT END OF DRILLING ---
 AFTER DRILLING ---

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲		
							20	40	60
0.0 - 0.1		ASPHALT - 30 mm layer							
0.1 - 0.3		CONCRETE - 150 mm layer, deteriorated							
0.3 - 0.5		CLAY FILL - Black-grey mixed, trace of gravel	MC = 17%			17			
0.5 - 0.8			MC = 18%			18			
0.8 - 1.0			MC = 33%			33			
1.0 - 1.35		SILT - Tan-brown - Moist, soft below 1.35 m - Frost to 1.35 m	MC = 33%			33			
1.35 - 1.5			MC = 25%			25			
1.5 - 2.0		CLAY - Brown, stratified with SILT, soft	MC = 33%			33			
2.0 - 2.3		SILT - Tan-brown, soft, moist	MC = 23%			23			
2.3 - 2.5		CLAY - Brown, stiff, cohesive							
2.5 - 3.0			MC = 43%			43			
Bottom of hole at 3.05 m.									



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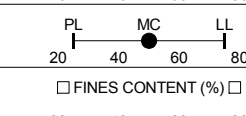
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CLIENT City of Winnipeg
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 GROUND ELEVATION _____ HOLE SIZE 125 mm
 GROUND WATER LEVELS:
 AT TIME OF DRILLING ---
 AT END OF DRILLING ---
 AFTER DRILLING ---

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17

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 - 150 mm, intact							
0.5		CLAY FILL - Black-grey mixed - Trace of gravel above 0.6 m	MC = 21%			21			
			MC = 28%			28			
1.0			MC = 29%			29			
1.5		CLAY - Grey above 1.5 m - Frost to 1.2 m - Stiff below 1.2 m - Brown below 1.5 m - SILTY from 1.65 m to 1.8 m - Soft below 2.4 m	MC = 30%			30			
			MC = 32%			32			
2.0			MC = 39%			39			
			MC = 37%			37			
3.0			MC = 51%			51			
Bottom of hole at 3.05 m.									



□ FINES CONTENT (%) □



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PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
0.0 - 0.2		CONCRETE - 200 mm, intact							
0.2 - 0.6		CLAY FILL - Black-grey mixed, trace of gravel above 0.6 m	MC = 22%			22			
0.6 - 1.0		CLAY - Brown - Frost to 1.2 m - Stiff, fissured below 1.2 m - Cohesive below 1.8 m - Soft below 2.4 m	MC = 39%			39			
1.0 - 1.4			MC = 35%			35			
1.4 - 1.8			MC = 41%			41			
1.8 - 2.2			MC = 38%			38			
2.2 - 2.6			MC = 46%			46			
2.6 - 3.0			MC = 45%			45			
3.0 - 3.05			MC = 53%			53			

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
0.0 - 0.1		ASPHALT - 30 mm layer							
0.1 - 0.2		CONCRETE - 200 mm layer, cracked							
0.2 - 0.3		CLAY FILL - Black, trace of gravel above 0.3 m	MC = 22%			22			
0.3 - 3.0		CLAY - Brown - Trace of silt inclusions below 1.2 m - Frost to 1.35 m - SILTY from 1.65 m to 1.8 m - Stiff, cohesive below 1.8 m - Soft below 2.7 m	MC = 33%			33			
			MC = 33%			33			
			MC = 40%			40			
			MC = 40%			40			
			MC = 45%			45			
			MC = 45%			45			
			MC = 56%			56			

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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 DRILLING CONTRACTOR Maple Leaf Drilling
 DRILLING METHOD Continuous Auger
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano
 NOTES Alley btw Clifton & Erin, from Ellice to St. Matthews

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
		CONCRETE - 210 mm layer, intact							
		GRANULAR FILL - 150 mm layer	MC = 24%			24			
0.5		CLAY FILL - Black-brown mixed, trace of gravel	MC = 27%			27			
1.0		SILT - Tan-brown - Moist and soft below 1.2 m - Frost to 1.2 m	MC = 29%			29			
1.5			MC = 26%			26			
2.0		CLAY - Brown, stiff, cohesive - Soft below 2.4 m - Silt Inclusions below 2.55 m	MC = 29%			29			
			MC = 41%			41			
			MC = 45%			45			
3.0			MC = 52%			52			

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ GINT STD CANADA.GDT 4/19/17



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PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
0.0 - 0.1		ASPHALT - 40 mm layer							
0.1 - 0.2		CONCRETE - 200 mm layer, intact							
0.2 - 0.4		GRANULAR FILL - 150 mm layer	MC = 22%			22			
0.4 - 0.5		CLAY FILL - Black-brown mixed							
0.5 - 1.5		SILT - Tan-brown - Frost to 1.35 m	MC = 27%			27			
1.5 - 1.6		CLAY - Brown, stiff - Silt inclusions below 1.5 m - Soft below 2.4 m - Grey below 2.7 m	MC = 26%			26			
1.6 - 1.7			MC = 27%			27			
1.7 - 1.8			MC = 36%			36			
1.8 - 1.9			MC = 46%			46			
1.9 - 2.0			MC = 43%			43			
2.0 - 2.1									
2.1 - 2.2									
2.2 - 2.3									
2.3 - 2.4									
2.4 - 2.5									
2.5 - 2.6									
2.6 - 2.7									
2.7 - 2.8									
2.8 - 2.9									
2.9 - 3.0			MC = 51%			51			
Bottom of hole at 3.05 m.									

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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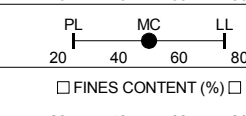
PAGE 1 OF 1

CLIENT City of Winnipeg
PROJECT NUMBER 171-01396-00
DATE STARTED 3/1/17 **COMPLETED** 3/1/17
DRILLING CONTRACTOR Maple Leaf Drilling
DRILLING METHOD Continuous Auger
LOGGED BY Dana Bredin **CHECKED BY** Silvestre Urbano
NOTES Alley btw Clifton & Erin, from Ellice to St. Matthews

PROJECT NAME 2017 Alley Renewals
PROJECT LOCATION Winnipeg, MB
GROUND ELEVATION _____ **HOLE SIZE** 125 mm
GROUND WATER LEVELS:
AT TIME OF DRILLING ---
AT END OF DRILLING ---
AFTER DRILLING ---

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲		
							20	40	60
0.0 - 0.25		CONCRETE - 250 mm layer, intact							
0.25 - 0.4		GRANULAR FILL - 150 mm layer	MC = 22%			22			
0.4 - 1.2		CLAY FILL - Black-brown mixed, trace of fine gravel	MC = 32%			32			
1.2 - 1.5		CLAY - Brown - Frost to 1.2 m - Stiff, cohesive below 1.2 m - SILTY from 2.1 m to 2.4 m	MC = 31%			31			
1.5 - 1.8			MC = 32%			32			
1.8 - 2.1			MC = 32%			32			
2.1 - 2.4			MC = 42%			42			
2.4 - 2.7			MC = 42%			42			
2.7 - 3.0			MC = 52%			52			
Bottom of hole at 3.05 m.									





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 GROUND ELEVATION _____ HOLE SIZE 125 mm
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 AT TIME OF DRILLING ---
 AT END OF DRILLING ---
 AFTER DRILLING ---

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ GINT STD CANADA.GDT 4/19/17

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲		
							20	40	60
0.0 - 0.17		CONCRETE - 170 mm layer, intact							
0.17 - 0.32		GRANULAR FILL - 150 mm layer							
0.32 - 1.2		CLAY FILL - Black-brown mixed above 0.6 m - Brown below 0.6 m - Trace of fine gravel - Frost to 1.2 m	MC = 14%			14			
1.2 - 1.6		CLAY - Brown, stiff, stratified with SILT	MC = 28%			28			
1.6 - 2.0		CLAY - Brown, stiff, stratified with SILT	MC = 27%			27			
2.0 - 2.4		SILT - Tan-brown, soft, moist to wet	MC = 30%			30			
2.4 - 2.8		SILT - Tan-brown, soft, moist to wet	MC = 28%			28			
2.8 - 3.0		SILT - Tan-brown, soft, moist to wet	MC = 23%			23			
3.0 - 3.05		CLAY - Brown, cohesive, soft	MC = 24%			24			
3.05		Bottom of hole at 3.05 m.	MC = 46%			46			



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 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano
 NOTES Alley btw Ingersoll & Lipton, from Yarwood to Notre Dame

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
0.0 - 0.15		CONCRETE - 150 mm layer, deteriorated							
0.15 - 1.1		CLAY FILL - Black-brown mixed - Trace of gravel above 0.3 m	MC = 19%			19			
			MC = 33%			33			
			MC = 35%			35			
1.1 - 2.1		SILT - Tan-brown - Frost to 1.2 m - Soft, moist below 1.2 m	MC = 36%			36			
			MC = 22%			22			
			MC = 24%			24			
			MC = 23%			23			
2.1 - 3.0		CLAY - Brown, stiff, cohesive							
			MC = 50%			50			
Bottom of hole at 3.05 m.									

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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 AT TIME OF DRILLING ---
 AT END OF DRILLING ---
 AFTER DRILLING ---

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲		
							20	40	60
0.0 - 0.15		CONCRETE - 150 mm layer, deteriorated							
0.15 - 1.0		CLAY FILL - Black-brown mixed - Trace of gravel above 0.3 m	MC = 20%			20			
0.5			MC = 33%			33			
1.0 - 1.35		CLAY - Brown, trace of silt inclusions - Frost to 1.35 m	MC = 34%			34			
1.35 - 1.5			MC = 33%			33			
1.5 - 2.0		SILT - Tan-brown, soft, moist	MC = 21%			21			
2.0 - 2.4			MC = 23%			23			
2.4 - 2.5			MC = 23%			23			
2.5 - 3.0		CLAY - Brown, stiff, cohesive - Trace of silt inclusions at 2.4 m	MC = 43%			43			
Bottom of hole at 3.05 m.									



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 GROUND ELEVATION _____ HOLE SIZE 125 mm
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 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 ▲		
							20	40	60
0.0 - 0.2		CONCRETE - 220 mm layer, intact							
0.2 - 1.0		CLAY FILL - Black-brown mixed, trace fine gravel	MC = 30%			30			
1.0 - 1.5		CLAY - Brown - Frost to 1.2 m - Stiff below 1.2 m	MC = 32%			32			
1.5 - 2.5		SILT - Tan-brown, soft, moist - Clayey below 2.15 m	MC = 30%			30			
2.5 - 2.6			MC = 32%			32			
2.6 - 2.8			MC = 21%			21			
2.8 - 3.0			MC = 26%			26			
3.0 - 3.4			MC = 34%			34			
3.4 - 3.05		CLAY - Brown, stiff, cohesive	MC = 51%			51			

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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CLIENT City of Winnipeg
 PROJECT NUMBER 171-01396-00
 DATE STARTED 3/2/17 COMPLETED 3/2/17
 DRILLING CONTRACTOR Maple Leaf Drilling
 DRILLING METHOD Continuous Auger
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano
 NOTES Alley btw Lipton & Banning, from Yarwood to Notre Dame

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
0.0 - 0.15		CONCRETE - 150 mm layer, deteriorated							
0.15 - 0.3		GRANULAR FILL - 150 mm layer							
0.3 - 0.7		CLAY FILL - Grey-black mixed	MC = 12%			12			
0.7 - 1.05		CLAY - Grey-black above 1.05 m - Brown below 1.05 m - Frost to 1.35 m	MC = 33%			33			
1.05 - 1.35		CLAY - Grey-black above 1.05 m - Brown below 1.05 m - Frost to 1.35 m	MC = 31%			31			
1.35 - 1.45		CLAY - Grey-black above 1.05 m - Brown below 1.05 m - Frost to 1.35 m	MC = 34%			34			
1.45 - 1.6		SILT - Tan-brown, soft, moist	MC = 21%			21			
1.6 - 1.8		SILT - Tan-brown, soft, moist	MC = 21%			21			
1.8 - 2.0		SILT - Tan-brown, soft, moist	MC = 24%			24			
2.0 - 2.5		CLAY - Brown, stiff, fissured							
2.5 - 3.0		CLAY - Brown, stiff, fissured	MC = 40%			40			
Bottom of hole at 3.05 m.									

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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 NOTES Alley btw Lipton & Banning, from Yarwood to Notre Dame

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
0.0 - 0.05		ASPHALT - 50 mm layer							
0.05 - 0.15		CONCRETE - 100 mm layer, deteriorated							
0.15 - 0.45		GRANULAR FILL - 300 mm layer	MC = 8%			8			
0.45 - 0.55		CLAY FILL - Black-brown mixed	MC = 31%			31			
0.55 - 1.00		CLAY - Brown, fissured - Frost to 1.35 m	MC = 37%			37			
1.00 - 1.45		CLAY - Brown, fissured - Frost to 1.35 m	MC = 36%			36			
1.45 - 1.65		SILT - Tan-brown, soft, moist	MC = 27%			27			
1.65 - 2.00		SILT - Tan-brown, soft, moist	MC = 25%			25			
2.00 - 2.50		SILT - Tan-brown, soft, moist	MC = 23%			23			
2.50 - 3.05		CLAY - Brown, stiff, fissured	MC = 40%			40			
Bottom of hole at 3.05 m.									

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
0.0 - 0.3		ASPHALT - 30 mm layer							
0.3 - 0.4		CONCRETE - 120 mm layer, deteriorated							
0.4 - 0.5		GRANULAR FILL - 150 mm layer	MC = 20%			20			
0.5 - 1.2		CLAY FILL - Black-brown mixed - Frost to 1.2 m	MC = 33%			33			
1.2 - 1.6		SILT - Tan-brown, soft, moist to wet - Clayey	MC = 32%			32			
1.6 - 1.8			MC = 46%			46			
1.8 - 2.0			MC = 22%			22			
2.0 - 2.2			MC = 23%			23			
2.2 - 2.8		CLAY - Brown, stiff, fissured	MC = 34%			34			
2.8 - 3.0			MC = 53%			53			

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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 NOTES Alley btw Arlington & Alverstone from Adele to Notre Dame

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
		CONCRETE - 200 mm layer, intact							
		GRANULAR FILL - 150 mm layer	MC = 29%			29			
0.5		CLAY FILL - Black-grey above 0.6 m - Black-brown below 0.6 m - Frost to 1.2 m	MC = 32%			32			
1.0			MC = 38%			38			
1.5			MC = 21%			21			
		SILT - Tan-brown, moist to wet, soft	MC = 22%			22			
2.0			MC = 25%			25			
		CLAY - Brown, stiff, fissured	MC = 29%			29			
2.5									
3.0			MC = 48%			48			
Bottom of hole at 3.05 m.									

