APPENDIX ‘A’

GEOTECHNICAL REPORT

APPENDIX 'A' - GEOTECHNICAL REPORT

GEOTECHNICAL REPORT FOR:

I. Aikins Street from Atlantic Avenue to Carruthers Avenue.
II. Carruthers Avenue from Arlington street to Parr Street.
III. Carruthers Avenue from McKenzie Street to McGregor Street.
IV Carruthers Avenue from Powers Street to Salter Street.
V. Powers Street from Burrows Avenue to Redwood Avenue.
VI. Powers Street from Carruthers Avenue to Smithfield Avenue.

The geotechnical report is provided to aid in the Contractor's evaluation of the existing pavement structure and/or soil conditions. The information presented is considered accurate at the locations shown on the Drawings and at the time of drilling. However, variations in pavement structure and/or soil conditions may exist between test holes and fluctuations in groundwater levels can be expected seasonally and may occur as a result of construction activities. The nature and extent of variations may not become evident until construction commences.

2016 Residential Street Renewal Program

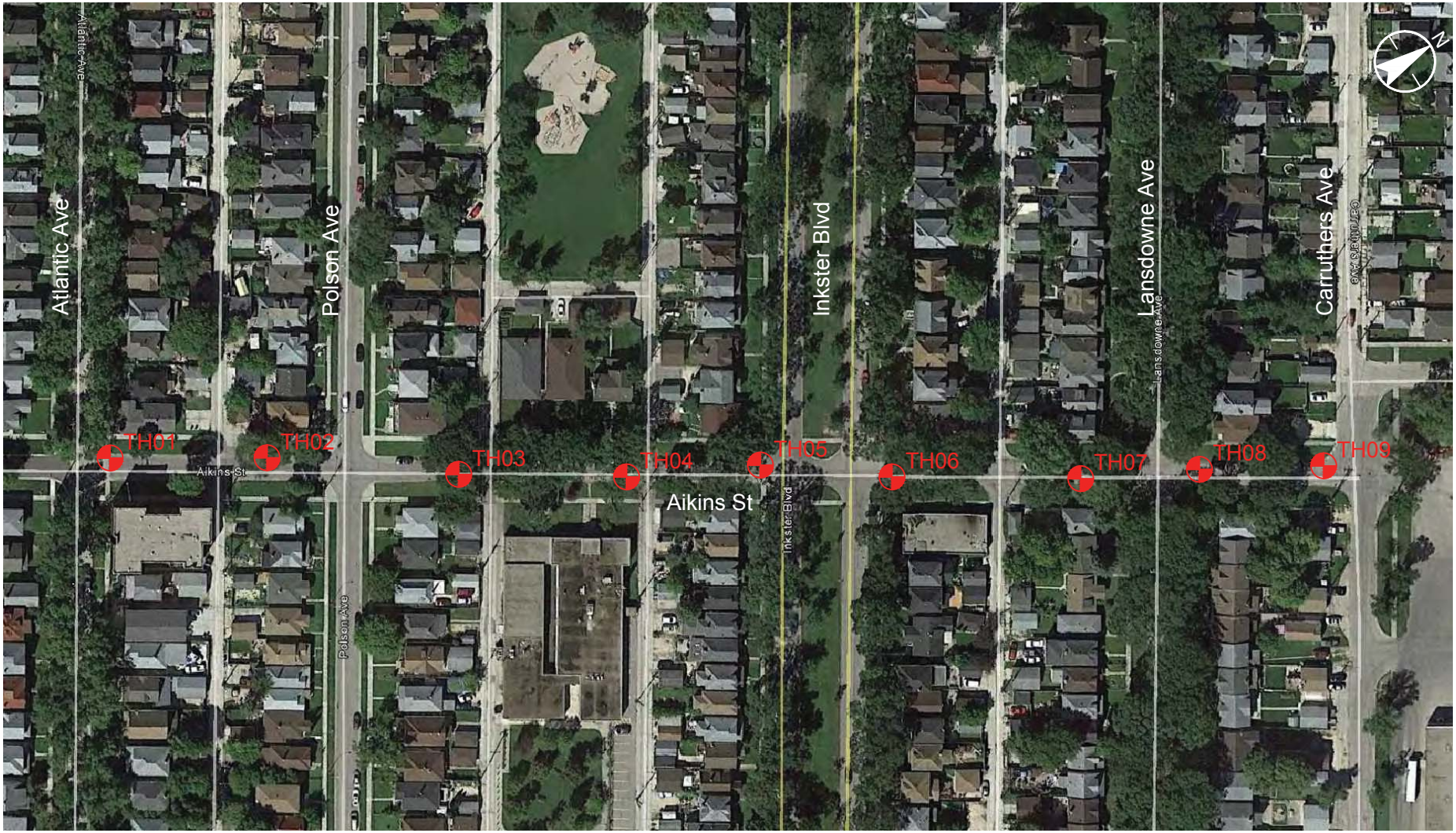
Geotechnical Investigation - Aikins Street from Atlantic Avenue to Carruthers Avenue

Prepared for:
City of Winnipeg
Engineering Division
Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

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

Project No. 123312305

January 21, 2016



January, 2016
123312305

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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

TESTHOLE

Notes

- IMAGE SOURCE: GOOGLE EARTH
- SITE: AIKINS STREET FROM CARRUTHERS AVENUE TO ATLANTIC AVENUE

Client/Project
CITY OF WINNIPEG
2016 RESIDENTIAL STREET RENEWAL PROGRAM
WINNIPEG, MB

Figure No.
1

Title
TESTHOLE LOCATION PLAN

TABLE 1
2016 RESIDENTIAL STREET RENEWAL PROGRAM
AIKINS STREET FROM ATLANTIC AVENUE TO CARRUTHERS AVENUE
GEOTECHNICAL INVESTIGATION

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure		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	Aikins Street 5.0 m North of Northwest corner Atlantic Avenue and Aikins Street 2.0 m East of West curb	Asphalt	35	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	145												
TH02	Aikins Street 15.0 m South of Southwest corner Polson Avenue and Aikins Street 2.0 m East of West curb	Asphalt	60	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	150												
TH03	Aikins Street 25.5 m North of Northeast corner Polson Avenue and Aikins Street 2.0 m West of East curb	Asphalt	35	-	-	Silt	0.9	23	0.7	6.3	73.4	19.6	28	18	10
		Concrete	140												
TH04	Aikins Street 42.0 m South of Southeast corner Inkster Boulevard and Aikins Street 2.0 m West of East curb	Asphalt	40	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	130												
TH05	Aikins Street 4.0 m South of Southwest corner Inkster Boulevard and Aikins Street 2.0 m East of West curb	Asphalt	30	-	-	Clay	0.6	38	0.0	4.5	24.3	71.2	92	34	58
		Concrete	160												
TH06	Aikins Street 4.0 m North of Northeast corner Inkster Boulevard and Aikins Street 1.5 m West of East curb	Asphalt	50	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	130												
TH07	Aikins Street 21.5 m South of Southwest corner Lansdowne Avenue and Aikins Street 2.0 m East of West curb	Asphalt	35	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	210												
TH08	Aikins Street 6.0 m North of Northwest corner Lansdowne Avenue and Aikins Street 2.0 m East of West curb	Asphalt	20	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	180												
TH09	Aikins Street 3.0 m South of Southwest corner Carruthers Avenue and Aikins Street 2.0 m East of West curb	Asphalt	55	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	165												

TH01 TESTHOLE RECORD

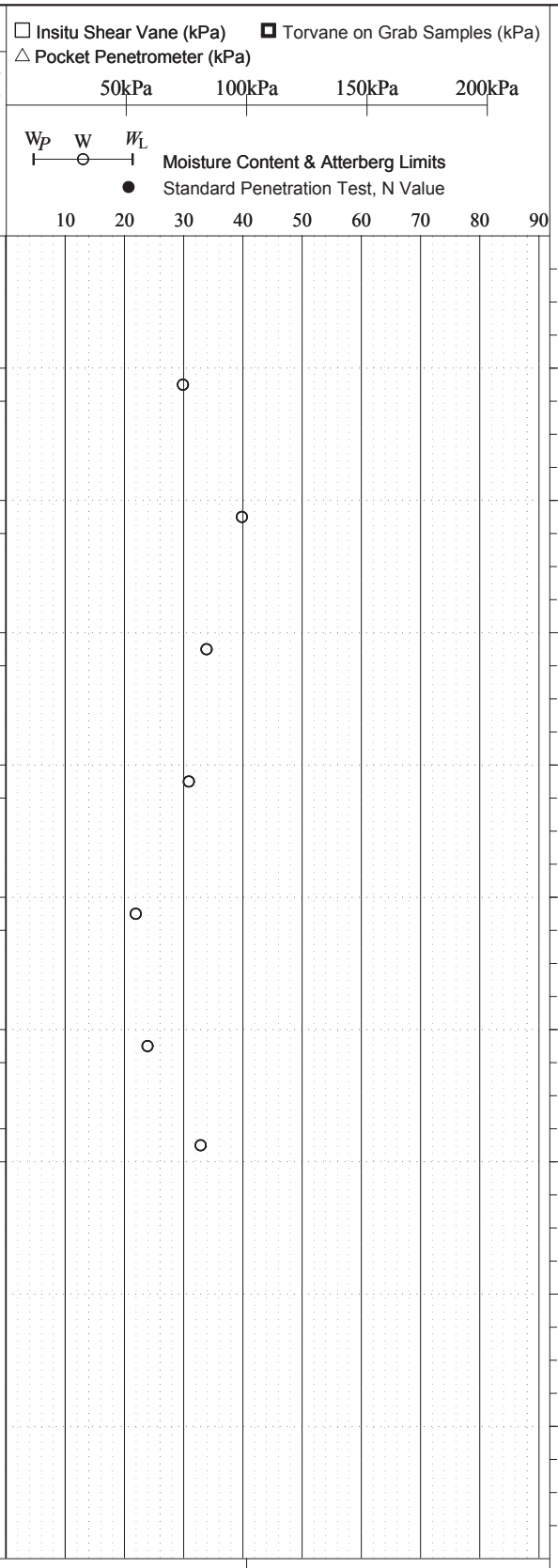
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Aikins St from Atlantic Ave to Carruthers Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	CH		Firm black fat CLAY (CH) with trace organic and trace fine sand	GS		30
				GS		40
1				GS		34
				GS		31
	ML		Soft tan SILT (ML)	GS		22
				GS		24
2	CH		Firm brown fat CLAY (CH)	GS		33
			TESTHOLE LOCATION: 5.0 m North of Northwest corner Atlantic Avenue and Aikins Street, 2.0 m East of West curb.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			
3						



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH02 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Aikins St from Atlantic Ave to Carruthers Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	CH		Firm black fat CLAY (CH) with trace organic and trace fine sand	GS		33
				GS		35
1				GS		32
	ML		Soft tan SILT (ML)	GS		22
	CH		Firm brown fat CLAY (CH)	GS		30
	ML		Soft tan SILT (ML)	GS		22
2				GS		22
			TESTHOLE LOCATION: 15.0 m South of Southwest corner Polson Avenue and Aikins Street, 2.0 m East of West curb.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
			• Testhole terminated at a depth of 2.1 m.			
3						

☐ Insitu Shear Vane (kPa) ■ Torvane on Grab Samples (kPa)
△ Pocket Penetrometer (kPa)

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Standard Penetration Test, N Value

10 20 30 40 50 60 70 80 90

DEPTH (ft): 0 2 4 6 8 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

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TH03 TESTHOLE RECORD

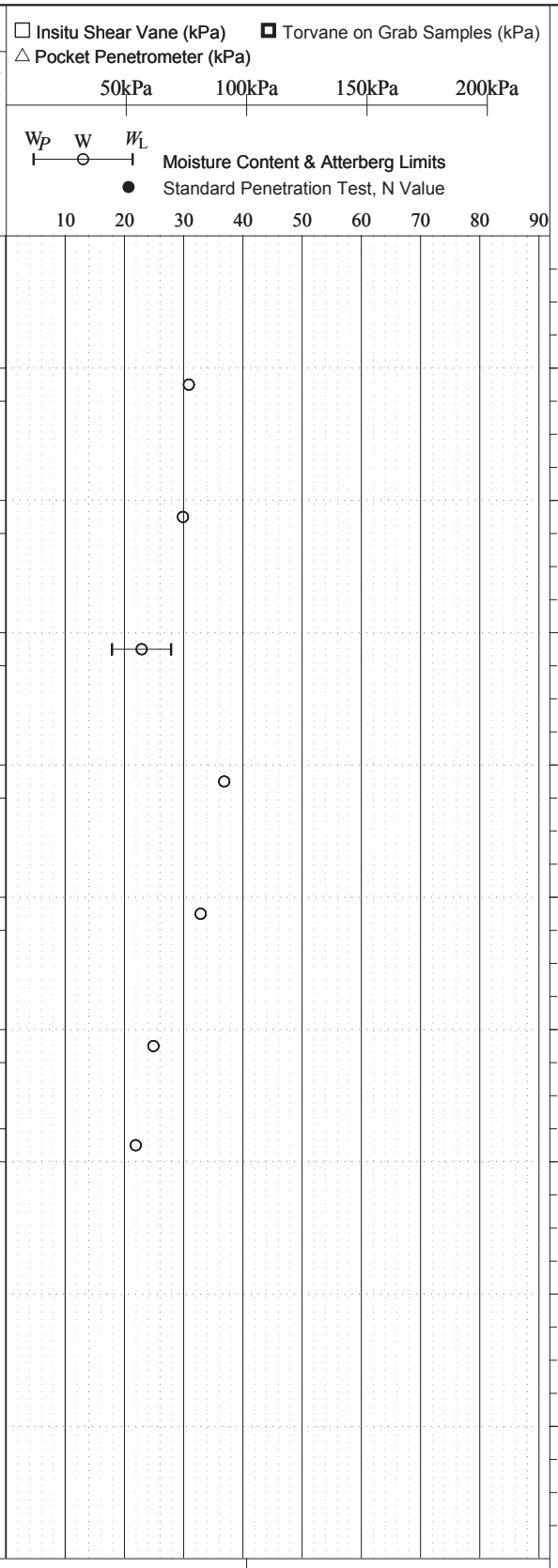
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Aikins St from Atlantic Ave to Carruthers Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	CH		Firm black fat CLAY (CH) with trace organic and trace fine sand	GS		31
				GS		30
	ML		Soft tan SILT (ML) Particle Size Analysis at 0.9 m: 0.7% Gravel, 6.3% Sand, 73.4% Silt, 19.6% Clay	GS		23
1	CH		Firm brown fat CLAY (CH)	GS		37
				GS		33
	ML		Soft tan SILT (ML)	GS		25
2				GS		22
			TESTHOLE LOCATION: 25.5 m North of Northeast corner Polson Avenue and Aikins Street, 2.0 m West of East curb. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			
3						



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

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TH04 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Aikins St from Atlantic Ave to Carruthers Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS	ASPHALT			
	CO	CONCRETE			
	CH	Firm black fat CLAY (CH) with trace organic and trace fine sand	GS		38
			GS		37
1			GS		30
			GS		30
			GS		32
	CL ML	Firm tan SILTY CLAY (CL-ML)	GS		32
2			GS		38
		TESTHOLE LOCATION: 42.0 m South of Southeast corner Inkster Boulevard and Aikins Street, 2.0 m West of East curb.			
		• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
		• Testhole terminated at a depth of 2.1 m.			
3					

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

△ Pocket Penetrometer (kPa)

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Standard Penetration Test, N Value

10 20 30 40 50 60 70 80 90

DEPTH (ft): 0 2 4 6 8 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

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TH05 TESTHOLE RECORD

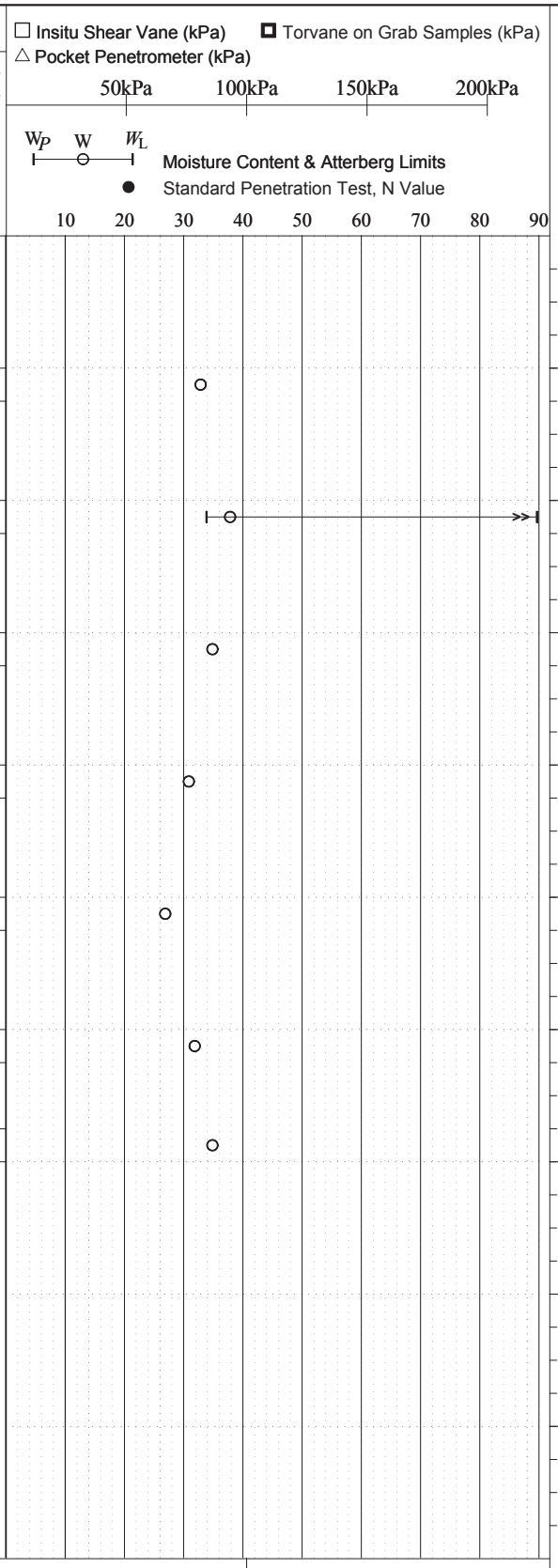
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Aikins St from Atlantic Ave to Carruthers Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	CH		Firm black fat CLAY (CH) with trace organic and trace fine sand	GS		33
			Particle Size Analysis at 0.6 m: 0.0% Gravel, 4.5% Sand, 24.3% Silt, 71.2% Clay	GS		38
1				GS		35
				GS		31
				GS		27
	CL ML		Firm tan SILTY CLAY (CL-ML)	GS		32
2				GS		35
			TESTHOLE LOCATION: 4.0 m South of Southwest corner Inkster Boulevard and Aikins Street, 2.0 m East of West curb.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			
3						



Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH06 TESTHOLE RECORD

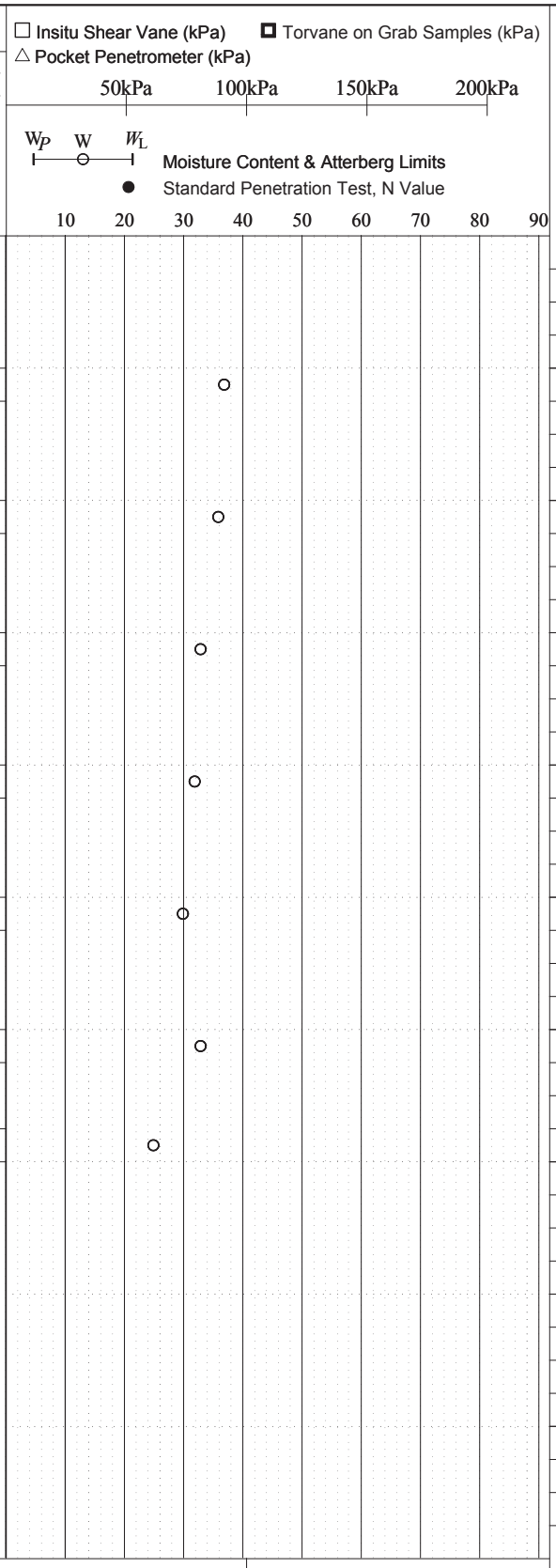
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Aikins St from Atlantic Ave to Carruthers Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	CH		Firm black fat CLAY (CH) with trace organic and trace fine sand	GS		37
				GS		36
1				GS		33
				GS		32
				GS		30
			brown below 1.7 m	GS		33
2				GS		25
			TESTHOLE LOCATION: 4.0 m North of Northeast corner Inkster Boulevard and Aikins Street, 1.5 m West of East curb.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			
3						



