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



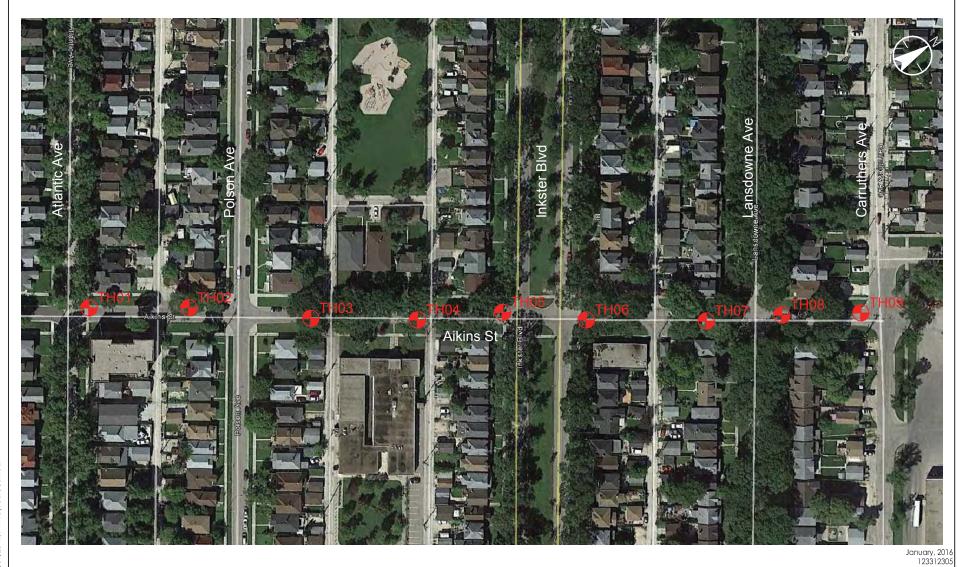
Prepared for: City of Winnipeg Engineering Division Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1

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

Project No. 123312305

January 21, 2016

V:\1233\active\123312305\0300_drawing\testhole Location Plans\12305_aikins_caruthers_atlantic_thlp.dwg 1 2016/01/20 1:59 PM By: Bun, Sothea



ORIGINAL SHEET - ISO 8.5x11 H - v14.06



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		Paveme	ent Surface	Pavemer	nt Structure	Sample	Sample	Moisture		Particle Siz	e Analysis			Atterberg Limi	its
ID	Testhole Location	Туре	Thickness	Туре	Thickness	Description	Depth	Content	Gravel	Sand	Silt	Clay	Liquid	Plastic	Plasticity
	Aikins Street	Asphalt	(mm) 35		(mm)		(m)	(%)	(%)	(%)	(%)	(%)	Limit	Limit	Index
TH01	5.0 m North of Northwest corner Atlantic Avenue and Aikins Street 2.0 m East of West curb	Concrete	145	-	-	-	-	-	-	-	-	-	-	-	-
	Aikins Street	Asphalt	60												
TH02	15.0 m South of Southwest corner Polson Avenue and Aikins Street 2.0 m East of West curb	Concrete	150	-	-	-	-	-	-	-	-	-	-	-	-
	Aikins Street	Asphalt	35	-											
TH03	25.5 m North of Northeast corner Polson Avenue and Aikins Street 2.0 m West of East curb	Concrete	140	-	-	Silt	0.9	23	0.7	6.3	73.4	19.6	28	18	10
	Aikins Street	Asphalt	40	-											
TH04	42.0 m South of Southeast corner Inkster Boulevard and Aikins Street 2.0 m West of East curb	Concrete	130	-	-	-	-	-	-	-	-	-	-	-	-
	Aikins Street	Asphalt	30												
TH05	4.0 m South of Southwest corner Inkster Boulevard and Aikins Street 2.0 m East of West curb	Concrete	160	-	-	Clay	0.6	38	0.0	4.5	24.3	71.2	92	34	58
	Aikins Street	Asphalt	50												
TH06	4.0 m North of Northeast corner Inkster Boulevard and Aikins Street 1.5 m West of East curb	Concrete	130	-	-	-	-	-	-	-	-	-	-	-	-
	Aikins Street	Asphalt	35	-											
TH07	21.5 m South of Southwest corner Lansdowne Avenue and Aikins Street 2.0 m East of West curb	Concrete	210	-	-	-	-	-	-	-	-	-	-	-	-
	Aikins Street	Asphalt	20												
TH08	6.0 m North of Northwest corner Lansdowne Avenue and Aikins Street 2.0 m East of West curb	Concrete	180	-	-	-	-	-	-	-	-	-	-	-	-
	Aikins Street	Asphalt	55												
TH09	3.0 m South of Southwest corner Carruthers Avenue and Aikins Street 2.0 m East of West curb	Concrete	165	-	-	-	-	-	-	-	-	-	-	-	-



P L	ROJI OCA	ECT TION	TH01 TEST City of Winnipeg 2016 Residential Street Renewal Program 2016 Residential Street Renewal Program Aikins St from Atlantic Ave to Carruthers Ave DATE December 16, 2015 DRILLING CO. Padded	2	I	DATUM	Ι ΓΙΟΝ				– NO – EA	RTHIN STING				5
			DATE December 10, 2013 DRILLING CO. 1 add							ne (kPa)			on Grab		es (kPa)	
(m) H	LYPE	SYMBOL			R	JRE [(%)		cket Pe		neter (kl			50kPa		0kPa	
DEPTH (m)	SOIL TYPE	SOIL SY	SOIL DESCRIPTION	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	₩ _P ⊢	0	•	Standar	d Penetr	ation T	erberg Lin est, N Va	alue		DEPTH (ft)
- 0	AS	A 4	ASPHALT	r				0	20	30	40	50	60 7	70 8	0 90	0
			CONCRETE Firm black fat CLAY (CH) with trace organic and													-
			trace fine sand	GS		30				0						-
																-
				GS		40					0					- 2
	СН															-
1.				GS		34				0						_
																-
				GS		31				0						- 4
	╞		Soft tan SILT (ML)													-
				GS		22			0							_
	ML															_
				GS		24			0							- 6
- 2 -	СН		Firm brown fat CLAY (CH)													_
			TESTHOLE LOCATION: 5.0 m North of	GS		33				0						-
	_		Northwest corner Atlantic Avenue and Aikins Street, 2.0 m East of West curb.													_
			• No groundwater seepage or soil sloughing was													- 8
	-		observed during or upon completion of drilling.Testhole terminated at a depth of 2.1 m.													-
	-															-
- 3 -	0		way of our formal opt of the training of the		 -	11										- 10
	Pie	zome	ype: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Var er Evre Bentonite Drill Cuttings Sand Solution		<u>ـ</u>	ogged by		tor Aba man Le					Sta	ant	cec	
	Ba	kfill	Type: Bentonite Drill Cuttings Sand	gu							Y					

Pl L	ROЛ ОСА	ECT TION	TH02 TEST City of Winnipeg 2016 Residential Street Renewal Program Aikins St from Atlantic Ave to Carruthers Ave DATE December 16, 2015 DRILLING CO. Paddo	<u> </u>	I F	DATUM	ι ΓΙΟΝ					NOI EAS	RTHI STING	NG G		_1233 SSA		
DEPTH (m)	SOIL TYPE	SYMBOL	SOIL DESCRIPTION			URE T (%)		itu She cket Pe 5(mete	er (kPa			e on (Sample	es (kPa 0kPa ⊣	DEPTH (ft)
	SOIL	SOIL S	SOIL DESCRIPTION	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	₩ _P ⊢	0	<i>W</i> _L → ● 20		ndard	Content Penetra				ue	30 <u>9</u>	90
- 0	AS		ASPHALT	-														0
	CO		CONCRETE Firm black fat CLAY (CH) with trace organic and															
			trace fine sand	GS		33					0							
	-																	
-	Сн			GS		35					0							-2
	-																	
- 1 -			Soft tan SILT (ML)	XGS		32				C	>							
	ML		Soft tail SILT (ML)	GS		22			0									4
			Firm brown fat CLAY (CH)						Ŭ									
	СН			GS		30				0								
			Soft tan SILT (ML)															
-				GS		22			0									- 6
- 2 -	ML																	
	-		TESTHOLE LOCATION: 15.0 m South of	GS		22			0									
-	-		Southwest corner Polson Avenue and Aikins Street, 2.0 m East of West curb.															- 8
	-		• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.															
			• Testhole terminated at a depth of 2.1 m.															
-																		
- 3 -	S ~	nnla 7	Time CC Crob Sounds SDT Standard Developed on T		т	oggad 1.	// N T	A1										10
			Type: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Van		. –	ogged by eviewed		tor Aba man Lea				\cap		S	ta	Int	e	
		zome ckfill	Type: Bentonite Drill Cuttings Sand	gh)					-

