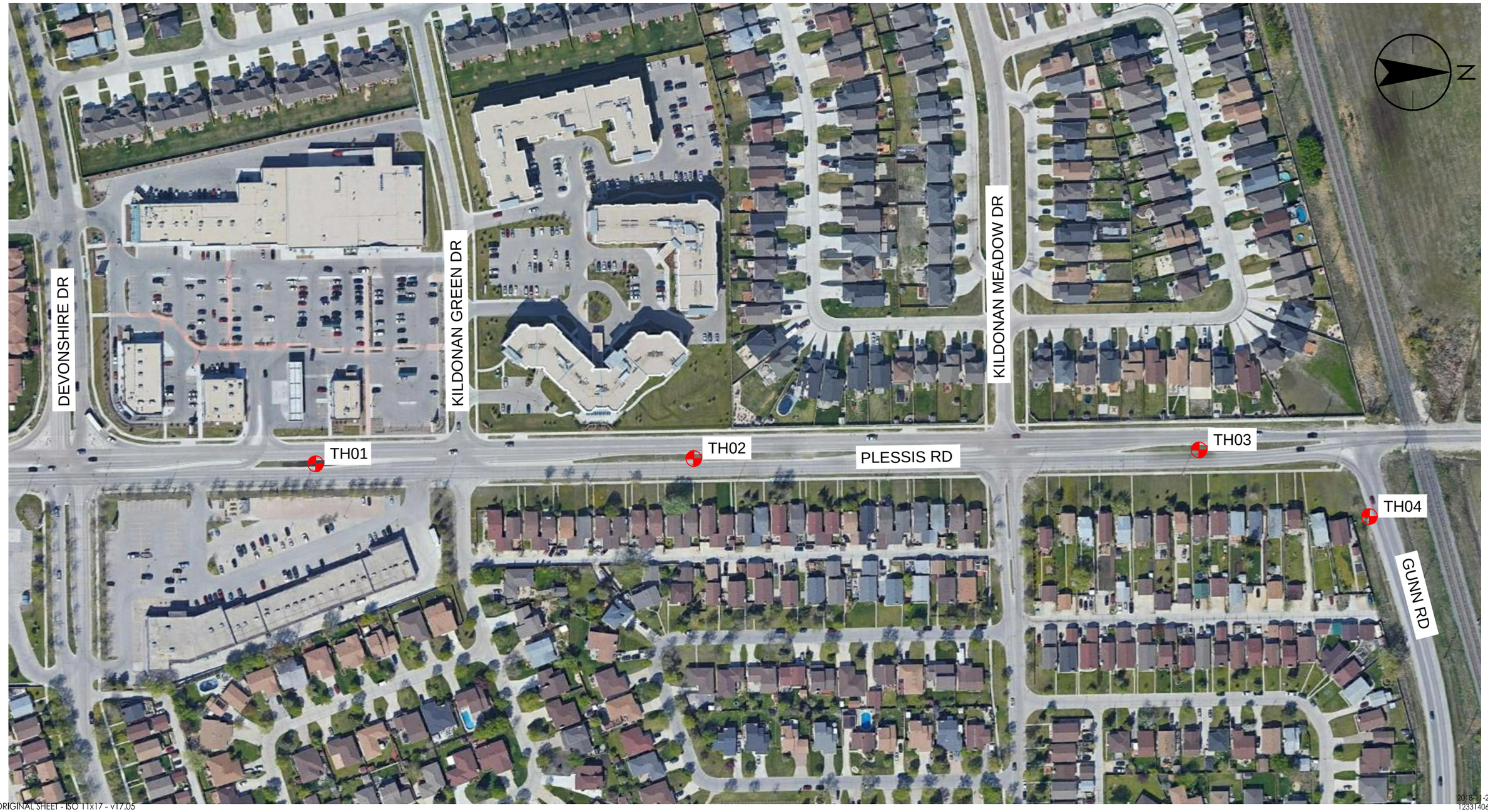
APPENDIX A – SOILS INVESTIGATION REPORT



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ORIGINAL SHEET - ISO 11x17 - v17.05

2018-11-21
123314063

Stantec

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

APPROXIMATE TESTHOLE LOCATION

Notes

Client/Project
CITY OF WINNIPEG
GEOTECHNICAL INVESTIGATION ON PLESSIS AND GUNN ROAD
WINNIPEG, MB

Figure No.
PLESSIS ROAD

Title
TESTHOLE LOCATION PLAN

ORIGINAL SHEET - ISO 11x17 - v17.05

2018-11-21
123314063

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2018/11/22 10:40 AM By: Boughton, Lee

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Legend

APPROXIMATE TESTHOLE LOCATION

Notes

Client/Project
CITY OF WINNIPEG
GEOTECHNICAL INVESTIGATION ON PLESSIS AND GUNN ROAD
WINNIPEG, MB

Figure No.
GUNN ROAD

Title
TESTHOLE LOCATION PLAN

TH01 TESTHOLE RECORD

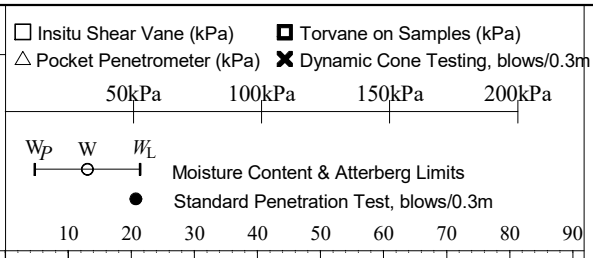
CLIENT City of Winnipeg PROJECT No. 123314063

PROJECT Sewer Installation on Plessis Road and Gunn Road DATUM UTM NORTHING 5530535.962

LOCATION Plessis Road and Gunn Road, Winnipeg, MB ELEVATION 232.107 m EASTING 641782.09

