

**APPENDIX 'A'**  
**GEOTECHNICAL REPORT**

February 14, 2018  
File: 123313534

**Attention: Mr. Jeff Fraser**  
KGS Group  
3rd Floor - 865 Waverley Street  
Winnipeg, Manitoba R3T 5P4

Good day Jeff,

**Reference: Geotechnical Investigation for McGregor Street 2018 Regional Street Renewals from Selkirk Avenue to Mountain Avenue – Winnipeg, Manitoba**

On February 1, 2, and 5, 2018, a total of ten core samples were recovered and ten testholes were drilled on McGregor Street from Selkirk Avenue to Mountain Avenue. The purpose of the geotechnical investigation was to determine the thickness of the pavement structure and observe the underlying soil conditions. The testhole locations are shown on the Testhole Location Plan. Upon completion of the work, the testholes were backfilled with bentonite and clay cuttings; the top 100 mm were repaired with cold mix asphalt. The testhole locations, pavement structure thickness and laboratory test results are provided in the attached Table 1. Photographs of the core samples, testhole logs and the laboratory test reports are also attached to this report.

We appreciate the opportunity to assist you on this project. Please contact the undersigned if you have any questions regarding our report.

Regards,

**STANTEC CONSULTING LTD.**

Prepared by:



Lee Boughton  
Geotechnical Technologist  
Phone: (204) 944-3795  
lee.boughton@stantec.com

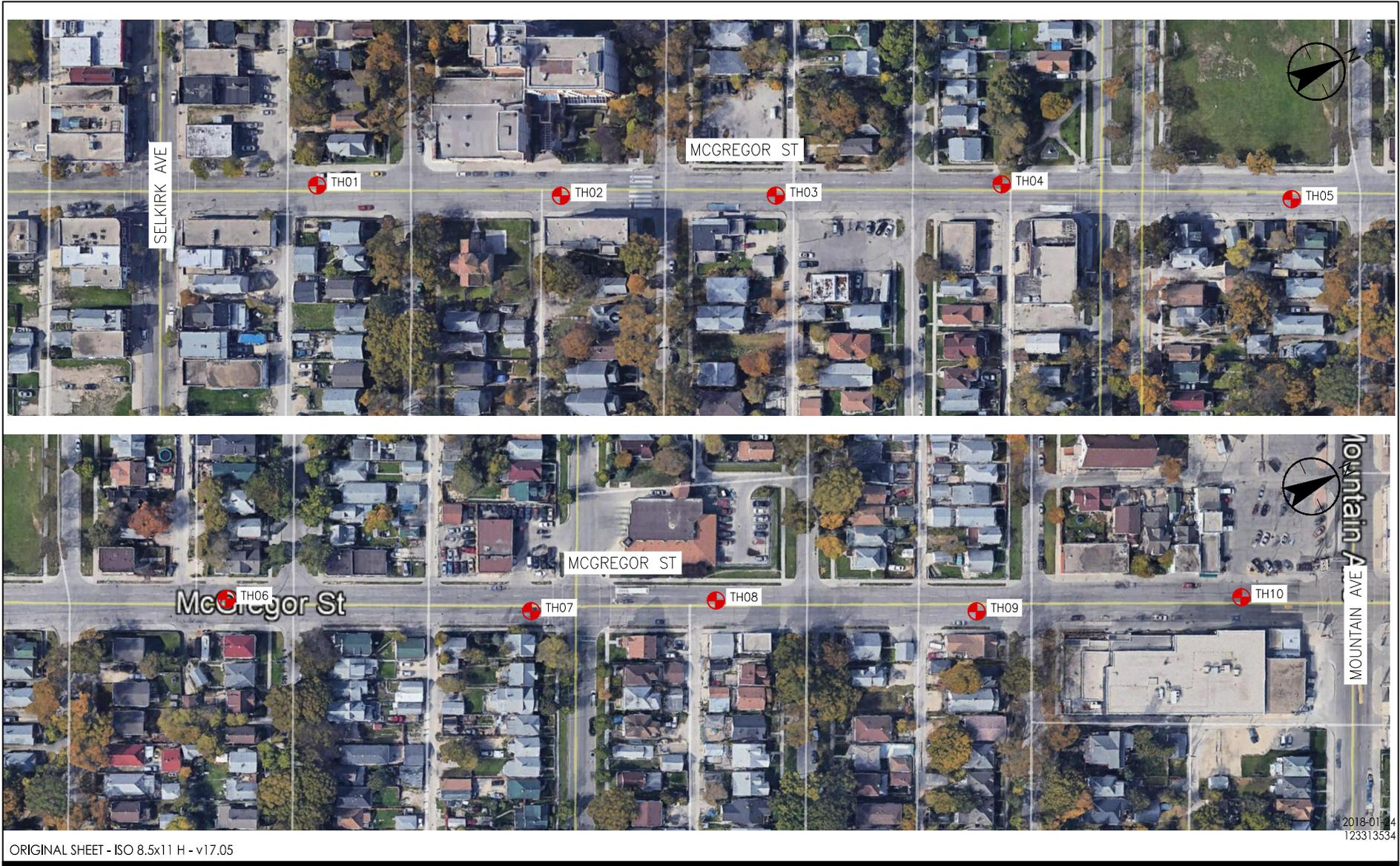
Reviewed by:



German Leal, P. Eng  
Associate, Geotechnical Engineering  
Phone: (204) 928-4005  
german.leal@stantec.com

Attachments:

1. Testhole location plan
2. Table 1
3. Core photos
4. Testhole logs
5. Laboratory test reports



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 2018/01/24 1:55 PM By: Boughton, Lee

ORIGINAL SHEET - ISO 8.5x11 H - v17.05

2018-01-24  
 123313534



Stantec Consulting Ltd.  
 Suite 500, 311 Portage Avenue  
 Winnipeg MB Canada R3B 2B9  
 Tel. 204.489.5900 Fax. 204.453.9012  
 www.stantec.com

Legend



Notes

IMAGE SOURCE:  
 GOOGLE EARTH

Client/Project

KGS GROUP  
 MCGREGOR STREET 2018 REGIONAL STREET RENEWALS  
 WINNIPEG, MANITOBA

Figure No.