Pl L	ROЛ ОСА	ECT TION	TH03TESTCity of Winnipeg2016 Residential Street Renewal Program2016 Residential Street Renewal ProgramAikins St from Atlantic Ave to Carruthers AveDATEDecember 16, 2015 DRILLING CO. Paddo	e	I	DATUM	Ι ΓΙΟΝ				. NOR . EAS	THIN FING	G	_1233 SSA		<u>5</u>
						LES	🗆 Insi	itu She	ar Van	e (kPa) ieter (kP	D To			Sample	s (kPa)	
DEPTH (m)	SOIL TYPE	IL SYMBOL	SOIL DESCRIPTION	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	Wp		OkPa W _L		0kPa		0kPa		0kPa 	DEPTH (ft)
- 0		SOIL			ž	CONC	1			Standard	Content Penetra 40 5	tion Te	est, N Va		0 90	
	AS CO		ASPHALT CONCRETE	Л												
-			Firm black fat CLAY (CH) with trace organic and trace fine sand	GS		31										
	СН			Ags		51										
	-			GS		30				9						- 2
-	ML		Soft tan SILT (ML)													-
- 1 -			Particle Size Analysis at 0.9 m: 0.7% Gravel, 6.3% Sand, 73.4% Silt, 19.6% Clay Firm brown fat CLAY (CH)	GS_		23			0	1						-
				ØS		37				0						- 4
	СН			<u>N</u> US		57										
	-			GS		33				0						-
			Soft tan SILT (ML)													
	ML			GS		25			0							- 6
- 2 -				GS		22			0							
-	-		TESTHOLE LOCATION: 25.5 m North of Northeast corner Polson Avenue and Aikins Street, 2.0 m West of East curb.													- 8
	-		 No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 													0
- 3 -	-															
	Sar	nple 7	Ype: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Va	ine Tes	<u>ـ</u>	ogged by		tor Aba			1		C+-			10
		zomet ckfill	-		R	eviewed	by: Gen	man Lea	al		V		219	ant	ec	-

Pl Le	RОЛ ОСА	ECT TION	TH04 TEST City of Winnipeg 2016 Residential Street Renewal Program Aikins St from Atlantic Ave to Carruthers Ave DATE December 16, 2015 DRILLING COPaddo	2	I	DATUM	ι ΓΙΟΝ					NOI EAS	RTHI STIN(G			31230	
			DATE DATE DATE DATE OF			LES											es (kPa	
) c	ш	ÖL						cket Pe	enetro	meter ((kPa)				-		
DEPTH (m)	SOIL TYPE	SYMBOL	SOIL DESCRIPTION	Щ	BER	URE UT (%		5	0kPa		100	kPa		150kl	Pa	200	0kPa	DEPTH (ft)
DEP.	SOIL	SOIL S		ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	₩ _P ⊢	W		Moistu Standa								DEP.
- 0	AS		ASPHALT				1	0	20	30	4	0 :	50	60	70	8	0 9	0
-	со	4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	CONCRETE															
-			Firm black fat CLAY (CH) with trace organic and trace fine sand															
-			and the said	GS		38					0							
							-2-6-1-6-											2
-	-			GS		37					0							
-																		
-	СН			GS		30				0								
- 1 -																		
-				GS		30				9								-4
				MCS		22												
-				GS		32				0								
-		K	Firm tan SILTY CLAY (CL-ML)															
	CL			GS		32				0								- 6
- 2 -	ML																	
-				GS		38					0							
-			TESTHOLE LOCATION: 42.0 m South of															
-			Southeast corner Inkster Boulevard and Aikins Street, 2.0 m West of East curb.															
-																		- 8
			• No groundwater seepage or soil sloughing was															
.			observed during or upon completion of drilling.Testhole terminated at a depth of 2.1 m.															
-																		
-																		
- 3 -																		
			Ype: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Va		. –	ogged by eviewed		tor Aba man Le				\bigwedge		S	ta	nt	teo	
		zomet kfill	er Type: Bentonite Drill Cuttings Sand	gh								V)	0	LU			-

P L	ROЛ ОСА	ECT TION	TH05TES1City of Winnipeg2016 Residential Street Renewal Program2016 Residential Street Renewal ProgramAikins St from Atlantic Ave to Carruthers AveDATEDecember 16, 2015 DRILLING CO. Padde	e	I	DATUM	ΓΙΟN				NOF EAS	DJECT RTHING TING	G		31230	
			DATE December 10, 2013 DRILLING CO. 1 audi			-										
		Ы		5/	AMP	LES		itu Shea cket Per		e (kPa) eter (kPa		orvane o	on Grat	Sample	es (kPa)	
H (m	TYPE	SYMBOL			ШЧ	JRE (%)		50	kPa	10	0kPa	15	0kPa	20	0kPa	H (ff
DEPTH (m)	SOIL TYPE		SOIL DESCRIPTION	ТҮРЕ	NUMBER	DIST(₩ _P	W		loisture	Content	· & Δtter	hera li	mite		DEPTH (ft)
	l o	SOIL			z	MOISTURE CONTENT (%)			• s	standard	Penetra	ation Te	st, N V	alue		
- 0	AS		ASPHALT	Г			1	10 2	20	30 4	10 5	50 6	50 '	70 8	0 90	0
	со		CONCRETE													_
	\vdash		Firm black fat CLAY (CH) with trace organic and	-												-
	1		trace fine sand	GS		33				0						-
· ·	1															
	1															-
			Particle Size Analysis at 0.6 m: 0.0% Gravel, 4.5%	GS		38				⊢⊖				-		- 2
	1		Sand, 24.3% Silt, 71.2% Clay													_
																-
1 -	СН			GS		35				0						
																-
																-
				GS		31				0						- 4
																-
	-															
	-			GS		27			0							_
	╞		Firm tan SILTY CLAY (CL-ML)	-												-
	-															- 6
	CL	X		GS		32				0						-
- 2 -	ML															-
	1	μł		GS		35				0						_
	1		TESTHOLE LOCATION: 4.0 m South of Southwest corner Inkster Boulevard and Aikins													-
	1		Street, 2.0 m East of West curb.													
· ·	1															- 8
	1		• No groundwater seepage or soil sloughing was													-
			• Testhole terminated at a depth of 2.1 m.													
	1		- resultie terminateu at a ucpui 01 2.1 III.													-
	1															_
- 3 -																_
	Sar	nple T	ype: GS - Grab Sample SPT - Standard Penetration Test			ogged by	/: Nes	tor Abar	ca							- 10
	Pie	zomet	ST - Shelby Tube PT - Piston Tube VT - Shear Va		t R	eviewed							Sta	ant	tec	
	Ba	kfill	er Γ Bentonite Drill Cuttings Sand Slow	ıgu							Y					