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
0.0 - 0.1		ASPHALT - 100 mm layer							
0.1 - 0.2		CONCRETE - 200 mm layer, intact							
0.2 - 0.4		GRANULAR FILL - 200 mm layer	MC = 16%			16			
0.4 - 0.9		CLAY FILL - Black-grey mixed - SILTY from 0.9 m to 1.2 m	MC = 31%			31			
0.9 - 1.2			MC = 30%			30			
1.2 - 1.35		SILT - Tan-brown - Frost to 1.35 m - Soft, moist to wet below 1.35 m	MC = 27%			27			
1.35 - 1.5			MC = 20%			20			
1.5 - 1.8			MC = 23%			23			
1.8 - 2.2			MC = 38%			38			
2.2 - 3.0		CLAY - Brown, stiff, fissured							
3.0			MC = 50%			50			

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
0.0 - 0.15		CONCRETE - 180 mm layer, deteriorated							
0.15 - 0.3		GRANULAR FILL - 150 mm layer	MC = 21%			21			
0.3 - 0.9		CLAY FILL - Black, SILTY, mixed	MC = 27%			27			
0.9 - 1.2		SILT - Tan-brown - Frost to 1.2 m - Soft, moist below 1.2 m	MC = 21%			21			
1.2 - 1.5			MC = 18%			18			
1.5 - 2.0			MC = 20%			20			
2.0 - 2.5		CLAY - Brown, stiff, fissured	MC = 30%			30			
2.5 - 3.0			MC = 40%			40			
3.0 - 3.05			MC = 50%			50			

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano
 NOTES Alley btw Logan & Alexander, from Patrick to Laura

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
0.0 - 0.15		CONCRETE - 150 mm layer, cracked							
0.15 - 0.3		GRANULAR FILL - 100 mm layer							
0.3 - 1.0		CLAY FILL - Black-grey mixed - Trace of fine gravel	MC = 14%			14			
1.0 - 1.2		CLAY - Grey - Frost to 1.2 m - Stiff below 1.2 m	MC = 33%			33			
1.2 - 1.5		CLAY - Grey - Frost to 1.2 m - Stiff below 1.2 m	MC = 36%			36			
1.5 - 2.1		SILT - Tan-brown, soft, moist - Clayey below 2.1 m	MC = 30%			30			
2.1 - 2.4		SILT - Tan-brown, soft, moist - Clayey below 2.1 m	MC = 25%			25			
2.4 - 2.5		SILT - Tan-brown, soft, moist - Clayey below 2.1 m	MC = 22%			22			
2.5 - 2.8		SILT - Tan-brown, soft, moist - Clayey below 2.1 m	MC = 24%			24			
2.8 - 3.0		CLAY - Brown, stiff, cohesive	MC = 46%			46			

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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 PROJECT NUMBER 171-01396-00
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 DRILLING CONTRACTOR Maple Leaf Drilling
 DRILLING METHOD Continuous Auger
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano
 NOTES Alley btw Logan & Alexander, from Patrick to Laura

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ HOLE SIZE 125 mm
 GROUND WATER LEVELS:
 AT TIME OF DRILLING ---
 AT END OF DRILLING ---
 AFTER DRILLING ---

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17

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 - 200 mm layer, intact							
0.5		CLAY FILL - Black-grey mixed - Trace of gravel above 0.3 m	MC = 29%			29			
			MC = 42%			42			
1.0		CLAY - Grey - Frost to 1.2 m - Stiff below 1.2 m	MC = 36%			36			
			MC = 34%			34			
1.5		SILT - Tan-brown, soft, moist	MC = 33%			33			
			MC = 26%			26			
2.0			MC = 24%			24			
2.5		CLAY - Brown, stiff, cohesive							
3.0			MC = 49%			49			
Bottom of hole at 3.05 m.									



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CLIENT City of Winnipeg
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 DATE STARTED 3/3/17 COMPLETED 3/3/17
 DRILLING CONTRACTOR Maple Leaf Drilling
 DRILLING METHOD Continuous Auger
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano
 NOTES Alley btw Jefferson & Seven Oaks, from Powers to McGregor

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ HOLE SIZE 125 mm
 GROUND WATER LEVELS:
 AT TIME OF DRILLING ---
 AT END OF DRILLING ---
 AFTER DRILLING ---

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ GINT STD CANADA.GDT 4/19/17

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲		
							20	40	60
0.0 - 0.15		CONCRETE - 170 mm layer, intact							
0.15 - 0.3		GRANULAR FILL - 130 mm layer							
0.3 - 1.4		CLAY FILL - Black-grey, mixed above 0.6 m - Grey below 0.6 m - Trace of fine gravel - Frost to 1.35 m	MC = 12%			12			
			MC = 31%			31			
			MC = 32%			32			
			MC = 29%			29			
1.4 - 1.7		SILT - Tan-brown, soft	MC = 22%			22			
1.7 - 2.0		CLAY - Brown, stiff - Trace of silt inclusions below 2.4 m	MC = 36%			36			
2.0 - 2.4			MC = 38%			38			
2.4 - 3.0			MC = 43%			43			
Bottom of hole at 3.05 m.									



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PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ HOLE SIZE 125 mm
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 AT TIME OF DRILLING ---
 AT END OF DRILLING ---
 AFTER DRILLING ---

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17

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	20 40 60 80
		CONCRETE - 180 mm layer, intact						
0.5		CLAY FILL - Black-grey mixed	MC = 31%			31		
		SILT - Tan-brown - Frost to 1.2 m - Soft, moist below 1.2 m	MC = 46%			46		
1.0			MC = 31%			31		
			MC = 21%			21		
1.5			MC = 21%			21		
		CLAY - Brown, stiff - SILTY at 2.7 m - Soft below 2.7 m	MC = 25%			25		
2.0			MC = 41%			41		
2.5								
3.0			MC = 46%			46		
Bottom of hole at 3.05 m.								



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 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano
 NOTES Alley btw Jefferson & Seven Oaks, from Powers to McGregor

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲			
							20	40	60	80
0.0 - 0.1		ASPHALT - 20 mm layer								
0.1 - 0.3		CONCRETE - 130 mm layer, intact								
0.3 - 0.5		CLAY FILL - Black-grey mixed	MC = 21%			21				
0.5 - 0.7			MC = 51%			51				
0.7 - 1.0			MC = 49%			49				
1.0 - 1.5		SILT - Tan-brown - Frost to 1.2 m - Soft, moist below 1.2 m	MC = 24%			24				
1.5 - 1.8			MC = 26%			26				
1.8 - 2.0		CLAY - Brown, stiff	MC = 36%			36				
2.0 - 2.2			MC = 42%			42				
2.2 - 2.5										
2.5 - 2.8										
2.8 - 3.0			MC = 49%			49				
Bottom of hole at 3.05 m.										

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17



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 NOTES Alley btw William & Elgin from Gertie to Ellen

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 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
		CONCRETE - 200 mm layer, deteriorated							
		GRANULAR FILL - 150 mm layer	MC = 12%			12			
0.5		CLAY FILL - Black-grey mixed	MC = 34%			34			
1.0		CLAY - Grey - Frost to 1.2 m	MC = 32%			32			
1.5		SILT - Tan-brown, soft, moist	MC = 26%			26			
2.0		CLAY - Brown, stiff	MC = 30%			30			
2.5		SILT - Tan-brown, soft, moist to wet	MC = 36%			36			
3.0		CLAY - Brown, stiff	MC = 46%			46			
Bottom of hole at 3.05 m.									

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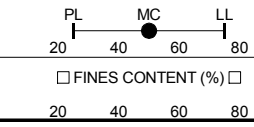
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 NOTES Alley btw William & Elgin from Gertie to Ellen

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ HOLE SIZE 125 mm
 GROUND WATER LEVELS:
 AT TIME OF DRILLING ---
 AT END OF DRILLING ---
 AFTER DRILLING ---

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ GINT STD CANADA.GDT 4/19/17

DEPTH (m)	GRAPHIC LOG	MATERIAL DESCRIPTION	TESTS AND REMARKS	BLOW COUNTS (N VALUE)	POCKET PEN. (kPa)	MOISTURE CONTENT (%)	▲ SPT N VALUE ▲		
							20	40	60
0.0 - 0.2		CONCRETE - 220 mm layer, intact							
0.2 - 0.4		GRANULAR FILL - 150 mm layer							
0.4 - 1.0		CLAY FILL - Black-grey mixed							
1.0 - 2.1		SILT - Tan-brown - Frost to 1.2 m - Soft, moist below 1.2 m							
2.1 - 3.0		CLAY - Brown, stiff - SILTY from 1.95 m to 2.1 m, trace of fine gravel - Cohesive below 2.1 m							
Bottom of hole at 3.05 m.									





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 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano
 NOTES Alley btw River & Stradbrook, from Lewis to Clarke

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
		ASPHALT - 30 mm layer							
		CONCRETE - 160 mm layer, intact							
		GRANULAR FILL - 250 mm layer	MC = 7%			7			
0.5		CLAY FILL - Black-grey mixed	MC = 33%			33			
1.0		SILT - Tan-brown - Frost 1.2 m - Soft, moist below 1.2 m	MC = 29%			29			
1.5			MC = 26%			26			
2.0			MC = 29%			29			
2.5		CLAY - Brown, stiff - SILTY from 2.4 m to 2.55 m, soft	MC = 42%			42			
3.0			MC = 48%			48			
			MC = 50%			50			

Bottom of hole at 3.05 m.

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ GINT STD CANADA.GDT 4/19/17



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

TH35

PAGE 1 OF 1

CLIENT City of Winnipeg
 PROJECT NUMBER 171-01396-00
 DATE STARTED 3/3/17 COMPLETED 3/3/17
 DRILLING CONTRACTOR Maple Leaf Drilling
 DRILLING METHOD Continuous Auger
 LOGGED BY Dana Bredin CHECKED BY Silvestre Urbano
 NOTES Alley south of 1600 Taylor, interior of Renfrew Bay

PROJECT NAME 2017 Alley Renewals
 PROJECT LOCATION Winnipeg, MB
 GROUND ELEVATION _____ 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 ▲		
							20	40	60
		CONCRETE - 190 mm layer, intact							
		GRANULAR FILL - 150 mm layer	MC = 15%			15			
0.5		CLAY FILL - Black, trace of gravel	MC = 36%			36			
1.0		SILT - Tan-brown	MC = 21%			21			
1.5		CLAY - Brown - Frost to 1.5 m - Stiff, cohesive below 1.5 m	MC = 31%			31			
			MC = 32%			32			
			MC = 42%			42			
			MC = 45%			45			
2.0									
2.5									
3.0			MC = 48%			48			
Bottom of hole at 3.05 m.									

GENERAL BH PLOTS - WSP TESTHOLE LOGS FOR 2017 ALLEY RENEWAL GPJ - GINT STD CANADA.GDT 4/19/17

Appendix B

MATERIAL TESTING RESULTS

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 1	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Chestnut		

Description	TH 1	TH 1	TH 1	TH 1	TH 1
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	148.40	102.80	152.90	169.20	157.20
Wt Dry Sample + Tare	137.20	81.80	111.40	125.70	123.00
Wt Water	11.20	21.00	41.50	43.50	34.20
Wt Tare	4.20	4.30	4.20	4.30	4.70
Wt Dry Sample	133.00	77.50	107.20	121.40	118.30
Moisture Content (%)	8.4	27.1	38.7	35.8	28.9

Description	TH 1	TH 1	TH 1		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	147.80	154.50	131.30		
Wt Dry Sample + Tare	111.70	112.00	90.30		
Wt Water	36.10	42.50	41.00		
Wt Tare	4.10	4.20	4.30		
Wt Dry Sample	107.60	107.80	86.00		
Moisture Content (%)	33.6	39.4	47.7		

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 (%)					

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 1	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Chestnut		

Description	TH 2	TH 2	TH 2	TH 2	TH 2
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	118.50	112.70	99.90	88.30	124.30
Wt Dry Sample + Tare	108.20	101.70	89.80	80.50	111.80
Wt Water	10.30	11.00	10.10	7.80	12.50
Wt Tare	4.30	4.30	4.40	4.20	4.40
Wt Dry Sample	103.90	97.40	85.40	76.30	107.40
Moisture Content (%)	9.9	11.3	11.8	10.2	11.6

Description	TH 2	TH 2	TH 2		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	105.80	87.10	88.70		
Wt Dry Sample + Tare	75.40	61.40	61.60		
Wt Water	30.40	25.70	27.10		
Wt Tare	4.30	4.30	4.70		
Wt Dry Sample	71.10	57.10	56.90		
Moisture Content (%)	42.8	45.0	47.6		

Description	TH 3	TH 3	TH 3	TH 3	TH 3
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	159.50	150.80	154.90	152.80	170.60
Wt Dry Sample + Tare	131.00	108.50	115.10	113.70	129.10
Wt Water	28.50	42.30	39.80	39.10	41.50
Wt Tare	4.30	4.60	4.50	4.30	4.20
Wt Dry Sample	126.70	103.90	110.60	109.40	124.90
Moisture Content (%)	22.5	40.7	36.0	35.7	33.2

Description	TH 3	TH 3	TH 3		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	168.00	127.10	132.90		
Wt Dry Sample + Tare	117.00	87.50	90.90		
Wt Water	51.00	39.60	42.00		
Wt Tare	4.40	4.20	4.20		
Wt Dry Sample	112.60	83.30	86.70		
Moisture Content (%)	45.3	47.5	48.4		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 3	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Dorchester		

Description	TH 4	TH 4	TH 4	TH 4	TH 4
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	77.90	108.80	119.00	103.30	115.60
Wt Dry Sample + Tare	70.00	75.90	87.10	85.40	97.20
Wt Water	7.90	32.90	31.90	17.90	18.40
Wt Tare	4.30	4.20	4.40	4.40	4.50
Wt Dry Sample	65.70	71.70	82.70	81.00	92.70
Moisture Content (%)	12.0	45.9	38.6	22.1	19.8

Description	TH 4	TH 4	TH 4		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	91.00	92.30	127.60		
Wt Dry Sample + Tare	69.60	65.20	88.70		
Wt Water	21.40	27.10	38.90		
Wt Tare	4.30	4.20	4.30		
Wt Dry Sample	65.30	61.00	84.40		
Moisture Content (%)	32.8	44.4	46.1		

Description	TH 5	TH 5	TH 5	TH 5	TH 5
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	104.10	88.00	103.10	84.00	81.40
Wt Dry Sample + Tare	86.00	64.30	75.50	63.10	61.60
Wt Water	18.10	23.70	27.60	20.90	19.80
Wt Tare	4.10	4.20	4.20	4.30	4.20
Wt Dry Sample	81.90	60.10	71.30	58.80	57.40
Moisture Content (%)	22.1	39.4	38.7	35.5	34.5

Description	TH 5	TH 5	TH 5		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	88.00	87.70	93.50		
Wt Dry Sample + Tare	65.50	61.50	64.70		
Wt Water	22.50	26.20	28.80		
Wt Tare	4.70	4.30	4.20		
Wt Dry Sample	60.80	57.20	60.50		
Moisture Content (%)	37.0	45.8	47.6		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 7	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Waverly		

Description	TH 7	TH 7	TH 7	TH 7	TH 7
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	83.90	106.20	111.00	109.90	115.20
Wt Dry Sample + Tare	75.00	72.20	84.90	89.80	95.20
Wt Water	8.90	34.00	26.10	20.10	20.00
Wt Tare	4.30	4.30	4.30	4.20	4.30
Wt Dry Sample	70.70	67.90	80.60	85.60	90.90
Moisture Content (%)	12.6	50.1	32.4	23.5	22.0

Description	TH 7	TH 7	TH 7		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	93.30	83.20	80.50		
Wt Dry Sample + Tare	68.60	58.00	56.80		
Wt Water	24.70	25.20	23.70		
Wt Tare	4.20	4.20	4.20		
Wt Dry Sample	64.40	53.80	52.60		
Moisture Content (%)	38.4	46.8	45.1		