123313534

Title

TESTHOLE LOCATION PLAN

**TABLE 1  
MCGREGOR STREET  
SELKIRK AVENUE TO MOUNTAIN AVENUE  
GEOTECHNICAL INVESTIGATION**

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure Material		Sample Description	Sample Depth (m)	Moisture Content (%)	Particle Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH01	McGergor Street Southbound median lane, 30 m south of Pritchard Avenue 5 m east of curb	Asphalt	90	Crushed Limestone	100	-	-	-	-	-	-	-	-	-	-
		Concrete	200												
TH02	McGergor Street Northbound median lane, 34 m south of Manitoba Avenue 5 m west of curb	Asphalt	90	Crushed Limestone	100	-	-	-	-	-	-	-	-	-	-
		Concrete	190												
TH03	McGergor Street Northbound median lane, 37 m south of Manitoba Avenue 5 m west of curb	Asphalt	65	Crushed Limestone	100	-	-	-	-	-	-	-	-	-	-
		Concrete	220												
TH04	McGergor Street Southbound median lane, 30 m south of Burrows Avenue 5 m east of curb	Asphalt	90	Crushed Limestone	100	Silt	1.0	19	0.3	5.5	72.3	21.9	22	17	5
		Concrete	210												
TH05	McGergor Street Northbound median lane, 19 m south of Alfred Avenue 5 m west of curb	Asphalt	100	Crushed Limestone	100	-	-	-	-	-	-	-	-	-	-
		Concrete	150												
TH06	McGergor Street Southbound median lane, 18 m south of Aberdeen Avenue 5 m east of curb	Asphalt	90	Crushed Limestone	100	Fill	1.0	32	0.4	3.1	21.6	74.9	82	22	60
		Concrete	170												
TH07	McGergor Street Northbound median lane, 16 m south of Redwood Avenue 5 m west of curb	Asphalt	70	Crushed Limestone	100	-	-	-	-	-	-	-	-	-	-
		Concrete	175												
TH08	McGergor Street Southbound median lane, 27 m south of Boyd Avenue 5 m east of curb	Asphalt	65	Crushed Limestone	100	-	-	-	-	-	-	-	-	-	-
		Concrete	180												
TH09	McGergor Street Northbound median lane, 19 m south of College Avenue 5 m west of curb	Asphalt	105	Crushed Limestone	100	-	-	-	-	-	-	-	-	-	-
		Concrete	245												
TH10	McGergor Street Southbound median lane, 37 m south of Mountain Avenue 5 m east of curb	Asphalt	155	Crushed Limestone	100	-	-	-	-	-	-	-	-	-	-
		Concrete	255												

McGregor Street – Selkirk Avenue to Mountain Avenue



Figure 1 – TH01 Core



Figure 2 – TH02 Core

McGregor Street – Selkirk Avenue to Mountain Avenue



Figure 3 – TH03 Core



Figure 4 – TH04 Core

**McGregor Street – Selkirk Avenue to Mountain Avenue**



**Figure 5 – TH05 Core**



**Figure 6 – TH06 Core**

McGregor Street – Selkirk Avenue to Mountain Avenue



Figure 7 – TH07 Core



Figure 8 – TH08 Core

McGregor Street – Selkirk Avenue to Mountain Avenue



Figure 9 – TH09 Core



Figure 10 – TH10 Core

# TH01 TESTHOLE RECORD

CLIENT KGS Group PROJECT No. 123313534  
 PROJECT McGregor Street 2018 Regional Street Renewals DATUM Geodetic NORTHING 5531088  
 LOCATION McGregor St from Selkirk Ave to Mountain Ave ELEVATION \_\_\_\_\_ EASTING 632903  
 DRILLING DATE February 5, 2018 DRILLING CO. Maple Leaf Drilling DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES			<input type="checkbox"/> Insitu Shear Vane (kPa) <input type="checkbox"/> Torvane on Samples (kPa) <input type="checkbox"/> Pocket Penetrometer (kPa) <input checked="" type="checkbox"/> Dynamic Cone Testing, blows/0.3m 50kPa    100kPa    150kPa    200kPa W <sub>p</sub> W    W <sub>L</sub> Moisture Content & Atterberg Limits ● Standard Penetration Test, blows/0.3m				DEPTH (ft)				
				TYPE	NUMBER	MOISTURE CONTENT (%)	10	20	30	40		50	60	70	80
0	AS		Asphalt												0
	CO		Concrete												
	GW		Granular												
	FL		FILL: grey clay - silty, trace fine to coarse sand, trace gravel	X GS	28										2
	ML		SILT: light brown - clayey, trace fine and coarse sand, trace gravel	X GS	22										4
	CH		grey fat CLAY (CH) - silty, trace fine sand - moist	X GS	29										6
2				X GS	30										8
3			<ul style="list-style-type: none"> <li>TESTHOLE LOCATION: 30 m south of McGregor Street and Pritchard Avenue, southbound median lane.</li> <li>No groundwater seepage or sloughing was observed upon completion of drilling.</li> <li>Frost observed to a depth of 1.4 m.</li> <li>Testhole terminated at depth of 2.1 m.</li> </ul>												10