P	RОЛ	ECT	TH06 TEST City of Winnipeg 2016 Residential Street Renewal Program		Ι	DATUN	[. NO	DJECT	IG		312305	5
			DATE December 16, 2015 DRILLING CO. Paddo							LLING M		STING D <u>10</u>				
(m)	ТҮРЕ	SYMBOL				RE (%)		ket Pe		ne (kPa) meter (kPa 10			on Grab 50kPa	-	es (kPa) 0kPa	
DEPTH (m)	SOIL T	SOIL SY	SOIL DESCRIPTION	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	₩ _P ⊢	-0	•	Moisture Standard	Penetra	ation Te	est, N Va	alue		DEPTH (ft)
- 0	AS	P 14 4	ASPHALT	-			1	0	20	30 4	40 :	50	60 7	/0 8	30 90	0
	CO	1 4 4 4	CONCRETE Firm black fat CLAY (CH) with trace organic and	_												-
	-		trace fine sand	GS		37				0						-
	-			Maa												- 2
	-			GS		36				0						_
- 1 -	-			GS		33				0						-
	Сн															-
	-			GS		32				0						- 4
	-			GS		30										-
	-		brown below 1.7 m			50										-
				GS		33				0						- 6
- 2 -	-			GS		25			0							_
- - -	-		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. 													- 8 - -
	-		*													-
- 3 -	Sar	nple T	ype: GS - Grab Sample SPT - Standard Penetration Test			ogged by	/: Nes	tor Aba	rca							10
	Pie	zomet	ST - Shelby Tube PT - Piston Tube VT - Shear Var			eviewed					Ć		Sta	ant	tec	

Pl L	ROЛ ЭСА	ECT ATION	TH07 TES1 City of Winnipeg 2016 Residential Street Renewal Program Aikins St from Atlantic Ave to Carruthers Ave DATE December 16, 2015 DRILLING CO. Padde		I	DATUM	ί					NOI EAS	RTHIN STING	G	<u>1233</u>		
			DATE December 10, 2013 DATE NO CO. Tuun														
Ē	ш	Ы		- 3				itu Shea ket Per	netror		(kPa)			b Sample		
TH (n	ΤYΡ	SYMBOL	SOIL DESCRIPTION	ш	3ER	URE IT (%		50	kPa		100	kPa	15	0kPa	20	0kPa	DEPTH (ft)
DEPTH (m)	SOIL TYPE	SOIL S		ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	₩p ⊢	W O					t & Atte ation Te		/alue		
- 0	AS		ASPHALT	_			1	0 2	20	30	40	0 :	50	60	70 8	0 90	0
-	со																-
-			Firm black fat CLAY (CH) with trace organic and trace fine sand	GS		37					0						-
-						51											
	СН																-
-				GS		31				þ							- 2
			Soft tan SILT (ML)														-
.																	_
- 1 -	ML	,		GS		27			(o							-
-																	-
-			Firm brown fat CLAY (CH)	X GS		38			· · · · · · · · · · · · · · · · · · ·		0						- 4
-	СН			Age		30					Ŭ						-
-			Soft tan SILT (ML)														-
				GS		23			0								-
	ML	,															F
-																	-
				GS		25			0								- 6
- 2 -			Firm brown SILTY CLAY (CL-ML)	-													-
-	CL ML	ļ.		GS		30				0							
-			TESTHOLE LOCATION: 21.5 m South of Southwest corner Lansdowne Avenue and Aikins														-
-			Street, 2.0 m East of West curb.														
-																	- 8
			• No groundwater seepage or soil sloughing was														
			observed during or upon completion of drilling.Testhole terminated at a depth of 2.1 m.														-
-																	-
-																	-
- 3 -																	- 10
	Sar	nple	Type: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Va	ne Tes	<u>ـ</u>	.ogged by .eviewed		tor Abar				1		C+	ant		
	Pie Bao	zome ckfill	ter Type: Bentonite Drill Cuttings Sand Slow	gh			Jy. Gerl	пап Lea	1					JL	aill	.60	•

P L	ROJ. OCA	ECT ATION	TH08 TES1 City of Winnipeg 2016 Residential Street Renewal Program Aikins St from Atlantic Ave to Carruthers Ave DATE December 16, 2015 DRILLING CO. Padde	e	I	DATUM	ι ΓΙΟΝ				NOR EAS	JECT THIN TING D 100	G	_1233 SSA		
DEPTH (m)	SOIL TYPE	SYMBOL	SOIL DESCRIPTION			TES (%)		ket Pe	ar Vane netrom	eter (kPa			on Grab		es (kPa) OkPa	DEPTH (ft)
		SOIL		ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	₩ _P ⊢	0	• s	loisture (tandard 30 4	Penetra	tion Te	est, N Va		0 9	0
- 0	-AS CO	_ 9 ⊿	ASPHALT CONCRETE Firm black fat CLAY (CH) with trace organic and	/												0
	-		trace fine sand	GS		31				o						-
	-			GS		34				0						- 2 -
- 1 -	СН			GS		35				0						
	-			GS		30				•						- - 4
 -	-		brown, trace silt below	GS		30				•						- - -
			Soft tan SILT (ML)	GS		24			0							- - 6 -
- 2 -	ML		TESTHOLE LOCATION: 6.0 m North of	GS		24			0							
	-		Northwest corner Lansdowne Avenue and Aikins Street, 2.0 m East of West curb.													- 8
	-		 No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 													-
- 3 -	Sai	nple	Fype: GS - Grab Sample SPT - Standard Penetration Test		1	.ogged by	/: Nest	tor Aba	rca							- - 10
	Pie	zome	ST - Shelby Tube PT - Piston Tube VT - Shear Va		t –	eviewed					Q		Sta	ant	tec	-

Pl Le	ROЛ ОСА	ECT TION	TH09 TEST City of Winnipeg 2016 Residential Street Renewal Program Aikins St from Atlantic Ave to Carruthers Ave DATE December 16, 2015 DRILLING CO. Paddo	e	. [E	DATUN	ι ΓΙΟΝ				NOI EAS	DJECT RTHIN STING	G		312305	
			DATE December 10, 2013 DRILLING CO. 1 audo			-										
DEPTH (m)	IL TYPE	SYMBOL	SOIL DESCRIPTION	TYPE	AMP NUMBER	MOISTURE T CONTENT (%)		cket Pe 5(ne (kPa) neter (kPa 100			on Grab		es (kPa) 0kPa ⊣	DEPTH (ft)
DE	SOIL	SOIL		 	N	MOI		0	•	Moisture (Standard	Penetra	ation Te	est, N Va	alue		
- 0	AS		ASPHALT	<u> </u>	-	~	1	10	20	30 4	0 :	50 (60 7	70 8	30 90	0
-	со	A 4 4 4	CONCRETE	1												-
-			Firm black fat CLAY (CH) with trace organic and	-												
.	-		trace fine sand	GS		42					0					-
																-
-	СН			GS		36				0						- 2
																-
	-			GS		34				0						-
- 1 -						74										
			Soft tan SILT (ML)													-
	-			GS	<u> </u>	22			0							- 4
	ML															-
				GS	<u> </u>	26			c							-
																F
					<u> </u>	25										- 6
	СН		Firm brown fat CLAY (CH)	GS		35				O						
- 2 -				GS	<u> </u>	36				0						-
-	-		TESTHOLE LOCATION: 3.0 m South of	1												-
-	-		Southwest corner Carruthers Avenue and Aikins Street, 2.0 m East of West curb.													-
																- 8
-			 No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 													-
-	-															-
- 3 -																- 10
	San	nple 7	Type: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Va	ine Tes		ogged by					1		C+-		tec	
	Piez Bac	zome ckfill	ter Type: Bentonite Orill Cuttings Sand	ıgh	K	eviewed	by. Gen	man Lea	11			<u>ر</u>	310	111	lec	•