DRILLING DATE November 12, 2018 DRILLING CO. Maple Leaf Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	TP		TOPSOIL			
			19 mm Crushed Limestone			
1	GW			GS		5
			firm to stiff, brown, fat CLAY (CH)	GS		39
2			- some silt, trace fine to coarse grained sand	GS		44
3				GS		49
4						
	CH			GS		47
5						
6				GS		47
7						
				GS		47
8			End of Testhole			
			• Testhole terminated at a depth of 8.0 m.			
9			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			



DEPTH (ft): 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30

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

Stantec

TH02 TESTHOLE RECORD

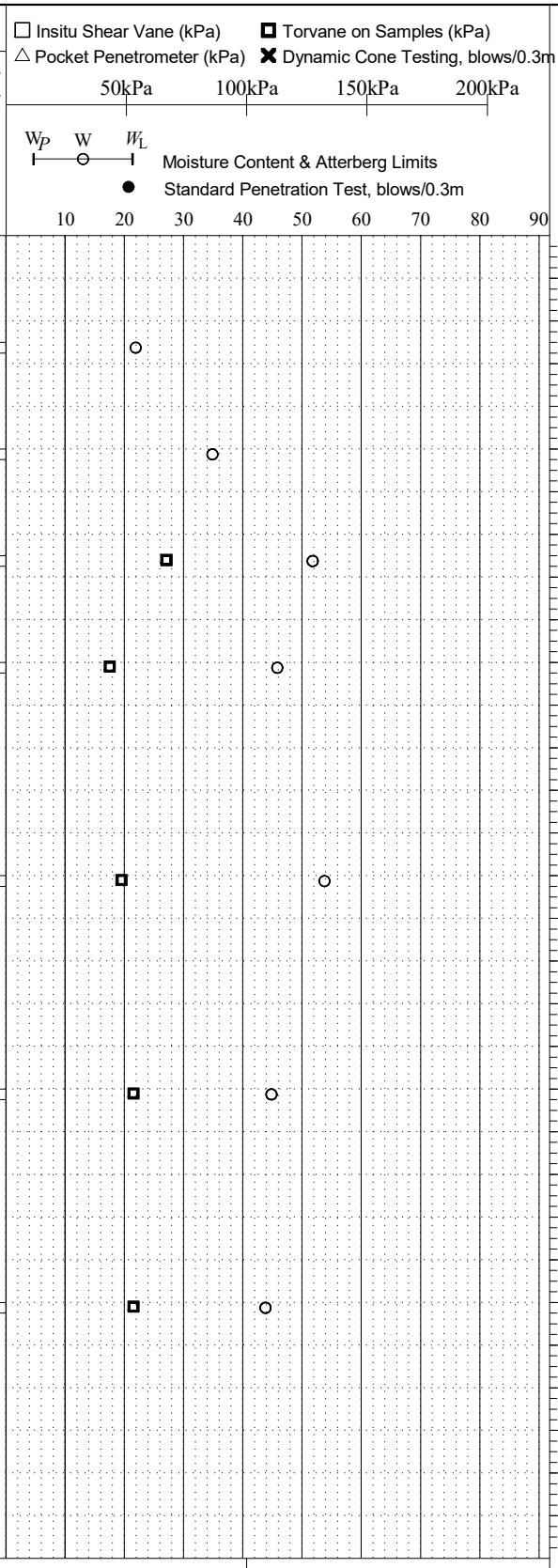
CLIENT City of Winnipeg PROJECT No. 123314063

PROJECT Sewer Installation on Plessis Road and Gunn Road DATUM UTM NORTHING 5530738.528

LOCATION Plessis Road and Gunn Road, Winnipeg, MB ELEVATION 231.828 m EASTING 641779.256

DRILLING DATE November 12, 2018 DRILLING CO. Maple Leaf Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	TP		TOPSOIL			
	FL		FILL: stiff, dark grey, fat clay (CH) - silty, trace gravel, trace fine to coarse grained sand	GS		22
1						
				GS		35
2			stiff, brown, fat CLAY (CH) - some silt, trace fine to coarse grained sand	GS		52
3				GS		46
4						
	CH			GS		54
5						
6				GS		45
7						
				GS		44
8			End of Testhole • Testhole terminated at a depth of 8.0 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
9						



DEPTH (ft): 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30

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

Stantec

TH03 TESTHOLE RECORD

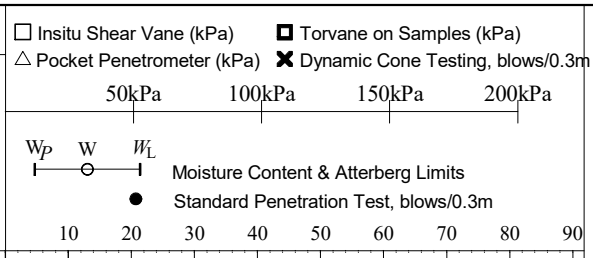
CLIENT City of Winnipeg PROJECT No. 123314063

PROJECT Sewer Installation on Plessis Road and Gunn Road DATUM UTM NORTHING 5531009.269

LOCATION Plessis Road and Gunn Road, Winnipeg, MB ELEVATION 232.608 m EASTING 641774.626

DRILLING DATE November 12, 2018 DRILLING CO. Maple Leaf Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	TP		TOPSOIL			
	FL		FILL: stiff, dark grey, fat clay (CH) - silty, trace gravel, trace fine to coarse grained sand	GS		24
1						
	ML		compact, brown SILT (ML) - some clay, trace fine grained sand	GS		19
2			firm, brown, fat CLAY (CH) - some silt, trace fine to coarse grained sand	GS		52
3				GS		52
4						
	CH			GS		50
5						
6				GS		48
7						
				GS		46
8			End of Testhole • Testhole terminated at a depth of 8.0 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
9						