Sample Type: GS - Grab Sample    SS - Split Spoon    RC - Rock Core  
 ST - Shelby Tube    PT - Piston Tube    VT - Shear Vane Test  
 Piezometer Backfill Type: Bentonite    Drill Cuttings    Sand    Slough

Logged by: Lee Boughton  
 Reviewed by: German Leal



# TH02 TESTHOLE RECORD

CLIENT KGS Group PROJECT No. 123313534  
 PROJECT McGregor Street 2018 Regional Street Renewals DATUM Geodetic NORTHING 5531167  
 LOCATION McGregor St from Selkirk Ave to Mountain Ave ELEVATION \_\_\_\_\_ EASTING 632944  
 DRILLING DATE February 5, 2018 DRILLING CO. Maple Leaf Drilling DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES			<input type="checkbox"/> Insitu Shear Vane (kPa) <input type="checkbox"/> Torvane on Samples (kPa) <input type="checkbox"/> Pocket Penetrometer (kPa) <input checked="" type="checkbox"/> Dynamic Cone Testing, blows/0.3m 50kPa    100kPa    150kPa    200kPa W <sub>p</sub> W    W <sub>L</sub> Moisture Content & Atterberg Limits ● Standard Penetration Test, blows/0.3m				DEPTH (ft)				
				TYPE	NUMBER	MOISTURE CONTENT (%)	10	20	30	40		50	60	70	80
0	AS		Asphalt												0
	CO		Concrete												
	GW		Granular												
	FL		FILL: grey clay - silty, trace fine to coarse sand, trace gravel	X GS	39										2
				X GS	26										
1				X GS	24										4
				X GS	21										
	ML		SILT: light brown - clayey, trace fine and coarse sand, trace gravel	X GS	21										6
2				X GS	23										8
															10
3			<ul style="list-style-type: none"> <li>TESTHOLE LOCATION: 34 m south of McGregor Street and Manitoba Avenue, northbound median lane.</li> <li>No groundwater seepage or sloughing was observed upon completion of drilling.</li> <li>Frost observed to a depth of 1.4 m.</li> <li>Testhole terminated at depth of 2.1</li> </ul>												

Sample Type: GS - Grab Sample    SS - Split Spoon    RC - Rock Core  
 ST - Shelby Tube    PT - Piston Tube    VT - Shear Vane Test  
 Piezometer Backfill Type: Bentonite    Drill Cuttings    Sand    Slough

Logged by: Lee Boughton  
 Reviewed by: German Leal



# TH03 TESTHOLE RECORD

CLIENT KGS Group PROJECT No. 123313534  
 PROJECT McGregor Street 2018 Regional Street Renewals DATUM Geodetic NORTHING 5531237  
 LOCATION McGregor St from Selkirk Ave to Mountain Ave ELEVATION \_\_\_\_\_ EASTING 632977  
 DRILLING DATE February 5, 2018 DRILLING CO. Maple Leaf Drilling DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES			<input type="checkbox"/> Insitu Shear Vane (kPa) <input type="checkbox"/> Torvane on Samples (kPa) <input type="checkbox"/> Pocket Penetrometer (kPa) <input checked="" type="checkbox"/> Dynamic Cone Testing, blows/0.3m				DEPTH (ft)			
				TYPE	NUMBER	MOISTURE CONTENT (%)	50kPa	100kPa	150kPa	200kPa				
0	AS		Asphalt								0			
	CO		Concrete											
	GW		Granular											
	FL		FILL: grey clay - silty, trace fine to coarse sand, trace gravel	X GS	35							2		
				X GS	30									
1				X GS	26									4
				X GS	25									
	ML		SILT: light brown - clayey, trace fine and coarse sand, trace gravel	X GS	19							6		
2				X GS	27									
3			<ul style="list-style-type: none"> <li>TESTHOLE LOCATION: 37 m north of McGregor Street and Manitoba Avenue, northbound median lane.</li> <li>No groundwater seepage or sloughing was observed upon completion of drilling.</li> <li>Frost observed to a depth of 1.4 m.</li> <li>Testhole terminated at depth of 2.1</li> </ul>								8			
												10		

Sample Type: GS - Grab Sample    SS - Split Spoon    RC - Rock Core  
 ST - Shelby Tube    PT - Piston Tube    VT - Shear Vane Test  
 Piezometer Backfill Type: Bentonite    Drill Cuttings    Sand    Slough