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

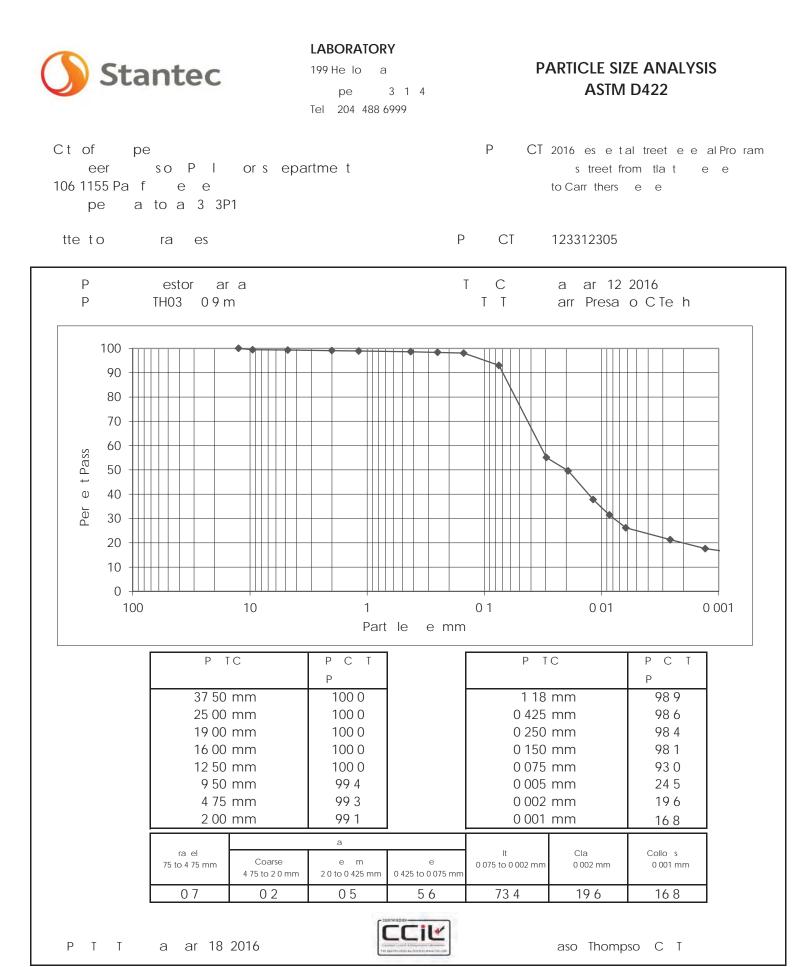


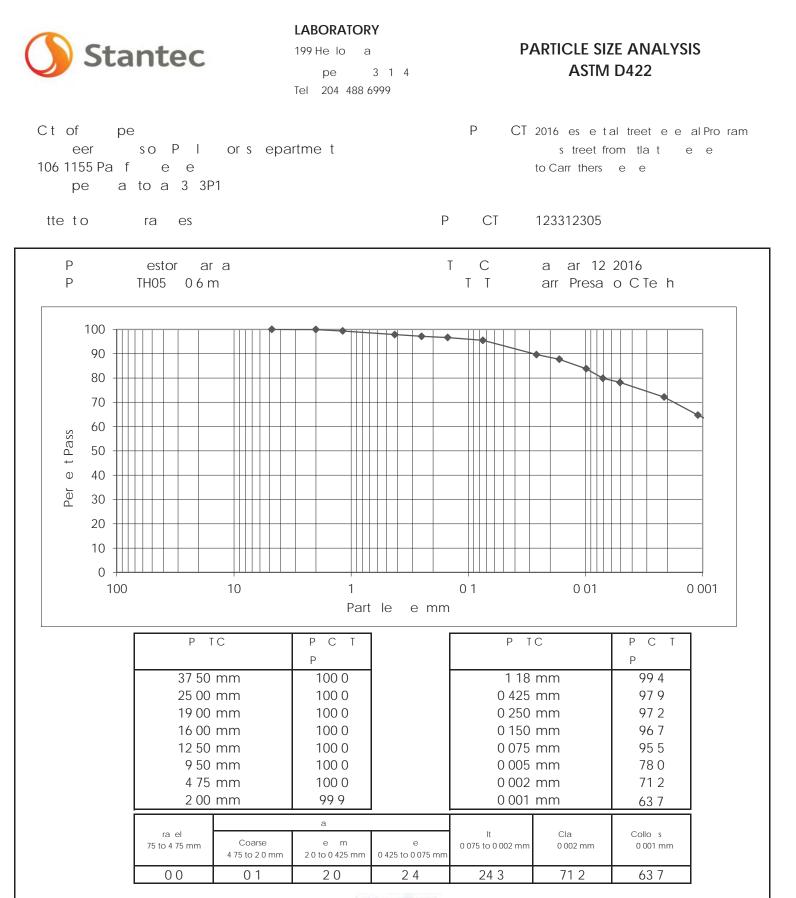
Photo 8 - Core sample from Testhole TH08





Photo 9 – Core sample from Testhole TH09





PTT a ar 18 2016

aso Thompso C T

2016 Residential Street Renewal Program

Geotechnical Investigation -Carruthers Avenue from Arlington Street to Parr Street

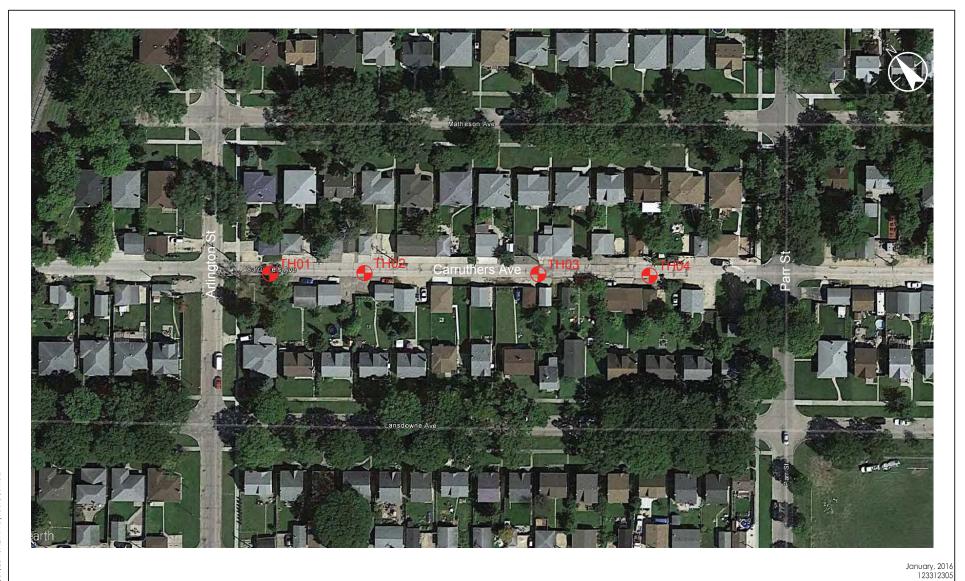


Prepared for: City of Winnipeg Engineering Division Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1

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

Project No. 123312305

January 21, 2016



ORIGINAL SHEET - ISO 8.5x11 H - v14.06



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: 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		Pavemer	nt Surface	Pavemen	t Structure	Sample	Sample	Moisture		Particle Siz	e Analysis		A	tterberg Limi	its
ID	Testhole Location	Туре	Thickness (mm)	Туре	Thickness (mm)	Description	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
	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
	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	-	-	-	-	-	-	-	-	-	-	-	-
	Carruthers Avenue	Asphalt	30												
TH03	110.0 m East of Southeast corner Carruthers Avenue and Arlington Street 1.0 m North between property lines 671 and 675 Lansdowne Avenue	Concrete	150	-	-	-	-	-	-	-	-	-	-	-	-
	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