DEPTH (ft): 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30

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

Stantec

TH04 TESTHOLE RECORD

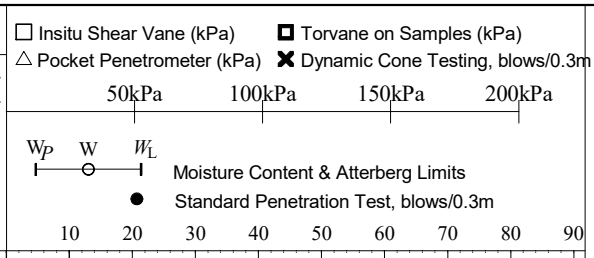
CLIENT City of Winnipeg PROJECT No. 123314063

PROJECT Sewer Installation on Plessis Road and Gunn Road DATUM UTM NORTHING 5531100.534

LOCATION Plessis Road and Gunn Road, Winnipeg, MB ELEVATION 232.533 m EASTING 641810.305

DRILLING DATE November 12, 2018 DRILLING CO. Maple Leaf Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	TP		TOPSOIL			
	FL		FILL: stiff, dark grey, fat clay (CH) - silty, trace gravel, trace fine to coarse grained sand	GS		37
1				GS		27
2				GS		40
	CH		firm to stiff, brown, fat CLAY (CH) - some silt, trace fine to coarse grained sand	GS		49
3						
4				GS		51
5						
6				GS		47
7						
8			End of Testhole • Testhole terminated at a depth of 8.0 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling.	GS		46
9						



DEPTH (ft): 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30

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

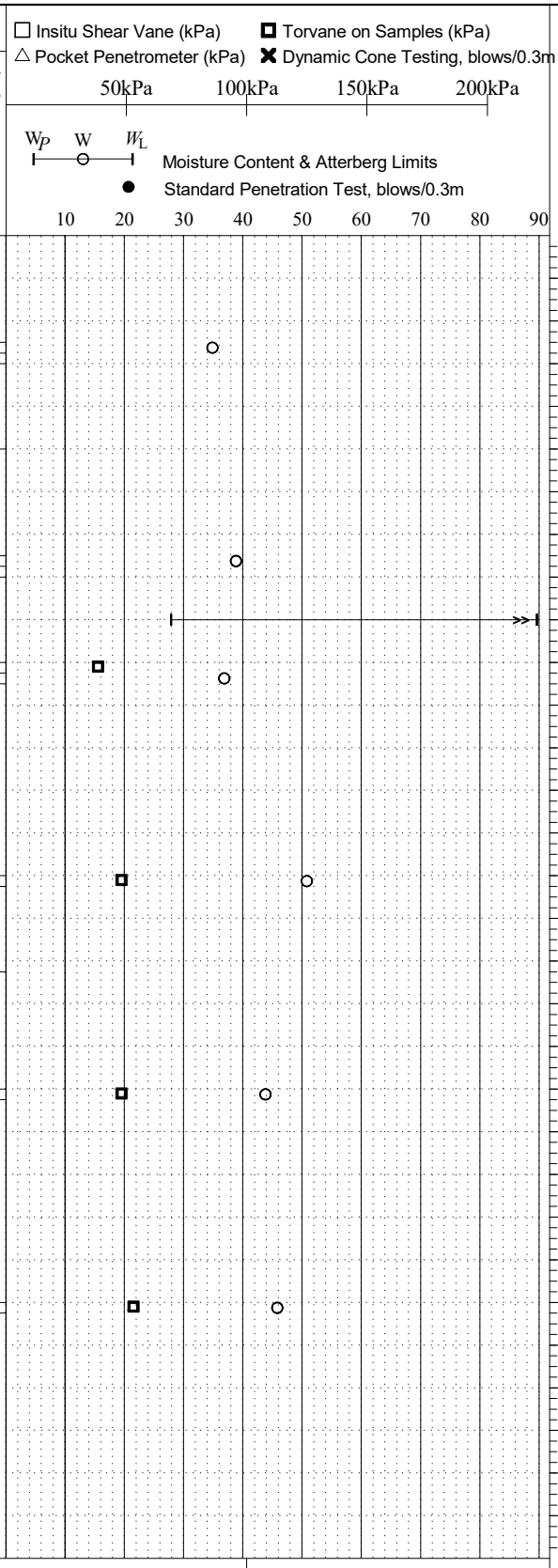
Reviewed by: German Leal

Stantec

TH05 TESTHOLE RECORD

CLIENT City of Winnipeg | PROJECT No. 123314063
PROJECT Sewer Installation on Plessis Road and Gunn Road | DATUM UTM | NORTHING 5531134.263
LOCATION Plessis Road and Gunn Road, Winnipeg, MB | ELEVATION 232.461 m | EASTING 641972.801
DRILLING DATE November 12, 2018 | DRILLING CO. Maple Leaf Drilling Ltd. | DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	TP	TOPSOIL			
	FL	FILL: stiff, dark grey, fat clay (CH) - silty, trace gravel, trace fine to coarse grained sand	GS		35
1			ST		
		-mixed SILT and CLAY between 1.67 m and 1.82 m			
2			GS		39
	CH	firm to stiff, brown, fat CLAY (CH) - some silt, trace fine to coarse grained sand Particle Size Analysis Results @ 2.8 m: - 0% Gravel, 0.4% Sand, 11.7% Silt, 87.9% Clay	ST		
3			GS		37
4					
			GS		51
5			ST		
6			GS		44
7					
			GS		46
8		End of Testhole • Testhole terminated at a depth of 8.0 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
9					



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

Stantec

TH06 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123314063

PROJECT Sewer Installation on Plessis Road and Gunn Road DATUM UTM NORTHING 5531137.324