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

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TH07 TESTHOLE RECORD

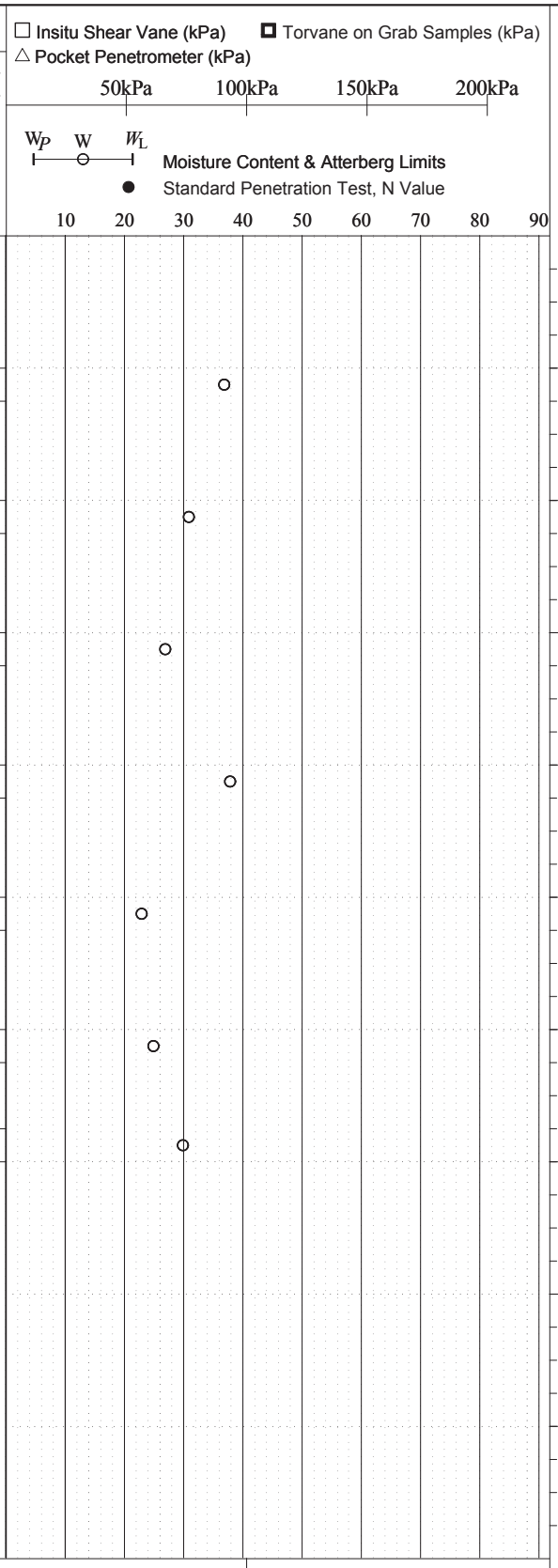
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Aikins St from Atlantic Ave to Carruthers Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	CH		Firm black fat CLAY (CH) with trace organic and trace fine sand	GS		37
				GS		31
1	ML		Soft tan SILT (ML)	GS		27
	CH		Firm brown fat CLAY (CH)	GS		38
	ML		Soft tan SILT (ML)	GS		23
				GS		25
2	CL ML		Firm brown SILTY CLAY (CL-ML)	GS		30
			TESTHOLE LOCATION: 21.5 m South of Southwest corner Lansdowne Avenue and Aikins Street, 2.0 m East of West curb.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
			• Testhole terminated at a depth of 2.1 m.			
3						



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

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TH08 TESTHOLE RECORD

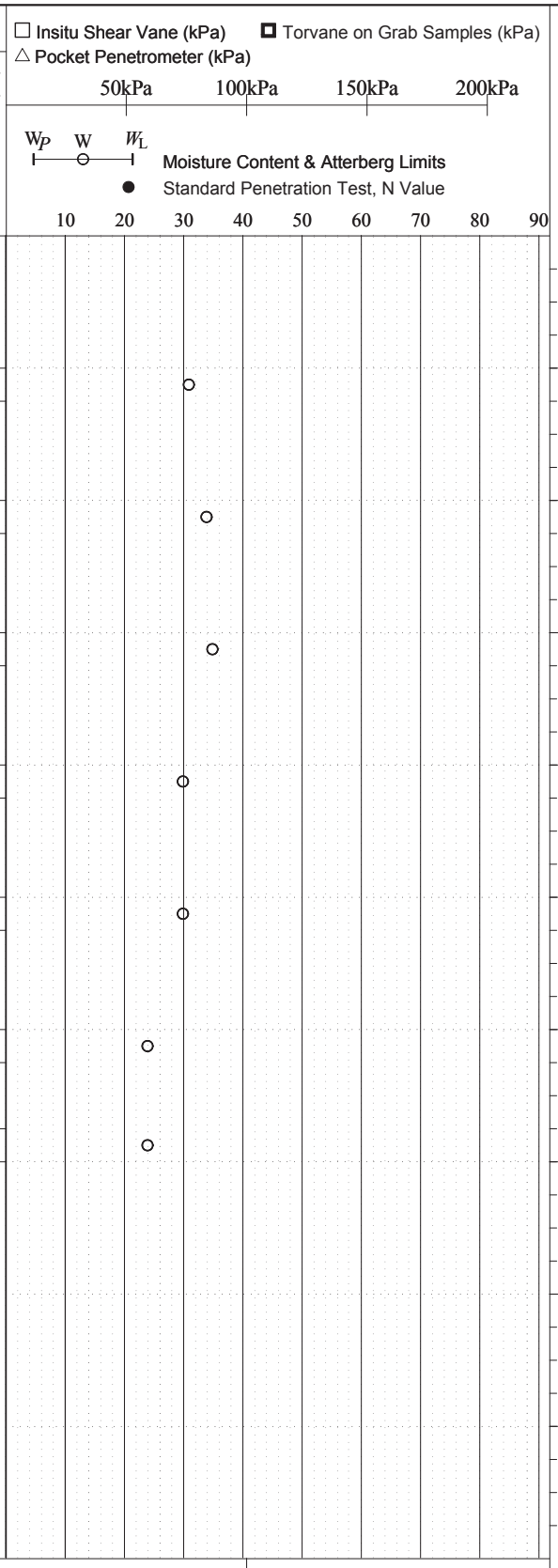
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Aikins St from Atlantic Ave to Carruthers Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
			Firm black fat CLAY (CH) with trace organic and trace fine sand	GS		31
				GS		34
1	CH			GS		35
				GS		30
			brown, trace silt below	GS		30
2	ML		Soft tan SILT (ML)	GS		24
				GS		24
			TESTHOLE LOCATION: 6.0 m North of Northwest corner Lansdowne Avenue and Aikins Street, 2.0 m East of West curb.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			
3						



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

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TH09 TESTHOLE RECORD

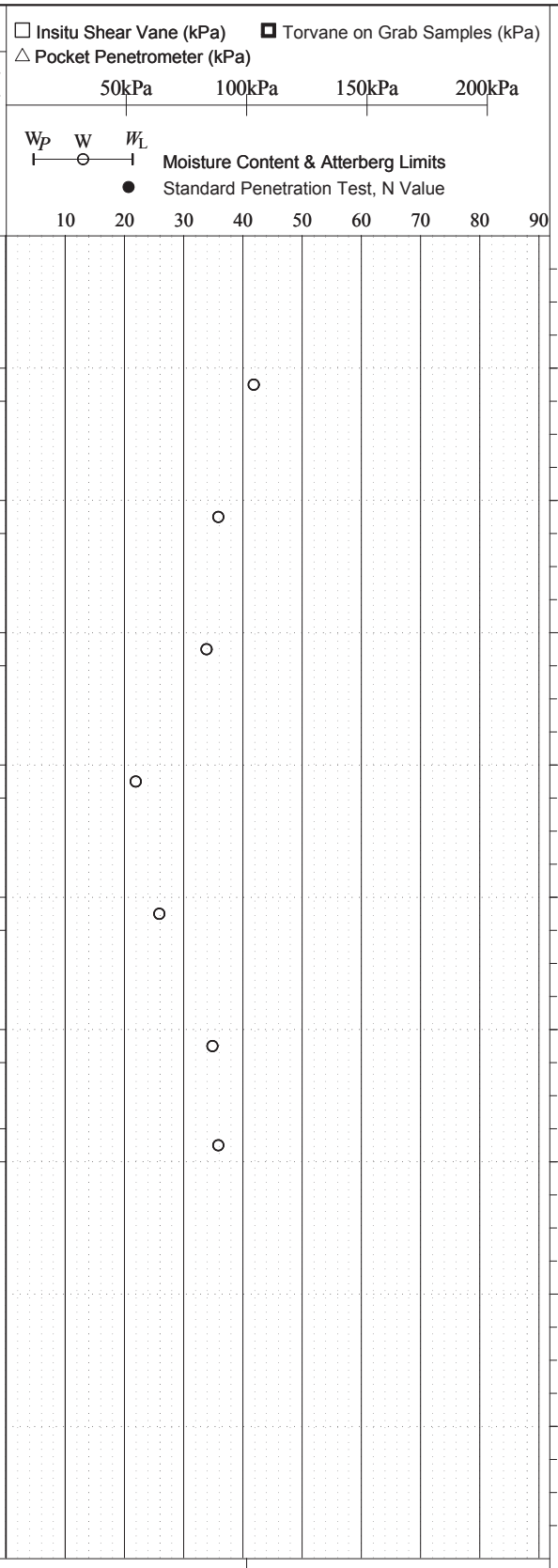
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Aikins St from Atlantic Ave to Carruthers Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	CH		Firm black fat CLAY (CH) with trace organic and trace fine sand	GS		42
				GS		36
1				GS		34
	ML		Soft tan SILT (ML)	GS		22
				GS		26
	CH		Firm brown fat CLAY (CH)	GS		35
2				GS		36
			TESTHOLE LOCATION: 3.0 m South of Southwest corner Carruthers Avenue and Aikins Street, 2.0 m East of West curb.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
			• Testhole terminated at a depth of 2.1 m.			
3						



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

Photo 1 – Core sample from Testhole TH01

Photo 2 – Core sample from Testhole TH02

Photo 3 – Core sample from Testhole TH03

Photo 4 – Core sample from Testhole TH04

Photo 5 – Core sample from Testhole TH05

Photo 6 – Core sample from Testhole TH06

Photo 7 – Core sample from Testhole TH07

Photo 8 – Core sample from Testhole TH08

Photo 9 – Core sample from Testhole TH09

Stantec

LABORATORY
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Tel 204 488 6999

PARTICLE SIZE ANALYSIS
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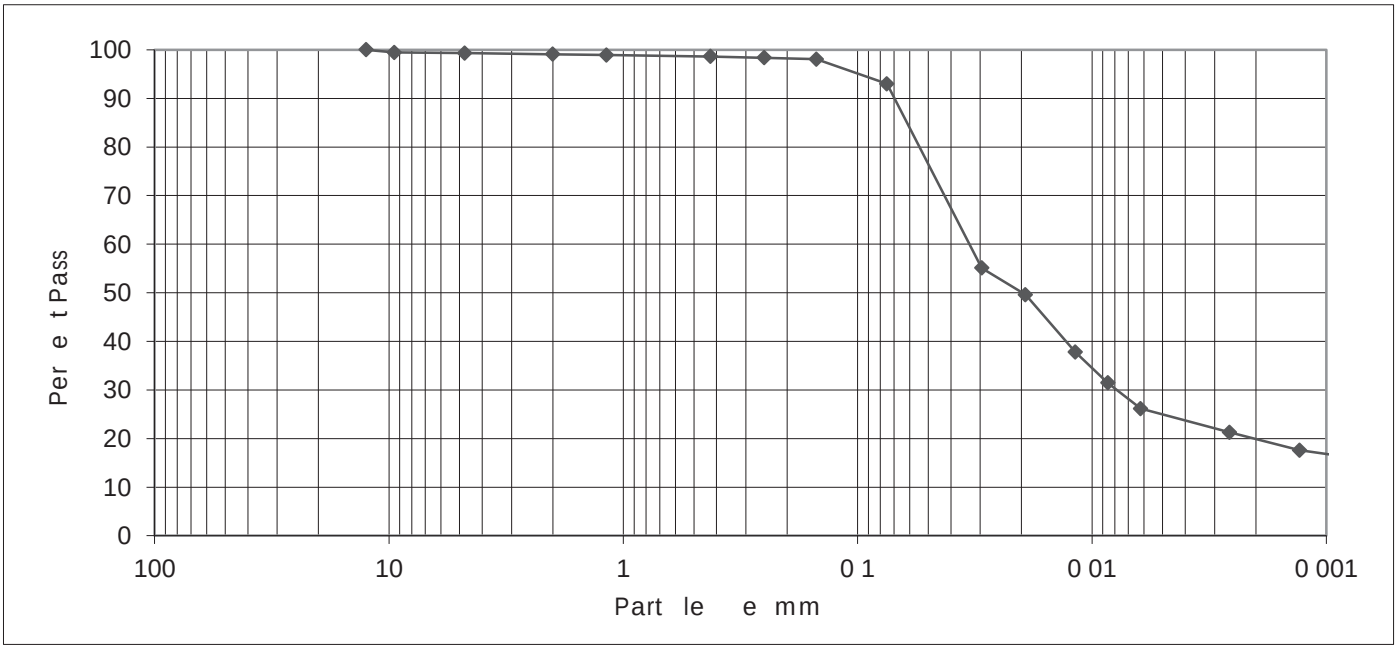

P TC	P C T P
37 50 mm	100 0
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19 00 mm	100 0
16 00 mm	100 0
12 50 mm	100 0
9 50 mm	99 4
4 75 mm	99 3
2 00 mm	99 1

P TC	P C T P
1 18 mm	98 9
0 425 mm	98 6
0 250 mm	98 4
0 150 mm	98 1
0 075 mm	93 0
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LABORATORY
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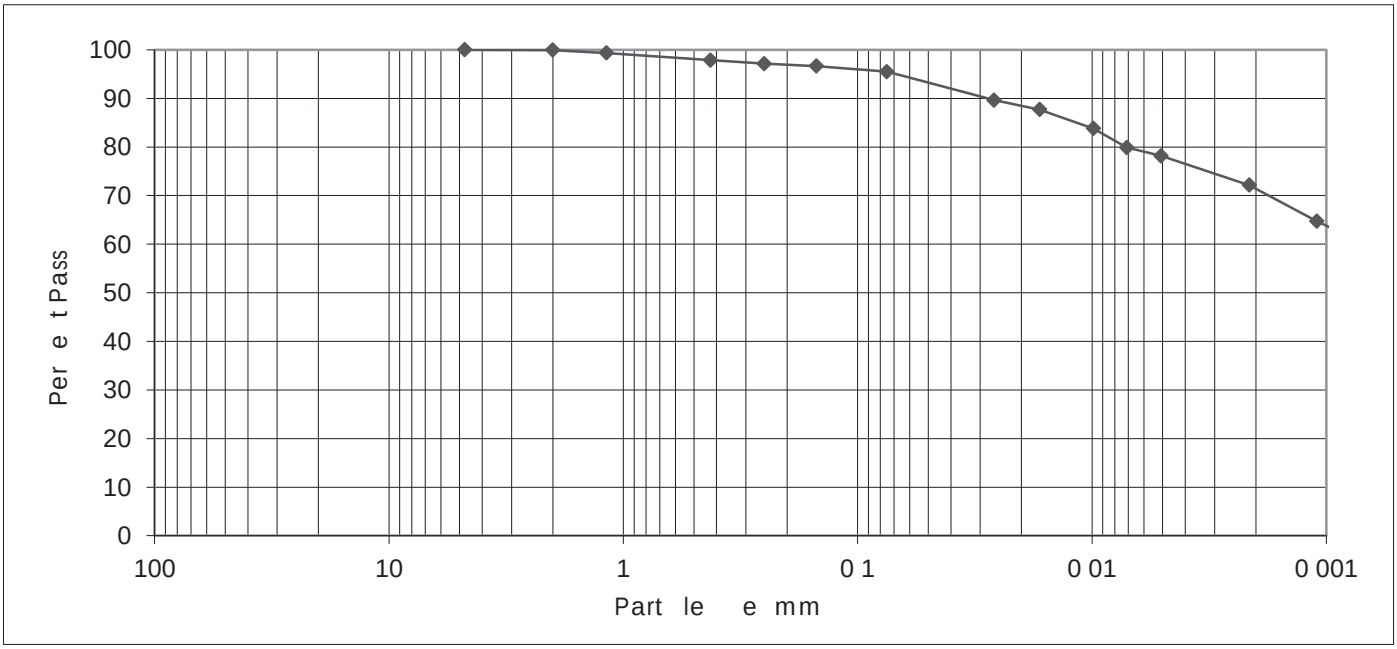

P TC	P C T P
37 50 mm	100 0
25 00 mm	100 0
19 00 mm	100 0
16 00 mm	100 0
12 50 mm	100 0
9 50 mm	100 0
4 75 mm	100 0
2 00 mm	99 9

P TC	P C T P
1 18 mm	99 4
0 425 mm	97 9
0 250 mm	97 2
0 150 mm	96 7
0 075 mm	95 5
0 005 mm	78 0
0 002 mm	71 2
0 001 mm	63 7

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2016 Residential Street Renewal Program

Geotechnical Investigation -
Carruthers Avenue from
Arlington Street to Parr Street

Prepared for:
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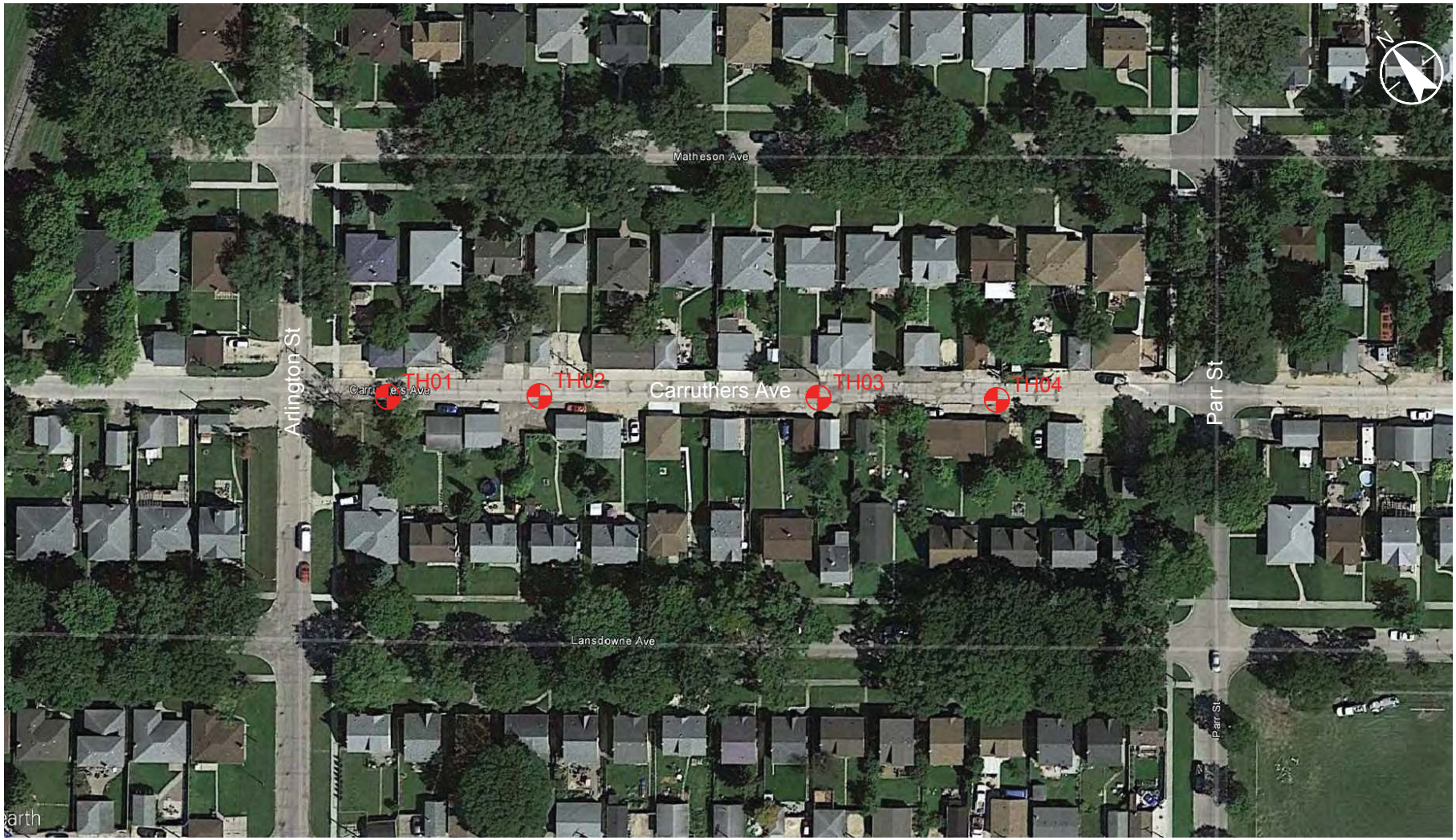

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123312305

ORIGINAL SHEET - ISO 8.5x11 H - v14.06

V:\1233\active\123312305\0300_drawing\testhole Location Plans\123305_carruthers_arlington_parr_thlp.dwg 1
2016/01/20 10:42 AM By: Bun, Sothea

Stantec

Stantec Consulting Ltd.
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Winnipeg MB Canada R3B 2B9
Tel. 204.489.5900 Fax. 204.453.9012
www.stantec.com

Legend

TESTHOLE

Notes

- IMAGE SOURCE: GOOGLE EARTH
- SITE: CARRUTHERS AVENUE FROM ARLINGTON STREET TO PARR STREET

Client/Project

CITY OF WINNIPEG

2016 RESIDENTIAL STREET RENEWAL PROGRAM
WINNIPEG, MB

Figure No.