Description	TH 6	TH 6	TH 6	TH 6	TH 6
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	154.30	165.10	140.20	166.00	162.90
Wt Dry Sample + Tare	126.00	134.20	129.00	128.90	138.70
Wt Water	28.30	30.90	11.20	37.10	24.20
Wt Tare	4.30	4.40	4.30	4.30	4.20
Wt Dry Sample	121.70	129.80	124.70	124.60	134.50
Moisture Content (%)	23.3	23.8	9.0	29.8	18.0

Description	TH 6	TH 6	TH 6		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	186.10	152.10	153.20		
Wt Dry Sample + Tare	134.40	107.70	106.70		
Wt Water	51.70	44.40	46.50		
Wt Tare	4.20	4.10	4.30		
Wt Dry Sample	130.20	103.60	102.40		
Moisture Content (%)	39.7	42.9	45.4		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 7	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Waverly		

Description	TH 9	TH 9	TH 9	TH 9	TH 9
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	108.40	104.80	99.20	107.60	86.00
Wt Dry Sample + Tare	78.40	82.10	75.80	82.30	65.30
Wt Water	30.00	22.70	23.40	25.30	20.70
Wt Tare	4.50	4.20	4.20	4.30	4.30
Wt Dry Sample	73.90	77.90	71.60	78.00	61.00
Moisture Content (%)	40.6	29.1	32.7	32.4	33.9

Description	TH 9	TH 9	TH 9		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	103.10	104.50	71.60		
Wt Dry Sample + Tare	72.40	69.70	47.80		
Wt Water	30.70	34.80	23.80		
Wt Tare	4.40	4.20	4.30		
Wt Dry Sample	68.00	65.50	43.50		
Moisture Content (%)	45.1	53.1	54.7		

Description	TH 8	TH 8	TH 8	TH 8	TH 8
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	94.50	91.20	98.60	107.80	103.00
Wt Dry Sample + Tare	75.60	68.50	76.10	81.10	76.00
Wt Water	18.90	22.70	22.50	26.70	27.00
Wt Tare	4.20	4.10	4.20	4.30	4.20
Wt Dry Sample	71.40	64.40	71.90	76.80	71.80
Moisture Content (%)	26.5	35.2	31.3	34.8	37.6

Description	TH 8	TH 8	TH 8		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	108.10	98.60	104.20		
Wt Dry Sample + Tare	78.20	69.80	71.40		
Wt Water	29.90	28.80	32.80		
Wt Tare	4.20	4.20	4.20		
Wt Dry Sample	74.00	65.60	67.20		
Moisture Content (%)	40.4	43.9	48.8		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 2	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Waterloo		

Description	TH 11	TH 11	TH 11	TH 11	TH 11
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	109.70	111.20	107.00	110.80	110.30
Wt Dry Sample + Tare	91.10	87.60	84.00	86.20	84.90
Wt Water	18.60	23.60	23.00	24.60	25.40
Wt Tare	4.20	4.40	4.20	4.30	4.20
Wt Dry Sample	86.90	83.20	79.80	81.90	80.70
Moisture Content (%)	21.4	28.4	28.8	30.0	31.5

Description	TH 11	TH 11	TH 11		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	114.70	112.20	103.20		
Wt Dry Sample + Tare	83.90	83.20	69.80		
Wt Water	30.80	29.00	33.40		
Wt Tare	4.30	4.20	4.60		
Wt Dry Sample	79.60	79.00	65.20		
Moisture Content (%)	38.7	36.7	51.2		

Description	TH 10	TH 10	TH 10	TH 10	TH 10
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	139.60	157.70	170.70	170.00	176.20
Wt Dry Sample + Tare	120.10	134.00	129.40	128.80	142.00
Wt Water	19.50	23.70	41.30	41.20	34.20
Wt Tare	4.20	4.10	4.30	4.20	4.70
Wt Dry Sample	115.90	129.90	125.10	124.60	137.30
Moisture Content (%)	16.8	18.2	33.0	33.1	24.9

Description	TH 10	TH 10	TH 10		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	168.50	198.70	164.60		
Wt Dry Sample + Tare	127.50	162.30	116.10		
Wt Water	41.00	36.40	48.50		
Wt Tare	4.20	4.30	4.10		
Wt Dry Sample	123.30	158.00	112.00		
Moisture Content (%)	33.3	23.0	43.3		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 2	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Waterloo		

Description	TH 12	TH 12	TH 12	TH 12	TH 12
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	101.40	73.90	69.30	81.90	58.00
Wt Dry Sample + Tare	83.80	54.40	52.50	59.60	43.10
Wt Water	17.60	19.50	16.80	22.30	14.90
Wt Tare	4.20	4.20	4.20	4.50	4.20
Wt Dry Sample	79.60	50.20	48.30	55.10	38.90
Moisture Content (%)	22.1	38.8	34.8	40.5	38.3

Description	TH 12	TH 12	TH 12		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	87.10	123.60	78.50		
Wt Dry Sample + Tare	61.10	86.40	52.70		
Wt Water	26.00	37.20	25.80		
Wt Tare	4.20	4.20	4.30		
Wt Dry Sample	56.90	82.20	48.40		
Moisture Content (%)	45.7	45.3	53.3		

Description	TH 13	TH 13	TH 13	TH 13	TH 13
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	86.10	74.40	64.60	97.10	98.10
Wt Dry Sample + Tare	71.20	57.20	49.60	70.60	71.60
Wt Water	14.90	17.20	15.00	26.50	26.50
Wt Tare	4.20	4.30	4.40	4.60	4.20
Wt Dry Sample	67.00	52.90	45.20	66.00	67.40
Moisture Content (%)	22.2	32.5	33.2	40.2	39.3

Description	TH 13	TH 13	TH 13		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	100.70	97.70	77.50		
Wt Dry Sample + Tare	71.00	68.90	51.10		
Wt Water	29.70	28.80	26.40		
Wt Tare	4.20	4.50	4.30		
Wt Dry Sample	66.80	64.40	46.80		
Moisture Content (%)	44.5	44.7	56.4		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 4	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Erin		

Description	TH 14	TH 14	TH 14	TH 14	TH 14
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	176.90	101.00	118.40	95.00	96.80
Wt Dry Sample + Tare	143.40	80.50	93.10	76.10	75.90
Wt Water	33.50	20.50	25.30	18.90	20.90
Wt Tare	4.30	4.30	4.40	4.30	4.20
Wt Dry Sample	139.10	76.20	88.70	71.80	71.70
Moisture Content (%)	24.1	26.9	28.5	26.3	29.1

Description	TH 14	TH 14	TH 14		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	92.10	109.50	93.50		
Wt Dry Sample + Tare	66.70	76.90	63.00		
Wt Water	25.40	32.60	30.50		
Wt Tare	4.40	4.60	4.20		
Wt Dry Sample	62.30	72.30	58.80		
Moisture Content (%)	40.8	45.1	51.9		

Description	TH 16	TH 16	TH 16	TH 16	TH 16
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	116.90	73.20	88.60	106.10	103.60
Wt Dry Sample + Tare	96.50	56.60	68.90	81.30	79.50
Wt Water	20.40	16.60	19.70	24.80	24.10
Wt Tare	4.50	4.20	4.70	4.80	4.20
Wt Dry Sample	92.00	52.40	64.20	76.50	75.30
Moisture Content (%)	22.2	31.7	30.7	32.4	32.0

Description	TH 16	TH 16	TH 16		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	106.90	105.90	88.70		
Wt Dry Sample + Tare	76.70	75.90	60.00		
Wt Water	30.20	30.00	28.70		
Wt Tare	4.20	4.20	4.30		
Wt Dry Sample	72.50	71.70	55.70		
Moisture Content (%)	41.7	41.8	51.5		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 4	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Erin		

Description	TH 17	TH 17	TH 17	TH 17	TH 17
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	165.00	162.30	132.40	176.50	156.00
Wt Dry Sample + Tare	145.60	127.40	104.80	136.50	122.50
Wt Water	19.40	34.90	27.60	40.00	33.50
Wt Tare	4.20	4.60	4.20	4.20	4.10
Wt Dry Sample	141.40	122.80	100.60	132.30	118.40
Moisture Content (%)	13.7	28.4	27.4	30.2	28.3

Description	TH 17	TH 17	TH 17		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	174.10	252.10	168.80		
Wt Dry Sample + Tare	142.70	204.60	116.90		
Wt Water	31.40	47.50	51.90		
Wt Tare	4.30	4.10	4.40		
Wt Dry Sample	138.40	200.50	112.50		
Moisture Content (%)	22.7	23.7	46.1		

Description	TH 15	TH 15	TH 15	TH 15	TH 15
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	172.20	161.90	163.10	151.60	160.60
Wt Dry Sample + Tare	142.20	128.30	130.00	120.50	119.30
Wt Water	30.00	33.60	33.10	31.10	41.30
Wt Tare	4.30	4.40	4.40	4.20	4.40
Wt Dry Sample	137.90	123.90	125.60	116.30	114.90
Moisture Content (%)	21.8	27.1	26.4	26.7	35.9

Description	TH 15	TH 15	TH 15		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	157.40	150.00	164.00		
Wt Dry Sample + Tare	109.20	106.10	110.10		
Wt Water	48.20	43.90	53.90		
Wt Tare	4.20	4.30	4.30		
Wt Dry Sample	105.00	101.80	105.80		
Moisture Content (%)	45.9	43.1	50.9		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 8	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Ingersoll		

Description	TH 18	TH 18	TH 18	TH 18	TH 18
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	179.60	167.60	150.10	154.90	165.50
Wt Dry Sample + Tare	151.60	127.40	112.30	115.50	136.20
Wt Water	28.00	40.20	37.80	39.40	29.30
Wt Tare	4.20	4.20	4.30	4.50	4.20
Wt Dry Sample	147.40	123.20	108.00	111.00	132.00
Moisture Content (%)	19.0	32.6	35.0	35.5	22.2

Description	TH 18	TH 18	TH 18		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	194.80	145.90	161.80		
Wt Dry Sample + Tare	158.40	119.20	109.40		
Wt Water	36.40	26.70	52.40		
Wt Tare	4.20	4.10	4.30		
Wt Dry Sample	154.20	115.10	105.10		
Moisture Content (%)	23.6	23.2	49.9		

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 (%)					

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 8	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Ingersoll		

Description	TH 20	TH 20	TH 20	TH 20	TH 20
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	119.50	79.60	101.30	70.30	85.10
Wt Dry Sample + Tare	92.90	61.40	78.90	54.40	71.10
Wt Water	26.60	18.20	22.40	15.90	14.00
Wt Tare	4.30	4.30	4.30	4.30	4.30
Wt Dry Sample	88.60	57.10	74.60	50.10	66.80
Moisture Content (%)	30.0	31.9	30.0	31.7	21.0

Description	TH 20	TH 20	TH 20		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	99.10	105.90	84.00		
Wt Dry Sample + Tare	79.50	80.40	57.30		
Wt Water	19.60	25.50	26.70		
Wt Tare	4.30	4.50	4.40		
Wt Dry Sample	75.20	75.90	52.90		
Moisture Content (%)	26.1	33.6	50.5		

Description	TH 19	TH 19	TH 19	TH 19	TH 19
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	109.00	103.70	101.50	106.80	107.60
Wt Dry Sample + Tare	91.00	79.10	77.00	81.60	89.40
Wt Water	18.00	24.60	24.50	25.20	18.20
Wt Tare	4.20	4.20	4.60	4.20	4.20
Wt Dry Sample	86.80	74.90	72.40	77.40	85.20
Moisture Content (%)	20.7	32.8	33.8	32.6	21.4

Description	TH 19	TH 19	TH 19		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	109.30	111.90	112.00		
Wt Dry Sample + Tare	89.40	91.90	79.40		
Wt Water	19.90	20.00	32.60		
Wt Tare	4.20	4.50	4.30		
Wt Dry Sample	85.20	87.40	75.10		
Moisture Content (%)	23.4	22.9	43.4		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 13	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 20-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Lipton		

Description	TH 21	TH 21	TH 21	TH 21	TH 21
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	165.40	134.70	183.70	152.10	172.70
Wt Dry Sample + Tare	148.50	102.30	141.30	114.50	143.50
Wt Water	16.90	32.40	42.40	37.60	29.20
Wt Tare	4.20	4.30	4.20	4.40	4.20
Wt Dry Sample	144.30	98.00	137.10	110.10	139.30
Moisture Content (%)	11.7	33.1	30.9	34.2	21.0

Description	TH 21	TH 21	TH 21		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	181.90	123.90	134.20		
Wt Dry Sample + Tare	150.80	101.10	97.00		
Wt Water	31.10	22.80	37.20		
Wt Tare	4.20	4.30	4.10		
Wt Dry Sample	146.60	96.80	92.90		
Moisture Content (%)	21.2	23.6	40.0		

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 (%)					

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 13	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 20-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Lipton		

Description	TH 23	TH 23	TH 23	TH 23	TH 23
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	164.50	111.80	109.30	149.50	163.40
Wt Dry Sample + Tare	138.10	85.20	83.80	104.00	134.70
Wt Water	26.40	26.60	25.50	45.50	28.70
Wt Tare	4.30	4.20	4.20	4.20	4.20
Wt Dry Sample	133.80	81.00	79.60	99.80	130.50
Moisture Content (%)	19.7	32.8	32.0	45.6	22.0

Description	TH 23	TH 23	TH 23		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	178.50	152.30	149.20		
Wt Dry Sample + Tare	145.90	115.00	99.10		
Wt Water	32.60	37.30	50.10		
Wt Tare	4.20	4.30	4.20		
Wt Dry Sample	141.70	110.70	94.90		
Moisture Content (%)	23.0	33.7	52.8		

Description	TH 22	TH 22	TH 22	TH 22	TH 22
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	152.10	143.60	157.60	159.20	154.60
Wt Dry Sample + Tare	140.80	110.80	116.10	118.50	123.20
Wt Water	11.30	32.80	41.50	40.70	31.40
Wt Tare	4.20	4.20	4.50	4.30	4.60
Wt Dry Sample	136.60	106.60	111.60	114.20	118.60
Moisture Content (%)	8.3	30.8	37.2	35.6	26.5

Description	TH 22	TH 22	TH 22		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	183.80	171.40	161.60		
Wt Dry Sample + Tare	148.40	139.90	116.70		
Wt Water	35.40	31.50	44.90		
Wt Tare	4.20	4.30	4.60		
Wt Dry Sample	144.20	135.60	112.10		
Moisture Content (%)	24.5	23.2	40.1		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 12	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 20-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Arlington		

Description	TH 24	TH 24	TH 24	TH 24	TH 24
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	137.70	174.20	156.20	143.20	152.40
Wt Dry Sample + Tare	107.60	133.20	114.20	118.70	125.60
Wt Water	30.10	41.00	42.00	24.50	26.80
Wt Tare	4.20	4.30	4.20	4.30	4.30
Wt Dry Sample	103.40	128.90	110.00	114.40	121.30
Moisture Content (%)	29.1	31.8	38.2	21.4	22.1

Description	TH 24	TH 24	TH 24		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	152.50	156.20	145.20		
Wt Dry Sample + Tare	122.90	121.40	99.40		
Wt Water	29.60	34.80	45.80		
Wt Tare	4.10	4.30	4.60		
Wt Dry Sample	118.80	117.10	94.80		
Moisture Content (%)	24.9	29.7	48.3		

Description	TH 25	TH 25	TH 25	TH 25	TH 25
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	154.60	144.30	120.10	136.90	167.30
Wt Dry Sample + Tare	134.30	111.20	93.30	108.40	140.70
Wt Water	20.30	33.10	26.80	28.50	26.60
Wt Tare	4.20	4.30	4.40	4.30	4.50
Wt Dry Sample	130.10	106.90	88.90	104.10	136.20
Moisture Content (%)	15.6	31.0	30.1	27.4	19.5