LOCATION Plessis Road and Gunn Road, Winnipeg, MB ELEVATION 232.490 m EASTING 642158.112

DRILLING DATE November 12, 2018 DRILLING CO. Maple Leaf Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	TP		TOPSOIL			
	FL		FILL: stiff, dark grey, fat clay (CH) - silty, trace gravel, trace fine to coarse grained sand	GS		49
1						
			firm to stiff, brown, fat CLAY (CH) - some silt, trace fine to coarse grained sand	GS		39
2				GS		48
3				GS		54
4						
	CH			GS		52
5						
6				GS		48
7						
				GS		44
8			End of Testhole • Testhole terminated at a depth of 8.0 m. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
9						

☐ Insitu Shear Vane (kPa) ■ Torvane on Samples (kPa)
△ Pocket Penetrometer (kPa) ✖ Dynamic Cone Testing, blows/0.3m

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Standard Penetration Test, blows/0.3m

10 20 30 40 50 60 70 80 90

DEPTH (ft): 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30

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

Stantec

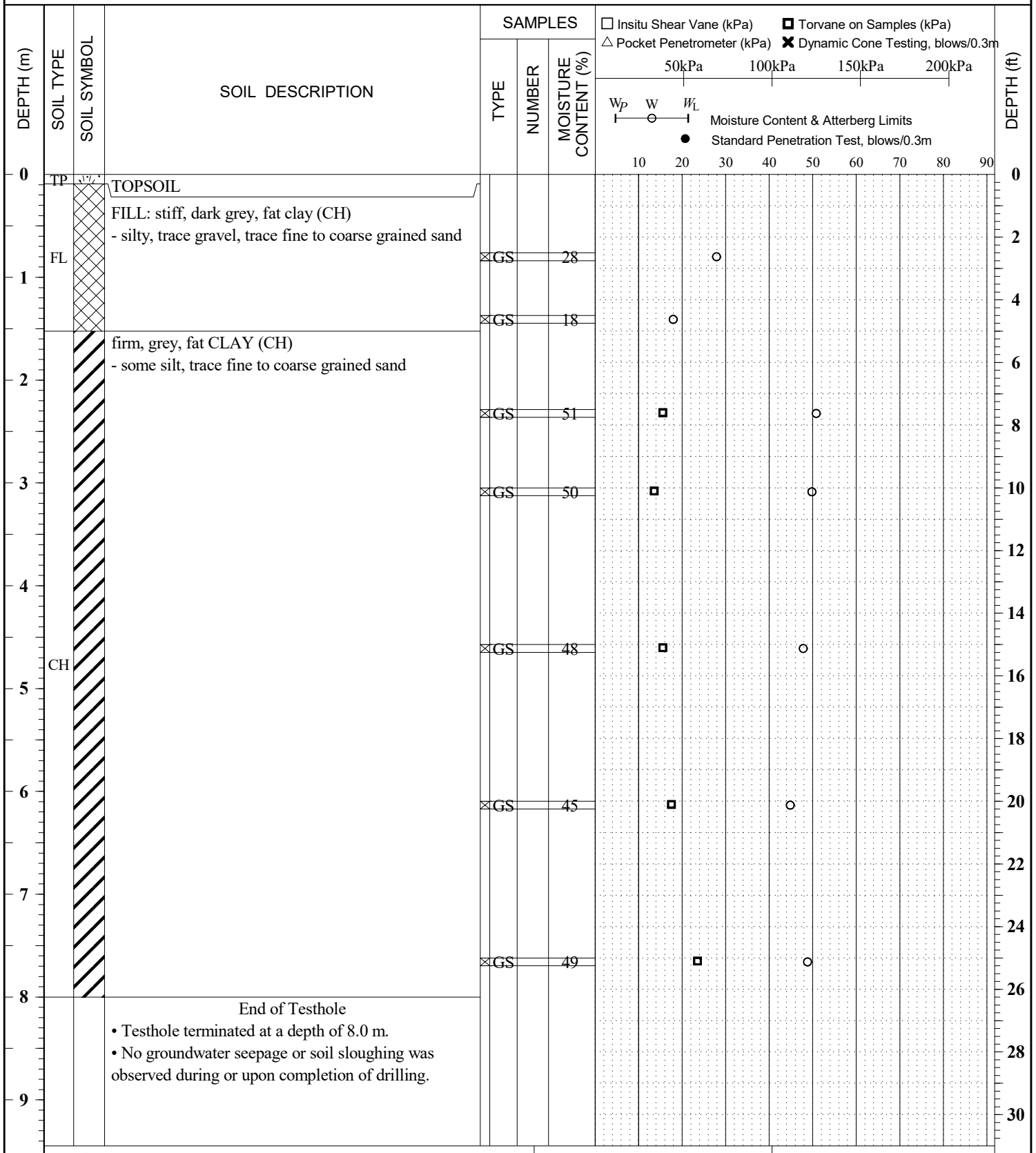
TH07 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123314063

PROJECT Sewer Installation on Plessis Road and Gunn Road DATUM UTM NORTHING 5531140.42

LOCATION Plessis Road and Gunn Road, Winnipeg, MB ELEVATION 232.307 m EASTING 642335.626

DRILLING DATE November 13, 2018 DRILLING CO. Maple Leaf Drilling Ltd. DRILLING METHOD 125 mm SSA