1

Title

TESTHOLE LOCATION PLAN

TABLE 1
2016 RESIDENTIAL STREET RENEWAL PROGRAM
CARRUTHERS AVENUE FROM ARLINGTON STREET TO PARR STREET
GEOTECHNICAL INVESTIGATION

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure		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	Carruthers Avenue 15.0 m East of Southeast corner Carruthers Avenue and Arlington Street 1.0 m North of property line 697 Lansdowne Avenue	Concrete	175	-	-	Clay Fill	0.6	32	0.0	17.1	37.1	45.8	67	23	44
TH02	Carruthers Avenue 45.0 m East of Southeast corner Carruthers Avenue and Arlington Street 1.0 m North of property line 691 Lansdowne Avenue	Concrete	160	-	-	-	-	-	-	-	-	-	-	-	-
TH03	Carruthers Avenue 110.0 m East of Southeast corner Carruthers Avenue and Arlington Street 1.0 m North between property lines 671 and 675 Lansdowne Avenue	Asphalt Concrete	30 150	-	-	-	-	-	-	-	-	-	-	-	-
TH04	Carruthers Avenue 38.5 m West of Southwest corner Carruthers Avenue and Parr Street 1.0 m North of property line 661 Lansdowne Avenue	Concrete	135	-	-	Silty Clay	0.6	23	0.0	14.4	47.8	37.8	52	17	35

TH01 TESTHOLE RECORD

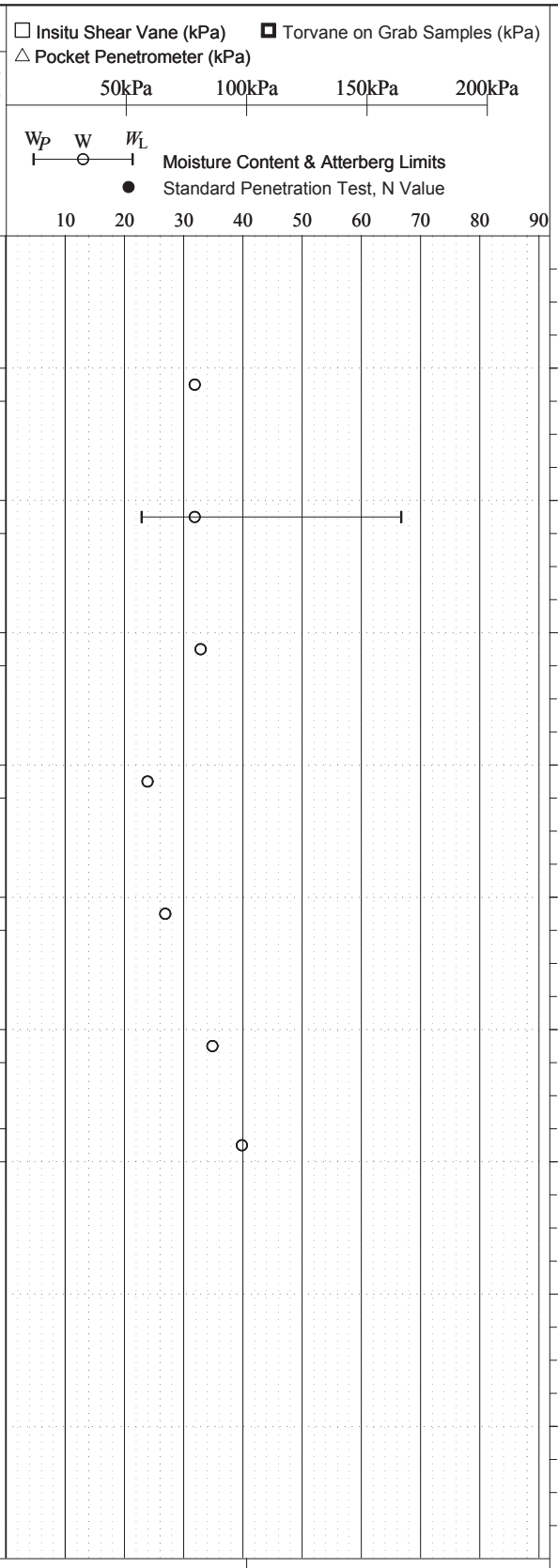
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Carruthers Ave from Arlington St and Parr St ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	CO		CONCRETE			
	FL		FILL: black silty clay with trace organic and some sand	GS		32
			Particle Size Analysis at 0.6 m: 0.0% Gravel, 17.1% Sand, 37.1% Silt, 45.8% Clay	GS		32
1				GS		33
	CL ML		Soft tan SILTY CLAY (CL-ML)	GS		24
				GS		27
	CH		Stiff brown fat CLAY (CH)	GS		35
2				GS		40
			TESTHOLE LOCATION: 15.0 m East of Southeast corner Carruthers Avenue and Arlington Street, 1.0 m North of property line 697 Lansdowne Avenue.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
			• Testhole terminated at a depth of 2.1 m.			
3						



Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH02 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Carruthers Ave from Arlington St and Parr St ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	CO	CONCRETE			
	FL	FILL: black silty clay with trace organic and some sand	GS		48
			GS		31
1	CL ML	Soft tan SILTY CLAY (CL-ML)	GS		27
			GS		27
	CH	Stiff brown fat CLAY (CH)	GS		32
2			GS		40
			GS		39
		TESTHOLE LOCATION: 45.0 m East of Southeast corner Carruthers Avenue and Arlington Street, 1.0 m North of property line 691 Lansdowne Avenue. NOTE: Testhole location moved due to overhead lines. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			
3					

☐ Insitu Shear Vane (kPa) ■ Torvane on Grab Samples (kPa)
△ Pocket Penetrometer (kPa)

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Standard Penetration Test, N Value

10 20 30 40 50 60 70 80 90

DEPTH (ft): 0 2 4 6 8 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH03 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Carruthers Ave from Arlington St and Parr St ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	FL		FILL: black silty clay with trace organic and some sand	GS		39
	CL ML		Soft brown SILTY CLAY (CL-ML)	GS		23
1				GS		29
	CH		Firm brown fat CLAY (CH)	GS		36
				GS		38
				GS		44
2				GS		43
			TESTHOLE LOCATION: 110.0 m East of Southeast corner Carruthers Avenue and Arlington Street, 1.0 m North between property lines 671 and 675 Lansdowne Avenue.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
3			• Testhole terminated at a depth of 2.1 m.			

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

△ Pocket Penetrometer (kPa)

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Standard Penetration Test, N Value

10 20 30 40 50 60 70 80 90

DEPTH (ft): 0 2 4 6 8 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH04 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Carruthers Ave from Arlington St and Parr St ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	CO		CONCRETE			
	FL		FILL: black silty clay with trace organic and some sand	GS		30
	CL ML		Soft tan SILTY CLAY (CL-ML) Particle Size Analysis at 0.6 m: 0.0% Gravel, 14.4% Sand, 47.8% Silt, 37.8% Clay	GS		23
1				GS		26
				GS		28
	CH		Firm brown fat CLAY (CH)	GS		34
2				GS		35
				GS		40
			TESTHOLE LOCATION: 38.5 m West of Southwest corner Carruthers Avenue and Parr Street, 1.0 m North of property line 661 Lansdowne Avenue. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			
3						

☐ Insitu Shear Vane (kPa) ■ Torvane on Grab Samples (kPa)
△ Pocket Penetrometer (kPa)

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Standard Penetration Test, N Value

10 20 30 40 50 60 70 80 90

DEPTH (ft): 0 2 4 6 8 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

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Photo 1 – Core sample from Testhole TH01

Photo 2 – Core sample from Testhole TH02

Photo 3 – Core sample from Testhole TH03

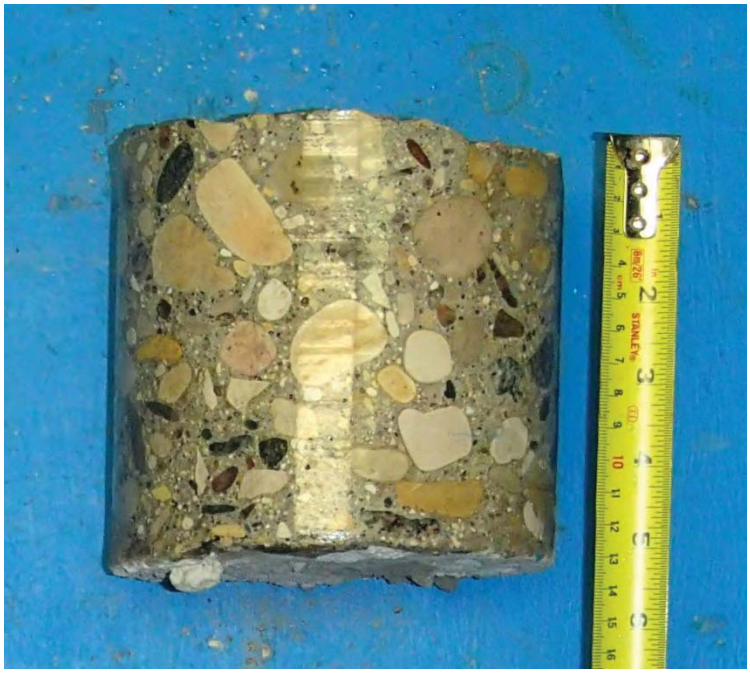


Photo 4 – Core sample from Testhole TH04

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

PARTICLE SIZE ANALYSIS
ASTM D422

City of Winnipeg
Engineering Division, Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

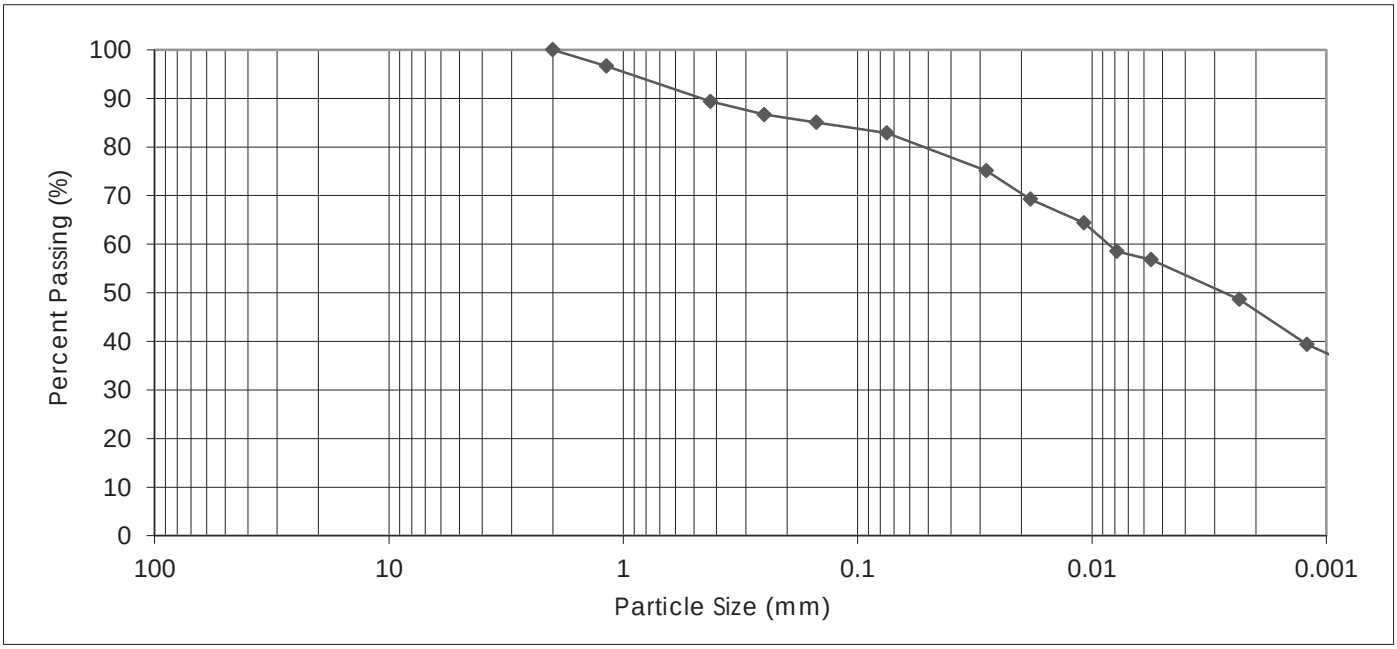
PROJECT: 2016 Residential Street Renewal Program
Carruthers Avenue from Arlington
Street to Parr Street

Attention: Brad Besyk

PROJECT NO.: 123312305

SAMPLED BY: Nestor Abarca
SAMPLE ID: TH01 @ 0.6 m

DATE RECEIVED: January 12, 2016
TESTED BY: Larry Presado, 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	100.0

PARTICLE SIZE	PERCENT PASSING
1.18 mm	96.7
0.425 mm	89.4
0.250 mm	86.7
0.150 mm	85.1
0.075 mm	82.9
0.005 mm	55.3
0.002 mm	45.8
0.001 mm	37.4

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	0.0	10.6	6.5	37.1	45.8	37.4

REPORT DATE: January 18, 2016

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

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

PARTICLE SIZE ANALYSIS
ASTM D422

City of Winnipeg
Engineering Division, Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

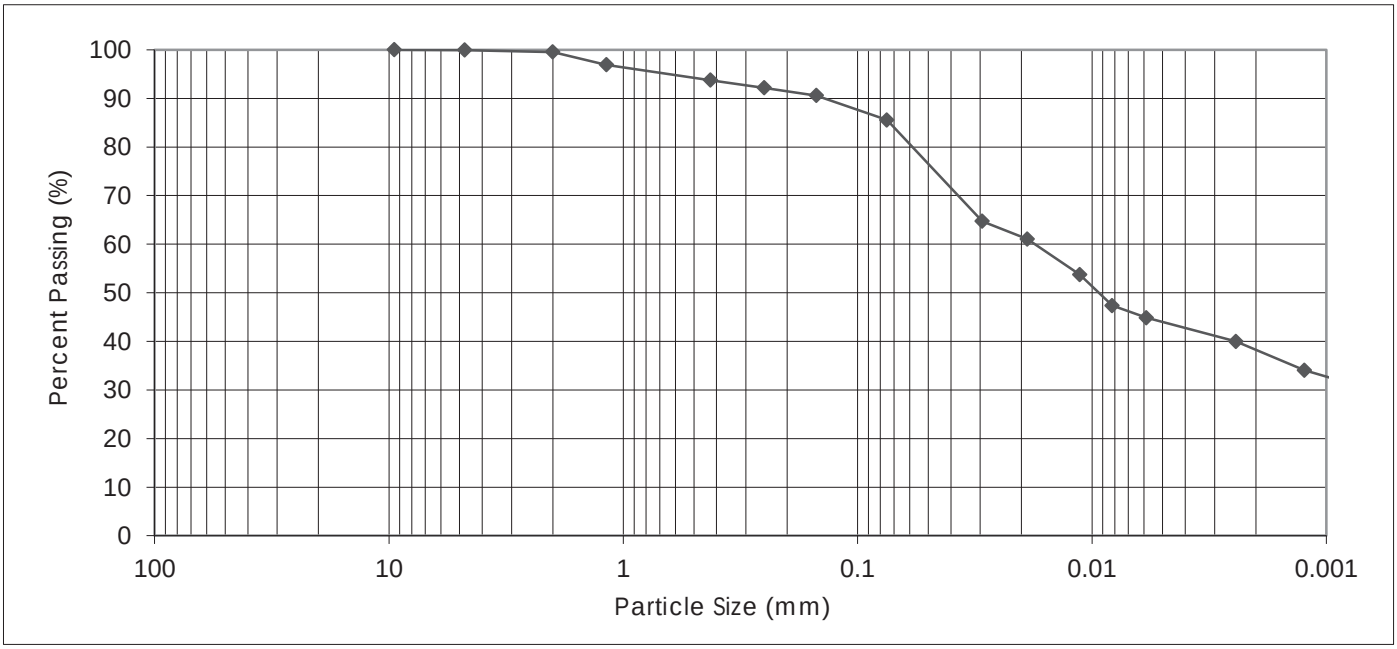
PROJECT: 2016 Residential Street Renewal Program
Carruthers Avenue from Arlington Street to Parr Street

Attention: Brad Besyk

PROJECT NO.: 123312305

SAMPLED BY: Nestor Abarca
SAMPLE ID: TH04 @ 0.6 m

DATE RECEIVED: January 12, 2016
TESTED BY: Larry Presado, 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	99.6

PARTICLE SIZE	PERCENT PASSING
1.18 mm	96.9
0.425 mm	93.8
0.250 mm	92.2
0.150 mm	90.6
0.075 mm	85.6
0.005 mm	43.6
0.002 mm	37.8
0.001 mm	32.7

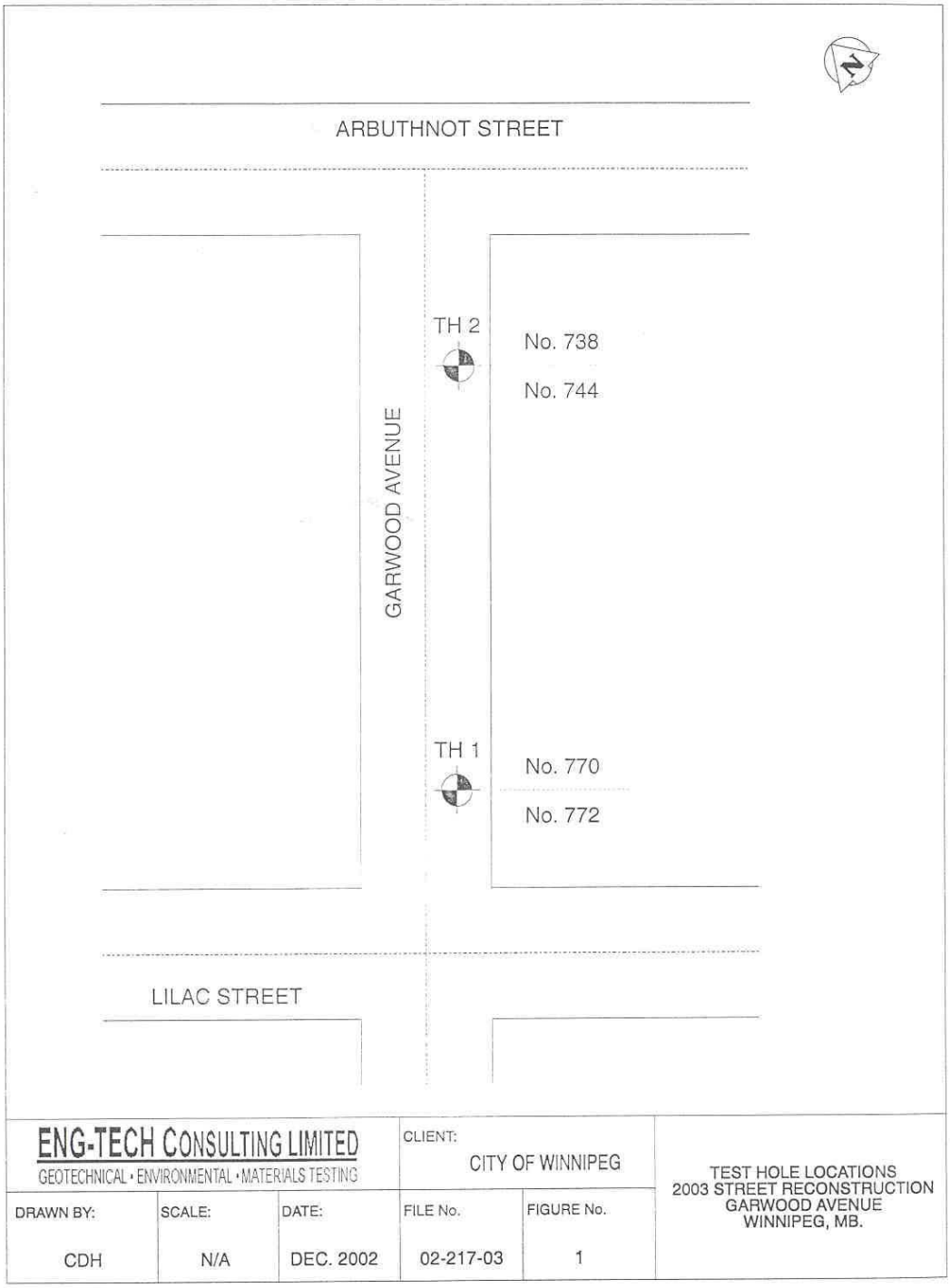
Gravel, % 75 to 4.75 mm	Sand, %			Silt, % <0.075 to 0.002 mm	Clay, % <0.002 mm	Colloids, % < 0.001 mm
	Coarse <4.75 to 2.0 mm	Medium <2.0 to 0.425 mm	Fine <0.425 to 0.075 mm			
0.0	0.4	5.8	8.2	47.8	37.8	32.7

REPORT DATE: January 18, 2016

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

Geotechnical Report for ^

Test Hole Locations



2016 Residential Street Renewal Program

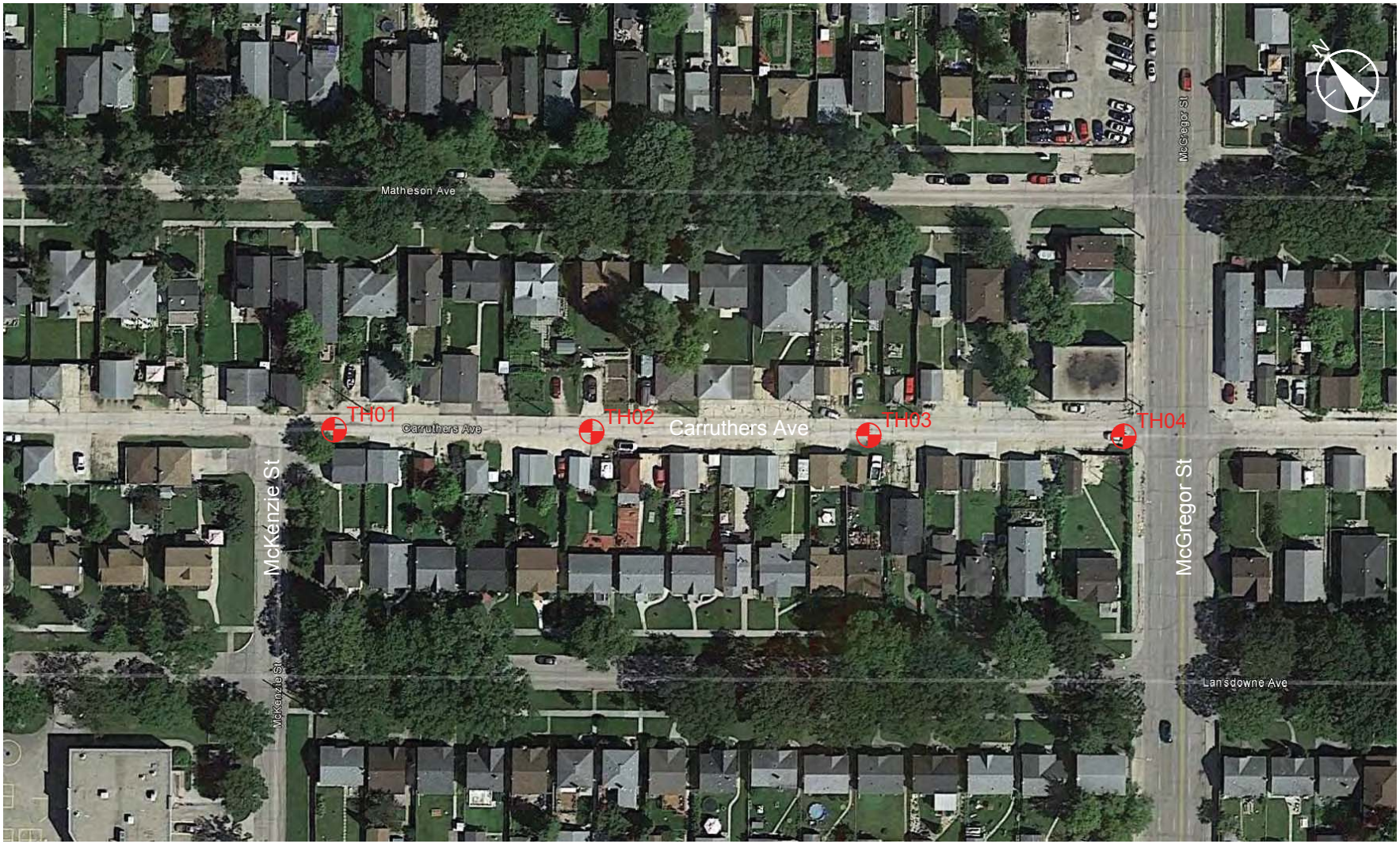
Geotechnical Investigation - Carruthers Avenue from McKenzie Street to McGregor Street

Prepared for:
City of Winnipeg
Engineering Division
Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

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

Project No. 123312305

January 21, 2016



January, 2016
123312305

ORIGINAL SHEET - ISO 8.5x11 H - v14.06

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2016/01/20 5:06 PM By: Bun, Sothea

Stantec

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Legend

TESTHOLE

Notes

- IMAGE SOURCE: GOOGLE EARTH
- SITE: CARRUTHERS AVENUE FROM MCKENZIE AVENUE TO MCGREGOR AVENUE

Client/Project

CITY OF WINNIPEG

2016 RESIDENTIAL STREET RENEWAL PROGRAM
WINNIPEG, MB

Figure No.