Description	TH 25	TH 25	TH 25		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	168.10	130.70	164.50		
Wt Dry Sample + Tare	137.50	96.20	111.40		
Wt Water	30.60	34.50	53.10		
Wt Tare	4.30	4.50	4.20		
Wt Dry Sample	133.20	91.70	107.20		
Moisture Content (%)	23.0	37.6	49.5		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 12	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 20-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Arlington		

Description	TH 26	TH 26	TH 26	TH 26	TH 26
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	149.70	138.30	83.70	156.30	156.70
Wt Dry Sample + Tare	124.10	109.90	69.80	133.00	130.90
Wt Water	25.60	28.40	13.90	23.30	25.80
Wt Tare	4.20	4.20	4.20	4.30	4.30
Wt Dry Sample	119.90	105.70	65.60	128.70	126.60
Moisture Content (%)	21.4	26.9	21.2	18.1	20.4

Description	TH 26	TH 26	TH 26		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	106.20	131.80	145.90		
Wt Dry Sample + Tare	82.50	95.50	98.50		
Wt Water	23.70	36.30	47.40		
Wt Tare	4.20	4.30	4.20		
Wt Dry Sample	78.30	91.20	94.30		
Moisture Content (%)	30.3	39.8	50.3		

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 (%)					

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 6	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Patrick/Logan		

Description	TH 28	TH 28	TH 28	TH 28	TH 28
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	91.70	89.60	94.30	97.30	93.00
Wt Dry Sample + Tare	72.10	64.30	70.40	73.50	71.20
Wt Water	19.60	25.30	23.90	23.80	21.80
Wt Tare	4.20	4.20	4.30	4.20	4.20
Wt Dry Sample	67.90	60.10	66.10	69.30	67.00
Moisture Content (%)	28.9	42.1	36.2	34.3	32.5

Description	TH 28	TH 28	TH 28		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	121.80	99.70	100.80		
Wt Dry Sample + Tare	98.00	81.10	69.10		
Wt Water	23.80	18.60	31.70		
Wt Tare	4.50	4.20	4.50		
Wt Dry Sample	93.50	76.90	64.60		
Moisture Content (%)	25.5	24.2	49.1		

Description	TH 27	TH 27	TH 27	TH 27	TH 27
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	113.80	111.50	83.60	96.50	99.20
Wt Dry Sample + Tare	100.50	84.90	62.80	75.50	80.00
Wt Water	13.30	26.60	20.80	21.00	19.20
Wt Tare	4.70	4.20	4.40	4.20	4.20
Wt Dry Sample	95.80	80.70	58.40	71.30	75.80
Moisture Content (%)	13.9	33.0	35.6	29.5	25.3

Description	TH 27	TH 27	TH 27		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	126.00	125.20	94.70		
Wt Dry Sample + Tare	104.00	102.00	66.20		
Wt Water	22.00	23.20	28.50		
Wt Tare	4.20	4.20	4.20		
Wt Dry Sample	99.80	97.80	62.00		
Moisture Content (%)	22.0	23.7	46.0		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 5	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: William Ave		

Description	TH 30	TH 30	TH 30	TH 30	TH 30
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	107.30	94.80	112.20	119.00	109.20
Wt Dry Sample + Tare	83.00	66.50	86.60	99.00	90.80
Wt Water	24.30	28.30	25.60	20.00	18.40
Wt Tare	4.20	4.30	4.30	4.30	4.20
Wt Dry Sample	78.80	62.20	82.30	94.70	86.60
Moisture Content (%)	30.8	45.5	31.1	21.1	21.2

Description	TH 30	TH 30	TH 30		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	96.50	80.80	65.40		
Wt Dry Sample + Tare	78.10	58.70	46.00		
Wt Water	18.40	22.10	19.40		
Wt Tare	4.40	4.30	4.20		
Wt Dry Sample	73.70	54.40	41.80		
Moisture Content (%)	25.0	40.6	46.4		

Description	TH 29	TH 29	TH 29	TH 29	TH 29
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	112.90	64.00	132.10	122.00	91.90
Wt Dry Sample + Tare	101.50	49.80	101.00	95.40	75.90
Wt Water	11.40	14.20	31.10	26.60	16.00
Wt Tare	4.20	4.30	4.40	4.50	4.20
Wt Dry Sample	97.30	45.50	96.60	90.90	71.70
Moisture Content (%)	11.7	31.2	32.2	29.3	22.3

Description	TH 29	TH 29	TH 29		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	82.40	99.60	91.70		
Wt Dry Sample + Tare	61.60	73.10	65.70		
Wt Water	20.80	26.50	26.00		
Wt Tare	4.30	4.30	4.70		
Wt Dry Sample	57.30	68.80	61.00		
Moisture Content (%)	36.3	38.5	42.6		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 11	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Jefferson		

Description	TH 31	TH 31	TH 31	TH 31	TH 31
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	84.40	97.80	84.40	95.10	106.10
Wt Dry Sample + Tare	70.70	66.20	58.00	77.80	84.90
Wt Water	13.70	31.60	26.40	17.30	21.20
Wt Tare	4.30	4.30	4.30	4.20	4.30
Wt Dry Sample	66.40	61.90	53.70	73.60	80.60
Moisture Content (%)	20.6	51.1	49.2	23.5	26.3

Description	TH 31	TH 31	TH 31		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	82.00	99.60	84.20		
Wt Dry Sample + Tare	61.60	71.30	58.00		
Wt Water	20.40	28.30	26.20		
Wt Tare	4.30	4.60	4.20		
Wt Dry Sample	57.30	66.70	53.80		
Moisture Content (%)	35.6	42.4	48.7		

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 (%)					

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 5	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: William Ave		

Description	TH 33	TH 33	TH 33	TH 33	TH 33
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	121.70	66.00	68.20	74.90	105.10
Wt Dry Sample + Tare	108.20	48.00	50.00	58.90	87.40
Wt Water	13.50	18.00	18.20	16.00	17.70
Wt Tare	4.20	4.30	4.50	4.20	4.10
Wt Dry Sample	104.00	43.70	45.50	54.70	83.30
Moisture Content (%)	13.0	41.2	40.0	29.3	21.2

Description	TH 33	TH 33	TH 33		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	79.20	103.40	111.70		
Wt Dry Sample + Tare	65.00	79.60	78.30		
Wt Water	14.20	23.80	33.40		
Wt Tare	4.20	4.20	4.40		
Wt Dry Sample	60.80	75.40	73.90		
Moisture Content (%)	23.4	31.6	45.2		

Description	TH 32	TH 32	TH 32	TH 32	TH 32
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	102.70	79.00	100.10	94.10	83.70
Wt Dry Sample + Tare	91.90	60.10	77.00	75.60	68.60
Wt Water	10.80	18.90	23.10	18.50	15.10
Wt Tare	4.30	4.30	4.80	4.20	4.30
Wt Dry Sample	87.60	55.80	72.20	71.40	64.30
Moisture Content (%)	12.3	33.9	32.0	25.9	23.5

Description	TH 32	TH 32	TH 32		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	119.70	106.70	109.80		
Wt Dry Sample + Tare	93.00	79.40	76.70		
Wt Water	26.70	27.30	33.10		
Wt Tare	4.20	4.20	4.20		
Wt Dry Sample	88.80	75.20	72.50		
Moisture Content (%)	30.1	36.3	45.7		

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 10	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Lewis		

Description	TH 34	TH 34	TH 34	TH 34	TH 34
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	115.60	90.10	115.40	88.00	103.80
Wt Dry Sample + Tare	107.90	68.60	90.20	70.60	81.40
Wt Water	7.60	21.50	25.20	17.40	22.40
Wt Tare	4.30	4.30	4.20	4.20	4.30
Wt Dry Sample	103.60	64.30	86.00	66.40	77.10
Moisture Content (%)	7.4	33.4	29.3	26.2	29.1

Description	TH 34	TH 34	TH 34		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	79.70	76.10	78.20		
Wt Dry Sample + Tare	57.60	52.70	53.50		
Wt Water	22.10	23.40	24.70		
Wt Tare	4.30	4.20	4.20		
Wt Dry Sample	53.30	48.50	49.30		
Moisture Content (%)	41.5	48.2	50.1		

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 (%)					

MOISTURE CONTENT OF SOIL (ASTM D2216)

CLIENT: WSP	TEST NO: 9	PROJECT NO: 103-1702
PROJECT: Concrete Alley Renewal Project (WSP 171-C)	DATE SAMPLED:	SAMPLED BY: Client
PROJECT CONTACT:	DATE TESTED: 13-Mar-2017	TESTED BY: Leon Yang
TEST LOCATION: Renfrew		

Description	TH 35	TH 35	TH 35	TH 35	TH 35
Depth (ft)	1	2	3	4	5
Wt Wet Sample + Tare	112.90	65.40	81.60	100.30	109.10
Wt Dry Sample + Tare	98.90	49.30	68.10	77.90	84.00
Wt Water	14.00	16.10	13.50	22.40	25.10
Wt Tare	4.30	4.30	4.50	4.60	4.40
Wt Dry Sample	94.60	45.00	63.60	73.30	79.60
Moisture Content (%)	14.8	35.8	21.2	30.6	31.5

Description	TH 35	TH 35	TH 35		
Depth (ft)	6	7	10		
Wt Wet Sample + Tare	110.00	90.20	106.80		
Wt Dry Sample + Tare	78.50	63.70	73.70		
Wt Water	31.50	26.50	33.10		
Wt Tare	4.20	4.20	4.20		
Wt Dry Sample	74.30	59.50	69.50		
Moisture Content (%)	42.4	44.5	47.6		

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

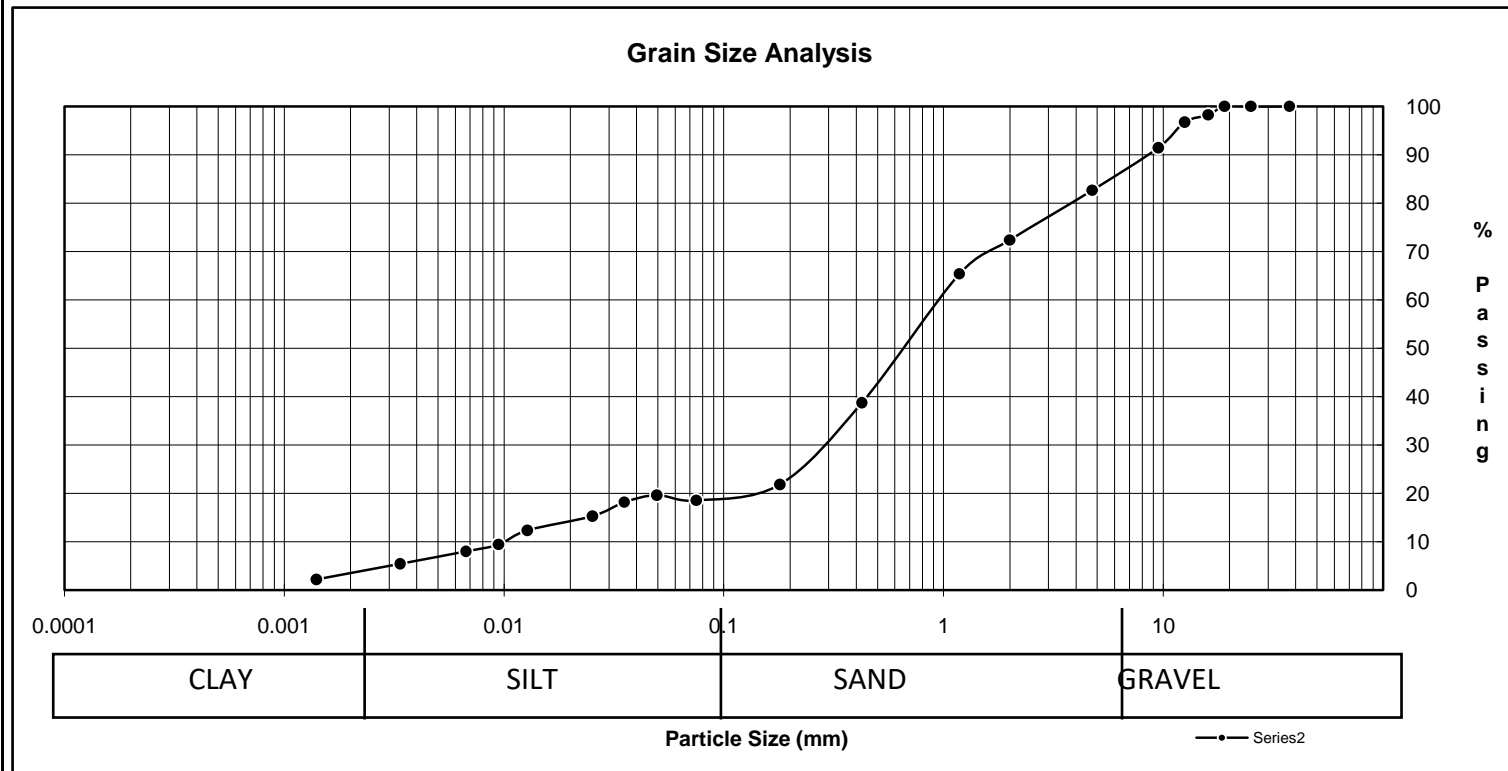
Description					
Depth (ft)					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: WSP
 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
ATTN: Silvestre Urbano
PROJECT: Concrete Alley Renewal Project

PROJECT NO. 103-1702

Date Sampled:	unknown	Date Received:	6-Mar-17	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	15-Mar-17	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH2 @ 4' Sample No. 5 Sample Source Chestnut Specific Gravity of Material: 2.65				50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	98.3		
				12.50	96.7	0.0496	19.6
				9.50	91.4	0.0353	18.2
				4.75	82.7	0.0253	15.3
				2.00	72.4	0.0128	12.3
				1.18	65.4	0.0094	9.4
0.425	38.7	0.0067	8.0				
0.180	21.8	0.0034	5.4				
0.075	18.5	0.0014	2.2				



SOIL DESCRIPTION	% Composition		D10	0.00944
	SANDY LOAM	17.4	Gravel	D30
64.1		Sand	D60	1.18000
16.3		Silt	Cu	125.00
2.2		Clay	Cc	16.22