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

Stantec

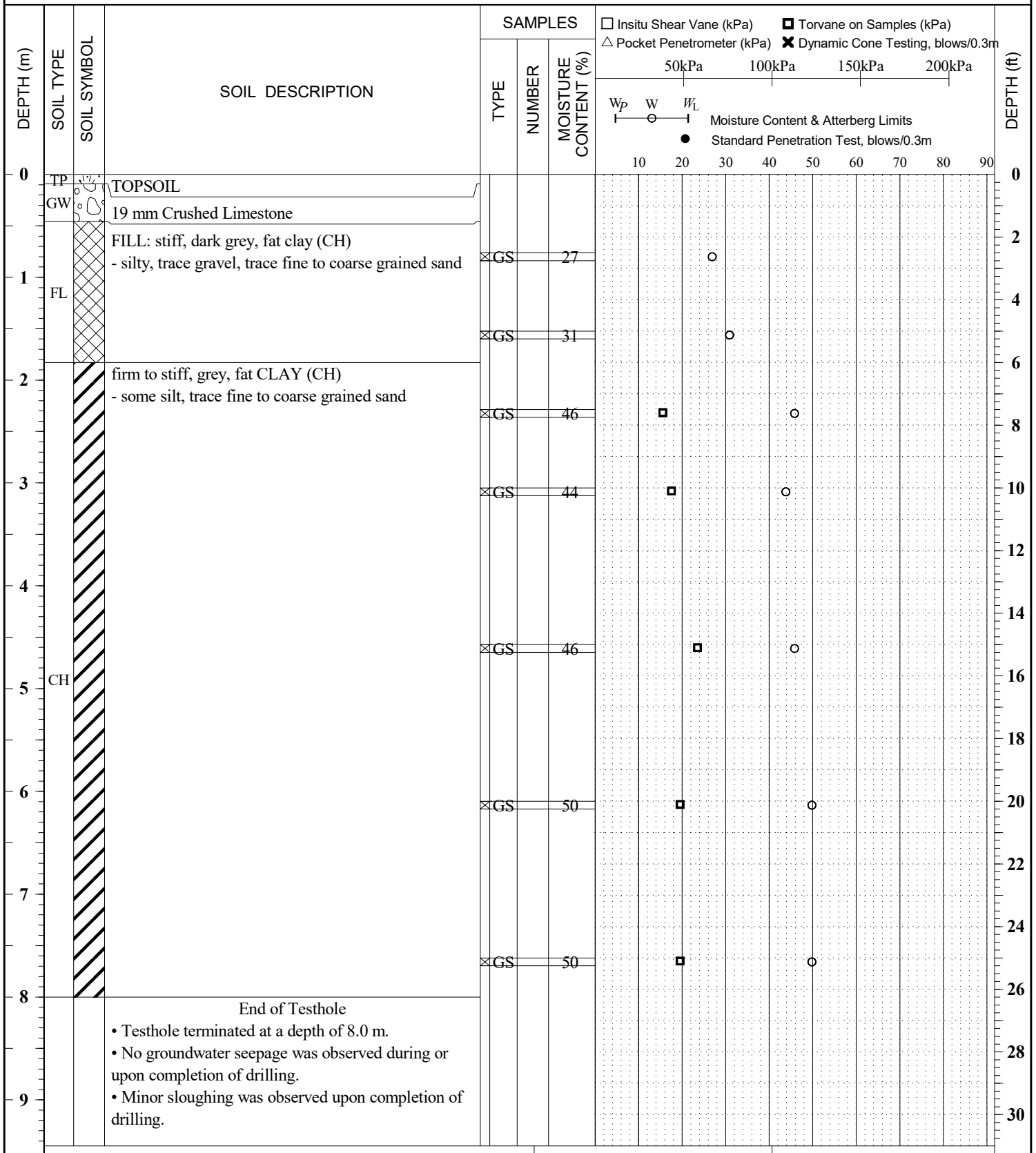
TH08 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123314063

PROJECT Sewer Installation on Plessis Road and Gunn Road DATUM UTM NORTHING 5531143.584

LOCATION Plessis Road and Gunn Road, Winnipeg, MB ELEVATION 232.370 m EASTING 642515.573

DRILLING DATE November 13, 2018 DRILLING CO. Maple Leaf Drilling Ltd. DRILLING METHOD 125 mm SSA



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

Stantec

TH09 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123314063

PROJECT Sewer Installation on Plessis Road and Gunn Road DATUM UTM NORTHING 5531146.765

LOCATION Plessis Road and Gunn Road, Winnipeg, MB ELEVATION 232.715 m EASTING 642698.46

DRILLING DATE November 13, 2018 DRILLING CO. Maple Leaf Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	TP		TOPSOIL			
	GW		19 mm Crushed Limestone			
	FL		FILL: stiff, dark grey, fat clay (CH) - silty, trace gravel, trace fine to coarse grained sand	GS		33
1			firm, grey, fat CLAY (CH) - some silt, trace fine to coarse grained sand	GS		28
2				GS		52
3				GS		56
4	CH			GS		55
5						
6				GS		54
7						
8			End of Testhole • Testhole terminated at a depth of 8.0 m. • No groundwater seepage or sloughing was observed during or upon completion of drilling.	GS		54
9						

☐ Insitu Shear Vane (kPa) ■ Torvane on Samples (kPa)
△ Pocket Penetrometer (kPa) ✖ Dynamic Cone Testing, blows/0.3m

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Standard Penetration Test, blows/0.3m

10 20 30 40 50 60 70 80 90

DEPTH (ft): 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30

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

Stantec

TH10 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123314063

PROJECT Sewer Installation on Plessis Road and Gunn Road DATUM UTM NORTHING 5531149.824

LOCATION Plessis Road and Gunn Road, Winnipeg, MB ELEVATION 232.776 m EASTING 642878.039

DRILLING DATE November 13, 2018 DRILLING CO. Maple Leaf Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	TP		TOPSOIL			
	GW		19 mm Crushed Limestone			
1	FL		FILL: stiff, dark grey, fat clay (CH) - silty, trace gravel, trace fine to coarse grained sand	GS		26
				GS		35
2			firm to stiff, grey, fat CLAY (CH) - some silt, trace fine to coarse grained sand	GS		49
3				GS		52
4	CH			GS		52
6				GS		43
8			End of Testhole • Testhole terminated at a depth of 8.0 m. • No groundwater seepage or sloughing was observed during or upon completion of drilling.	GS		52