P. L	RОЛ ОСА	ECT TION	TH01TESTCity of Winnipeg2016 Residential Street Renewal Program2016 Residential Street Renewal ProgramCarruthers Ave from Arlington St and Parr StDATE _December 15, 2015 DRILLING COPaddod		I	DATUM	ί				NOF EAS	DJECT RTHING TING D_100	G		312305	
DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION			MOISTURE 30 CONTENT (%)	□ Insi △ Poc	itu Shea cket Per 50 W	ar Van netrom kPa <i>W</i> L	e (kPa) leter (kPa 100 Moisture (DkPa 0kPa Content	15 15 & Atter ation Te	on Grab	Sample 200	es (kPa) 0kPa 	DEPTH (ft)
- 0	CO		CONCRETE FILL: black silty clay with trace organic and some sand	GS		32				0						- 0
	FL		Particle Size Analysis at 0.6 m: 0.0% Gravel, 17.1% Sand, 37.1% Silt, 45.8% Clay	GS		32			I.	0						- 2 2
- 1 -	-		Soft tan SILTY CLAY (CL-ML)	XGS XGS		33 24			o	o						- - - - 4
	CL ML		Stiff brown fat CLAY (CH)	GS		27			c							-
- 2 -	СН		TESTHOLE LOCATION: 15.0 m East of Southeast	XGS XGS		35				0	•			1 3 3 4 4 4 1 5 5 5 5 5 5 1 5 5 5 5 5 5 5 1 5		- 6 - - -
	-		 corner Carruthers Avenue and Arlington Street, 1.0 m North of property line 697 Lansdowne Avenue. No groundwater seepage or soil sloughing was 													- - - 8 -
	-		observed during or upon completion of drilling.Testhole terminated at a depth of 2.1 m.													-
- 3 -	Pie	zome	ype: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Var er Гуре: Bentonite Drill Cuttings Sand ASSIO		<u>ـ</u>	logged by		tor Abar nan Lea			C		Sta	ant	tec	10

P L	ROJ .OCA	ECT ATION	TH02 TEST City of Winnipeg 2016 Residential Street Renewal Program Carruthers Ave from Arlington St and Parr St DATE December 15, 2015 DRILLING CO. Paddo		I	DATUM	TION					NOF EAS	DJECT RTHING TING D 100	G		312305	
		_			AMP	LES	🗆 Insi	tu Shea ket Pei	ar Van	e (kPa leter (l)	🗖 To	orvane c		Sample	es (kPa) 0kPa	
DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	₩ _P	W	W _L ⊣ N	//oistu i Standa	re Co rd Pe	ntent enetra	& Atter	berg Li st, N Va	mits alue	-	DEPTH (ft)
- 0	cc		CONCRETE				1	0 2	20	30	40	3	06	0	70 8	0 90	0
	-		FILL: black silty clay with trace organic and some sand	GS		48						0					-
	FL			XGS		31				0							- 2
	-		Soft tan SILTY CLAY (CL-ML)			51				`							_
- 1 -	CL	riik		GS		27			c								-
			Stiff brown fat CLAY (CH)	GS		27			c								- 4
	-			GS		32				0							-
	СН			GS		40					0						- 6
- 2 -	-			GS		39					0						-
	-		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.														- 8
	_		 No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 							Image: Section of the sectio							-
- 3 -	Pie	zome	Type: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Va ter Type: Bentonite Drill Cuttings Sand		t R	ogged by		tor Abar nan Lea				Q		Sta	ant	tec	- 10

Pl L	RОЛ ОСА	ECT TION	TH03TESTCity of Winnipeg2016 Residential Street Renewal ProgramCarruthers Ave from Arlington St and Parr StDATEDecember 15, 2015DRILLING CO.Padde		I	DATUN	ι ΓΙΟΝ					NOF EAS	DJECT RTHING TING D_100	G	_1233 SSA		
DEPTH (m)	IL TYPE	SYMBOL	SOIL DESCRIPTION	LYPE S	AMP	MOISTURE CONTENT (%)				meter (kPa			on Grat	o Sample 20	es (kPa) OkPa	DEPTH (ft)
DEI - 0	SOIL	SOIL			NUN	MOIS	É	0				Penetra	& Atter ation Te	st, N V	alue	0 9	
- 0	AS	D D S	ASPHALT	/													
-	CO										· · ·						-
-	FL	\bigotimes	FILL: black silty clay with trace organic and some sand	GS		39					0						_
	-		Soft brown SILTY CLAY (CL-ML)														-
-				GS		23			0								- 2
- - 1 -	CL ML			GS		29				0					-		-
-			Firm brown fat CLAY (CH)														
-	-			GS		36					0						- 4
	СН			GS		38					0						-
- 2 -	-			GS		44						0					- 6
-				GS		43						0					-
-	-		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.														- 8
	-		 No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 														-
- 3 -	-																- 10
	Sar	nple 7	Sype: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Va	no To-		ogged by		tor Aba				1					
	Pie	zomet			R	eviewed	by: Gen	man Lea	ıl			U		Sta	ant	tec	

P L	ROЛ OCA	ECT TION	TH04 TEST City of Winnipeg 2016 Residential Street Renewal Program Carruthers Ave from Arlington St and Parr St DATE December 15, 2015 DRILLING CO. Paddo		I	DATUM	ί				NOF EAS	DJECT RTHING STING	G		312305	
			DATE December 15, 2013 DRILLING CO. 1444			_										
DEPTH (m)	SOIL TYPE	. SYMBOL		TYPE	SAMPLES NUMBER NOISTURE					eter (kPa			on Grab 0kPa	ab Samples (kPa		DEPTH (ft)
DE	so	SOIL		ļ Ĥ	Ν	MOISTURE CONTENT (%)	É	-Ö	H M	l oisture (tandard						DE
- 0	СО		CONCRETE				1	0 2	20	30 4	10 5	50 6	50 7	70 8	0 90	0
			FILL: black silty clay with trace organic and some													-
	FL		sand	GS		30				φ						-
		X	Soft tan SILTY CLAY (CL-ML)													
	-		Particle Size Analysis at 0.6 m: 0.0% Gravel, 14.4%	GS		23		F	0			-1				- 2
	-		Sand, 47.8% Silt, 37.8% Clay													-
	CL			GS		26			0							-
- 1 -	ML															-
	-			GS		28			c							- 4
	-		Firm brown fat CLAY (CH)	-												-
	-			GS		34				0						-
				Age		34										-
	СН			GS		25										- 6
- 2 -				AG2		35				0						-
				GS		40					þ					-
	-		TESTHOLE LOCATION: 38.5 m West of Southwest corner Carruthers Avenue and Parr													-
	-		Street, 1.0 m North of property line 661 Lansdowne Avenue.													- 8
			• No groundwater seepage or soil sloughing was													-
			observed during or upon completion of drilling.Testhole terminated at a depth of 2.1 m.													_
- 3 -																
- 3 -	Sar	nple 7	ype: GS - Grab Sample SPT - Standard Penetration Test			ogged by	: Nes	tor Abar	ca							10
	Pie	zome	ST - Shelby Tube PT - Piston Tube VT - Shear Va		. –	eviewed							Sta	ant	tec	
	Bac	kfill	er Гуре: Bentonite Drill Cuttings Sand Slou	gn							Y					





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

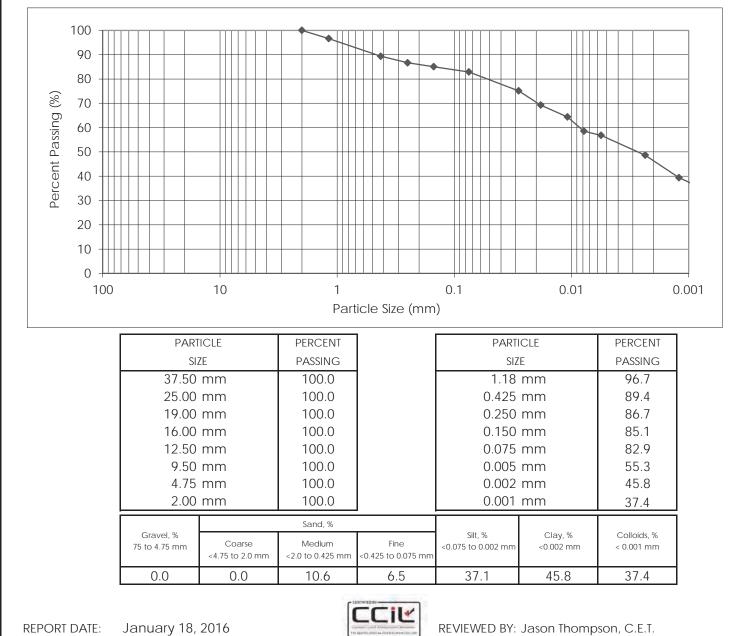
City of Winnipeg Engineering Division, Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1 PROJECT: 2016 Residential Street Renewal Program Carruthers Avenue from Arlington Street to Parr Street