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: IA/GM

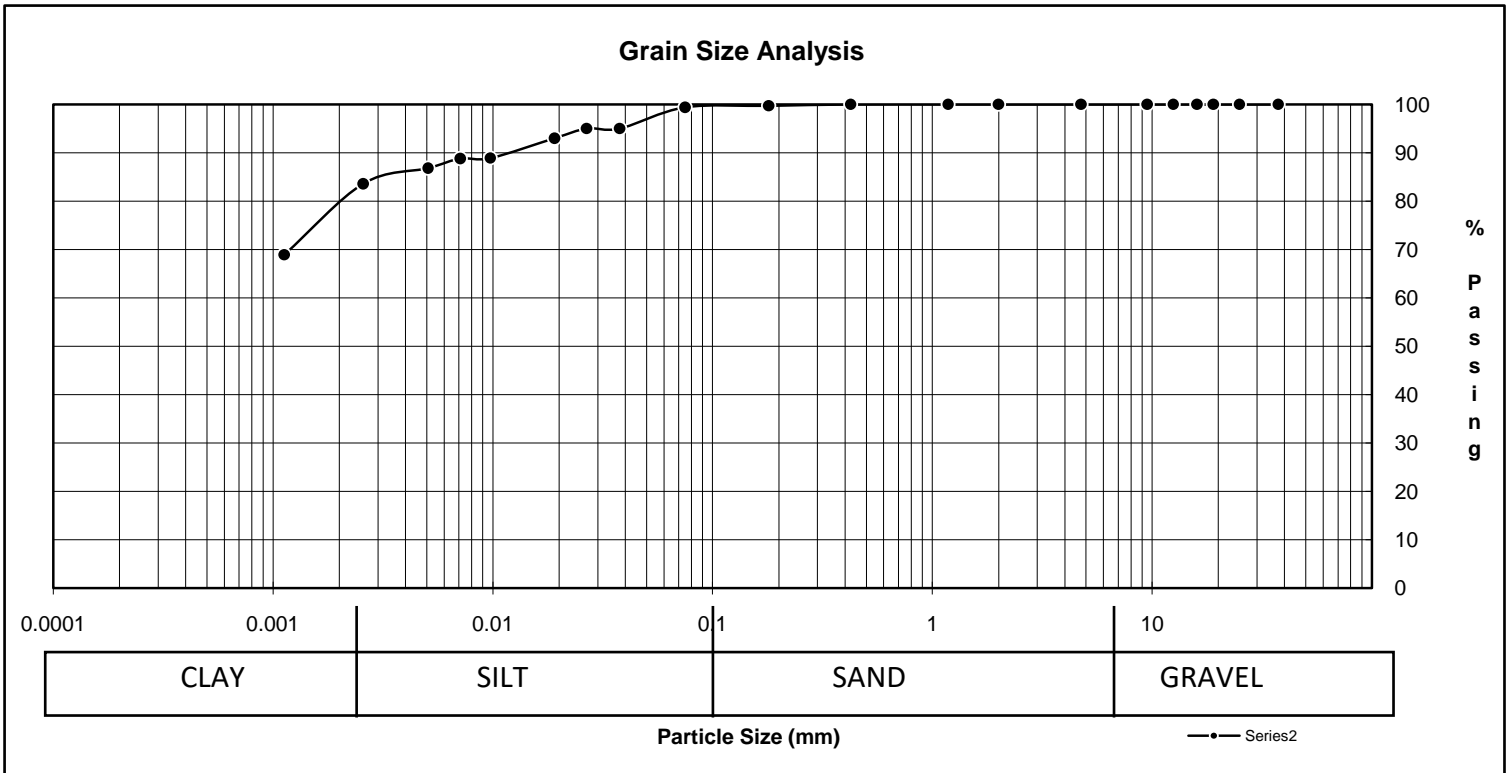


Reviewed by: Hermie Manalo

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: WSP PROJECT NO. 103-1702
1600 Buffalo Place
Winnipeg, MB R3T 6B8
ATTN: Silvestre Urbano
PROJECT: Concrete Alley Renewal Project

Date Sampled:	unknown	Date Received:	6-Mar-17	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	15-Mar-17	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH3 @ 7' Sample No. 6 Sample Source Chestnut Specific Gravity of Material: 2.65				50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
				12.50	100.0	0.0378	95.0
				9.50	100.0	0.0267	95.0
				4.75	100.0	0.0191	93.0
				2.00	100.0	0.0097	88.9
				1.18	100.0	0.0071	88.8
0.425	100.0	0.0051	86.8				
0.180	99.7	0.0026	83.6				
0.075	99.4	0.0011	68.9				



SOIL DESCRIPTION	% Composition		D10 D30 D60 Cu Cc
	HEAVY CLAY	0.6	
	30.5	Sand	
	68.9	Silt	
		Clay	

Remarks: Test Method: ASTM D422, D2216, D4318
Technician: IA/GM

H. Manalo

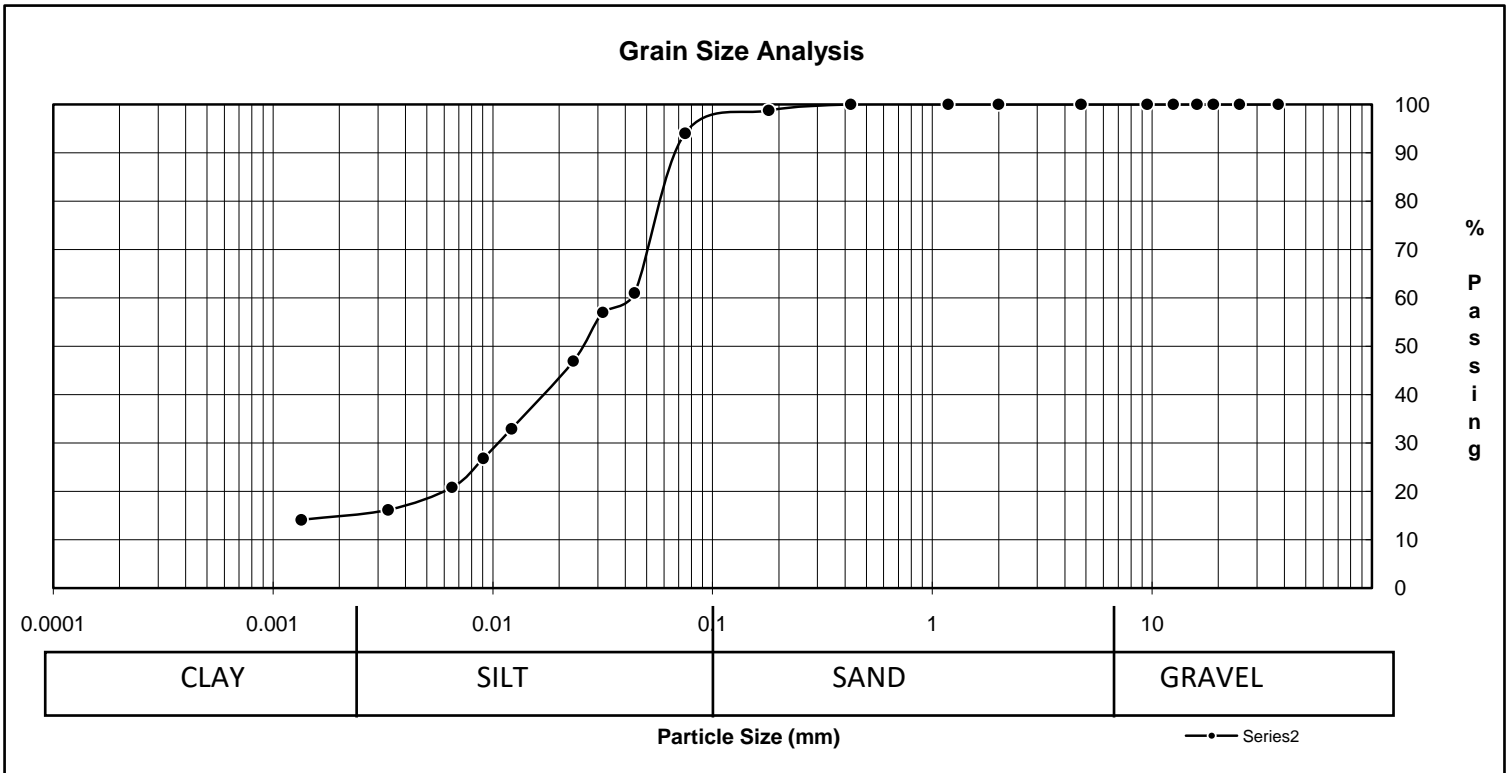
Reviewed by: Hermie Manalo

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: WSP
1600 Buffalo Place
Winnipeg, MB R3T 6B8
ATTN: Silvestre Urbano
PROJECT: Concrete Alley Renewal Project

PROJECT NO. 103-1702

Date Sampled:	unknown	Date Received:	6-Mar-17	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	15-Mar-17	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH4 @ 5' Sample No. 1 Sample Source Dorchester Specific Gravity of Material: 2.65				50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
				12.50	100.0	0.0441	61.0
				9.50	100.0	0.0317	57.0
				4.75	100.0	0.0232	46.9
				2.00	100.0	0.0122	32.9
				1.18	100.0	0.0091	26.8
0.425	100.0	0.0065	20.8				
0.180	98.7	0.0033	16.1				
0.075	94.0	0.0013	14.1				



SOIL DESCRIPTION	% Composition		D10	D30	D60	Cu	Cc
	Gravel	Sand					
SILT	6.0	Silt			0.01217		
	79.9	Silt			0.04500		
	14.1	Clay					

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: IA/GM

Reviewed by: Hermie Manalo

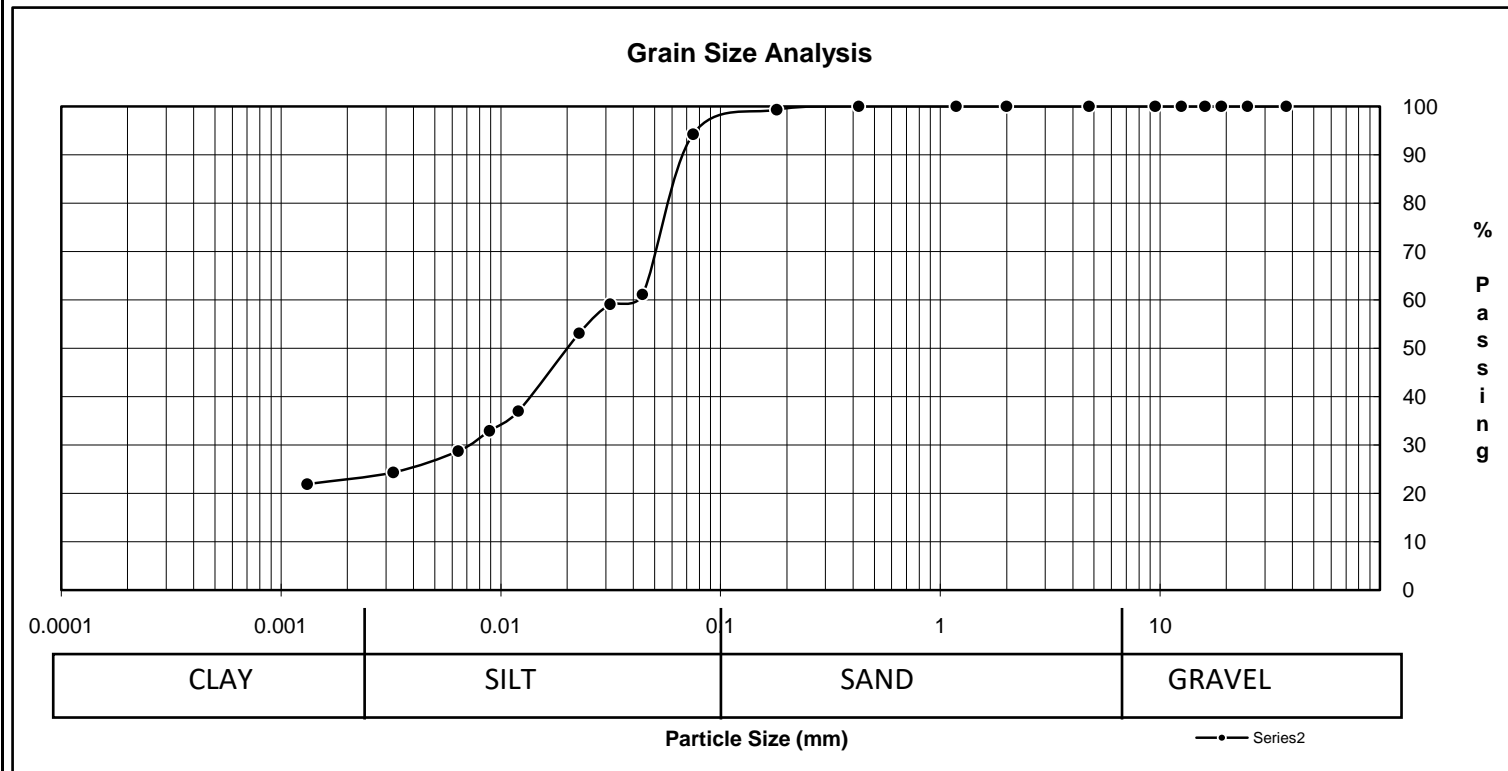
PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	WSP 1600 Buffalo Place Winnipeg, MB R3T 6B8	PROJECT NO. 103-1702
ATTN:	Silvestre Urbano	
PROJECT:	Concrete Alley Renewal Project	

Date Sampled:	unknown	Date Received:	6-Mar-17	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	15-Mar-17	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	0.0441	61.1
				9.50	100.0	0.0314	59.1
				4.75	100.0	0.0227	53.1
				2.00	100.0	0.0120	37.0
				1.18	100.0	0.0089	32.9
				0.425	100.0	0.0064	28.7
				0.180	99.3	0.0032	24.3
				0.075	94.2	0.0013	21.9

Material Identification

B.H./T.H. No. **TH7 @ 5'**
Sample No. 2
 Sample Source **Waverley**
 Specific Gravity of Material: **2.65**



SOIL DESCRIPTION	% Composition		D10	
	SILT LOAM	5.8	Gravel	D30
72.3		Sand	D60	0.04500
21.9		Silt	Cu	
		Clay	Cc	

Remarks: Test Method: ASTM D422, D2216, D4318

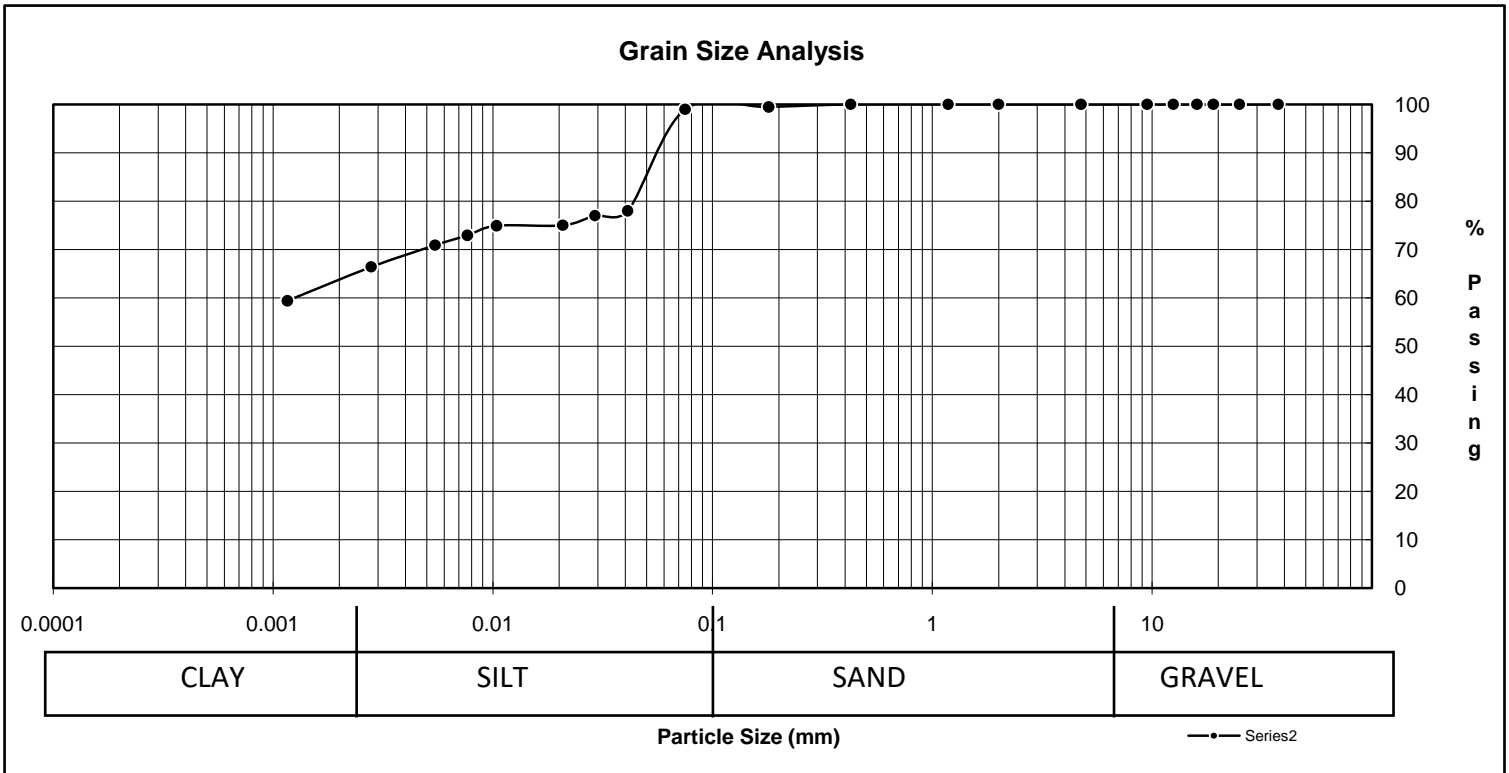
Technician: IA/GM

Reviewed by: Hermie Manalo

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: WSP PROJECT NO. 103-1702
1600 Buffalo Place
Winnipeg, MB R3T 6B8
ATTN: Silvestre Urbano
PROJECT: Concrete Alley Renewal Project