☐ Insitu Shear Vane (kPa) ■ Torvane on Samples (kPa)
△ Pocket Penetrometer (kPa) ✖ Dynamic Cone Testing, blows/0.3m

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Standard Penetration Test, blows/0.3m

10 20 30 40 50 60 70 80 90

DEPTH (ft): 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30

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

Stantec

TH11 TESTHOLE RECORD

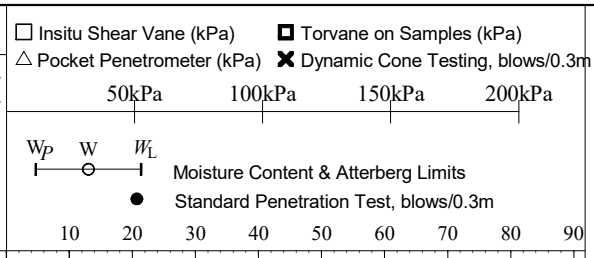
CLIENT City of Winnipeg PROJECT No. 123314063

PROJECT Sewer Installation on Plessis Road and Gunn Road DATUM UTM NORTHING 5531153.019

LOCATION Plessis Road and Gunn Road, Winnipeg, MB ELEVATION 232.927 m EASTING 643062.849

DRILLING DATE November 13, 2018 DRILLING CO. Maple Leaf Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	TP		TOPSOIL			
	GW		19 mm Crushed Limestone			
	FL		FILL: stiff, dark grey, fat clay (CH) - silty, trace gravel, trace fine to coarse grained sand	GS		35
1				GS		35
	ML		compact, brown SILT (ML) - clayey, trace fine grained sand	GS		34
2						
3	CH		firm, grey, fat CLAY (CH) - some silt, trace fine to coarse grained sand	GS		42
4						
				GS		59
5						
6				GS		55
7						
				GS		43
8			End of Testhole • Testhole terminated at a depth of 8.0 m. • No groundwater seepage or sloughing was observed during or upon completion of drilling.			
9						



DEPTH (ft): 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30

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

Stantec

TH12 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123314063

PROJECT Sewer Installation on Plessis Road and Gunn Road DATUM UTM NORTHING 5531156.007

LOCATION Plessis Road and Gunn Road, Winnipeg, MB ELEVATION 233.037 m EASTING 643238.048

DRILLING DATE November 13, 2018 DRILLING CO. Maple Leaf Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	TP		TOPSOIL			
	GW		19 mm Crushed Limestone			
	FL		FILL: stiff, dark grey, fat clay (CH) - silty, trace gravel, trace fine to coarse grained sand	GS		36
1	ML		compact, brown SILT (ML) - some clay, trace fine grained sand	GS		32
			firm, brown, fat CLAY (CH) - some silt, trace fine to coarse grained sand	GS		47
2				GS		54
3						
4				GS		49
	CH					
5						
6			- grey below 6.1 m	GS		42
7						
				GS		46
8			End of Testhole • Testhole terminated at a depth of 8.0 m. • No groundwater seepage or sloughing was observed during or upon completion of drilling.			
9						

☐ Insitu Shear Vane (kPa) ■ Torvane on Samples (kPa)

△ Pocket Penetrometer (kPa) ✖ Dynamic Cone Testing, blows/0.3m

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Standard Penetration Test, blows/0.3m

10 20 30 40 50 60 70 80 90

DEPTH (ft): 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30

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

Stantec

TH13 TESTHOLE RECORD

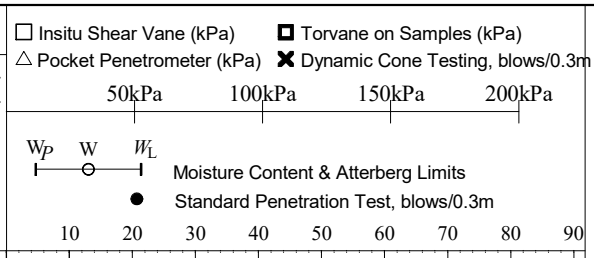
CLIENT City of Winnipeg PROJECT No. 123314063

PROJECT Sewer Installation on Plessis Road and Gunn Road DATUM UTM NORTHING 5531158.241

LOCATION Plessis Road and Gunn Road, Winnipeg, MB ELEVATION 233.309 m EASTING 643373.334

DRILLING DATE November 13, 2018 DRILLING CO. Maple Leaf Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	TP		TOPSOIL			
	GW		19 mm Crushed Limestone			
1	FL		FILL: stiff, dark grey, fat clay (CH) - silty, trace gravel, trace fine to coarse grained sand	GS		27
2			firm, grey, fat CLAY (CH) - some silt, trace fine to coarse grained sand	GS		26
				GS		48
3				GS		51
4						
5	CH			GS		57
6				GS		54
7						
				GS		44
8			End of Testhole • Testhole terminated at a depth of 8.0 m. • No groundwater seepage or sloughing was observed during or upon completion of drilling.			
9						