PROJECT NO.: 123312305

Attention: Brad Besyk

SAMPLED BY:Nestor AbarcaSAMPLE ID:TH01 @ 0.6 m

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





LABORATORY

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

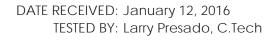
PARTICLE SIZE ANALYSIS ASTM D422

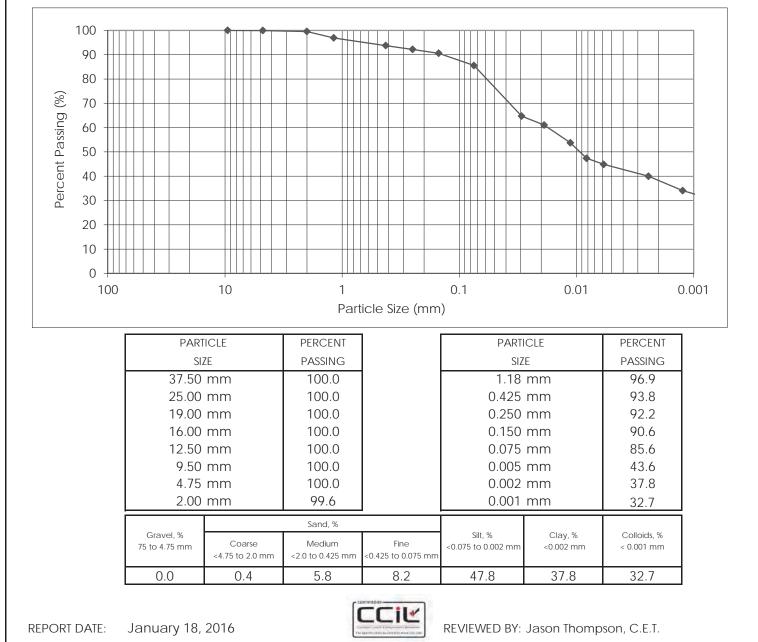
City of Winnipeg Engineering Division, Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1 PROJECT: 2016 Residential Street Renewal Program Carruthers Avenue from Arlington Street to Parr Street

PROJECT NO.: 123312305

Attention: Brad Besyk

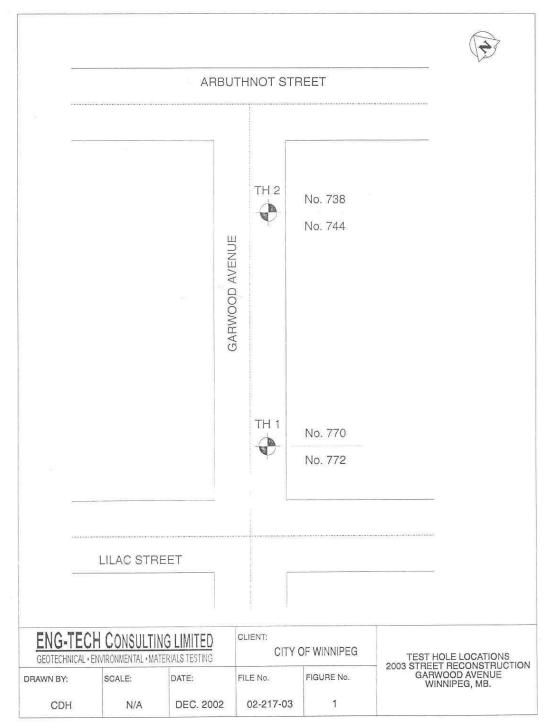
SAMPLED BY:Nestor AbarcaSAMPLE ID:TH04 @ 0.6 m





Geotechnical Report for ^

Test Hole Locations



2016 Residential Street Renewal Program

Geotechnical Investigation -Carruthers Avenue from McKenzie Street to McGregor Street

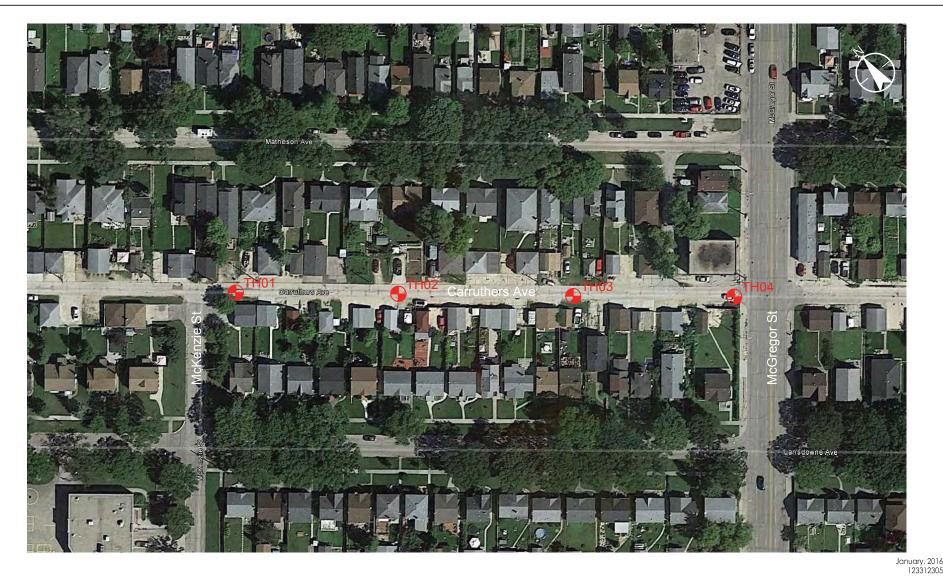


Prepared for: City of Winnipeg Engineering Division Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1

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

Project No. 123312305

January 21, 2016



ORIGINAL SHEET - ISO 8.5x11 H - v14.06



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: 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			Pavement Surface		Pavement Structure		Sample	Moisture	Particle Size Analysis				Atterberg Limits			
ID	Testhole Location	Туре	Thickness (mm)	Туре	Thickness (mm)	Sample Description	Depth (m)	Content (%)	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	-	-	-	-	-	-	-	-	-	-	-	-	



P. L	RОЛ ОСА	ECT TION	Carruthers Ave from McKenzie St to McGrego	or St	I	DATUM	ι ΓΙΟΝ				N E	ROJE IORT ASTI	HINC NG)		31230	
D	RILI	LING	DATE December 15, 2015 DRILLING CO. Paddo			-											
		Ы		S	AMP	LES				e (kPa) neter (k		Torv	ane oi	n Grab	Sample	es (kPa	
H (m	TYPE	SYMBOL			ЯЩ	JRE (%)		5	OkPa	1	00kPa	a	150	kPa	20	0kPa	H (ft)
DEPTH (m)	SOIL ⁻	SOIL S	SOIL DESCRIPTION	ТҮРЕ	NUMBER	DISTU TEN	Wp	W	WL	Moistur	e Cont	ent &	Δtterh	eralir	nite		DEPTH (
	N N	SO			z	MOISTURE CONTENT (%)		-	•	Standa	d Pen	etratio	n Tes	t, N Va	alue		
- 0			CONCRETE				1	0	20	30	40	50	60) 7	70 8	30 9	0
	CO																
		\bigotimes	FILL: black clay with trace organic														-
		\bigotimes		GS		44					0						
	FL	\bigotimes															-
		\bigotimes															- 2
		\bigotimes		GS		32				0							
		Ž	Firm brown fat CLAY (CH) with some sand and silt														
			Particle Size Analysis at 0.9 m: 0.0% Gravel, 10.2%	GS		33											-
- 1 -			Sand, 24.8% Silt, 65.0% Clay	Mas		33											-
	СН			GS		31				ο							- 4
																	-
				GS		31				ρ							
	-		Firm brown SILTY CLAY (CL-ML)														-
																	- 6
	CL	H		GS		30				0							-
- 2 -	ML																
		ŊИ		GS		37				(>						-
			TESTHOLE LOCATION: 5.5 m East of Southeast corner Carruthers Avenue and McKenzie Street, 1.0														
			m North of property line 597 Lansdowne Avenue.														-
L -																	- 8
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.														-
			• Testhole terminated at a depth of 2.1 m.														-
	-																
	-																-
- 3 -																	
			Sype: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Var	ne Tes	t R	ogged by		or Aba			-1	T		5+:	h	teo	
	Pie: Bac	zomet kfill	er Γype: Bentonite Drill Cuttings Sand Slou	gh			, 0m				-1	J					-