Logged by: Lee Boughton  
 Reviewed by: German Leal



# TH04 TESTHOLE RECORD

CLIENT KGS Group PROJECT No. 123313534  
 PROJECT McGregor Street 2018 Regional Street Renewals DATUM Geodetic NORTHING 5531311  
 LOCATION McGregor St from Selkirk Ave to Mountain Ave ELEVATION \_\_\_\_\_ EASTING 633007  
 DRILLING DATE February 5, 2018 DRILLING CO. Maple Leaf Drilling DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES			<input type="checkbox"/> Insitu Shear Vane (kPa) <input type="checkbox"/> Torvane on Samples (kPa) <input type="checkbox"/> Pocket Penetrometer (kPa) <input checked="" type="checkbox"/> Dynamic Cone Testing, blows/0.3m 50kPa    100kPa    150kPa    200kPa  W <sub>p</sub> W    W <sub>L</sub> Moisture Content & Atterberg Limits ● Standard Penetration Test, blows/0.3m				DEPTH (ft)				
				TYPE	NUMBER	MOISTURE CONTENT (%)	10	20	30	40		50	60	70	80
0	AS		Asphalt												0
	CO		Concrete												
	GW		Granular												
	FL		FILL: grey clay - silty, trace fine to coarse sand, trace gravel	X GS	33										2
				X GS	40										
1	ML		SILT: light brown - clayey, trace fine and coarse sand, trace gravel - Grain Size Analysis @ 1.0 m: 0.3% Gravel, 5.5% Sand, 72.3% Silt, 21.9% Clay	X GS	19										4
				X GS	22										
				X GS	21										6
2				X GS	29										8
															10
<ul style="list-style-type: none"> <li>• TESTHOLE LOCATION: 30 m south of McGregor Street and Burrows Avenue, southbound median lane.</li> <li>• No groundwater seepage or sloughing was observed upon completion of drilling.</li> <li>• Frost observed to a depth of 1.4 m.</li> <li>• Testhole terminated at depth of 2.1</li> </ul>															
Sample Type: GS - Grab Sample    SS - Split Spoon    RC - Rock Core ST - Shelby Tube    PT - Piston Tube    VT - Shear Vane Test Piezometer Backfill Type:  Bentonite     Drill Cuttings     Sand     Slough				Logged by: Lee Boughton Reviewed by: German Leal											





# TH07 TESTHOLE RECORD

CLIENT KGS Group PROJECT No. 123313534  
 PROJECT McGregor Street 2018 Regional Street Renewals DATUM Geodetic NORTHING 5531572  
 LOCATION McGregor St from Selkirk Ave to Mountain Ave ELEVATION \_\_\_\_\_ EASTING 633134  
 DRILLING DATE February 5, 2018 DRILLING CO. Maple Leaf Drilling DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES			<input type="checkbox"/> Insitu Shear Vane (kPa) <input type="checkbox"/> Torvane on Samples (kPa) <input type="checkbox"/> Pocket Penetrometer (kPa) <input checked="" type="checkbox"/> Dynamic Cone Testing, blows/0.3m				DEPTH (ft)			
				TYPE	NUMBER	MOISTURE CONTENT (%)	50kPa	100kPa	150kPa	200kPa				
0	AS		Asphalt								0			
	CO		Concrete											
	GW		Granular											
	FL		FILL: grey clay - silty, trace fine to coarse sand, trace gravel	X GS	27							2		
				X GS	21									4
1				X GS	24									6
				X GS	27									8
				X GS	20									10
2	ML		SILT: light brown - clayey, trace fine and coarse sand, trace gravel	X GS	22							10		
3			<ul style="list-style-type: none"> <li>TESTHOLE LOCATION: 16 m south of McGregor Street and Redwood Avenue, northbound median lane.</li> <li>No groundwater seepage or sloughing was observed upon completion of drilling.</li> <li>Frost observed to a depth of 1.4 m.</li> <li>Testhole terminated at depth of 2.1</li> </ul>											

Sample Type: GS - Grab Sample    SS - Split Spoon    RC - Rock Core  
 ST - Shelby Tube    PT - Piston Tube    VT - Shear Vane Test  
 Piezometer Backfill Type: Bentonite    Drill Cuttings    Sand    Slough

Logged by: Lee Boughton  
 Reviewed by: German Leal



# TH08 TESTHOLE RECORD

CLIENT KGS Group PROJECT No. 123313534  
 PROJECT McGregor Street 2018 Regional Street Renewals DATUM Geodetic NORTHING 5531636  
 LOCATION McGregor St from Selkirk Ave to Mountain Ave ELEVATION \_\_\_\_\_ EASTING 633160  
 DRILLING DATE February 5, 2018 DRILLING CO. Maple Leaf Drilling DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES			<input type="checkbox"/> Insitu Shear Vane (kPa) <input type="checkbox"/> Torvane on Samples (kPa) <input type="checkbox"/> Pocket Penetrometer (kPa) <input checked="" type="checkbox"/> Dynamic Cone Testing, blows/0.3m 50kPa    100kPa    150kPa    200kPa W <sub>p</sub> W    W <sub>L</sub> Moisture Content & Atterberg Limits ● Standard Penetration Test, blows/0.3m				DEPTH (ft)				
				TYPE	NUMBER	MOISTURE CONTENT (%)	10	20	30	40		50	60	70	80
0	AS		Asphalt												0
	CO		Concrete												
	GW		Granular												
	FL		FILL: grey clay - silty, trace fine to coarse sand, trace gravel	X GS	26										2
				X GS	28										
1				X GS	24										4
				X GS	33										
	ML		SILT: light brown - clayey, trace fine and coarse sand, trace gravel	X GS	23										6
2				X GS	20										
															8
3															10
<ul style="list-style-type: none"> <li>TESTHOLE LOCATION: 27 m south of McGregor Street and Boyd Avenue, southbound median lane.</li> <li>No groundwater seepage or sloughing was observed upon completion of drilling.</li> <li>Frost observed to a depth of 1.4 m.</li> <li>Testhole terminated at depth of 2.1</li> </ul>															
Sample Type: GS - Grab Sample    SS - Split Spoon    RC - Rock Core ST - Shelby Tube    PT - Piston Tube    VT - Shear Vane Test Piezometer Backfill Type:  Bentonite     Drill Cuttings     Sand     Slough				Logged by: Lee Boughton Reviewed by: German Leal			<b>Stantec</b>								