1

Title

TESTHOLE LOCATION PLAN

TABLE 1
2016 RESIDENTIAL STREET RENEWAL PROGRAM
CARRUTHERS AVENUE FROM MCKENZIE STREET TO MCGREGOR STREET
GEOTECHNICAL INVESTIGATION

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure		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	Carruthers Avenue 5.5 m East of Southeast corner of Carruthers Avenue and McKenzie Street 1.0 m North of property line 597 Lansdowne Avenue	Concrete	155	-	-	Clay	0.9	33	0.0	10.2	24.8	65.0	84	26	58
TH02	Carruthers Avenue 123.0 m West of Southwest corner Carruthers Avenue and McGregor Street 1.0 m North of property line 581 Lansdowne Avenue	Concrete	140	-	-	Silt	0.9	18	0.0	5.3	82.8	11.9	24	17	7
TH03	Carruthers Avenue 62.0 m West of Southwest corner Carruthers Avenue and McGregor Street 1.0 m North of property line 565 Lansdowne Avenue	Concrete	165	-	-	-	-	-	-	-	-	-	-	-	-
TH04	Carruthers Avenue 6.0 m West of Southwest corner Carruthers Avenue and McGregor Street 1.0 m North of property line 551 Lansdowne Avenue	Concrete	170	-	-	-	-	-	-	-	-	-	-	-	-

TH01 TESTHOLE RECORD

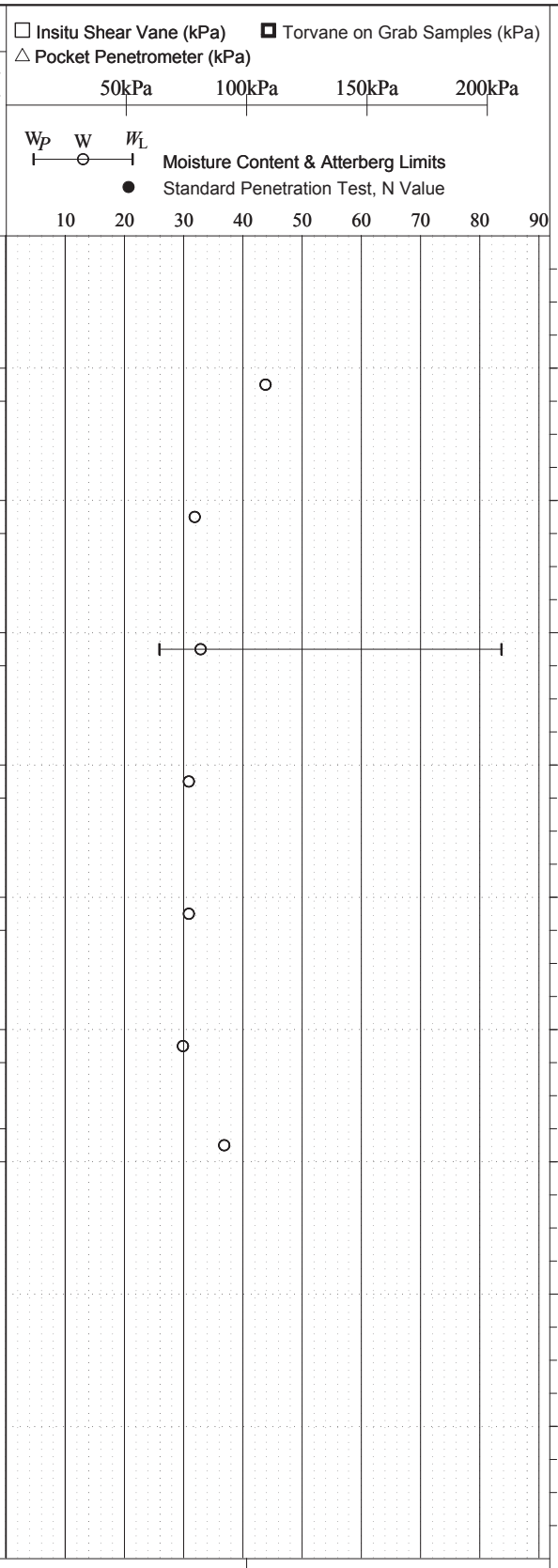
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Carruthers Ave from McKenzie St to McGregor St ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	CO	CONCRETE			
	FL	FILL: black clay with trace organic	GS		44
			GS		32
1	CH	Firm brown fat CLAY (CH) with some sand and silt Particle Size Analysis at 0.9 m: 0.0% Gravel, 10.2% Sand, 24.8% Silt, 65.0% Clay	GS		33
			GS		31
			GS		31
2	CL ML	Firm brown SILTY CLAY (CL-ML)	GS		30
			GS		37
3		TESTHOLE LOCATION: 5.5 m East of Southeast corner Carruthers Avenue and McKenzie Street, 1.0 m North of property line 597 Lansdowne Avenue. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH02 TESTHOLE RECORD

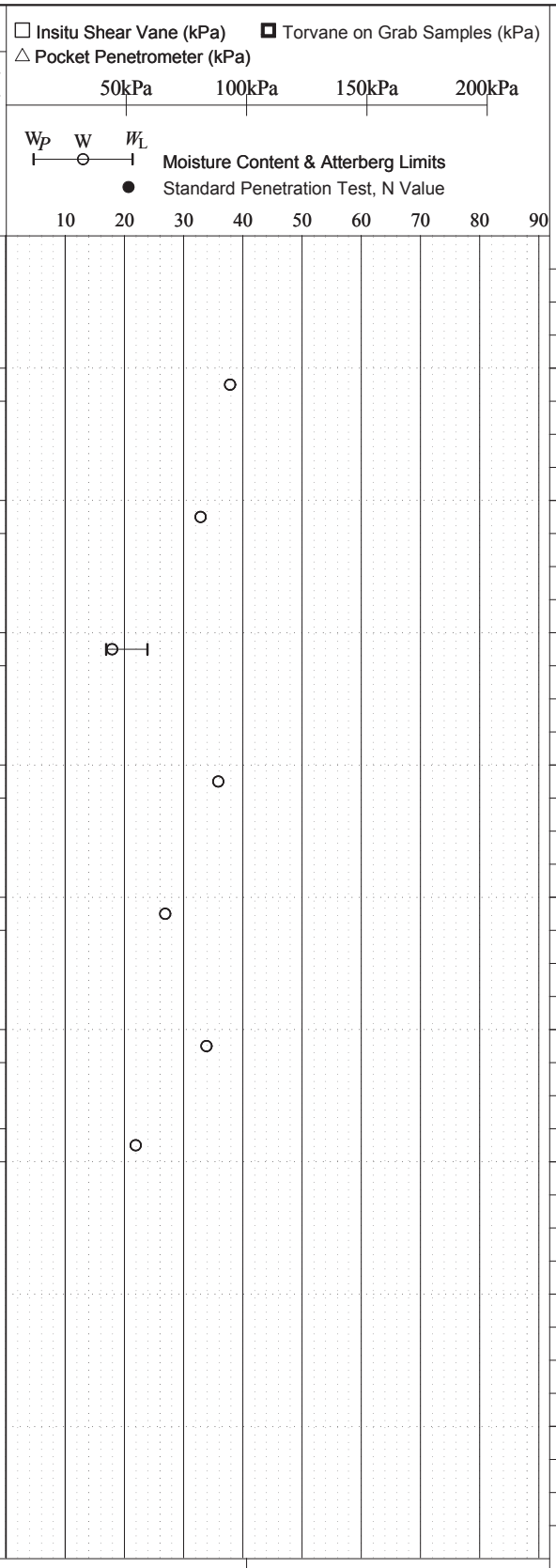
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Carruthers Ave from McKenzie St to McGregor St ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	CO	CONCRETE			
	FL	FILL: black clay with trace organic	GS		38
	ML	Soft tan SILT (ML) with trace sand and some clay	GS		33
1	ML	Particle Size Analysis at 0.9 m: 0.0% Gravel, 5.3% Sand, 82.8% Silt, 11.9% Clay	GS		18
	CH	Firm brown fat CLAY (CH) with some sand and silt	GS		36
	CH		GS		27
	CH		GS		34
2	ML	Soft tan SILT (ML)	GS		22
		TESTHOLE LOCATION: 123.0 m West of Southwest corner Carruthers Avenue and McGregor Street, 1.0 m North of property line 581 Lansdowne Avenue.			
		• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
		• Testhole terminated at a depth of 2.1 m.			
3					



Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH03 TESTHOLE RECORD

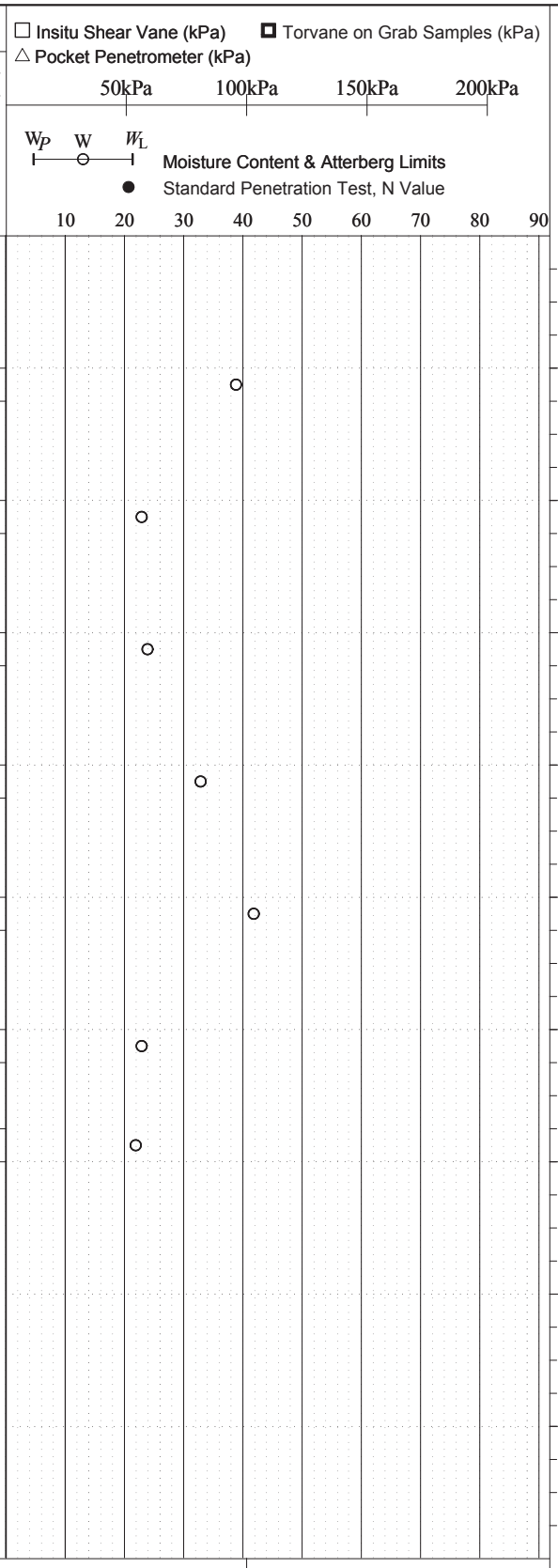
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Carruthers Ave from McKenzie St to McGregor St ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	CO	CONCRETE			
	FL	FILL: black clay with trace organic	GS		39
			GS		23
	ML	Soft tan SILT (ML) with trace sand and some clay			
1	CH	Firm brown fat CLAY (CH) with some sand and silt	GS		24
			GS		33
			GS		42
2	ML	Soft tan SILT (ML)	GS		23
			GS		22
		TESTHOLE LOCATION: 62.0 m West of Southwest corner Carruthers Avenue and McGregor Street, 1.0 m North of property line 565 Lansdowne Avenue.			
		• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
3		• Testhole terminated at a depth of 2.1 m.			



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH04 TESTHOLE RECORD

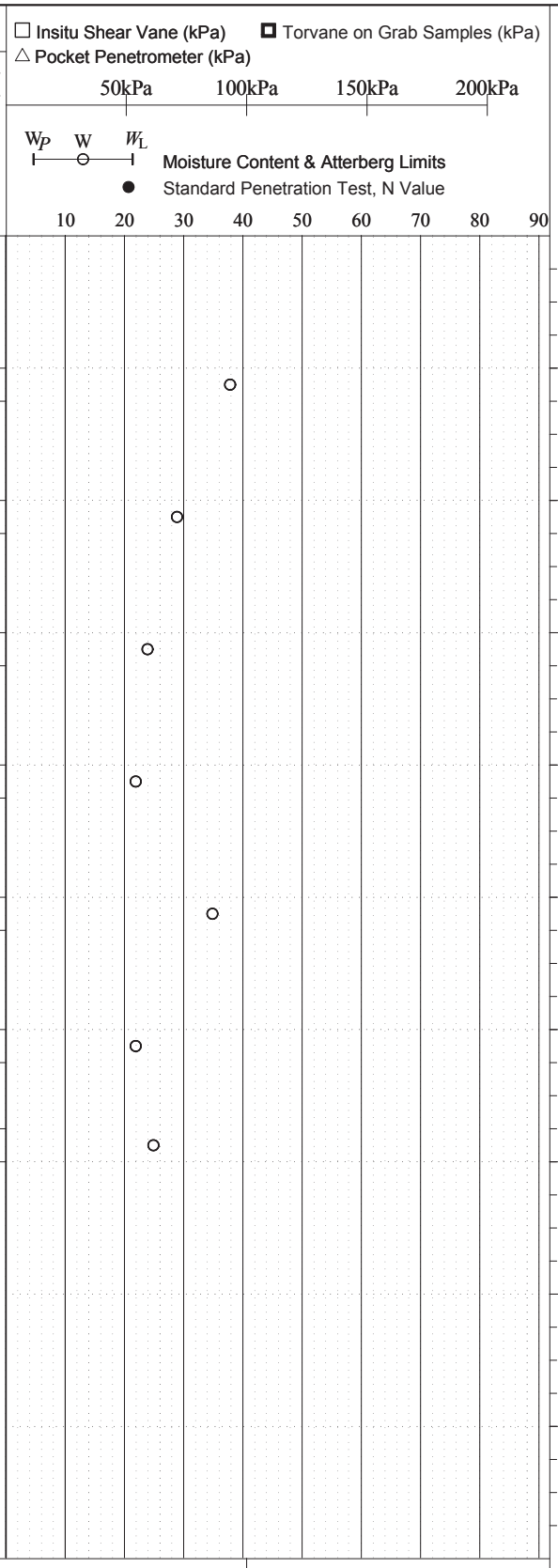
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Carruthers Ave from McKenzie St to McGregor St ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	CO		CONCRETE			
	FL		FILL: black clay with trace organic	GS		38
				GS		29
	ML		Soft tan SILT (ML) with trace sand and some clay	GS		24
1				GS		22
	CH		Firm brown fat CLAY (CH) with some sand and silt	GS		35
	ML		Soft tan SILT (ML)	GS		22
2				GS		25
			TESTHOLE LOCATION: 6.0 m West of Southwest corner Carruthers Avenue and McGregor Street, 1.0 m North of property line 551 Lansdowne Avenue. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			
3						



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

Photo 1 – Core sample from Testhole TH01

Photo 2 – Core sample from Testhole TH02

Photo 3 – Core sample from Testhole TH03

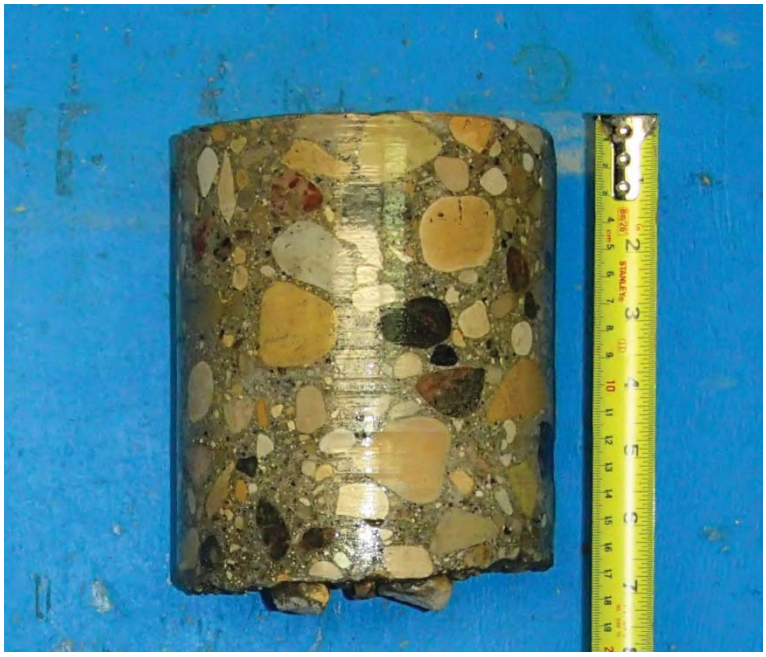


Photo 4 – Core sample from Testhole TH04

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

PARTICLE SIZE ANALYSIS
ASTM D422

City of Winnipeg
Engineering Division, Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

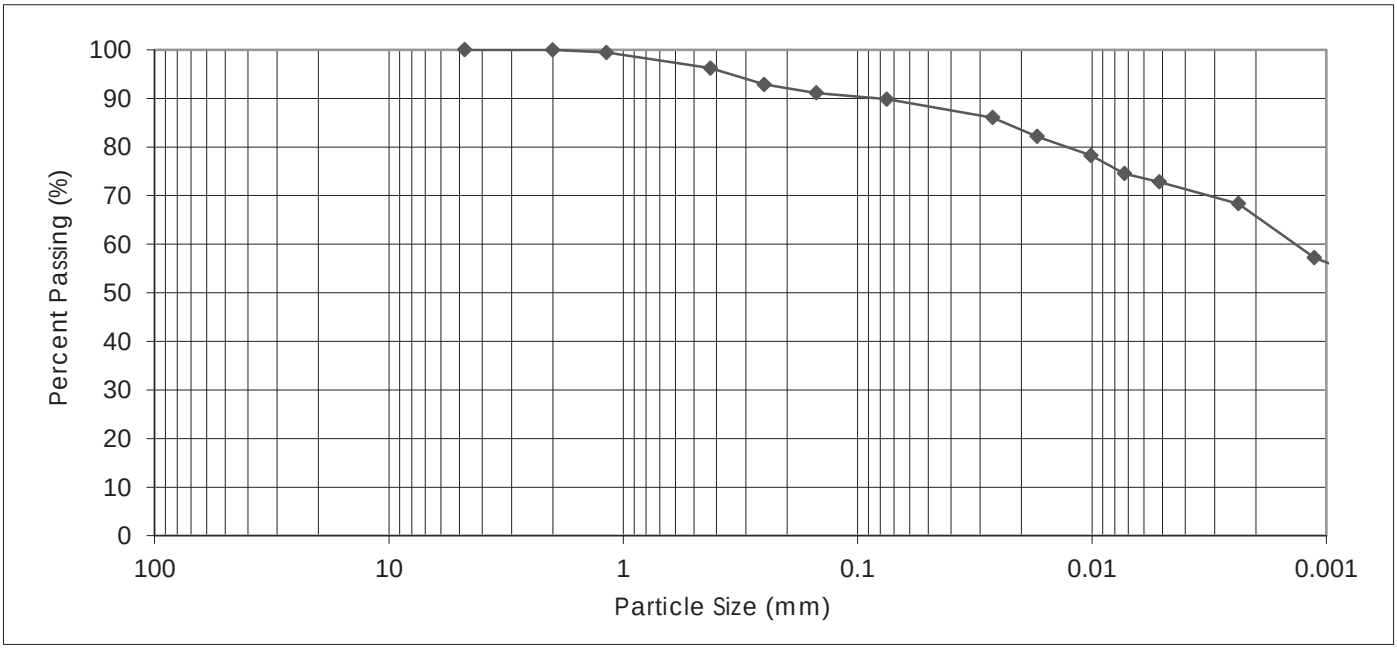
PROJECT: 2016 Residential Street Renewal Program
Carruthers Avenue from McKenzie Street to McGregor Street

Attention: Brad Besyk

PROJECT NO.: 123312305

SAMPLED BY: Nestor Abarca
SAMPLE ID: TH01 @ 0.9 m

DATE RECEIVED: January 12, 2016
TESTED BY: Larry Presado, 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	100.0