Pl L	ROJE OCA	ECT TION	TH02TESTCity of Winnipeg2016 Residential Street Renewal Program2016 Residential Street Renewal ProgramCarruthers Ave from McKenzie St to McGregoDATEDecember 15, 2015 DRILLING CO. Paddo	or St	. I E	DATUM	ί				NOF EAS	RTHI TINC	- ŭ	_1233 		
-					AMP	-									(1.De)	
		Ы	I	5/						ne (kPa) neter (kPa		orvane	e on Grat	o Samples	₃ (kPa)	
ш т	TYPE	SYMBOL	I		<u> </u>	JRE (%)		50)kPa	10)kPa	1	50kPa	200	kPa	H (ft)
DEPTH (m)	SOIL T	ΓSΥ	SOIL DESCRIPTION	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	Wp	W	WL			- • •			I	DEPTH
	N N	SOIL			z	OM		-0		Moisture Standard						
- 0				<u> </u>	<u> </u>	0	1	0 2	20	30 4	0 5	50	60 '	70 80) 90	0
-	Со		CONCRETE													-
	╞		FILL: black clay with trace organic	1												-
	-	\bigotimes	I		ļ											Ļ
	FL	\bigotimes]	GS	–	38				0						-
	-	\bigotimes	l													-
	_		L	<u> </u>	ļ											- 2
	-		Soft tan SILT (ML) with trace sand and some clay	GS	─	33				0						-
			I													-
	ML		I													
- 1 -	-		Particle Size Analysis at 0.9 m: 0.0% Gravel, 5.3% Sand, 82.8% Silt, 11.9% Clay	GS	<u> </u>	18		B	+-1							-
	-		Salid, 62.670 Silt, 11.770 Clay													-
																- 4
			Firm brown fat CLAY (CH) with some sand and silt	GS		36				0						-
			I													-
			1													-
	СН		I	GS		27				0						-
	-															-
	-															-
				GS		34				0						- 6
- 2 -	┣		Soft tan SILT (ML)	-												-
	ML			GS		22			0							-
			TESTHOLE LOCATION: 123.0 m West of													_
	-		Southwest corner Carruthers Avenue and McGregor													_
	-		Street, 1.0 m North of property line 581 Lansdowne Avenue.													-
Ļ -	-															- 8
	-		• No groundwater seepage or soil sloughing was													_
	-		observed during or upon completion of drilling.													-
	-		• Testhole terminated at a depth of 2.1 m.													_
	-															_
- 3 -	-															-
	San	nple 7	Fype: GS - Grab Sample SPT - Standard Penetration Test		L	l .ogged by	: Nes	tor Abaı	rca							- 10
	Pie	zomet	ST - Shelby Tube PT - Piston Tube VT - Shear Var	eviewed	by: Geri	man Lea	ıl				Sta	ant	ec			
			ter Type: Bentonite Drill Cuttings Sand Sloug	zn							Y					

Pl L	ROJI ОСА	ECT	Carruthers Ave from McKenzie St to McGrego	or St	I F	DATUM	I				– NO – EAS	OJECI RTHII STINC	NG i		31230:	<u>5</u>
	RILI		DATE December 15, 2015 DRILLING CO. Paddo			-										
-		Ы	Γ	54	AMP					ne (kPa) meter (kP		orvane	on Grat) Sample	es (kPa)	
ш) <u>Н</u>	TYPF	SYMBOL		ш	ЦЦ	URE 1 (%		50)kPa	10	00kPa	1	50kPa	20	00kPa	(ff) H
DEPTH (m)	SOIL TYPE	SOIL S'	SOIL DESCRIPTION	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	₩ _P	W	<i>₩</i> _L −1	Moisture	Conten	nt & Atte	erberg Li	mits		DEPTH
		Ň				ZOS	1	0	• 20	Standard		ration T 50			80 90	0
- 0			CONCRETE					•								0
			FILL: black clay with trace organic													
			FILL. Diack ciay with trace organic													
			Γ	GS		39					P					
	FL		ſ													
	-		Γ	GS		23			0		-					- 2
		\bigotimes	I			23										
-	ML		Soft tan SILT (ML) with trace sand and some clay													-
. 1	╞		Firm brown fat CLAY (CH) with some sand and silt	GS		24			0							
- 1 -			Γ													
			Γ													- 4
	-		I	GS	—	33				0						
	СН		I													
	-		Γ	MGS	-	42										
	-		Γ	XGS		42					0					
-	1		Γ													
	╞		Soft tan SILT (ML)	GS		23			0							- 6
2 -	ML		Γ													
-	-			GS		22			0							-
			TESTHOLE LOCATION: 62.0 m West of													
	-		Southwest corner Carruthers Avenue and McGregor Street, 1.0 m North of property line 565 Lansdowne													-
·	-		Avenue.								-					- 8
	1															
	-		• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.													
-			• Testhole terminated at a depth of 2.1 m.								-					
- 3 -																-
	San	nple T	Fype: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Var		<u>+</u>	ogged by		or Aba					a .	<u></u>	<u> : : : : </u>	10
	Pie: Bac	zomet ckfill			R	eviewed	by: Gern	nan Lea	ıl				Sta	an	tec	-

Pl Le	RОЛ ОСА	ECT TION	TH04 TEST City of Winnipeg 2016 Residential Street Renewal Program Carruthers Ave from McKenzie St to McGrego DATE December 15, 2015 DRILLING COPaddc	or St	I	DATUM	ι ΓΙΟΝ				NOF EAS	DJECT RTHIN TING 100	G		31230:	5
			DATE Deterior 10, 2015 DALLING CO. Tuda			-										
		5		54		LES				ne (kPa) meter (kPa		orvane	on Grab	Sample	es (kPa)	
T (m)	ΥΡ	SYMBOL			Ř	JRE (%)		50)kPa	100)kPa	15	0kPa	20	0kPa	H (ft)
DEPTH (m)	SOIL TYPE	ΓSΥ	SOIL DESCRIPTION	ТҮРЕ	NUMBER	ISTL ENT	Wp		WL		1		I		I	DEPTH
ā	Ň	SOIL			z	MOISTURE CONTENT (%)		-0		Moisture (Standard			•			ā
- 0		1.1.1.1.1.				0	1	0 2	20	30 4	0 5	50 6	50 7	70 8	0 90	0
- L	со		CONCRETE													-
-	_		FILL: black clay with trace organic													-
-		\bigotimes														
-		\bigotimes		GS		38				0						_
	FL	\bigotimes														-
.		\bigotimes														- 2
-		\bigotimes		GS		29				0						-
-	-	F	Soft tan SILT (ML) with trace sand and some clay													-
																L
- 1 -				X GS		24			0							-
	ML															-
-																- 4
-				GS		22			0							-
	<u> </u>		Firm brown fat CLAY (CH) with some sand and silt													-
L -																-
	СН			GS		35				0						-
	<u> </u>		Soft tan SILT (ML)													-
-																-
	ML			GS		22			0							- 6
- 2 -																-
				GS		25			0							-
.			TESTHOLE LOCATION: 6.0 m West of Southwest	Π												
-			corner Carruthers Avenue and McGregor Street, 1.0													-
-			m North of property line 551 Lansdowne Avenue.													-
																- 8
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.													-
-			• Testhole terminated at a depth of 2.1 m.													-
.																Ľ
.																-
- 3 -																-
	Sar	nple 7	ype: GS - Grab Sample SPT - Standard Penetration Test	 ~	I	ogged by	/: Nest	tor Abai	rca				<u> </u>	1::::	<u>. : : : : </u>	- 10
		zome			R	eviewed	by: Gerr	nan Lea	1		(Sta	ant	tec	
	Bac	kfill	Type: Entonne Drin Cuttings Sand Basiou	511												