# TH09 TESTHOLE RECORD

CLIENT KGS Group PROJECT No. 123313534  
 PROJECT McGregor Street 2018 Regional Street Renewals DATUM Geodetic NORTHING 5531717  
 LOCATION McGregor St from Selkirk Ave to Mountain Ave ELEVATION \_\_\_\_\_ EASTING 633202  
 DRILLING DATE February 5, 2018 DRILLING CO. Maple Leaf Drilling DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES			<input type="checkbox"/> Insitu Shear Vane (kPa) <input type="checkbox"/> Torvane on Samples (kPa) <input type="checkbox"/> Pocket Penetrometer (kPa) <input checked="" type="checkbox"/> Dynamic Cone Testing, blows/0.3m 50kPa    100kPa    150kPa    200kPa				DEPTH (ft)				
				TYPE	NUMBER	MOISTURE CONTENT (%)	W <sub>p</sub>	W	W <sub>L</sub>	Moisture Content & Atterberg Limits					
							●	Standard Penetration Test, blows/0.3m							
							10	20	30	40	50	60	70	80	90
0	AS		Asphalt												0
	CO		Concrete												
	GW		Granular												
	FL		FILL: grey clay - silty, trace fine to coarse sand, trace gravel	X	GS	34				○					2
				X	GS	32				○					
1				X	GS	35				○					4
	CH		grey fat CLAY (CH) - silty, trace fine sand - moist	X	GS	25				○					6
				X	GS	29				○					
2	ML		SILT: light brown - clayey, trace fine and coarse sand, trace gravel	X	GS	29				○					8
															10
<ul style="list-style-type: none"> <li>TESTHOLE LOCATION: 19 m south of McGregor Street and College Avenue, northbound median lane.</li> <li>No groundwater seepage or sloughing was observed upon completion of drilling.</li> <li>Frost observed to a depth of 1.2 m.</li> <li>Testhole terminated at depth of 2.1</li> </ul>															

Sample Type: GS - Grab Sample    SS - Split Spoon    RC - Rock Core  
 ST - Shelby Tube    PT - Piston Tube    VT - Shear Vane Test  
 Piezometer Backfill Type:  Bentonite     Drill Cuttings     Sand     Slough

Logged by: Lee Boughton  
 Reviewed by: German Leal



# TH10 TESTHOLE RECORD

CLIENT KGS Group PROJECT No. 123313534  
 PROJECT McGregor Street 2018 Regional Street Renewals DATUM Geodetic NORTHING 5531800  
 LOCATION McGregor St from Selkirk Ave to Mountain Ave ELEVATION \_\_\_\_\_ EASTING 633235  
 DRILLING DATE February 5, 2018 DRILLING CO. Maple Leaf Drilling DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES			<input type="checkbox"/> Insitu Shear Vane (kPa) <input type="checkbox"/> Torvane on Samples (kPa) <input type="checkbox"/> Pocket Penetrometer (kPa) <input checked="" type="checkbox"/> Dynamic Cone Testing, blows/0.3m 50kPa    100kPa    150kPa    200kPa W <sub>p</sub> W    W <sub>L</sub> Moisture Content & Atterberg Limits ● Standard Penetration Test, blows/0.3m				DEPTH (ft)
				TYPE	NUMBER	MOISTURE CONTENT (%)					
0	AS		Asphalt							0	
	CO		Concrete								
	GW		Granular	X GS	5	○					
	FL		FILL: grey clay - silty, trace fine to coarse sand, trace gravel	X GS	31			○		2	
1	ML		SILT: light brown - clayey, trace fine and coarse sand, trace gravel	X GS	23			○		4	
				X GS	23			○		6	
2				X GS	23			○		8	
				X GS	22			○		10	
3			<ul style="list-style-type: none"> <li>TESTHOLE LOCATION: 37 m south of McGregor Street and Mountain Avenue, southbound median lane.</li> <li>No groundwater seepage or sloughing was observed upon completion of drilling.</li> <li>Frost observed to a depth of 1.4 m.</li> <li>Testhole terminated at depth of 2.1</li> </ul>								

Sample Type: GS - Grab Sample    SS - Split Spoon    RC - Rock Core  
 ST - Shelby Tube    PT - Piston Tube    VT - Shear Vane Test  
 Piezometer Backfill Type:  Bentonite     Drill Cuttings     Sand     Slough

Logged by: Lee Boughton  
 Reviewed by: German Leal





**Atterberg Limits**  
 ASTM D4318  
 Method A- Multi-Point

Client: Stantec Consulting Ltd.  
 Project Name: McGregor Street 2018  
 Project No: 123313534  
 Date Received: February 5, 2017  
 Date Tested: February 12, 2018  
 Tested By: Nestor Abarca, C.Tech.