Date Sampled:	unknown	Date Received:	6-Mar-17	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	15-Mar-17	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH11 @ 6' Sample No. 3 Sample Source Waterloo Specific Gravity of Material: 2.65				50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
				12.50	100.0	0.0411	78.0
				9.50	100.0	0.0292	77.0
				4.75	100.0	0.0208	75.0
				2.00	100.0	0.0104	74.9
				1.18	100.0	0.0077	72.9
0.425	100.0	0.0055	70.9				
0.180	99.5	0.0028	66.4				
0.075	99.0	0.0012	59.4				



SOIL DESCRIPTION	% Composition		D10	0.00116
	SILTY CLAY	1.0	Gravel	
39.6		Sand	D60	
59.4		Silt	Cu	
		Clay	Cc	

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: IA/GM

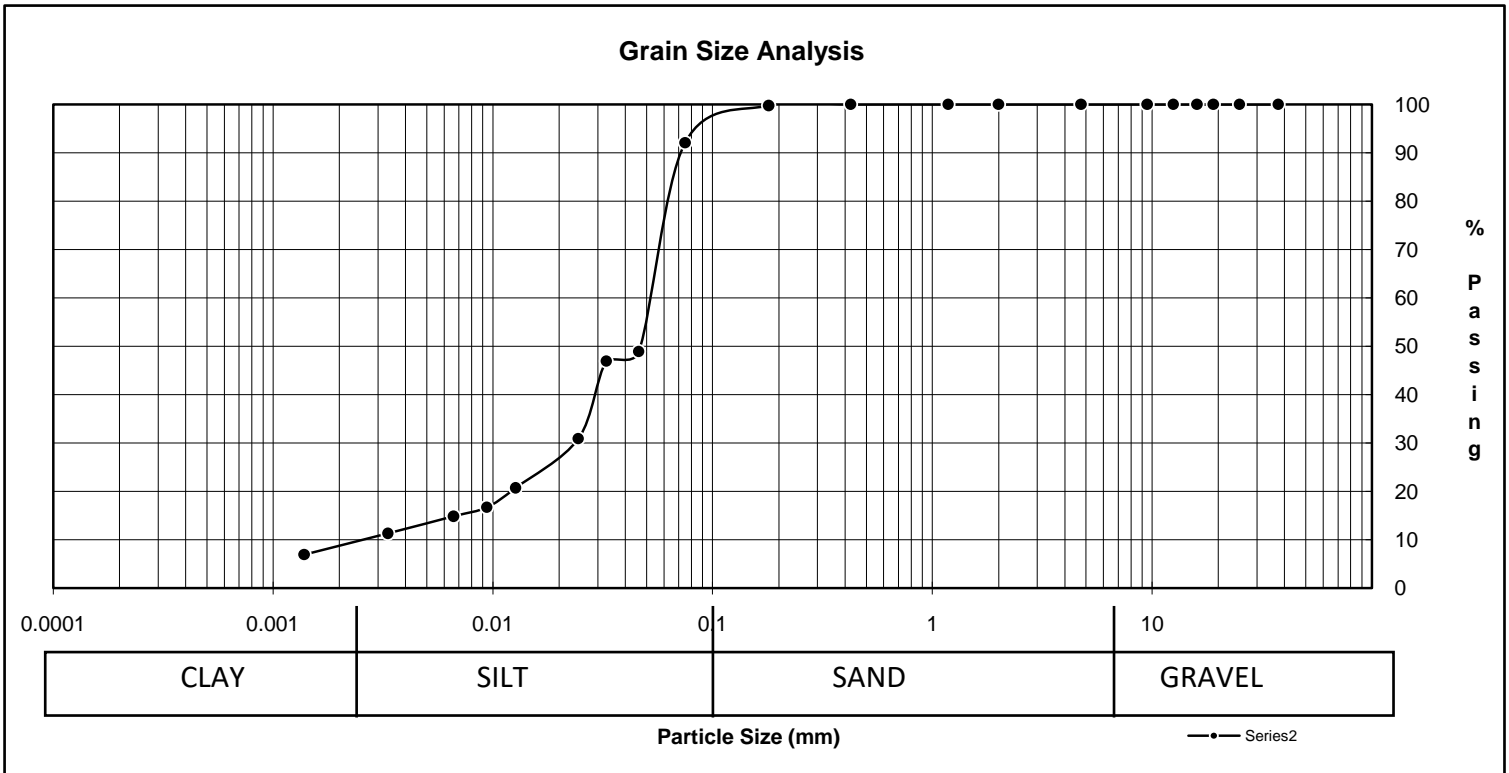
Reviewed by: Hermie Manalo

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	WSP 1600 Buffalo Place Winnipeg, MB R3T 6B8	PROJECT NO. 103-1702
ATTN:	Silvestre Urbano	
PROJECT:	Concrete Alley Renewal Project	

Date Sampled:	unknown	Date Received:	6-Mar-17	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	15-Mar-17	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	0.0461	48.9
				9.50	100.0	0.0328	46.9
				4.75	100.0	0.0245	30.9
				2.00	100.0	0.0127	20.7
				1.18	100.0	0.0094	16.7
				0.425	100.0	0.0066	14.8
				0.180	99.8	0.0033	11.3
				0.075	92.1	0.0014	6.9

Material Identification
 B.H./T.H. No. **TH17 @ 7'**
 Sample No. **4**
 Sample Source **Erin**
 Specific Gravity of Material: **2.65**



SOIL DESCRIPTION	% Composition		D10	0.00333
	SILT	7.9	Gravel	D30
85.2		Sand	D60	0.07500
6.9		Silt	Cu	22.52
6.9		Clay	Cc	2.40

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: IA/GM

Reviewed by: Hermie Manalo

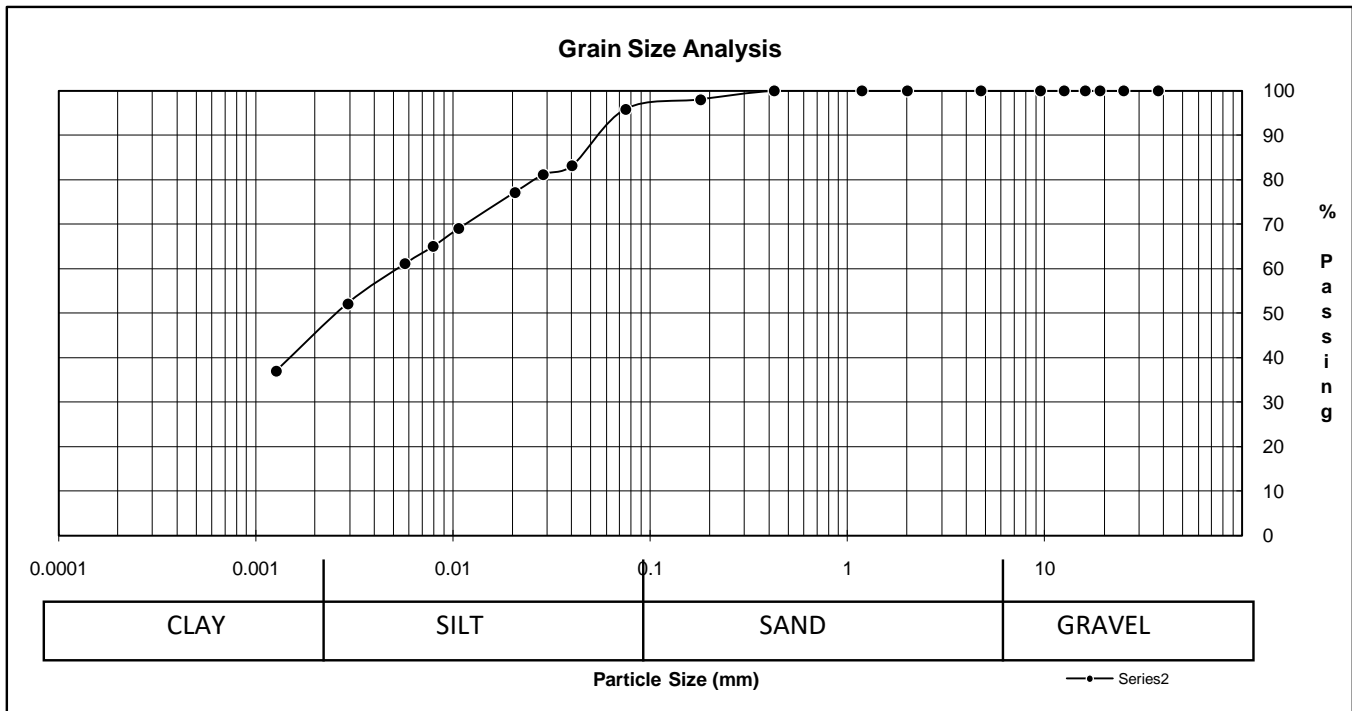
PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	WSP Canada 1600 Buffalo Place Winnipeg, MB R3T 6B8	PROJECT NO. 103-1702
ATTN:	Dana Brendin	
PROJECT:	Concrete Alley Renewal Project	

Date Sampled:	unknown	Date Received:	29-Mar-17	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	2-May-17	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	0.0401	83.2
				9.50	100.0	0.0286	81.2
				4.75	100.0	0.0206	77.2
				2.00	100.0	0.0107	69.1
				1.18	100.0	0.0079	65.1
				0.425	100.0	0.0057	61.2
				0.180	98.1	0.0029	52.2
				0.075	95.9	0.0013	37.0

Material Identification

B.H./T.H. No.	TH18 @ 4'
Sample No.	24
Sample Source	Ingersoll
Specific Gravity of Material:	2.65



SOIL DESCRIPTION	% Composition		Liquid Limit	
	CLAYEY SILT	4	Gravel	D10
59		Sand	D30	
37		Silt	D60	0.00569
		Clay	Cu	#DIV/0!
			Cc	#DIV/0!

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: BO/GM



Reviewed by: Hermie Manalo

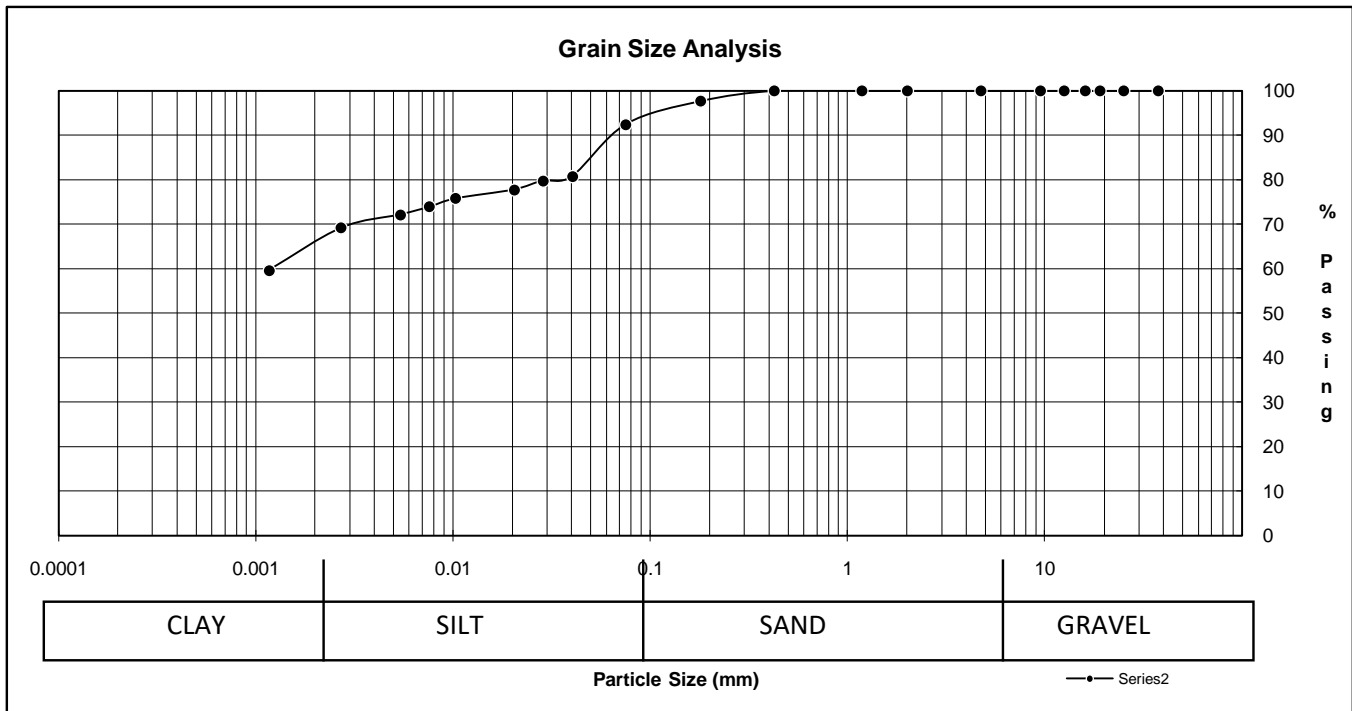
PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	WSP Canada 1600 Buffalo Place Winnipeg, MB R3T 6B8	PROJECT NO.	103-1702
ATTN:	Dana Brendin		
PROJECT:	Concrete Alley Renewal Project		

Date Sampled:	unknown	Date Received:	29-Mar-17	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	2-May-17	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	0.0402	80.8
				9.50	100.0	0.0286	79.8
				4.75	100.0	0.0204	77.8
				2.00	100.0	0.0103	75.9
				1.18	100.0	0.0076	74.0
				0.425	100.0	0.0054	72.2
				0.180	97.7	0.0027	69.2
				0.075	92.4	0.0012	59.7

Material Identification

B.H./T.H. No.	TH22 @ 3'
Sample No.	20
Sample Source	Lipton
Specific Gravity of Material:	2.65



SOIL DESCRIPTION	% Composition		D10	
	SILTY CLAY	8	Gravel	D30
33		Sand	D60	0.00116
60		Silt	Cu	#DIV/0!
60		Clay	Cc	#DIV/0!