PARTICLE SIZE	PERCENT PASSING
1.18 mm	99.5
0.425 mm	96.2
0.250 mm	92.9
0.150 mm	91.1
0.075 mm	89.8
0.005 mm	72.6
0.002 mm	65.0
0.001 mm	56.2

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	0.0	3.8	6.4	24.8	65.0	56.2

REPORT DATE: January 18, 2016

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

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

PARTICLE SIZE ANALYSIS
ASTM D422

City of Winnipeg
Engineering Division, Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

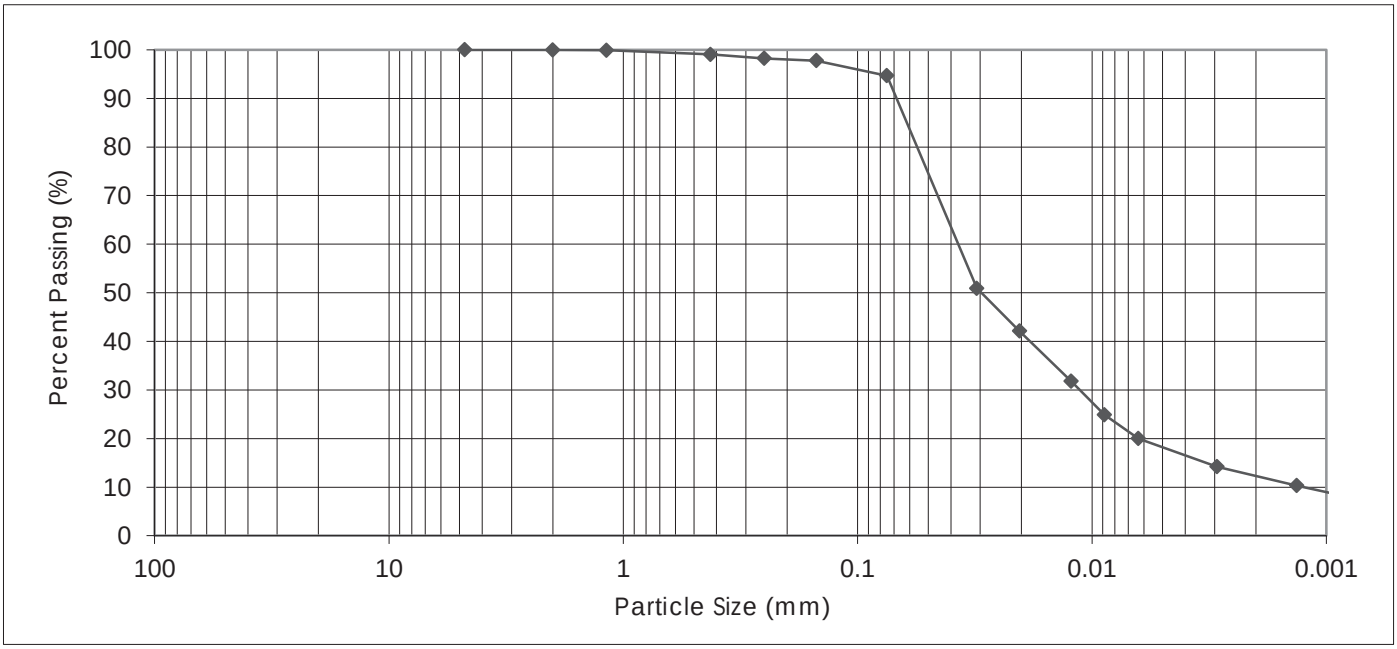
PROJECT: 2016 Residential Street Renewal Program
Carruthers Avenue from McKenzie Street to McGregor Street

Attention: Brad Besyk

PROJECT NO.: 123312305

SAMPLED BY: Nestor Abarca
SAMPLE ID: TH02 @ 0.9 m

DATE RECEIVED: January 12, 2016
TESTED BY: Larry Presado, 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	100.0

PARTICLE SIZE	PERCENT PASSING
1.18 mm	99.9
0.425 mm	99.1
0.250 mm	98.3
0.150 mm	97.8
0.075 mm	94.7
0.005 mm	17.7
0.002 mm	11.9
0.001 mm	9.0

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			
0.0	0.0	0.9	4.4	82.8	11.9	9.0

REPORT DATE: January 18, 2016

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

2016 Residential Street Renewal Program

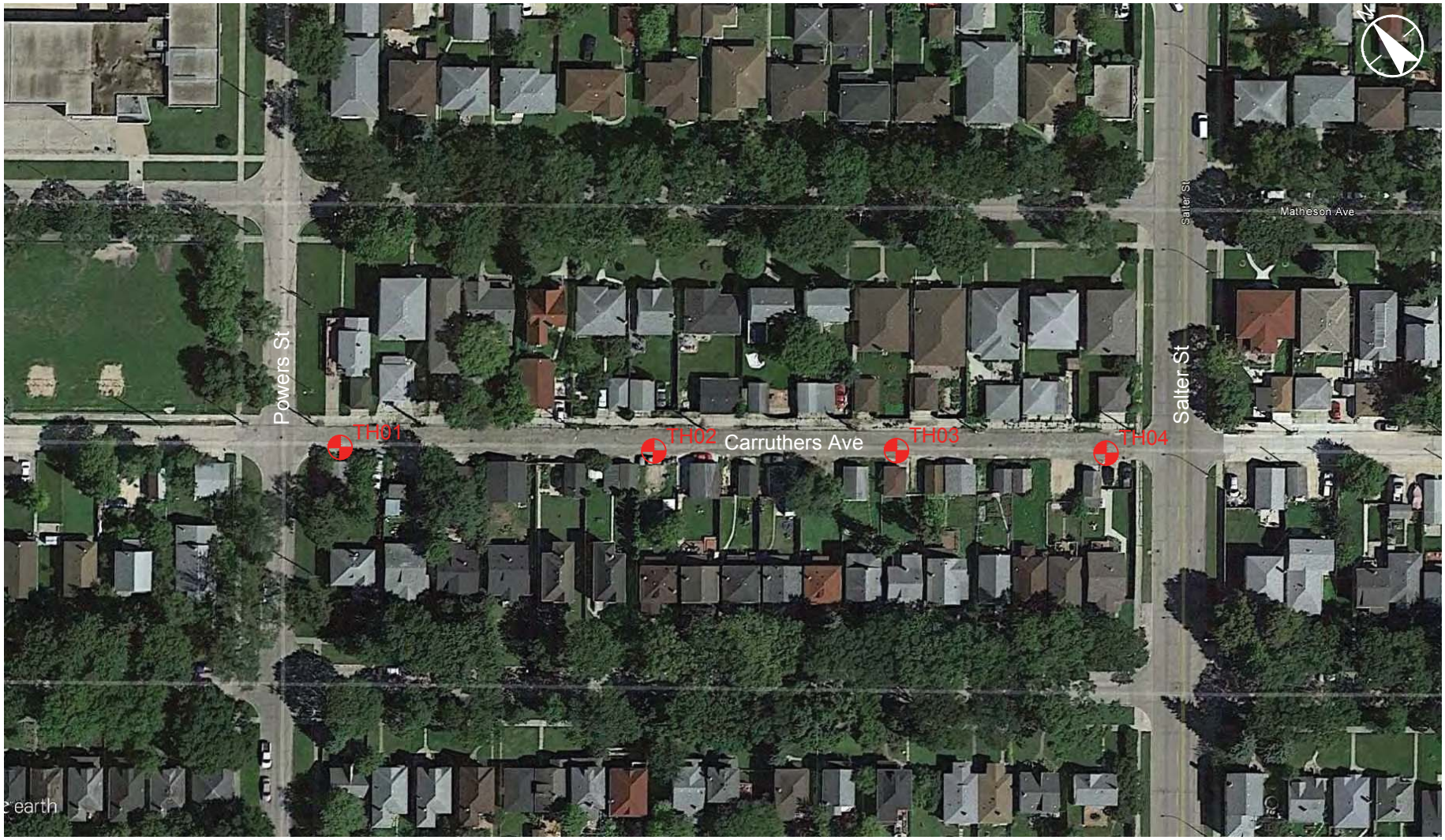
Geotechnical Investigation - Carruthers Avenue from Powers Street to Salter Street

Prepared for:
City of Winnipeg
Engineering Division
Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

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

Project No. 123312305

January 21, 2016



January, 2016
123312305

ORIGINAL SHEET - ISO 8.5x11 H - v14.06

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2016/01/20 11:29 AM By: Bun, Sothea

Stantec

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

Legend

TESTHOLE

Notes

- IMAGE SOURCE: GOOGLE EARTH
- SITE: CARRUTHERS AVENUE FROM POWERS STREET TO SALTER STREET

Client/Project

CITY OF WINNIPEG

2016 RESIDENTIAL STREET RENEWAL PROGRAM
WINNIPEG, MB

Figure No.

1

Title

TESTHOLE LOCATION PLAN

TABLE 1
2016 RESIDENTIAL STREET RENEWAL PROGRAM
CARRUTHERS AVENUE FROM POWERS STREET TO SALTER STREET
GEOTECHNICAL INVESTIGATION

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure		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	Carruthers Avenue 9.5 m East of Southeast Carruthers Avenue and Powers Street 1.0 m North of property line 375 Lansdowne Avenue	Asphalt Concrete	35 300	-	-	Clayey Silt	0.9	25	0.3	8.2	62.2	28.9	33	16	17
TH02	Carruthers Avenue 80.5 m East of Southeast corner Carruthers Avenue and Powers Street 1.0 m North of property line 359 Lansdowne Avenue	Asphalt Concrete	20 170	-	-	-	-	-	-	-	-	-	-	-	-
TH03	Carruthers Avenue 132.5 m East of Southeast corner Carruthers Avenue and Powers Street 1.0 m North of property line 347 Lansdowne Avenue	Asphalt Concrete	30 260	-	-	Clay	0.6	32	0.0	5.1	28.4	66.5	83	25	58
TH04	Carruthers Avenue 11.0 m West of Southwest corner Carruthers Avenue and Salter Street 1.0 m North of property line 337 Lansdowne Avenue	Asphalt Concrete	30 200	-	-	-	-	-	-	-	-	-	-	-	-

TH01 TESTHOLE RECORD

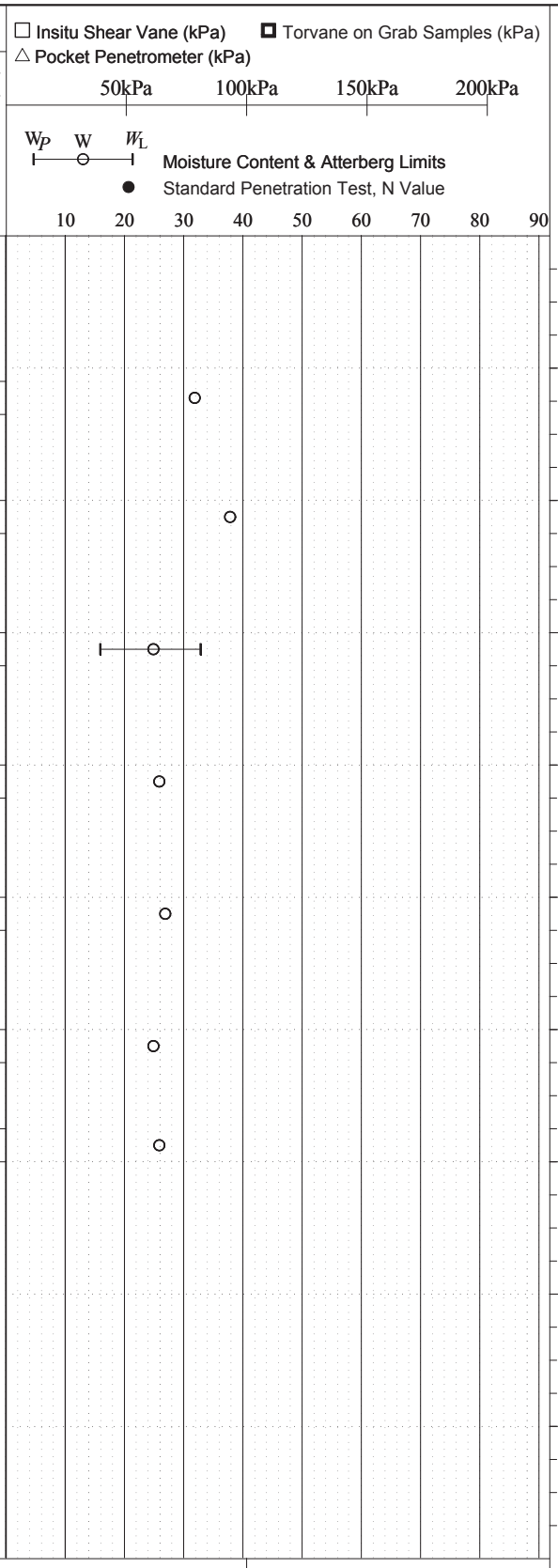
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Carruthers Ave from Powers St and Salter St ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	CH		Black firm fat CLAY (CH) with trace organic and sand, some silt	GS		32
				GS		38
	ML		Soft tan CLAYEY SILT (ML) with trace sand			
1			Particle Size Analysis at 0.9 m: 0.3% Gravel, 8.2% Sand, 62.2% Silt, 28.9% Clay	GS		25
				GS		26
				GS		27
2				GS		25
				GS		26
			TESTHOLE LOCATION: 9.5 m East of Southeast corner Carruthers Avenue and Powers Street, 1.0 m North of property line 375 Lansdowne Avenue.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			
3						



Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH02 TESTHOLE RECORD

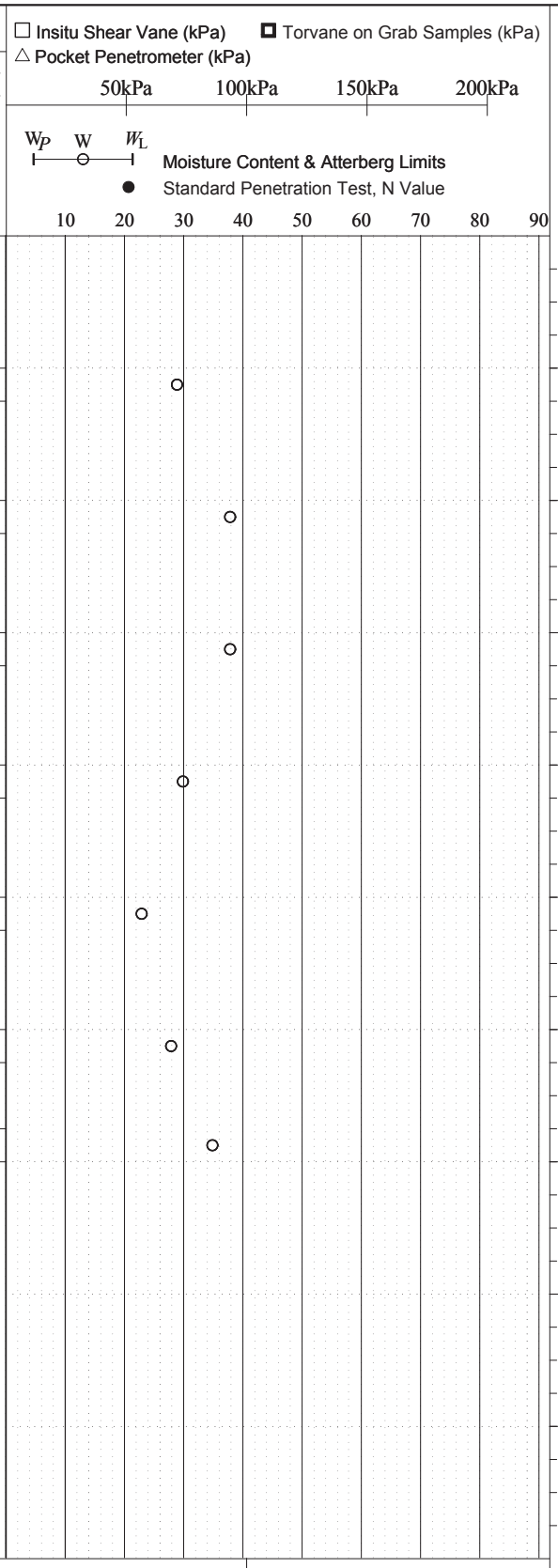
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Carruthers Ave from Powers St and Salter St ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	CH		Black firm fat CLAY (CH) with trace organic and sand, some silt	GS		29
				GS		38
1				GS		38
				GS		30
	ML		Soft tan CLAYEY SILT (ML) with trace sand	GS		23
	CL ML		Firm brown SILTY CLAY (CL-ML)	GS		28
2				GS		35
			TESTHOLE LOCATION: 80.5 m East of Southeast corner Carruthers Avenue and Powers Street, 1.0 m North of property line 359 Lansdowne Avenue.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
			• Testhole terminated at a depth of 2.1 m.			
3						



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH03 TESTHOLE RECORD

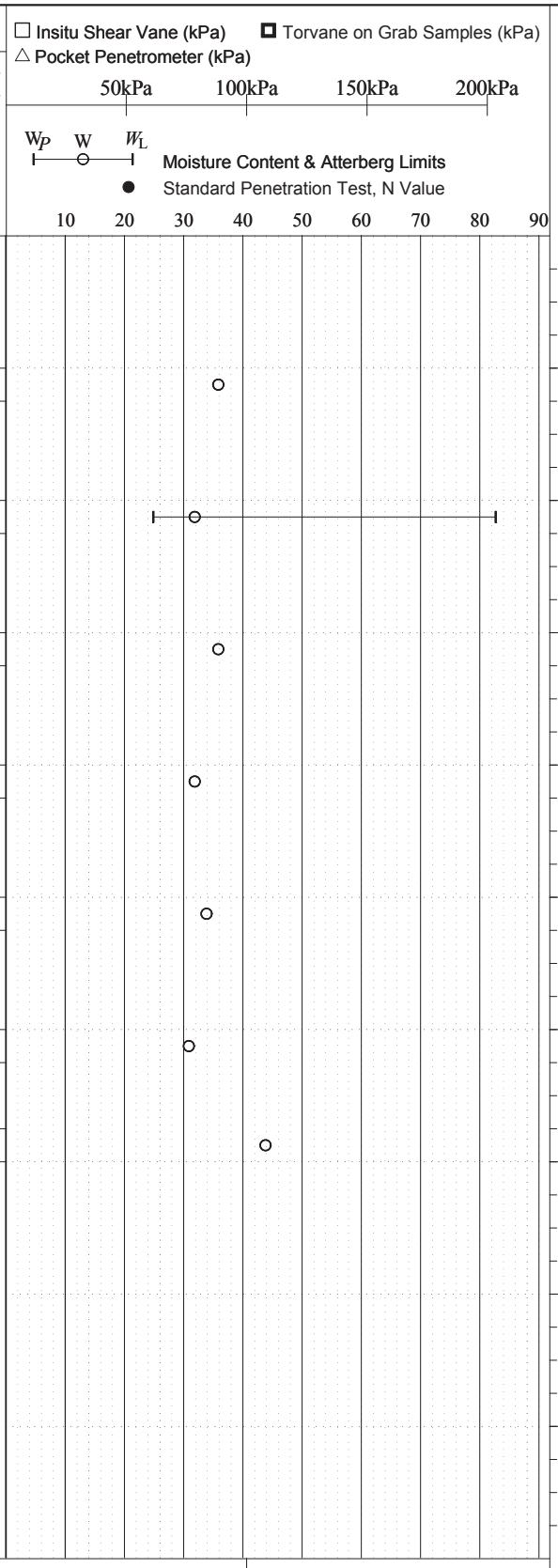
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Carruthers Ave from Powers St and Salter St ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	CH		Black firm fat CLAY (CH) with trace organic and sand, some silt	GS		36
				GS		32
1	CH		Particle Size Analysis at 0.9 m: 0.0% Gravel, 5.1% Sand, 28.4% Silt, 66.5% Clay	GS		36
				GS		32
				GS		34
	CL ML		Firm brown SILTY CLAY (CL-ML)	GS		31
2				GS		44
			TESTHOLE LOCATION: 132.5 m East of Southeast corner Carruthers Avenue and Powers Street, 1.0 m North of property line 347 Lansdowne Avenue.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
			• Testhole terminated at a depth of 2.1 m.			
3						



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH04 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Carruthers Ave from Powers St and Salter St ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
			FILL: tan sand with gravel	GS		7
				GS		9
1	SP			GS		8
				GS		4
				GS		3
	CH		Soft brown fat CLAY (CH) with trace silt	GS		29
2				GS		33
			TESTHOLE LOCATION: 11.0 m West of Southwest corner Carruthers Avenue and Salter Street, 1.0 m North of property line 337 Lansdowne Avenue.			
			NOTE: All underground utilities were cleared at testhole location.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
3			• Testhole terminated at a depth of 2.1 m.			