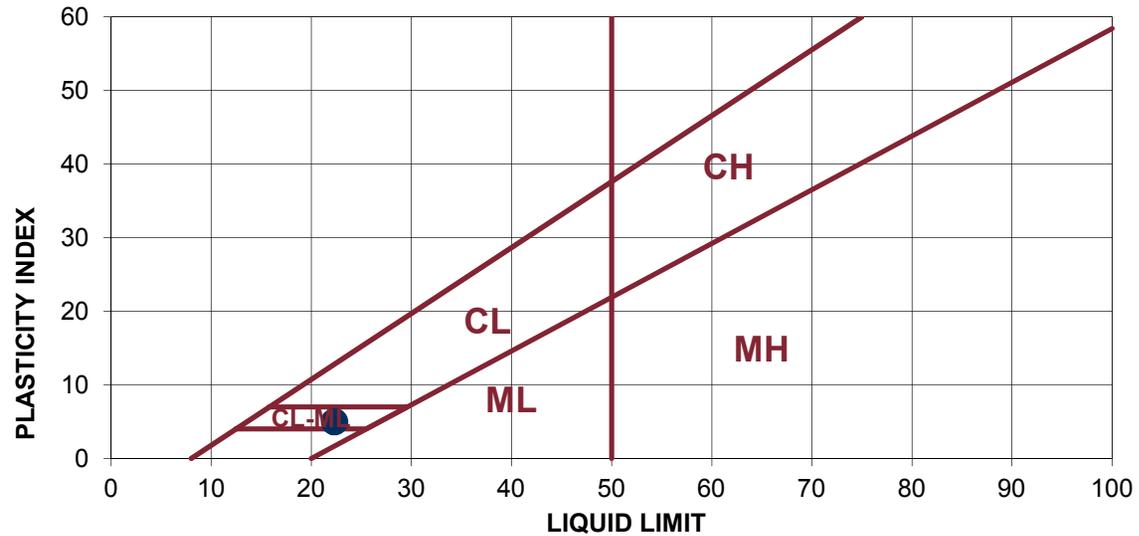
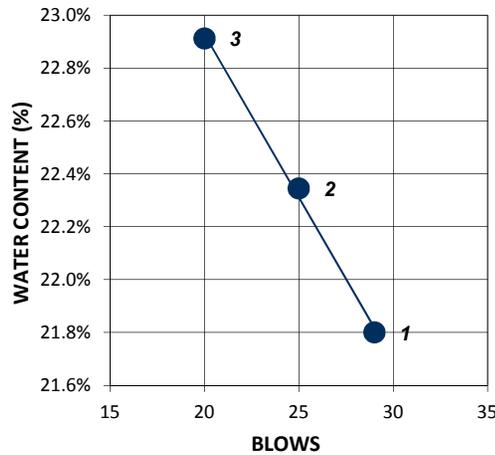
**LABORATORY**  
 199 Henlow Bay

Winnipeg, Manitoba  
 Canada R3Y 1G4  
 Tel: (204) 488-6999

Sample : TH04 @ 3.5'

LIQUID LIMIT			PLASTIC LIMIT			
Trial	1	2	3	Trial	1	2
No. of Blows	29	25	20	Tare No.	239	288
Tare No.	133	174	231	Wt. Sa. (wet+tare)(g)	42.09	42.28
Wt. Sa. (wet+tare)(g)	52	55	56	Wt. Sa. (dry+tare)(g)	39.08	39.13
Wt. Sa. (dry+tare)(g)	46	48	49	Wt. Tare (g)	20.79	20.17
Wt. Tare (g)	20	20	20	Wt. Dry Soil (g)	18.3	19.0
Wt. Dry Soil (g)	26.9	28.3	29.3	Wt. Water (g)	3.0	3.2
Wt. Water (g)	5.9	6.3	6.7	Water Content (%)	16.5%	16.6%
Water Content (%)	21.8%	22.3%	22.9%			

RESULTS	
<b>LL</b>	<b>22</b>
<b>PL</b>	<b>17</b>
<b>PI</b>	<b>5</b>
Natural MC (%)	
19.0%	



Reviewed By: German Leal, P. Eng

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request. The data presented above is for the sole use of the client stipulated above. STANTEC is not responsible, nor can be held liable, for the use of this report by any other party, with or without the knowledge of STANTEC.



**Atterberg Limits**  
 ASTM D4318  
 Method A- Multi-Point

Client: Stantec Consulting Ltd.  
 Project Name: McGregor Street 2018  
 Project No: 123313534  
 Date Received: February 5, 2017  
 Date Tested: February 12, 2018  
 Tested By: Nestor Abarca, C.Tech.

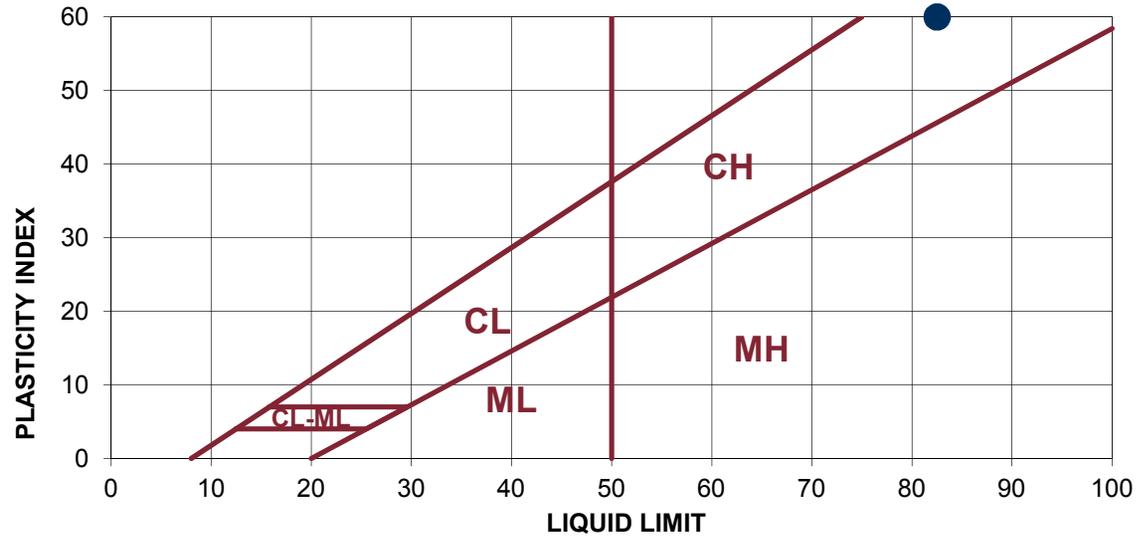
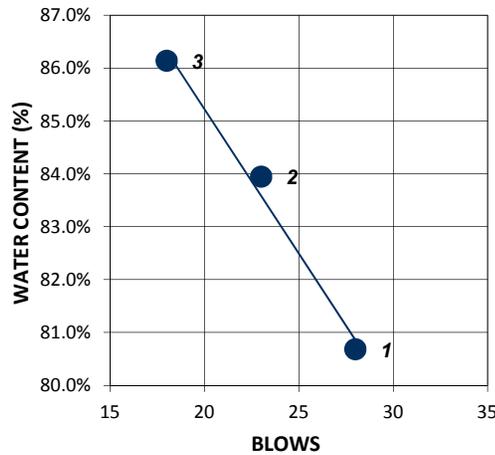
**LABORATORY**  
 199 Henlow Bay