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: BO/GM



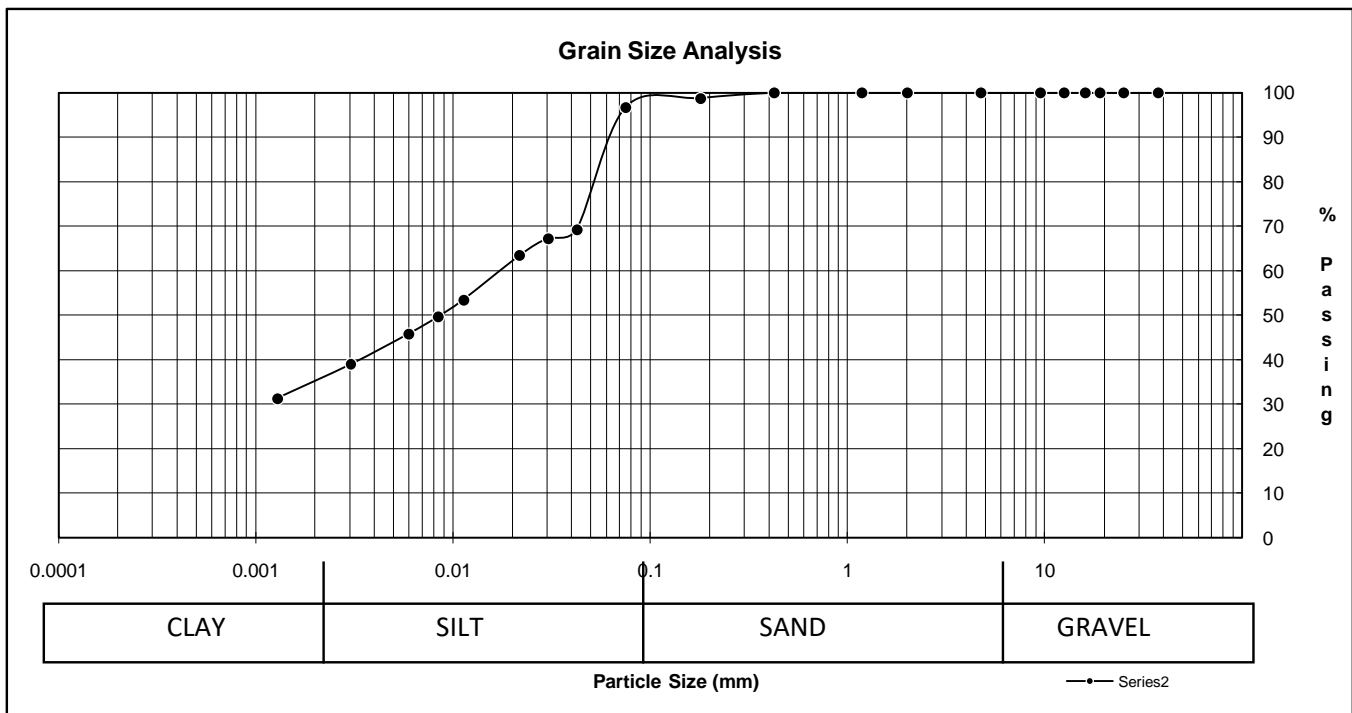
Reviewed by: Hermie Manalo

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: WSP Canada
 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
ATTN: Dana Brendin
PROJECT: Concrete Alley Renewal Project

PROJECT NO. 103-1702

Date Sampled:	unknown	Date Received:	29-Mar-17	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	2-May-17	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH25 @ 3' Sample No. 18 Sample Source Arlington Specific Gravity of Material: 2.65				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	69.3
				9.50	100.0	0.0303	67.3
				4.75	100.0	0.0217	63.5
				2.00	100.0	0.0113	53.5
				1.18	100.0	0.0084	49.7
0.425	100.0	0.0060	45.9				
0.180	98.8	0.0030	39.0				
0.075	96.8	0.0013	31.4				



SOIL DESCRIPTION	% Composition		SOIL CHARACTERISTICS	
	CLAYEY SILT	3	Gravel	D10
65		Sand	D30	
31		Silt	D60	0.02174
		Clay	Cu	#DIV/0!
			Cc	#DIV/0!

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: BO/GM



Reviewed by: Hermie Manalo

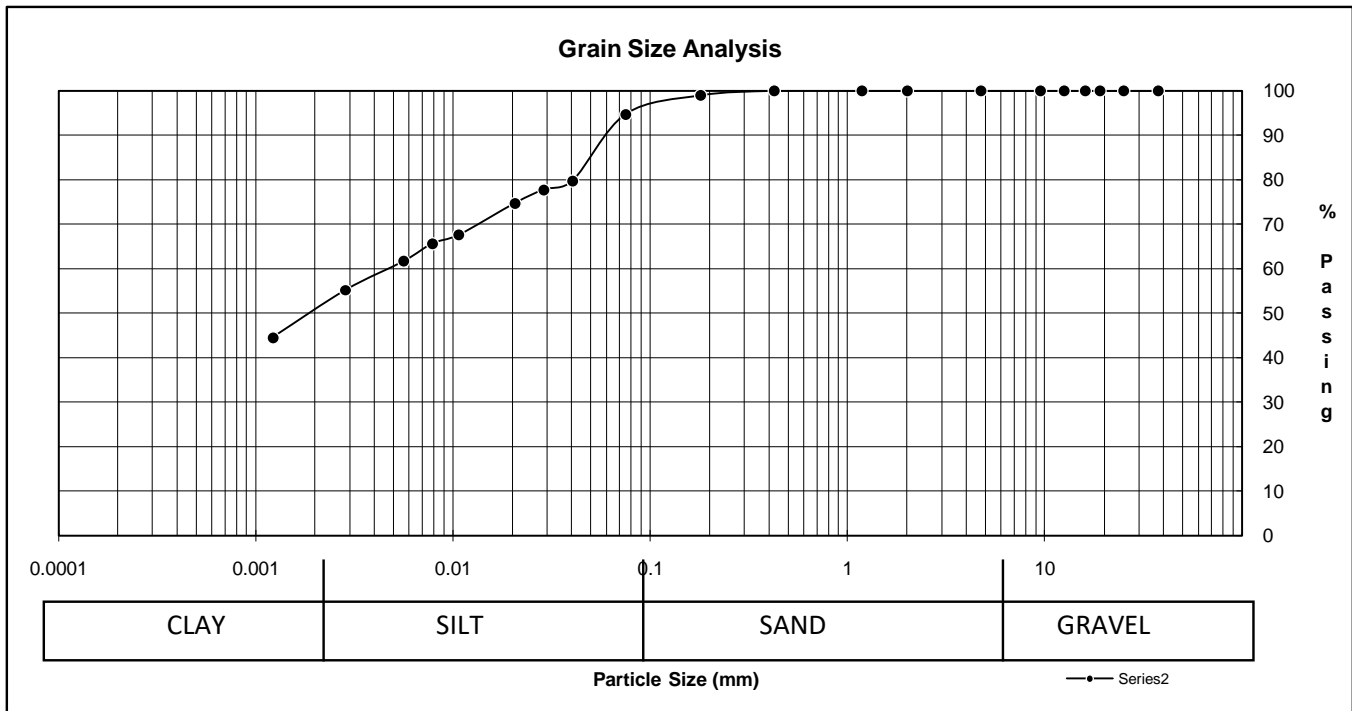
PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	WSP Canada 1600 Buffalo Place Winnipeg, MB R3T 6B8	PROJECT NO.	103-1702
ATTN:	Dana Brendin		
PROJECT:	Concrete Alley Renewal Project		

Date Sampled:	unknown	Date Received:	29-Mar-17	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	2-May-17	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	0.0404	79.8
				9.50	100.0	0.0288	77.8
				4.75	100.0	0.0206	74.8
				2.00	100.0	0.0107	67.7
				1.18	100.0	0.0079	65.7
				0.425	100.0	0.0056	61.8
				0.180	99.0	0.0028	55.2
				0.075	94.8	0.0012	44.6

Material Identification

B.H./T.H. No.	TH28 @ 2'
Sample No.	25
Sample Source	Patriick
Specific Gravity of Material:	2.65



SOIL DESCRIPTION	% Composition		SOIL CHARACTERISTICS	
	SILTY CLAY	5	Gravel	D10
50		Sand	D30	
50		Silt	D60	0.00562
45		Clay	Cu	#DIV/0!
			Cc	#DIV/0!

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: BO/GM



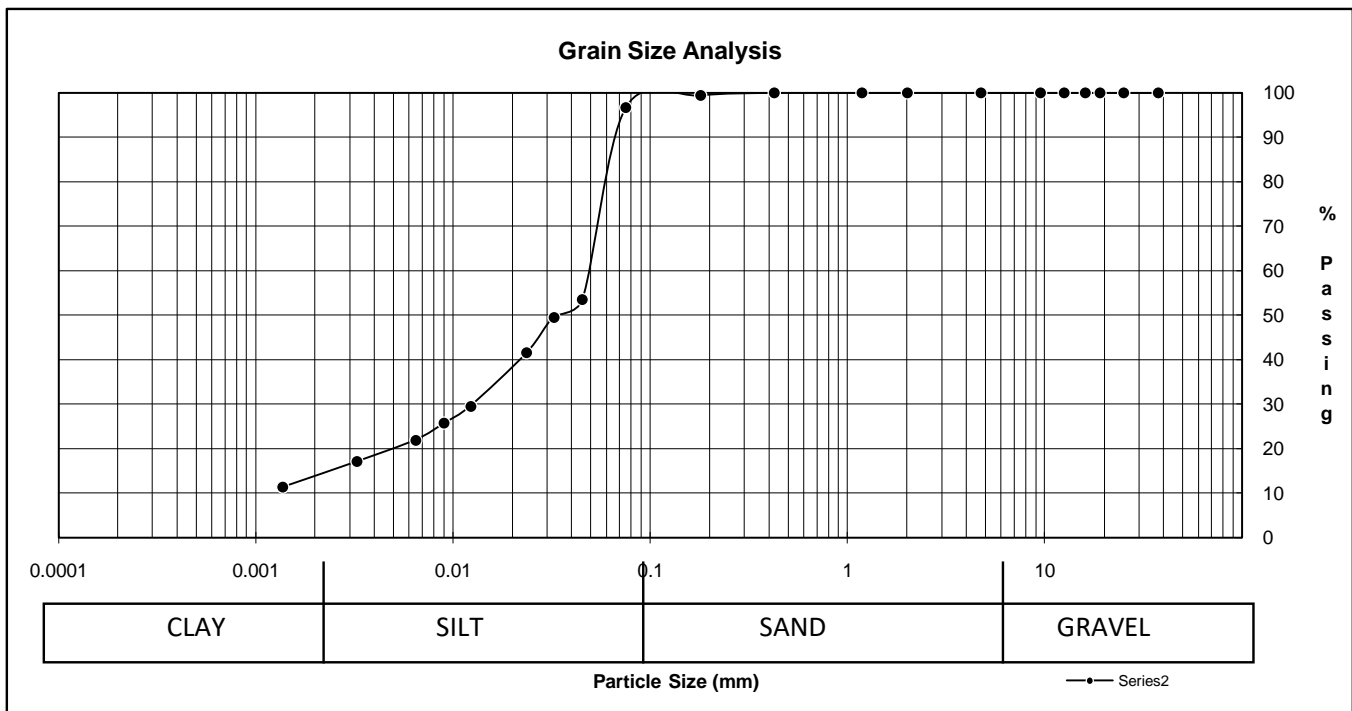
Reviewed by: Hermie Manalo

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: WSP Canada
 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
ATTN: Dana Brendin
PROJECT: Concrete Alley Renewal Project

PROJECT NO. 103-1702

Date Sampled:	unknown	Date Received:	29-Mar-17	Sieve Analysis		Hydrometer Analysis	
Sampled By:	Client	Date Tested:	2-May-17	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH30 @ 3' Sample No. 19 Sample Source Jefferson Specific Gravity of Material: 2.65				50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
				12.50	100.0	0.0452	53.6
				9.50	100.0	0.0324	49.6
				4.75	100.0	0.0236	41.6
				2.00	100.0	0.0122	29.6
				1.18	100.0	0.0090	25.8
0.425	100.0	0.0064	22.0				
0.180	99.4	0.0032	17.1				
0.075	96.7	0.0014	11.4				



SOIL DESCRIPTION	% Composition		SOIL CHARACTERISTICS	
	SILT	3	Gravel	D10
85		Sand	D30	0.01225
11		Silt	D60	0.07500
		Clay	Cu	#DIV/0!
			Cc	#DIV/0!

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: BO/GM



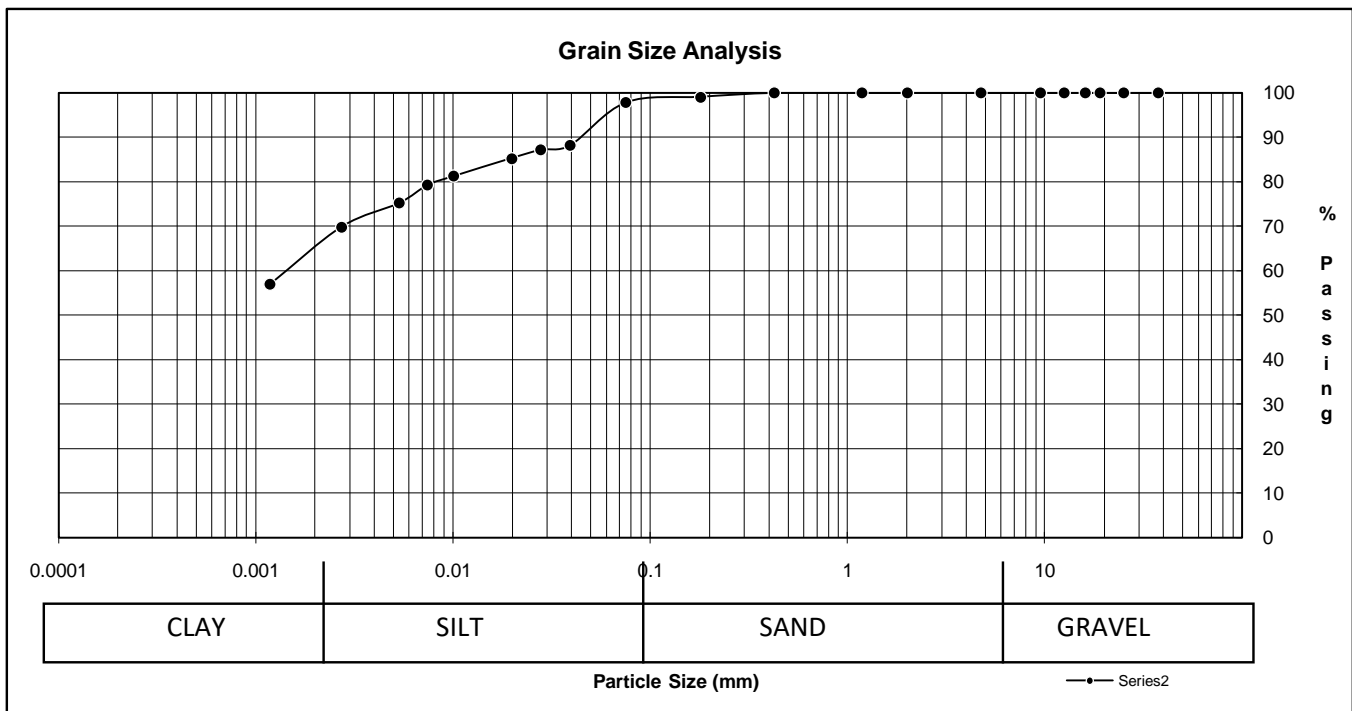
Reviewed by: Hermie Manalo

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: WSP Canada
 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
ATTN: Dana Brendin
PROJECT: Concrete Alley Renewal Project

PROJECT NO. 103-1702

Date Sampled:	unknown	Date Received:	29-Mar-17	Sieve Analysis	Hydrometer Analysis		
Sampled By:	Client	Date Tested:	2-May-17	Sieve (mm) % Passing	Diameter % Finer		
Material Identification B.H./T.H. No. TH32 @ 3' Sample No. 21 Sample Source William Specific Gravity of Material: 2.65				50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
				12.50	100.0	0.0392	88.2
				9.50	100.0	0.0278	87.2
				4.75	100.0	0.0198	85.3
				2.00	100.0	0.0101	81.3
				1.18	100.0	0.0074	79.3
0.425	100.0	0.0053	75.3				
0.180	99.1	0.0027	69.9				
0.075	97.8	0.0012	57.0				



SOIL DESCRIPTION	% Composition		D10	
	SILTY CLAY	2	Gravel	D30
41		Sand	D60	0.00272
57		Silt	Cu	#DIV/0!
		Clay	Cc	#DIV/0!