DEPTH (ft): 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30

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

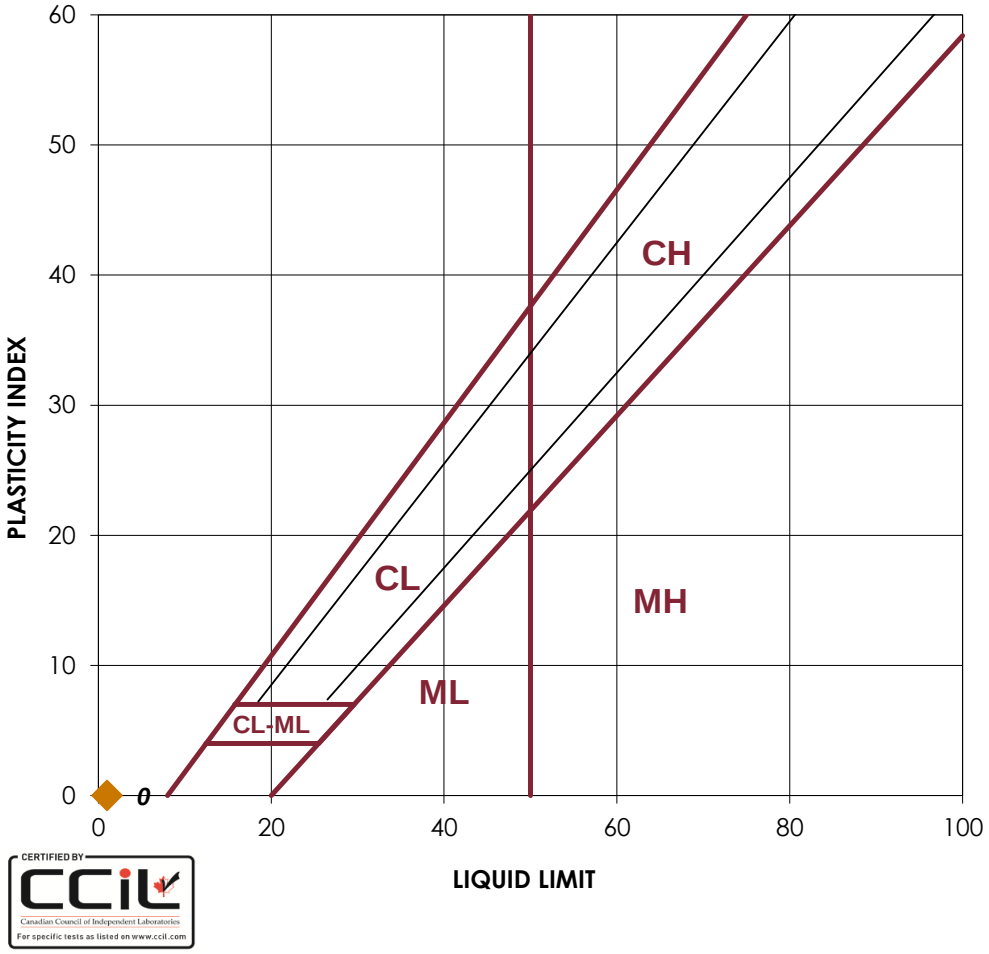
Stantec

Atterberg Limits
ASTM D4318
Method B- One Point

Client: Stantec Consulting Ltd.
Project Name: Geo. Investigation for Sewer Installation
Project No: 123314063
Date Received: November 14, 2018
Date Tested: November 19, 2018
Tested By: Nestor Abarca, C.Tech.

LABORATORY
199 Henlow Bay
Winnipeg, Manitoba
Canada R3Y 1G4
Tel: (204) 488-6999

Sample:			Sample:	
TH05 @ 8' - 10'				
LIQUID			LIQUID	
1	2	Trial No.	1	2
22	22	Number of Blows		
154	159	Container Number		
32.36	34.63	Wt. Sample (wet+tare)(g)		
25.59	26.69	Wt. Sample (dry+tare)(g)		
18.79	18.72	Wt. Tare (g)		
6.8	8.0	Wt. Dry Soil (g)		
6.8	7.9	Wt. Water (g)		
99.6%	99.6%	Water Content (%)		
98.0%	98.1%	Corrected Water Content (%		
PLASTIC			PLASTIC	
1	2	Trial No.	1	2
188	217	Container Number		
29.26	26.71	Wt. Sample (wet+tare)(g)		
27.03	24.87	Wt. Sample (dry+tare)(g)		
19.05	18.2	Wt. Tare (g)		
8.0	6.7	Wt. Dry Soil (g)		
2.2	1.8	Wt. Water (g)		
27.9%	27.6%	Water Content (%)		
AVERAGE VALUES			AVERAGE VALUES	
1	2		1	2
LL	98		LL	
PL	28		PL	
PI	70		PI	
Natural MC (%)	53.2%		Natural MC (%)	
CLASSIFICATION			CLASSIFICATION	
CH			**NON-PLASTIC**	



CERTIFIED BY CCIL Canadian Council of Independent Laboratories For specific tests as listed on www.ccil.com