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

△ Pocket Penetrometer (kPa)

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Standard Penetration Test, N Value

10 20 30 40 50 60 70 80 90

DEPTH (ft): 0 2 4 6 8 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

Photo 1 – Core sample from Testhole TH01

Photo 2 – Core sample from Testhole TH02

Photo 3 – Core sample from Testhole TH03

Photo 4 – Core sample from Testhole TH04

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

PARTICLE SIZE ANALYSIS
ASTM D422

City of Winnipeg
Engineering Division, Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

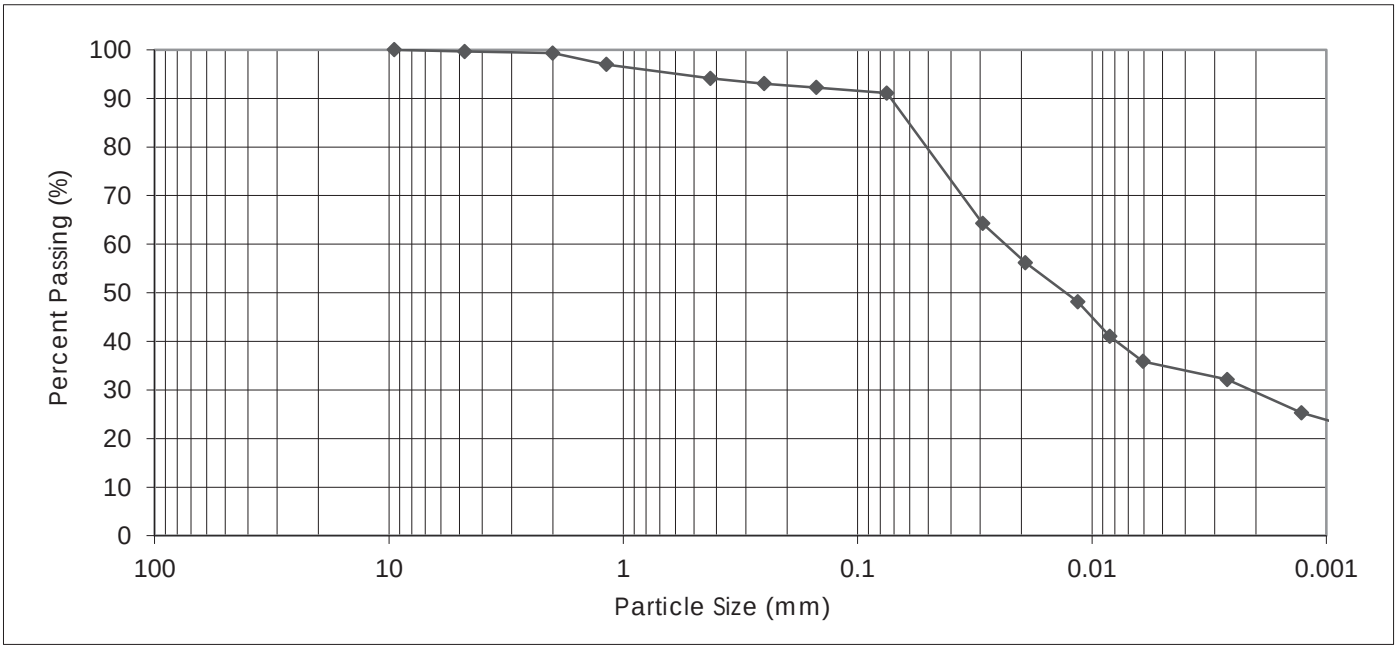
PROJECT: 2016 Residential Street Renewal Program
Carruthers Avenue from Powers
Street to Salter Street

Attention: Brad Besyk

PROJECT NO.: 123312305

SAMPLED BY: Nestor Abarca
SAMPLE ID: TH01 @ 0.9 m

DATE RECEIVED: January 12, 2016
TESTED BY: Larry Presado, 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	99.7
2.00 mm	99.3

PARTICLE SIZE	PERCENT PASSING
1.18 mm	97.0
0.425 mm	94.1
0.250 mm	93.0
0.150 mm	92.2
0.075 mm	91.1
0.005 mm	34.7
0.002 mm	28.9
0.001 mm	23.8

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	5.2	3.0	62.2	28.9	23.8

REPORT DATE: January 18, 2016

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

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

PARTICLE SIZE ANALYSIS
ASTM D422

City of Winnipeg
Engineering Division, Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

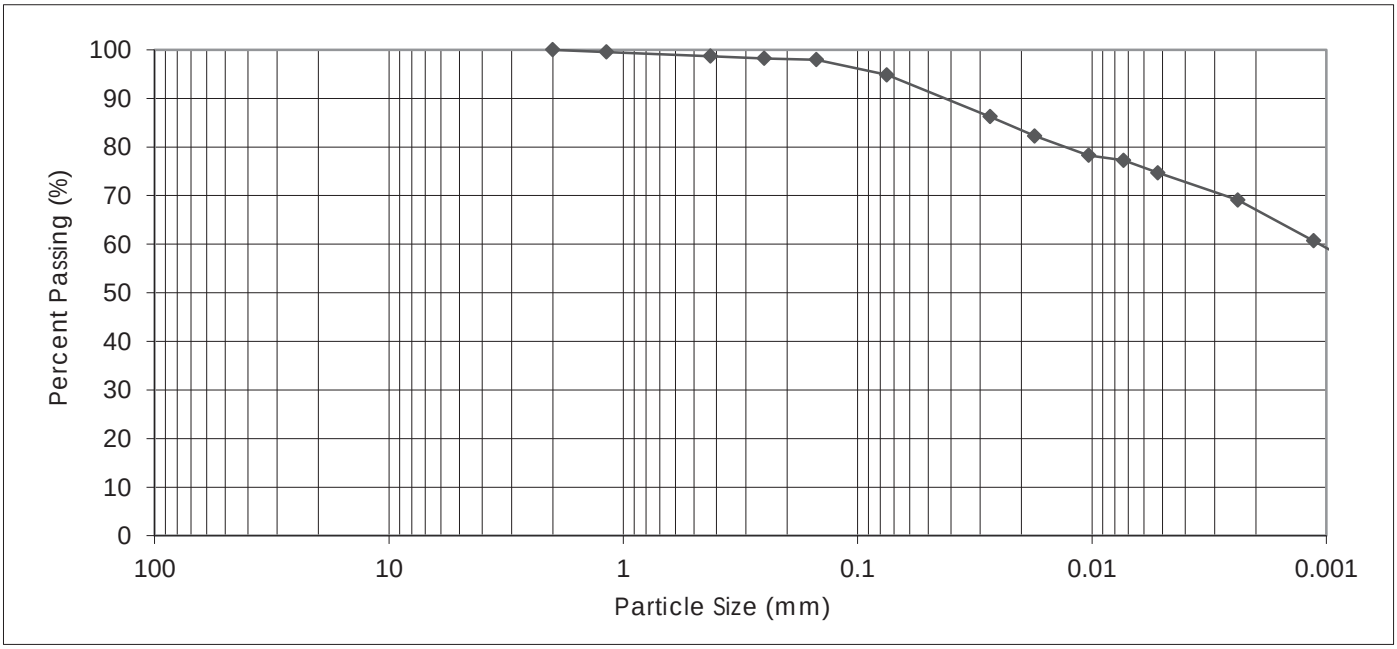
PROJECT: 2016 Residential Street Renewal Program
Carruthers Avenue from Powers
Street to Salter Street

Attention: Brad Besyk

PROJECT NO.: 123312305

SAMPLED BY: Nestor Abarca
SAMPLE ID: TH03 @ 0.6 m

DATE RECEIVED: January 12, 2016
TESTED BY: Larry Presado, 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	100.0

PARTICLE SIZE	PERCENT PASSING
1.18 mm	99.6
0.425 mm	98.7
0.250 mm	98.2
0.150 mm	98.0
0.075 mm	94.9
0.005 mm	74.2
0.002 mm	66.5
0.001 mm	59.1

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	0.0	1.3	3.8	28.4	66.5	59.1

REPORT DATE: January 18, 2016

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

2016 Residential Street Renewal Program

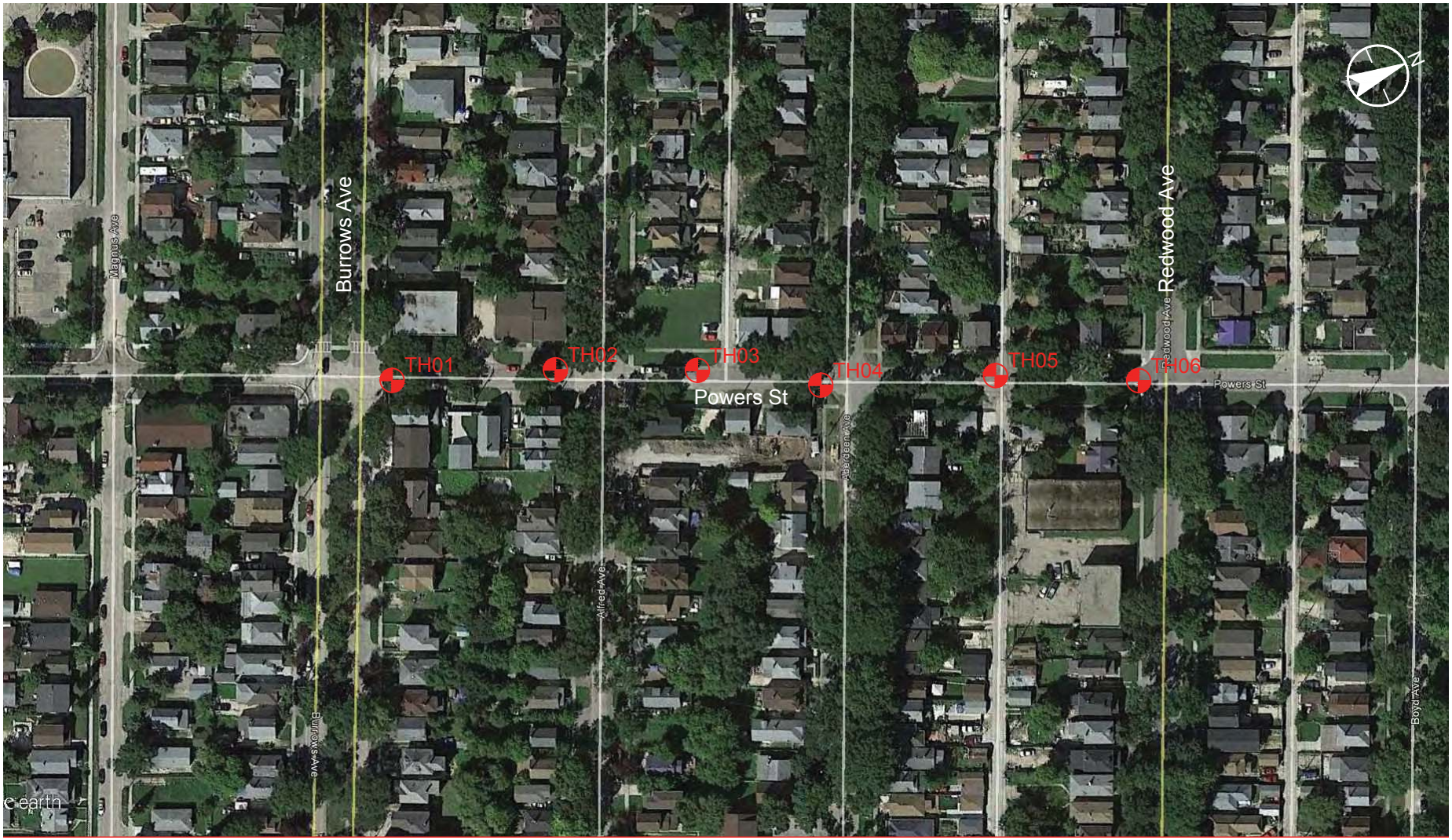
Geotechnical Investigation - Powers Street from Burrows Avenue to Redwood Avenue

Prepared for:
City of Winnipeg
Engineering Division
Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

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

Project No. 123312305

January 21, 2016



January, 2016
123312305

ORIGINAL SHEET - ISO 8.5x11 H - v14.06

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2016/01/20 11:37 AM By: Bun, Sothea

Stantec

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Tel. 204.489.5900 Fax. 204.453.9012
www.stantec.com

Legend

TESTHOLE

Notes

- IMAGE SOURCE: GOOGLE EARTH
- SITE: POWERS STREET FROM BURROWS AVENUE TO REDWOOD AVENUE

Client/Project

CITY OF WINNIPEG

2016 RESIDENTIAL STREET RENEWAL PROGRAM
WINNIPEG, MB

Figure No.

1

Title

TESTHOLE LOCATION PLAN

TABLE 1
2016 RESIDENTIAL STREET RENEWAL PROGRAM
POWERS STREET FROM BURROWS AVENUE TO REDWOOD AVENUE
GEOTECHNICAL INVESTIGATION

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure		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	Powers Street 4.0 m North of Northeast corner Powers Street and Burrows Street 2.0 m West of East curb	Concrete	205	-	-	Silt	0.9	20	0.2	8.0	77.8	14.0	25	18	7
TH02	Powers Street 12.5 m South of Southwest corner Powers Street and Alfred Avenue 2.0 m East of West curb	Asphalt Concrete	45 145	-	-	-	-	-	-	-	-	-	-	-	-
TH03	Powers Street 27.0 m North of Northwest corner Powers Street and Alfred Avenue 2.0 m East of West curb	Asphalt Concrete	30 150	-	-	Clay	0.9	29	0.1	5.8	29.3	64.8	79	22	57
TH04	Powers Street 5.5 m South of Southeast corner Powers Street and Aberdeen Avenue 2.0 m West of East curb	Asphalt Concrete	50 195	-	-	-	-	-	-	-	-	-	-	-	-
TH05	Powers Street 43.0 m North of Northwest corner Powers Street and Aberdeen Avenue 1.5 m East of West curb	Asphalt Concrete	20 170	-	-	-	-	-	-	-	-	-	-	-	-
TH06	Powers Street 5.0 m South of Southeast corner Powers Street and Redwood Avenue 2.0 m West of East curb	Asphalt Concrete	60 160	Crushed Limestone	540	Clay	0.9	32	0.4	9.6	29.9	60.1	86	26	60

TH01 TESTHOLE RECORD

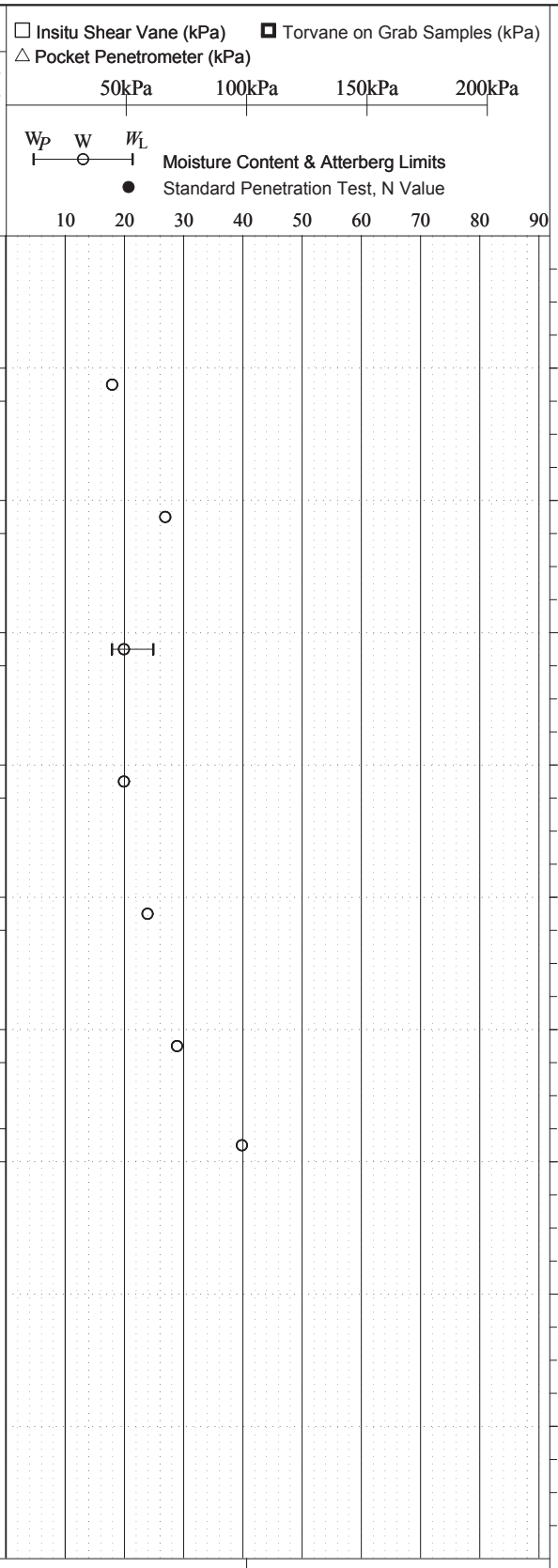
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Powers St from Burrows Ave to Redwood Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	CO	CONCRETE			
	FL	FILL: black silty clay with trace organic, sand and gravel	GS		18
	ML	Soft tan SILT (ML) with trace clay, sand and gravel	GS		27
1	ML	Particle Size Analysis at 0.9 m: 0.2% Gravel, 8.0% Sand, 77.8% Silt, 14.0% Clay	GS		20
	ML		GS		20
	ML		GS		24
	CH	Firm brown fat CLAY (CH)	GS		29
2	CH		GS		40
		TESTHOLE LOCATION: 4.0 m North of Northeast corner Powers Street and Burrows Avenue, 2.0 m West of East curb.			
		• No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			
3					



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH02 TESTHOLE RECORD

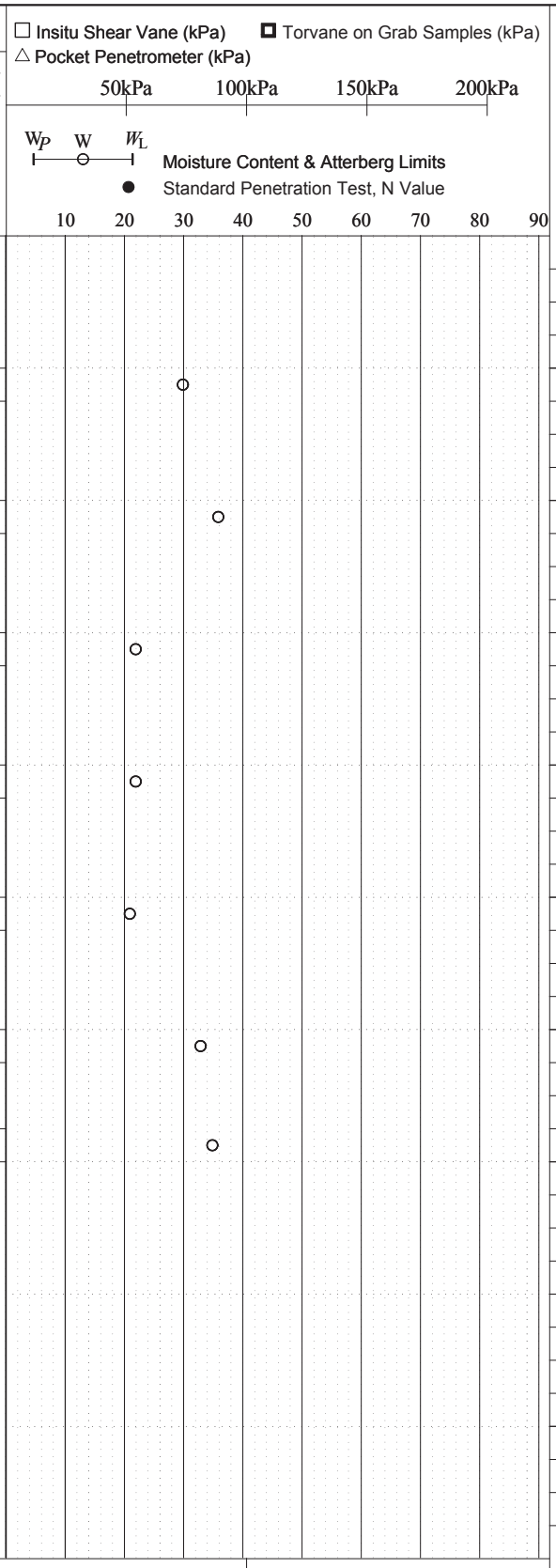
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Powers St from Burrows Ave to Redwood Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS	ASPHALT			
	CO	CONCRETE			
	FL	FILL: black silty clay with trace organic, sand and gravel	GS		30
	CH	Firm black fat CLAY (CH) with some silt, trace sand and gravel	GS		36
1	ML	Soft tan SILT (ML) with trace clay, sand and gravel	GS		22
			GS		22
			GS		21
2	CH	Firm brown fat CLAY (CH)	GS		33
			GS		35
3		TESTHOLE LOCATION: 12.5 m South of Southwest corner Powers Street and Alfred Avenue, 2.0 m East of West curb. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH03 TESTHOLE RECORD

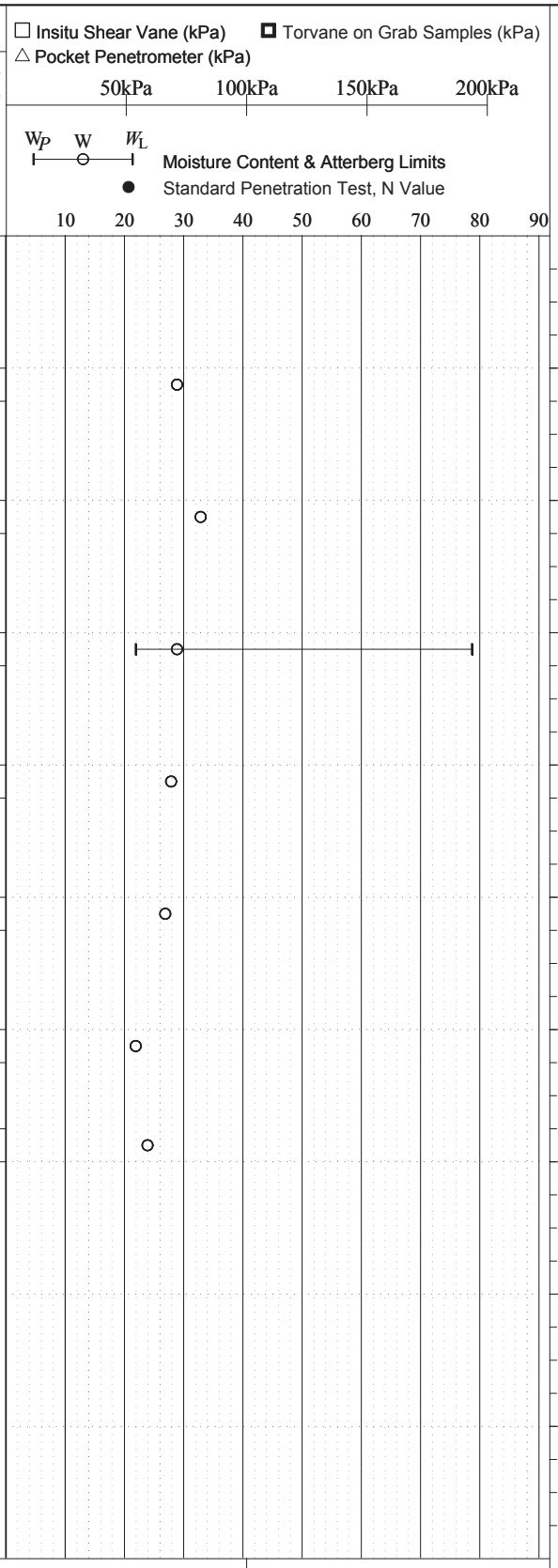
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Powers St from Burrows Ave to Redwood Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	CH		Firm black fat CLAY (CH) with trace organic, some silt, trace sand and gravel	GS		29
				GS		33
1			Particle Size Analysis at 0.9 m: 0.1% Gravel, 5.8% Sand, 29.3% Silt, 64.8% Clay	GS		29
				GS		28
	CL ML		Soft brown SILTY CLAY (CL-ML)	GS		27
2				GS		22
				GS		24
			TESTHOLE LOCATION: 27.0 m North of Northwest corner Powers Street and Alfred Avenue, 2.0 m East of West curb.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
			• Testhole terminated at a depth of 2.1 m.			
3						



Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH04 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Powers St from Burrows Ave to Redwood Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	CH		Firm black fat CLAY (CH) with trace organic, some silt, trace sand and gravel	GS		35
				GS		32
1				GS		30
	ML		Soft tan SILT (ML) with trace clay, sand and gravel	GS		27
				GS		25
				GS		23
2				GS		23
			TESTHOLE LOCATION: 5.5 m South of Southeast corner Powers Street and Aberdeen Avenue, 2.0 m West of East curb.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			
3						

☐ Insitu Shear Vane (kPa) ■ Torvane on Grab Samples (kPa)
△ Pocket Penetrometer (kPa)

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Standard Penetration Test, N Value

10 20 30 40 50 60 70 80 90

DEPTH (ft): 0 2 4 6 8 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH05 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Powers St from Burrows Ave to Redwood Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	CH		Firm black fat CLAY (CH) with trace organic, some silt, trace sand and gravel	GS		41
				GS		49
	ML		Soft tan SILT (ML) with trace clay, sand and gravel	GS		21
1	CH		Firm brown fat CLAY (CH) with some silt, trace sand and gravel	GS		33
				GS		29
				GS		41
2				GS		48
			TESTHOLE LOCATION: 43.0 m North of Northwest corner Powers Street and Aberdeen Avenue, 1.5 m East of West curb.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
			• Testhole terminated at a depth of 2.1 m.			
3						

☐ Insitu Shear Vane (kPa) ■ Torvane on Grab Samples (kPa)
△ Pocket Penetrometer (kPa)

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Standard Penetration Test, N Value

10 20 30 40 50 60 70 80 90

DEPTH (ft): 0 2 4 6 8 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH06 TESTHOLE RECORD

CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Powers St from Burrows Ave to Redwood Ave ELEVATION EASTING

DRILLING DATE December 16, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 125 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	AS		ASPHALT			
	CO		CONCRETE			
	GW		CRUSHED LIMESTONE	GS		4
				GS		7
	CH		Firm brown fat CLAY (CH) with some silt, trace sand and gravel			
1			Particle Size Analysis at 0.9 m: 0.4% Gravel, 9.6% Sand, 29.9% Silt, 60.1% Clay	GS		32
				GS		28
				GS		30
2				GS		23
				GS		27
			TESTHOLE LOCATION: 5.0 m South from Southeast corner Powers Street and Redwood Avenue, 2.0 m West of East curb. NOTE: Testhole located at a section where there was new pavement. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			
3						

☐ Insitu Shear Vane (kPa) ■ Torvane on Grab Samples (kPa)
△ Pocket Penetrometer (kPa)

50kPa 100kPa 150kPa 200kPa

W_P W W_L Moisture Content & Atterberg Limits

● Standard Penetration Test, N Value

10 20 30 40 50 60 70 80 90

DEPTH (ft): 0 2 4 6 8 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

Photo 1 – Core sample from Testhole TH01

Photo 2 – Core sample from Testhole TH02

Photo 3 – Core sample from Testhole TH03

Photo 4 – Core sample from Testhole TH04

Photo 5 – Core sample from Testhole TH05

Photo 6 – Core sample from Testhole TH06

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

PARTICLE SIZE ANALYSIS
ASTM D422

City of Winnipeg
Engineering Division, Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

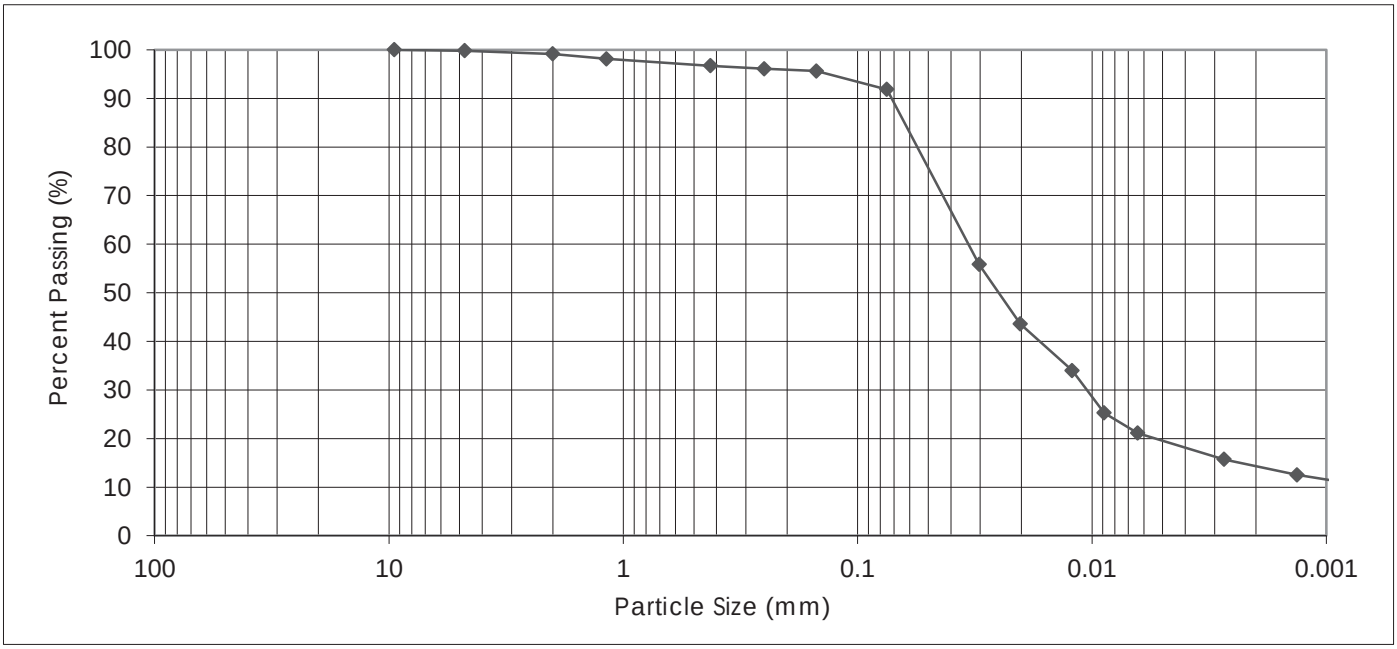
PROJECT: 2016 Residential Street Renewal Program
Powers Street from Burrows Avenue
to Redwood Avenue

Attention: Brad Besyk

PROJECT NO.: 123312305

SAMPLED BY: Nestor Abarca
SAMPLE ID: TH01 @ 0.9 m

DATE RECEIVED: January 12, 2016
TESTED BY: Larry Presado, 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	99.8
2.00 mm	99.2

PARTICLE SIZE	PERCENT PASSING
1.18 mm	98.1
0.425 mm	96.7
0.250 mm	96.1
0.150 mm	95.6
0.075 mm	91.8
0.005 mm	19.1
0.002 mm	14.0
0.001 mm	11.6

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			
0.2	0.6	2.5	4.9	77.8	14.0	11.6

REPORT DATE: January 18, 2016

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

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

PARTICLE SIZE ANALYSIS
ASTM D422

City of Winnipeg
Engineering Division, Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

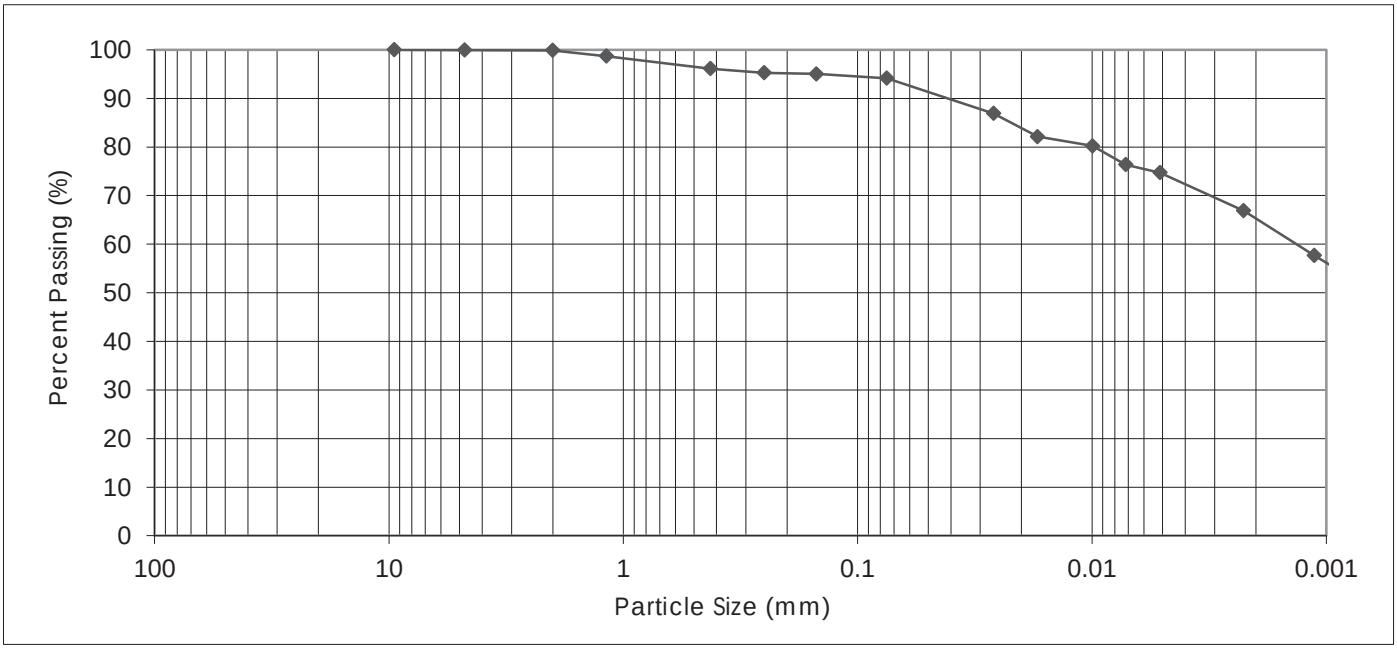
PROJECT: 2016 Residential Street Renewal Program
Powers Street from Burrows Avenue
to Redwood Avenue

Attention: Brad Besyk

PROJECT NO.: 123312305

SAMPLED BY: Nestor Abarca
SAMPLE ID: TH03 @ 0.9 m

DATE RECEIVED: January 12, 2016
TESTED BY: Larry Presado, 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	99.9
2.00 mm	99.9

PARTICLE SIZE	PERCENT PASSING
1.18 mm	98.7
0.425 mm	96.1
0.250 mm	95.3
0.150 mm	95.0
0.075 mm	94.1
0.005 mm	74.4
0.002 mm	64.8
0.001 mm	56.0

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			
0.1	0.0	3.8	2.0	29.3	64.8	56.0

REPORT DATE: January 18, 2016

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

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

PARTICLE SIZE ANALYSIS
ASTM D422

City of Winnipeg
Engineering Division, Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

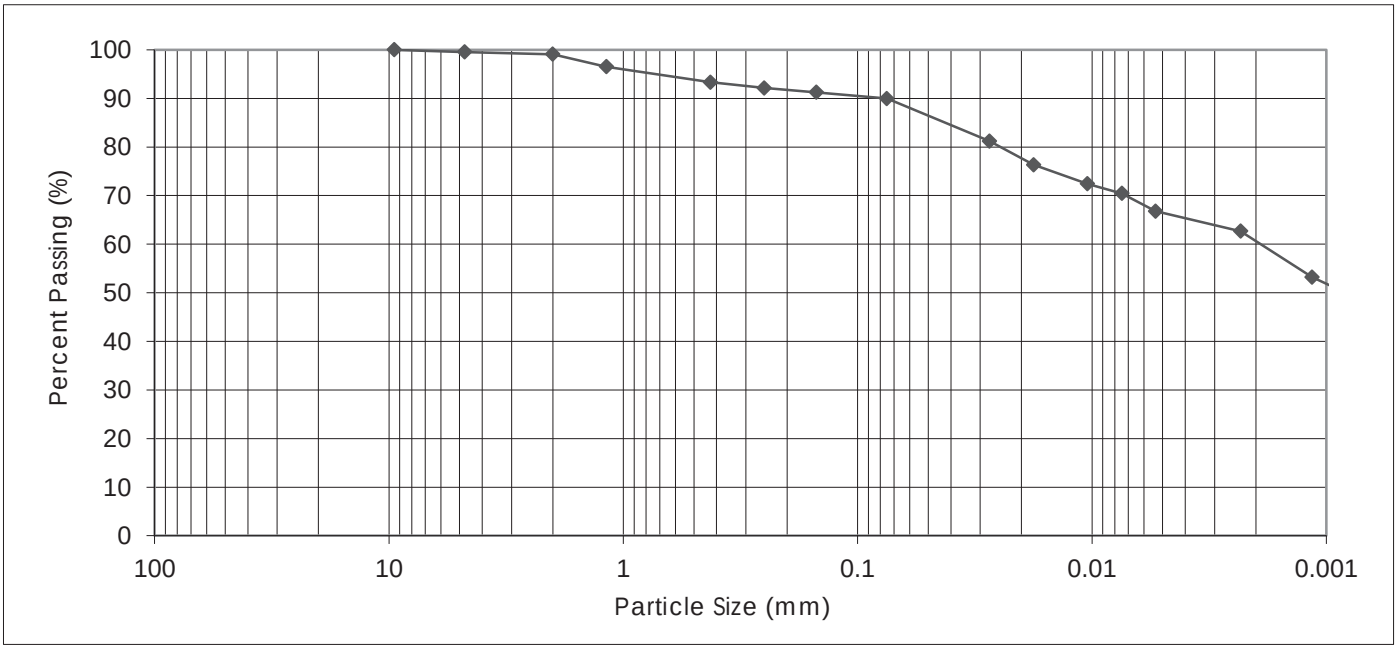
PROJECT: 2016 Residential Street Renewal Program
Powers Street from Burrows Avenue
to Redwood Avenue

Attention: Brad Besyk

PROJECT NO.: 123312305

SAMPLED BY: Nestor Abarca
SAMPLE ID: TH06 @ 0.9 m

DATE RECEIVED: January 12, 2016
TESTED BY: Larry Presado, 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	99.6
2.00 mm	99.1

PARTICLE SIZE	PERCENT PASSING
1.18 mm	96.5
0.425 mm	93.3
0.250 mm	92.1
0.150 mm	91.2
0.075 mm	90.0
0.005 mm	66.3
0.002 mm	60.1
0.001 mm	51.7

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	0.5	5.8	3.3	29.9	60.1	51.7

REPORT DATE: January 18, 2016

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

2016 Residential Street Renewal Program

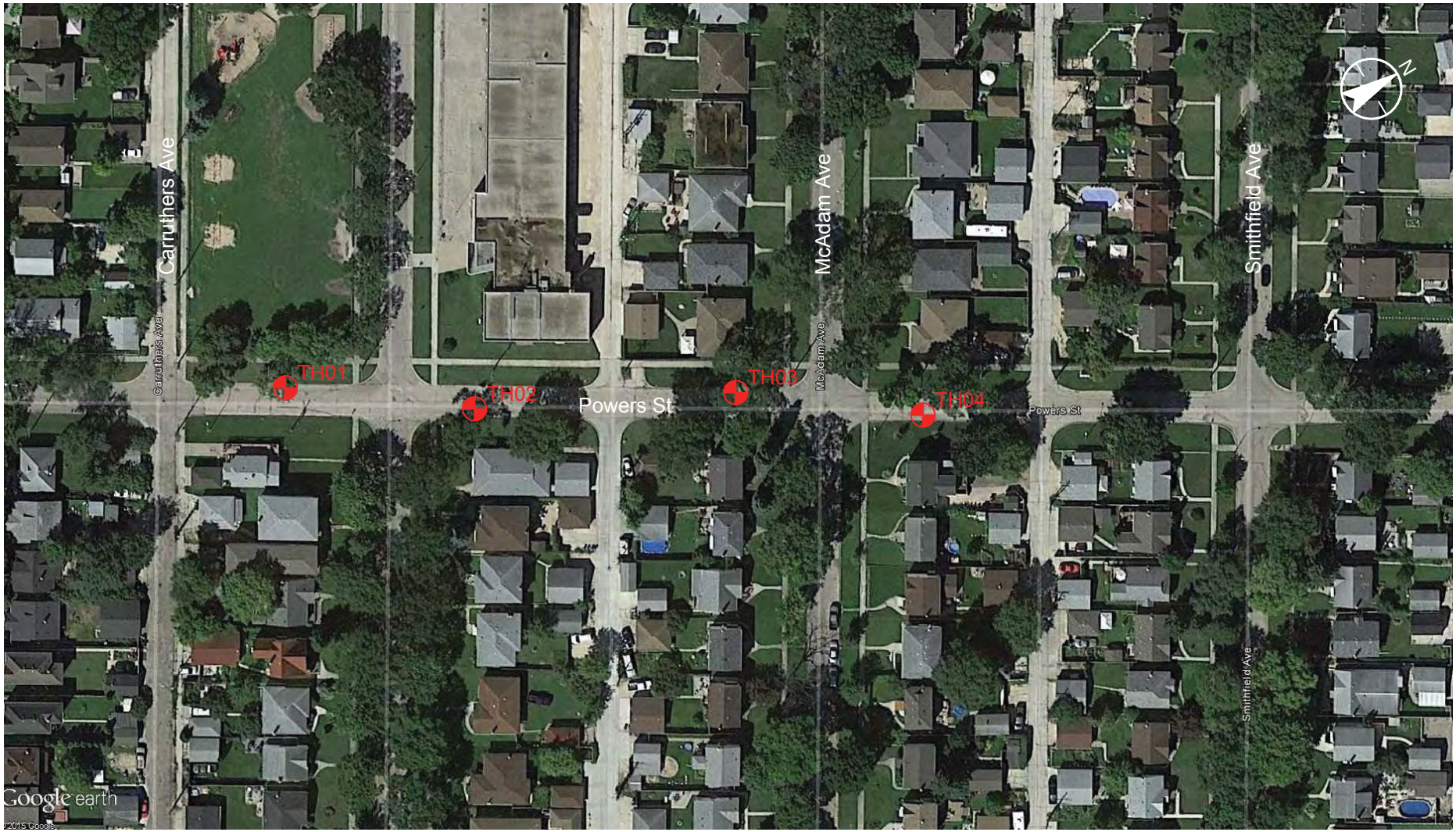
Geotechnical Investigation - Powers Street from Carruthers Avenue to Smithfield Avenue

Prepared for:
City of Winnipeg
Engineering Division
Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

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

Project No. 123312305

January 21, 2016



January, 2016
123312305

ORIGINAL SHEET - ISO 8.5x11 H - v14.06

V:\1233\active\123312305\0300_drawing\testhole Location Plans\123305_powers_carruthers_smithfield_thlp.dwg 1
2016/01/20 11:42 AM By: Bun, Sothea

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

TESTHOLE

Notes

- IMAGE SOURCE: GOOGLE EARTH
- SITE: POWERS STREET FROM CARRUTHERS AVENUE TO SMITHFIELD AVENUE

Client/Project

CITY OF WINNIPEG

2016 RESIDENTIAL STREET RENEWAL PROGRAM
WINNIPEG, MB

Figure No.