Winnipeg, Manitoba  
 Canada R3Y 1G4  
 Tel: (204) 488-6999

Sample : TH06 @ 3.5'

LIQUID LIMIT			PLASTIC LIMIT			
Trial	1	2	3	Trial	1	2
No. of Blows	28	23	18	Tare No.	242	311
Tare No.	204	220	230	Wt. Sa. (wet+tare)(g)	28.90	32.3
Wt. Sa. (wet+tare)(g)	44	41	43	Wt. Sa. (dry+tare)(g)	27.28	30.17
Wt. Sa. (dry+tare)(g)	32	31	33	Wt. Tare (g)	20.05	20.73
Wt. Tare (g)	19	19	21	Wt. Dry Soil (g)	7.2	9.4
Wt. Dry Soil (g)	13.8	11.5	11.8	Wt. Water (g)	1.6	2.1
Wt. Water (g)	11.1	9.6	10.2	Water Content (%)	22.4%	22.6%
Water Content (%)	80.7%	83.9%	86.1%			

RESULTS	
<b>LL</b>	<b>82</b>
<b>PL</b>	<b>22</b>
<b>PI</b>	<b>60</b>
Natural MC (%)	
32.1%	



Reviewed By: German Leal, P. Eng

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request. The data presented above is for the sole use of the client stipulated above. STANTEC is not responsible, nor can be held liable, for the use of this report by any other party, with or without the knowledge of STANTEC.



**LABORATORY**

199 Henlow Bay  
 Winnipeg MB R3Y 1G4  
 Tel: (204) 488-6999

**PARTICLE SIZE ANALYSIS  
 ASTM D422**

Stantec Consulting Ltd.  
 500-311 Portage Avenue  
 Winnipeg, Manitoba  
 R3B 2B9

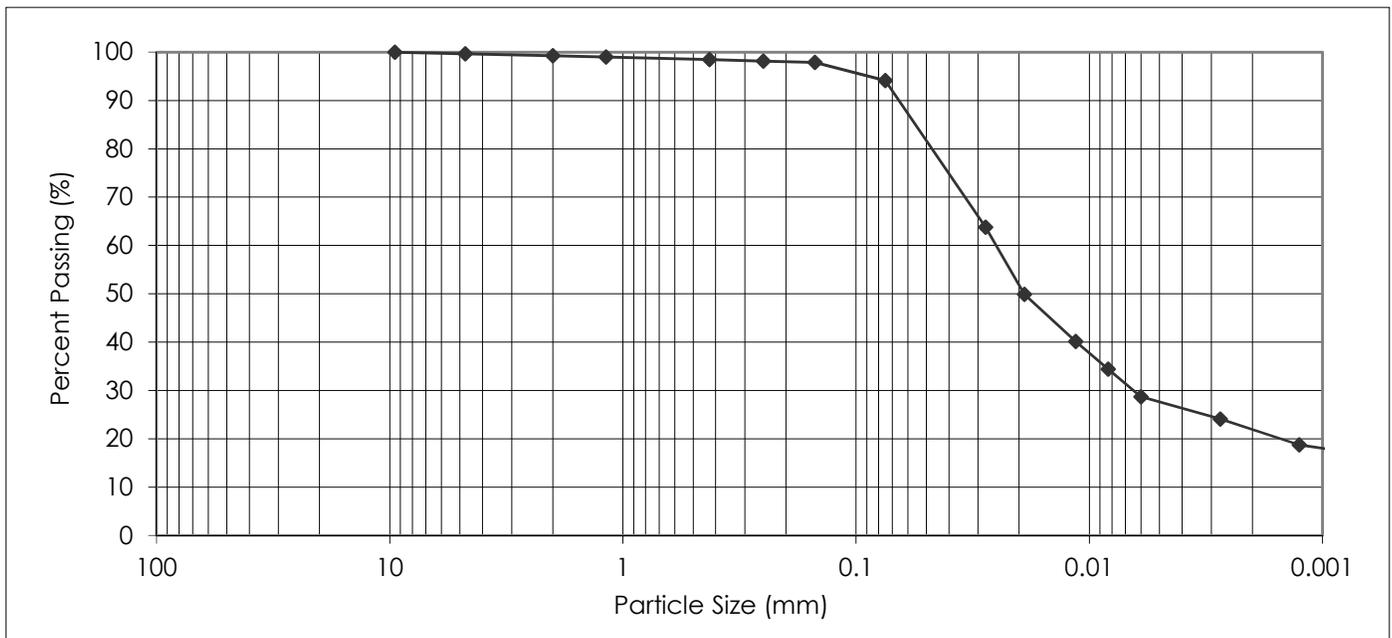
PROJECT: McGregor Street 2018

Attention: Lee Boughton

PROJECT NO.: 123313534

SAMPLED BY: Lee Boughton  
 SAMPLE ID: TH04 @ 3.5'