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Reviewed By: Lee Boughton

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

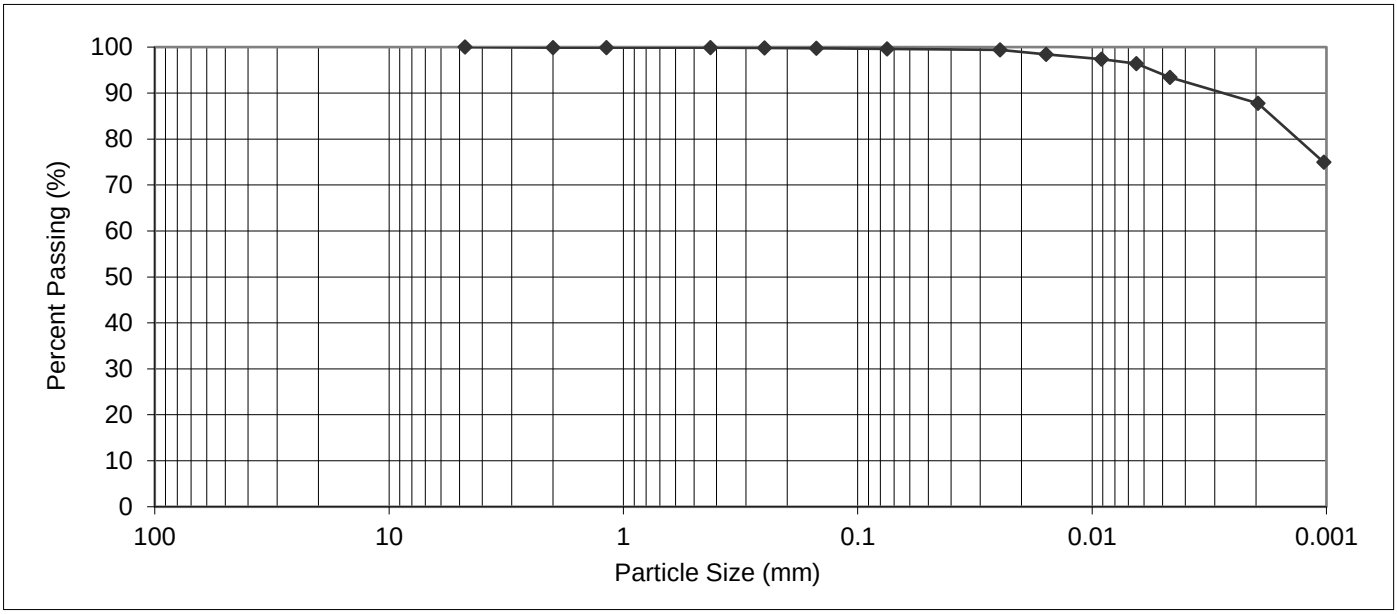
PROJECT: Geo. Investigation for Sewer Installation

Attention: Lee Boughton

PROJECT NO.: 123314063

SAMPLED BY: Lee Boughton
SAMPLE ID: TH05 @ 8' - 10'

DATE RECEIVED: November 14, 2018
TESTED BY: Nestor Abarca, C.Tech.



PARTICLE SIZE	PERCENT PASSING
37.50 mm	100.0
25.00 mm	100.0
19.00 mm	100.0
16.00 mm	100.0
12.50 mm	100.0
9.50 mm	100.0
4.75 mm	100.0
2.00 mm	99.9

PARTICLE SIZE	PERCENT PASSING
1.18 mm	99.9
0.425 mm	99.9
0.250 mm	99.8
0.150 mm	99.8
0.075 mm	99.6
0.005 mm	94.0
0.002 mm	87.9
0.001 mm	NT*

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			
0.0	0.1	0.0	0.3	11.7	87.9	NT*

NT* Sample not tested for colloids

REPORT DATE: November 20, 2018

REVIEWED BY: Lee Boughton

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LABORATORY
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Laboratory Determination of Density (Unit Weight) of Soil Specimens ASTM D7263 - Method B

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

PROJECT: Geo. Investigation for Sewer Intallation

PROJECT NO.: 123314063

Attention: Lee Boughton

REPORT NO.: 1

SAMPLED BY: Lee Boughton
FIELD ID: TH05
DEPTH: 3' - 5'

DATE SAMPLED: November 13, 2018
DATE RECEIVED: November 14, 2018
TESTED BY: Nestor Abarca, C.Tech.

Soil Description: Clay (fill), brown, firm, moist, high plasticity

Sampling Method: Shelby tube

MEASUREMENTS

Diameter (mm)		Height (mm)	
Reading 1	71.77	Reading 1	162.01
Reading 2	71.45	Reading 2	161.92
Reading 3	71.52	Reading 3	161.98
Average	71.58	Average	161.97

Volume of Sample: 651.79 cm^3
Mass of Sample: 1233.64 g

WATER CONTENT

	Top Portion	Bottom Portion	
Tare #	261	291	
Mass of Tare (g):	19.87	19.79	
Mass of Tare + wet soil (g):	70.26	62.81	
Mass of Tare + dry soil (g):	58.39	51.42	
Mass of Water (g):	11.87	11.39	
Mass of dry soil (g):	38.52	31.63	Average
Water Content (%):	30.82	36.01	33.41

	Density (g/cm^3)	Unit Weight (kN/m^3)
WET	**1.893**	**18.561**
DRY	**1.419**	**13.912**

REPORT DATE: November 16, 2018

REVIEWED BY: Jason Thompson, C.E.T.

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LABORATORY
199 Henlow Bay
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Laboratory Determination of Density (Unit Weight) of Soil Specimens ASTM D7263 - Method B

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

PROJECT: Geo. Investigation for Sewer Intallation

PROJECT NO.: 123314063

Attention: Lee Boughton

REPORT NO.: 1

SAMPLED BY: Lee Boughton
FIELD ID: TH05
DEPTH: 8' - 10'

DATE SAMPLED: November 13, 2018
DATE RECEIVED: November 14, 2018
TESTED BY: Nestor Abarca, C.Tech.

Soil Description: Clay, brown, firm, moist, high plasticity with silt inclusion

Sampling Method: Shelby tube

MEASUREMENTS

Diameter (mm)		Height (mm)	
Reading 1	71.54	Reading 1	161.73
Reading 2	71.35	Reading 2	161.72
Reading 3	71.44	Reading 3	161.53
Average	71.44	Average	161.66

Volume of Sample: 648.06 cm^3
Mass of Sample: 1107.76 g

WATER CONTENT

	Top Portion	Bottom Portion	
Tare #	152	245	
Mass of Tare (g):	19.28	18.78	
Mass of Tare + wet soil (g):	72.85	62.86	
Mass of Tare + dry soil (g):	54.24	47.49	
Mass of Water (g):	18.61	15.37	
Mass of dry soil (g):	34.96	28.71	Average
Water Content (%):	53.23	53.54	53.38

	Density (g/cm^3)	Unit Weight (kN/m^3)
WET	**1.709**	**16.763**
DRY	**1.114**	**10.929**

REPORT DATE: November 16, 2018

REVIEWED BY: Jason Thompson, C.E.T.

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