1

Title

TESTHOLE LOCATION PLAN

TABLE 1
2016 RESIDENTIAL STREET RENEWAL PROGRAM
POWERS STREET FROM CARRUTHERS AVENUE TO SMITHFIELD AVENUE
GEOTECHNICAL INVESTIGATION

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure		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	Powers Street 17.0 m North of Northwest corner Powers Street and Carruthers Avenue 2.0 m East of West curb	Concrete	150	-	-	-	-	-	-	-	-	-	-	-	-
TH02	Powers Street 19.5 m North of Northeast corner of Powers Street and Matheson Avenue 1.0 m West of East curb	Concrete	140	-	-	Silty Clay	0.6	36	0.0	8.0	30.6	61.4	80	27	53
TH03	Powers Street 20.0 m South of Southwest corner Powers Street and McAdam Avenue 2.0 m East of West curb	Concrete	180	-	-	-	-	-	-	-	-	-	-	-	-
TH04	Powers Street 19.0 m North of Northeast corner Powers Street and McAdam Avenue 1.25 m West of East curb	Concrete	180	-	-	Silt	0.9	22	1.2	6.7	74.0	18.1	30	18	12

TH01 TESTHOLE RECORD

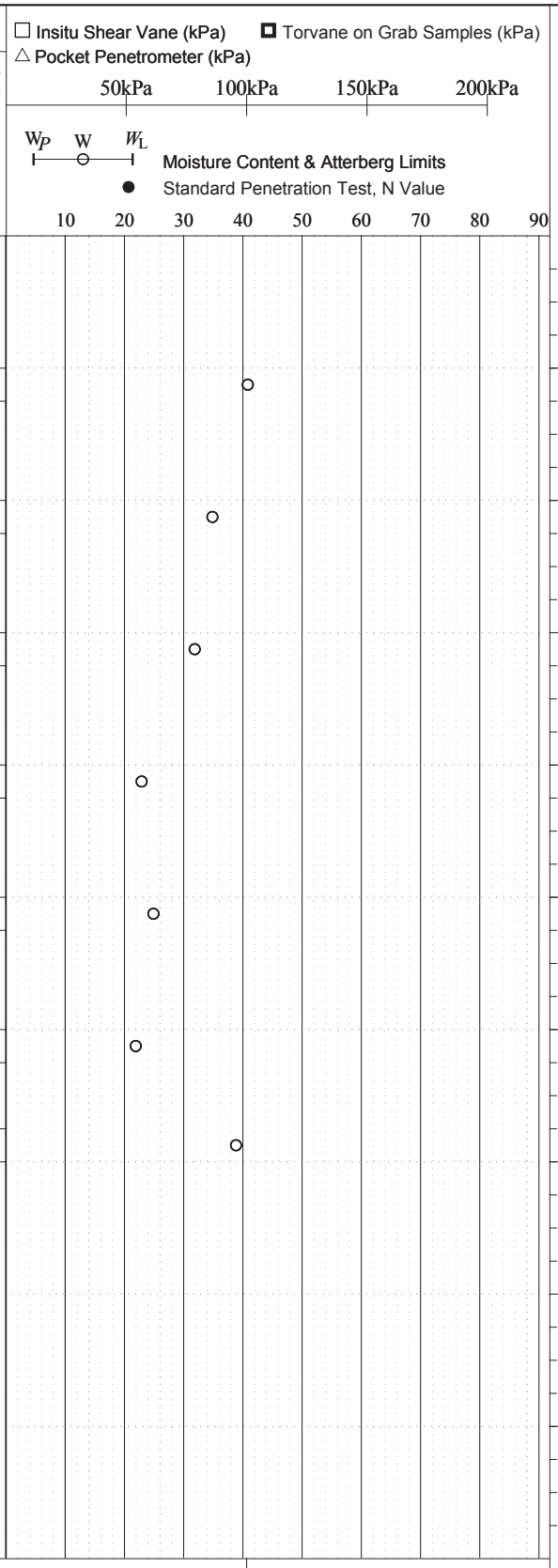
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Powers St from Carruthers Ave and Smithfield Ave ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	CO	CONCRETE			
	CL ML	Firm black SILTY CLAY (CL-ML) with trace organic and sand	GS		41
			GS		35
1	CH	Firm black fat CLAY (CH)	GS		32
	ML	Soft tan SILT (ML) with trace sand and gravel	GS		23
			GS		25
			GS		22
2	CH	Stiff brown fat CLAY (CH)	GS		39
		TESTHOLE LOCATION: 17.0 m North of Northwest corner Powers Street and Carruthers Avenue, 2.0 m East of West curb.			
		• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
		• Testhole terminated at a depth of 2.1 m.			
3					



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH02 TESTHOLE RECORD

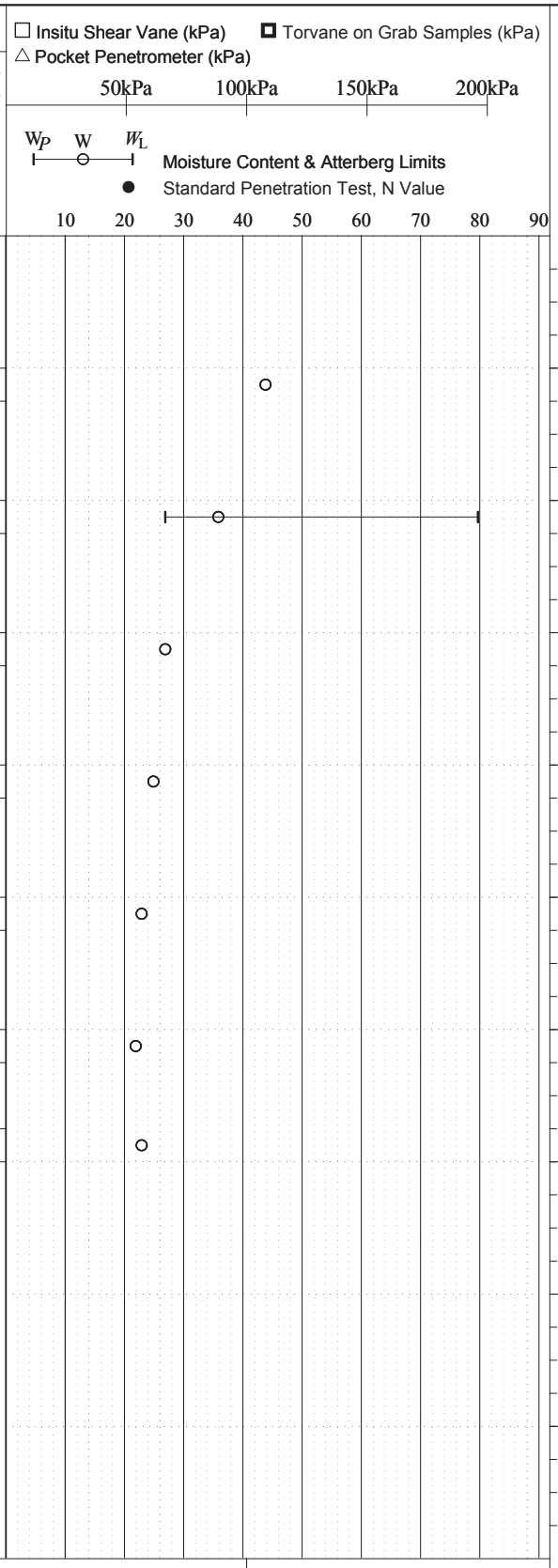
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Powers St from Carruthers Ave and Smithfield Ave ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	CO		CONCRETE			
	CL ML		Firm black SILTY CLAY (CL-ML) with trace organic and sand	GS		44
			Particle Size Analysis at 0.6 m: 0.0% Gravel, 8.0% Sand, 30.6% Silt, 61.4% Clay	GS		36
1				GS		27
	ML		Soft tan SILT (ML) with trace sand and gravel	GS		25
				GS		23
				GS		22
2				GS		23
			TESTHOLE LOCATION: 19.5 m North of Northeast corner Powers Street and Matheson Avenue, 1.0 m West of East curb.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			
3						



Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH03 TESTHOLE RECORD

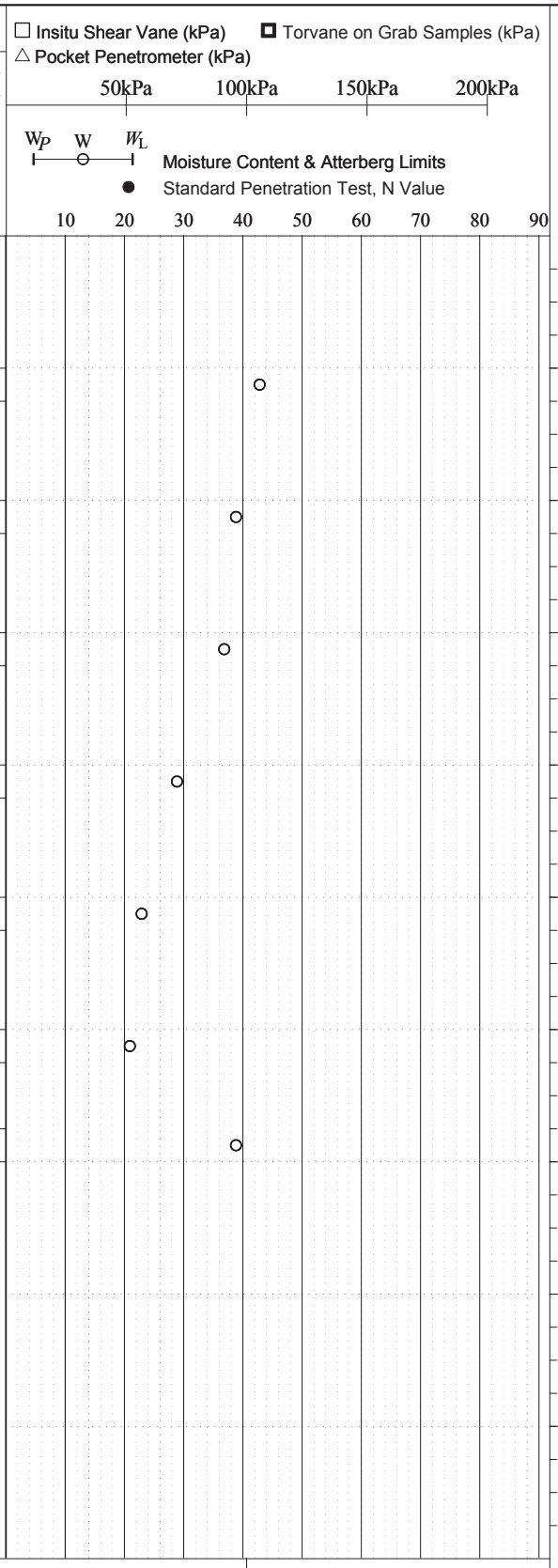
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Powers St from Carruthers Ave and Smithfield Ave ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	CO		CONCRETE			
	CL ML		Firm black SILTY CLAY (CL-ML) with trace organic and sand	GS		43
				GS		39
1				GS		37
	ML		Soft tan SILT (ML) with trace sand and gravel	GS		29
				GS		23
				GS		21
2	CH		Stiff brown fat CLAY (CH)	GS		39
			TESTHOLE LOCATION: 20.0 m South of Southwest corner Powers Street and McAdam Avenue, 2.0 m East of West curb.			
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.			
3			• Testhole terminated at a depth of 2.1 m.			



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

TH04 TESTHOLE RECORD

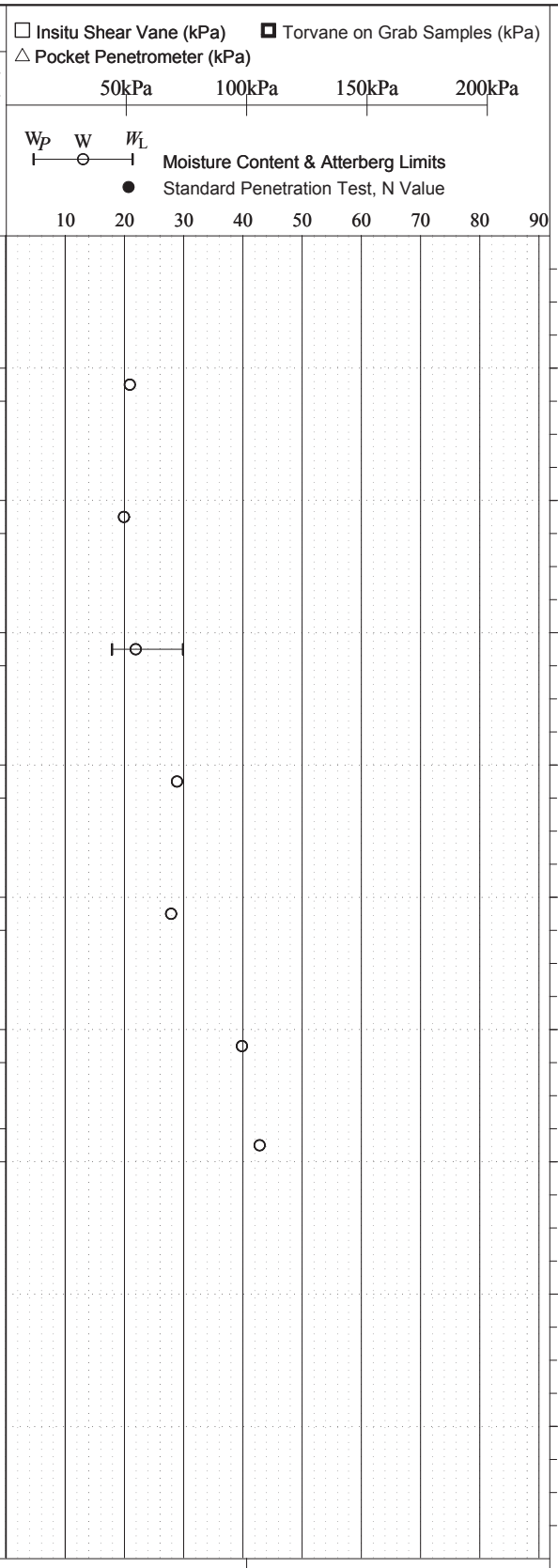
CLIENT City of Winnipeg PROJECT No. 123312305

PROJECT 2016 Residential Street Renewal Program DATUM NORTHING

LOCATION Powers St from Carruthers Ave and Smithfield Ave ELEVATION EASTING

DRILLING DATE December 15, 2015 DRILLING CO. Paddock Drilling Ltd. DRILLING METHOD 100 mm SSA

DEPTH (m)	SOIL TYPE	SOIL DESCRIPTION	SAMPLES TYPE	SAMPLES NUMBER	MOISTURE CONTENT (%)
0	CO	CONCRETE			
	CL ML	Firm black SILTY CLAY (CL-ML) with trace organic and sand	GS		21
	ML	Soft tan SILT (ML) with trace sand and gravel	GS		20
1		Particle Size Analysis at 0.9 m: 1.2% Gravel, 6.7% Sand, 74.0% Silt, 18.1% Clay	GS		22
	CH	Firm brown fat CLAY (CH)	GS		29
			GS		28
2			GS		40
			GS		43
3		TESTHOLE LOCATION: 19.0 m North of Northeast corner Powers Street and McAdam Avenue, 1.25 m West of East curb. • No groundwater seepage or soil sloughing was observed during or upon completion of drilling. • Testhole terminated at a depth of 2.1 m.			



DEPTH (ft): 0, 2, 4, 6, 8, 10

Sample Type: GS - Grab Sample SPT - Standard Penetration Test
ST - Shelby Tube PT - Piston Tube VT - Shear Vane Test

Piezometer Backfill Type: Bentonite Drill Cuttings Sand Slough

Logged by: Nestor Abarca

Reviewed by: German Leal

Stantec

Photo 1 – Core sample from Testhole TH01

Photo 2 – Core sample from Testhole TH02

Photo 3 – Core sample from Testhole TH03

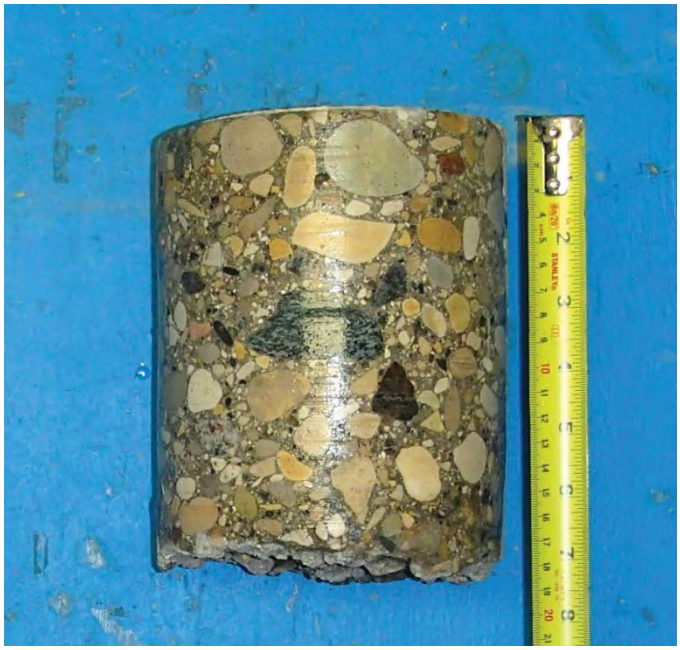


Photo 4 – Core sample from Testhole TH04

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

PARTICLE SIZE ANALYSIS
ASTM D422

City of Winnipeg
Engineering Division, Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

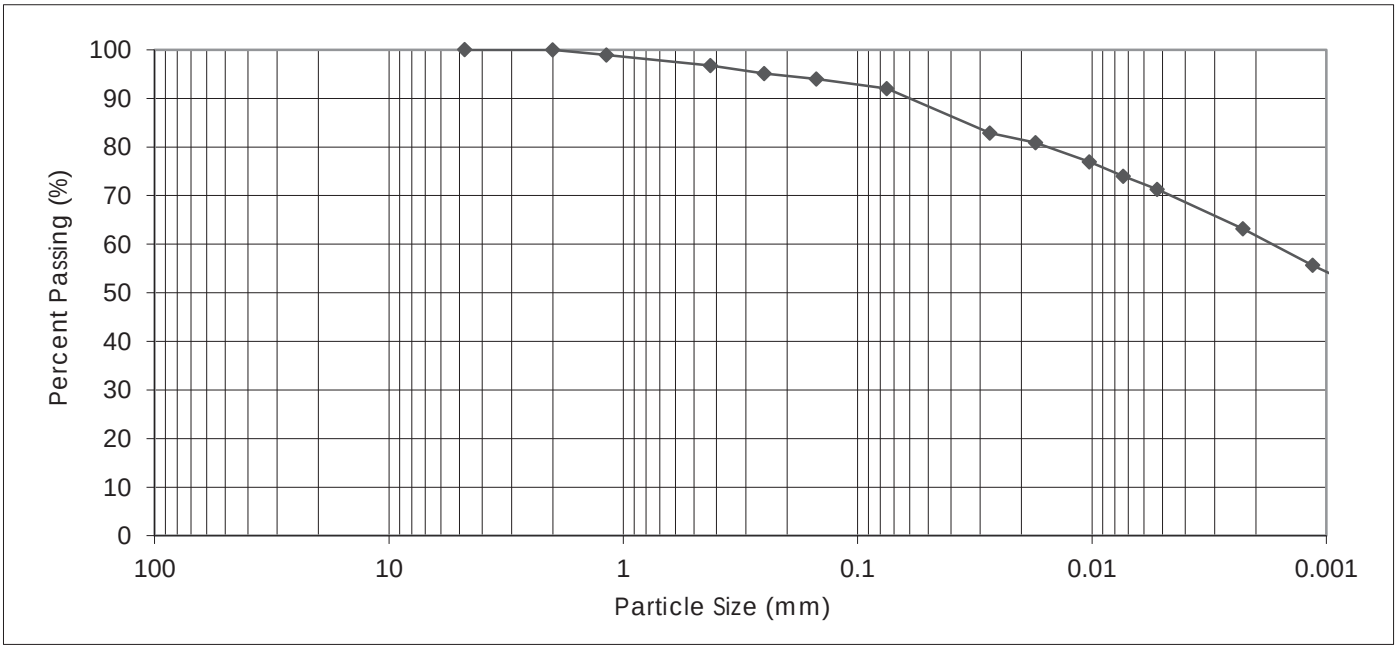
PROJECT: 2016 Residential Street Renewal Program
Powers Street from Carruthers Avenue
to Smithfield Avenue

Attention: Brad Besyk

PROJECT NO.: 123312305

SAMPLED BY: Nestor Abarca
SAMPLE ID: TH02 @ 0.6 m

DATE RECEIVED: January 12, 2016
TESTED BY: Larry Presado, 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	100.0

PARTICLE SIZE	PERCENT PASSING
1.18 mm	98.9
0.425 mm	96.8
0.250 mm	95.1
0.150 mm	94.0
0.075 mm	92.0
0.005 mm	70.5
0.002 mm	61.4
0.001 mm	54.2

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	0.0	3.2	4.8	30.6	61.4	54.2

REPORT DATE: January 18, 2016

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

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

PARTICLE SIZE ANALYSIS
ASTM D422

City of Winnipeg
Engineering Division, Public Works Department
106-1155 Pacific Avenue
Winnipeg, Manitoba R3E 3P1

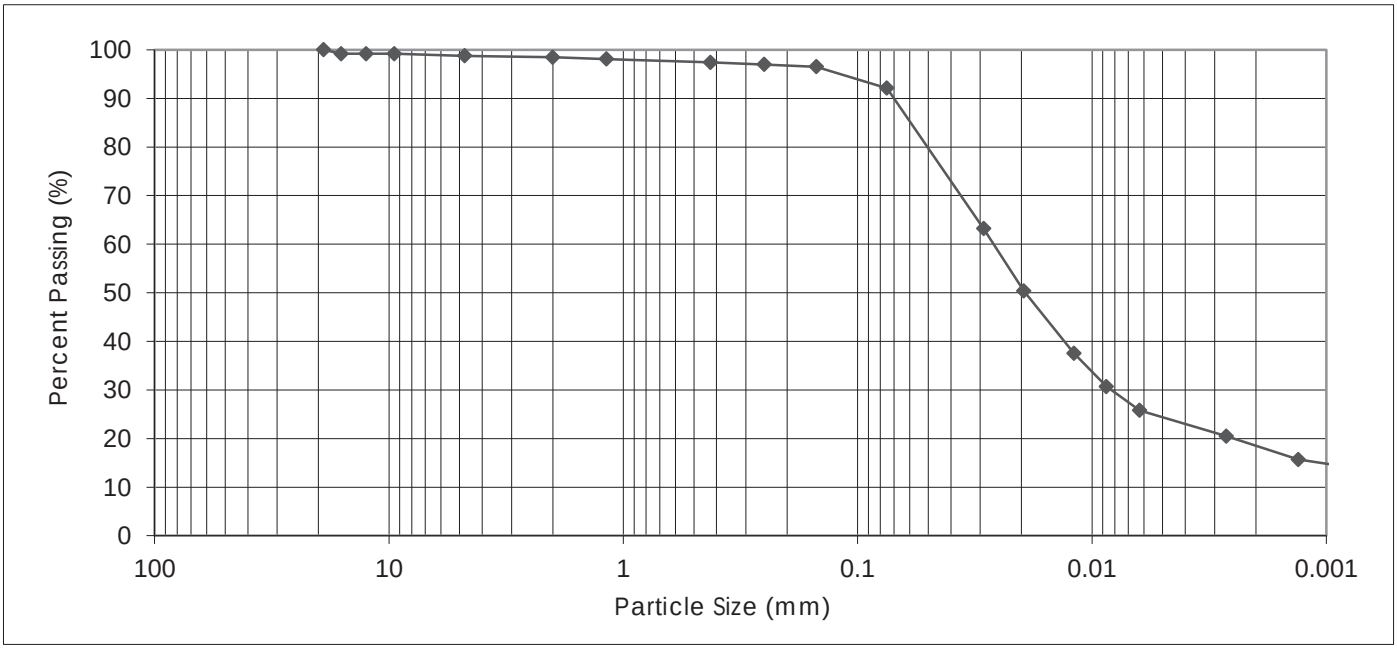
PROJECT: 2016 Residential Street Renewal Program
Powers Street from Carruthers Avenue
to Smithfield Avenue

Attention: Brad Besyk

PROJECT NO.: 123312305

SAMPLED BY: Nestor Abarca
SAMPLE ID: TH04 @ 0.9 m

DATE RECEIVED: January 12, 2016
TESTED BY: Larry Presado, C.Tech



PARTICLE SIZE	PERCENT PASSING
37.50 mm	100.0
25.00 mm	100.0
19.00 mm	100.0
16.00 mm	99.2
12.50 mm	99.2
9.50 mm	99.2
4.75 mm	98.8
2.00 mm	98.5

PARTICLE SIZE	PERCENT PASSING
1.18 mm	98.1
0.425 mm	97.4
0.250 mm	97.0
0.150 mm	96.5
0.075 mm	92.1
0.005 mm	23.9
0.002 mm	18.1
0.001 mm	14.8

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			
1.2	0.3	1.1	5.3	74.0	18.1	14.8

REPORT DATE: January 18, 2016

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