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: BO/GM



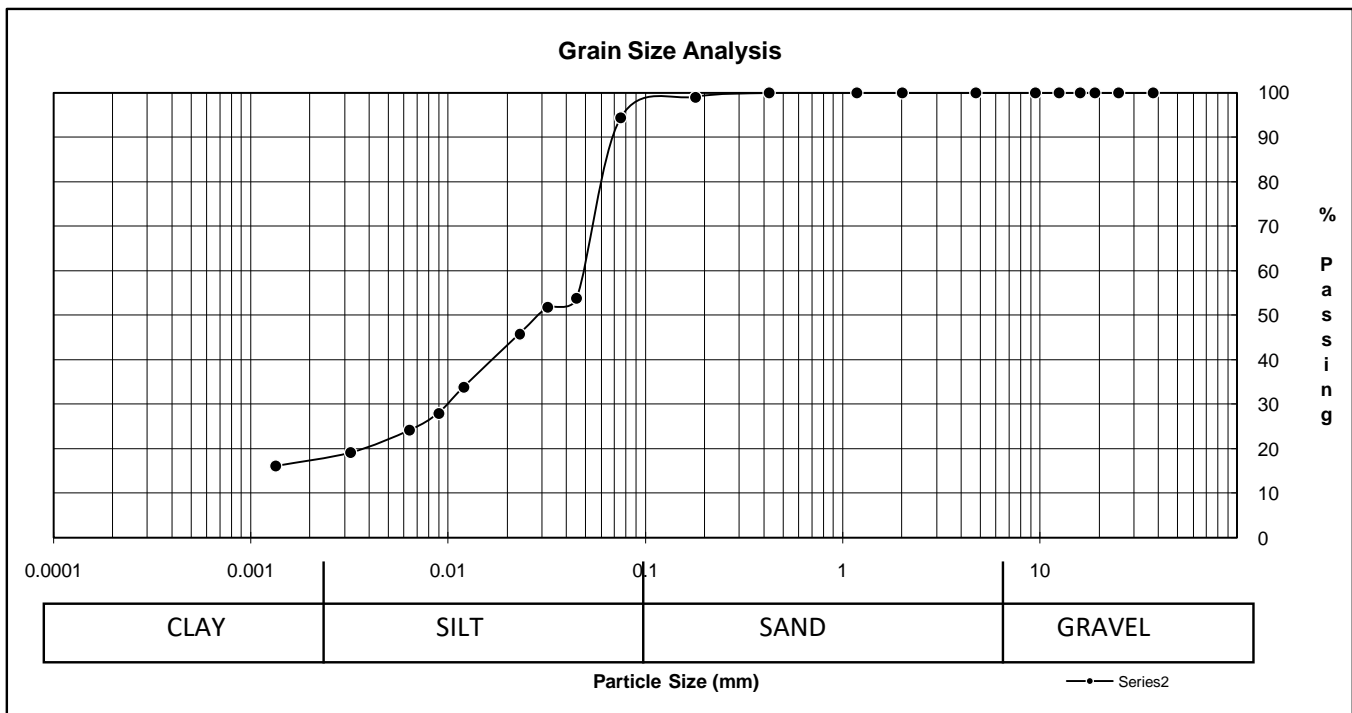
Reviewed by: Hermie Manalo

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: WSP Canada
 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
ATTN: Dana Brendin
PROJECT: Concrete Alley Renewal Project

PROJECT NO. 103-1702

Date Sampled:	unknown	Date Received:	29-Mar-17	Sieve Analysis	Hydrometer Analysis		
Sampled By:	Client	Date Tested:	2-May-17	Sieve (mm) % Passing	Diameter % Finer		
Material Identification B.H./T.H. No. TH34 @ 3' Sample No. 17 Sample Source Lewis Specific Gravity of Material: 2.65				50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
				12.50	100.0	0.0449	53.9
				9.50	100.0	0.0320	51.9
				4.75	100.0	0.0231	45.9
				2.00	100.0	0.0120	34.0
				1.18	100.0	0.0089	28.1
0.425	100.0	0.0064	24.3				
0.180	99.1	0.0032	19.2				
0.075	94.4	0.0013	16.2				



SOIL DESCRIPTION	% Composition		SOIL CHARACTERISTICS	
	SILT	6	Gravel	D10
78		Sand	D30	0.01202
16		Silt	D60	0.07500
		Clay	Cu	#DIV/0!
			Cc	#DIV/0!

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: BO/GM



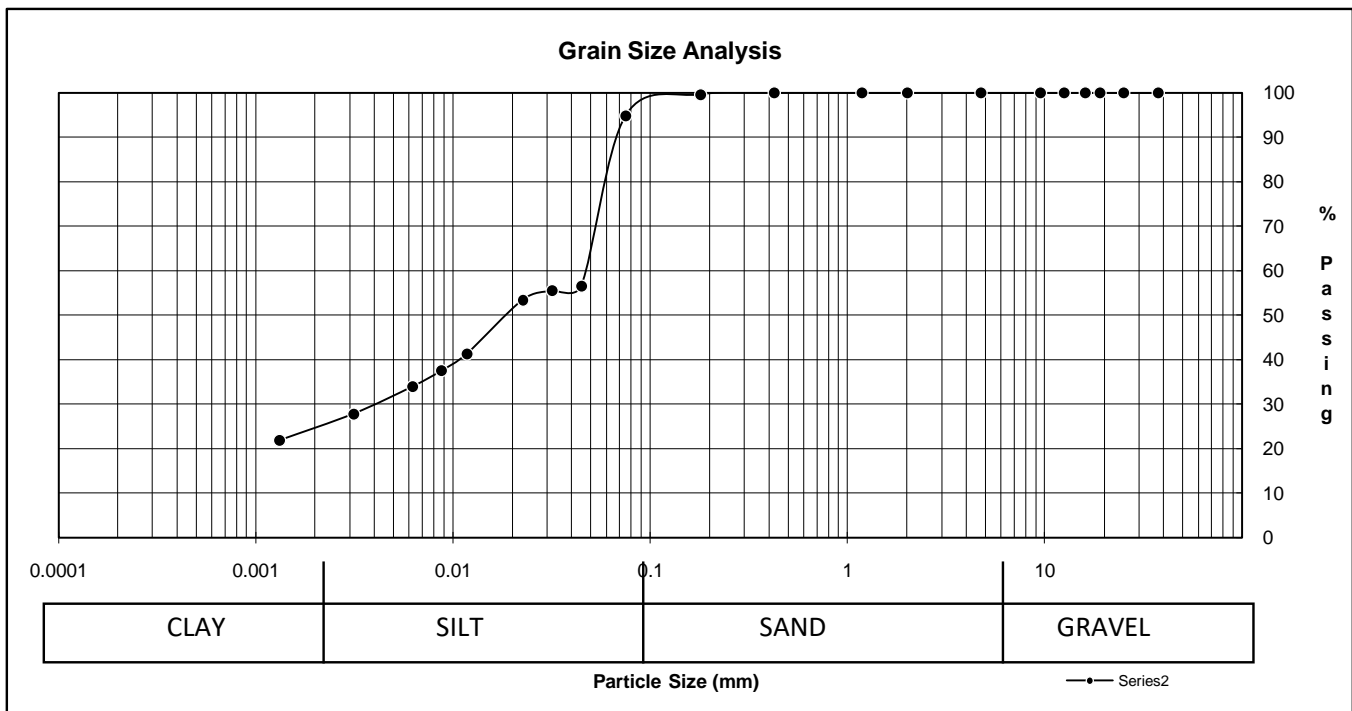
Reviewed by: Hermie Manalo

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: WSP Canada
 1600 Buffalo Place
 Winnipeg, MB R3T 6B8
ATTN: Dana Brendin
PROJECT: Concrete Alley Renewal Project

PROJECT NO. 103-1702

Date Sampled:	unknown	Date Received:	29-Mar-17	Sieve Analysis	Hydrometer Analysis		
Sampled By:	Client	Date Tested:	2-May-17	Sieve (mm) % Passing	Diameter % Finer		
Material Identification B.H./T.H. No. TH35 @ 3' Sample No. 26 Sample Source Renfrew Specific Gravity of Material: 2.65				50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
				12.50	100.0	0.0447	56.6
				9.50	100.0	0.0317	55.6
				4.75	100.0	0.0226	53.5
				2.00	100.0	0.0118	41.4
				1.18	100.0	0.0087	37.6
0.425	100.0	0.0062	34.0				
0.180	99.6	0.0031	27.9				
0.075	94.9	0.0013	21.9				



SOIL DESCRIPTION	% Composition		SOIL CHARACTERISTICS	
	SILT	5	Gravel	D10
73		Sand	D30	0.00621
22		Silt	D60	0.07500
		Clay	Cu	#DIV/0!
			Cc	#DIV/0!

Remarks: Test Method: ASTM D422, D2216, D4318

Technician: BO/GM



Reviewed by: Hermie Manalo

Appendix C

PHOTOS OF PAVEMENT CORES

1. North/south alley between Chestnut St and Walnut St from Wolseley Ave to Westminster Ave



Figure 1: TH1 – 80 mm asphalt, 50 mm deteriorated concrete



Figure 2: TH2 – 110 mm deteriorated concrete



Figure 3: TH3 – 30 mm asphalt, no concrete

2. East/west alley between Dorchester Ave and McMillan Ave from Lilac St to Arbutnot St



Figure 4: TH4 – 150 mm intact concrete



Figure 5: TH5– 150 mm cracked concrete

3. North/south alley between Waverley St and Oxford St from Kingsway to Academy Rd



Figure 6: TH6 – 50 mm asphalt, 150 mm intact concrete



Figure 7: TH7 – 30 mm asphalt, 150 mm deteriorated concrete



Figure 8: TH8 – 50 mm asphalt, 150 mm deteriorated concrete



Figure 9: TH9 – 170 mm intact concrete

4. North/south alley between Waterloo St and Ash St from Kingsway to Academy Rd



Figure 10: TH10 – 30 mm asphalt, 150 mm deteriorated concrete



Figure 11: TH11 – 160 mm intact concrete



Figure 12: TH12 – 200 mm intact concrete



Figure 13: TH13 – 30 mm asphalt, 200 mm cracked concrete

5. North/South alley between Erin St and Clifton St from St. Matthews Ave to Ellice Ave

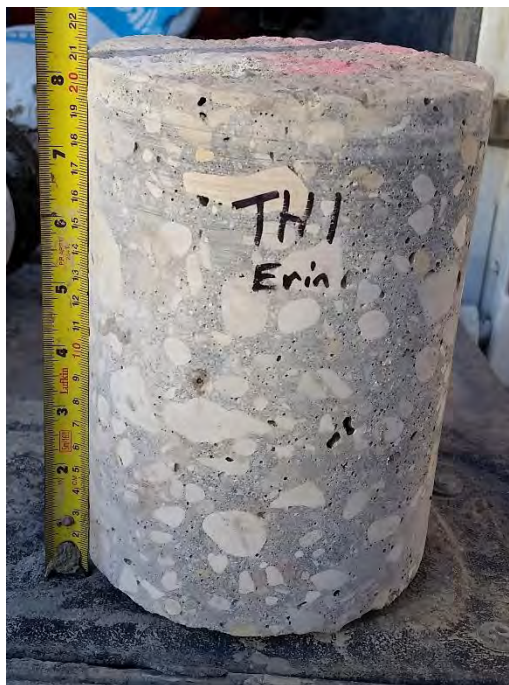


Figure 14: TH14 – 210 mm intact concrete



Figure 15: TH15 – 40 mm asphalt, 200 mm intact concrete



Figure 16: TH16 – 250 mm intact concrete



Figure 17: TH17 – 170 mm intact concrete

6. Alleys bounded by Ingersoll St and Lipton St, Yarwood Ave and Notre Dame Ave



Figure 18: TH18 – 150 mm deteriorated concrete



Figure 19: TH19 – 150 mm deteriorated concrete



Figure 20: TH20 – 220 mm intact concrete

7. Alleys bounded by Lipton St and Banning St, Yarwood Ave and Notre Dame Ave



Figure 21: TH21 – 150 mm deteriorated concrete



Figure 22: TH22 – 50 mm asphalt, 100 mm deteriorated concrete



Figure 23: TH03 – 30 mm asphalt, 120 mm deteriorated concrete

8. Alleys bounded by Arlington St and Alverstone St, Adele Ave and Notre Dame Ave



Figure 24: TH24 – 200 mm intact concrete



Figure 25: TH25 – 100 mm asphalt, 200 mm intact concrete



Figure 26: TH26 – 20 mm asphalt, 160 mm deteriorated concrete

9. Alley between Logan Ave and Alexander Ave from Patrick St to Laura St



Figure 27: TH27 – 150 mm cracked concrete, 100 mm granular fill (frozen)



Figure 28: TH28 – 200 mm intact concrete

10. East/west alley between Jefferson Ave and Seven Oaks Ave from McGregor St to Powers St



Figure 29: TH29 – 170 mm intact concrete



Figure 30: TH30 – 180 mm intact concrete



Figure 31: TH31 – 20 mm asphalt, 130 mm intact concrete



Figure 32: East end of alley, behind 360 Jefferson Ave – 200 mm intact concrete

****Did not drill here due to proximity to utilities**

11. East/west alley between Willam Ave and Elgin Ave from Gertie St to Ellen St



Figure 33: TH32 – 200 mm deteriorated concrete



Figure 34: TH33 – 220 mm intact concrete

12. East/west alley between by River Ave and Stradbrook Ave from Lewis St to Clarke St



Figure 35: TH34 – 30 mm asphalt, 160 mm intact concrete

13. East/west alley south of 1600 Taylor Ave, within the interior of Renfrew Bay



Figure 36: TH35 – 190 mm intact concrete