DATE RECEIVED: February 5, 2018  
 TESTED BY: Tabea Kleineberg, M.Sc., GIT



PARTICLE SIZE		PERCENT PASSING		PARTICLE SIZE		PERCENT PASSING	
37.50 mm		100.0		1.18 mm		99.0	
25.00 mm		100.0		0.425 mm		98.5	
19.00 mm		100.0		0.250 mm		98.2	
16.00 mm		100.0		0.150 mm		97.9	
12.50 mm		100.0		0.075 mm		94.2	
9.50 mm		100.0		0.005 mm		27.6	
4.75 mm		99.7		0.002 mm		21.9	
2.00 mm		99.3		0.001 mm		18.0	
Gravel, % 75 to 4.75 mm	Sand, %			Silt, % <0.075 to 0.002 mm	Clay, % <0.002 mm	Colloids, % < 0.001 mm	
	Coarse <4.75 to 2.0 mm	Medium <2.0 to 0.425 mm	Fine <0.425 to 0.075 mm				
0.3	0.4	0.8	4.3	72.3	21.9	18.0	

REPORT DATE: February 12, 2018



REVIEWED BY: German E. Leal, B.Sc., P. Eng.

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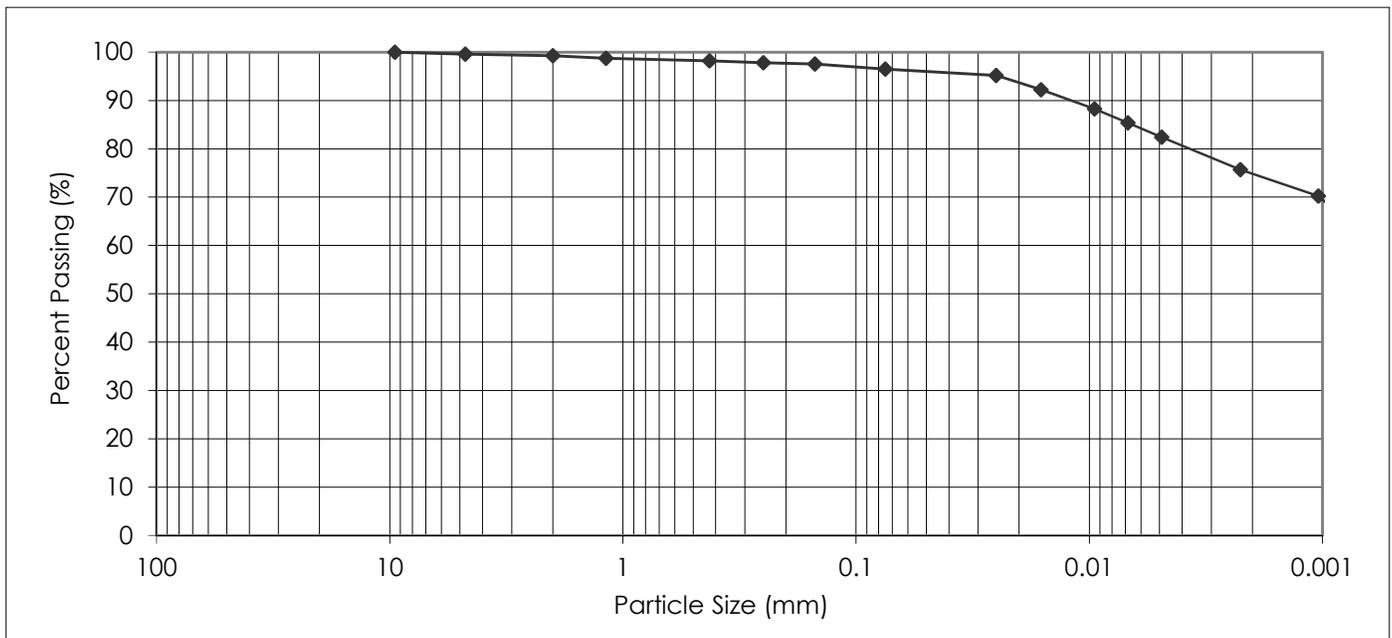
PROJECT: McGregor Street 2018

Attention: Lee Boughton

PROJECT NO.: 123313534

SAMPLED BY: Lee Boughton  
 SAMPLE ID: TH06 @ 3.5'

DATE RECEIVED: February 5, 2018  
 TESTED BY: Tabea Kleineberg, M.Sc., GIT



PARTICLE SIZE		PERCENT PASSING		PARTICLE SIZE		PERCENT PASSING	
37.50 mm	100.0	1.18 mm	98.8				
25.00 mm	100.0	0.425 mm	98.2				
19.00 mm	100.0	0.250 mm	97.8				
16.00 mm	100.0	0.150 mm	97.5				
12.50 mm	100.0	0.075 mm	96.5				
9.50 mm	100.0	0.005 mm	82.6				
4.75 mm	99.6	0.002 mm	74.9				
2.00 mm	99.3	0.001 mm	69.5				
Gravel, % 75 to 4.75 mm	Sand, %			Silt, % <0.075 to 0.002 mm	Clay, % <0.002 mm	Colloids, % < 0.001 mm	
	Coarse <4.75 to 2.0 mm	Medium <2.0 to 0.425 mm	Fine <0.425 to 0.075 mm				
0.4	0.3	1.1	1.7	21.6	74.9	69.5	

REPORT DATE: February 12, 2018



REVIEWED BY: German E. Leal, B.Sc., P. Eng.

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