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



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

PARTICLE SIZE ANALYSIS ASTM D422

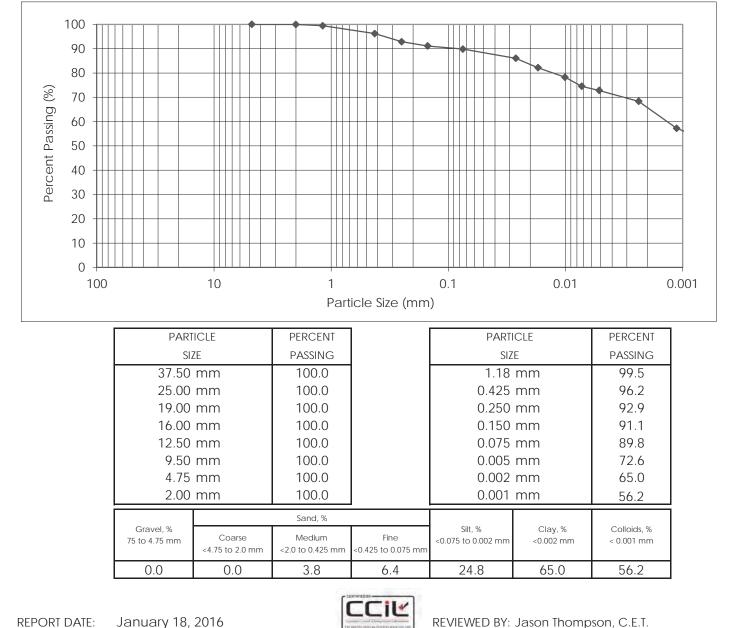
City of Winnipeg Engineering Division, Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1 PROJECT: 2016 Residential Street Renewal Program Carruthers Avenue from McKenzie Street to McGregor Street

PROJECT NO.: 123312305

Attention: Brad Besyk

SAMPLED BY:Nestor AbarcaSAMPLE ID:TH01 @ 0.9 m

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





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

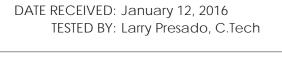
PARTICLE SIZE ANALYSIS ASTM D422

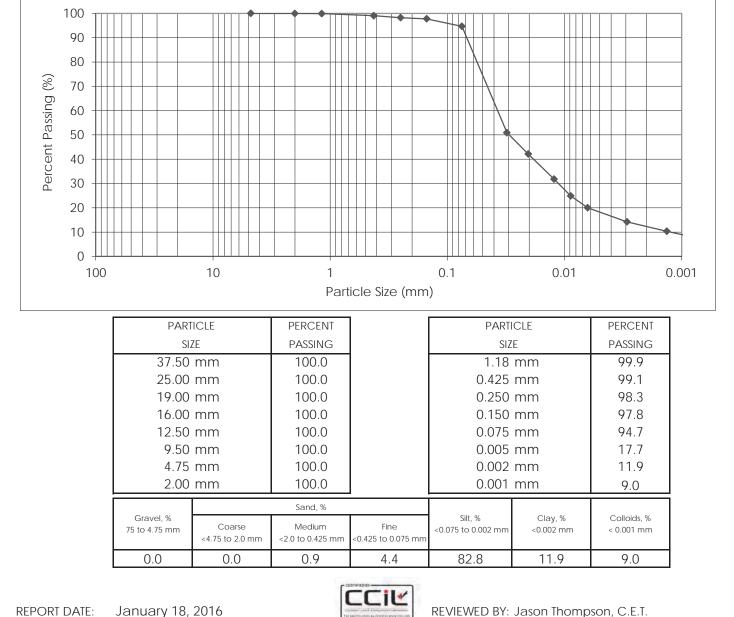
City of Winnipeg Engineering Division, Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1 PROJECT: 2016 Residential Street Renewal Program Carruthers Avenue from McKenzie Street to McGregor Street

PROJECT NO.: 123312305

Attention: Brad Besyk

SAMPLED BY:Nestor AbarcaSAMPLE ID:TH02 @ 0.9 m





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



ORIGINAL SHEET - ISO 8.5x11 H - v14.06



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: 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		Paveme	nt Surface	Pavemen	nt Structure	Sample	Sample	Moisture		Particle Siz	e Analysis		A	tterberg Limi	its
ID	Testhole Location	Туре	Thickness (mm)	Туре	Thickness (mm)	Description	Depth (m)	Content (%)	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
	Carruthers Avenue	Asphalt	20												
TH02	80.5 m East of Southeast corner Carruthers Avenue and Powers Street 1.0 m North of property line 359 Lansdowne Avenue	Concrete	170	-	-	-	-	-	-	-	-	-	-	-	-
	Carruthers Avenue	Asphalt	30												
TH03	132.5 m East of Southeast corner Carruthers Avenue and Powers Street 1.0 m North of property line 347 Lansdowne Avenue	Concrete	260	-	-	Clay	0.6	32	0.0	5.1	28.4	66.5	83	25	58
	Carruthers Avenue	Asphalt	30												
TH04	11.0 m West of Southwest corner Carruthers Avenue and Salter Street1.0 m North of property line 337 Lansdowne Avenue	Concrete	200	-	-	-	-	-	-	-	-	-	-	-	-



Pl L	RОЛ ОСА	ECT TIOI	TH01TESTCity of Winnipeg2016 Residential Street Renewal Program2016 Residential Street Renewal ProgramN Carruthers Ave from Powers St and Salter StDATEDecember 15, 2015 DRILLING CO. Padded		I	DATUM	Ι ΓΙΟΝ					NO EAS	DJEC RTH STIN	ING G			31230	
Ē	ш	Ы				1	□ Insi □ △ Poo	cket Pe	enetro	mete	r (kPa	I)				Sample	es (kPa)	
T (n	TYPE	SYMBOL	SOIL DESCRIPTION	ш	E R	URE T (%		5	0kPa		100)kPa		1501	«Pa	20	0kPa	TH (ft)
DEPTH (m)	SOIL	SOIL S	SUL DESCRIPTION	ТҮРЕ	NUMBER	DIST	W _P	W	<i>₩</i> _L	Mois	ture (Conten	t & A	tterbe	era Lir	nits		DEPTH
		S			Z	MOISTURE CONTENT (%)			•	Stan	dard	Penetr	ation	Test	, N Va	lue		
- 0	AS	P · · B·	ASPHALT	/				0	20	30	4	0	50	60	7	0 8	i0 9	0
		4 4 4 4 4 4 4	CONCRETE															
	CO																	
-		4.4	Black firm fat CLAY (CH) with trace organic and	GS		32				c								
			sand, some silt	Aga		32												
	СН																	-
				GS		38					0							2
-			Soft ton CLANEY SHIT (ML) with taxon cand	_														-
-			Soft tan CLAYEY SILT (ML) with trace sand															-
1			Particle Size Analysis at 0.9 m: 0.3% Gravel, 8.2%	GS		25		⊢		,	l							
- 1 -			Sand, 62.2% Silt, 28.9% Clay															-
				GS		26				o								4
																		-
	ML																	-
				GS		27				0								
																		-
																		- 6
				GS		25			C	>								
- 2 -																		
				GS		26				0								
			TESTHOLE LOCATION: 9.5 m East of Southeast															-
	-		corner Carruthers Avenue and Powers Street, 1.0 m North of property line 375 Lansdowne Avenue.															-
-			North of property line 575 Eansdowne Avenue.															8
			• No groundwater seepage or soil sloughing was															
			observed during or upon completion of drilling.															-
	-		• Testhole terminated at a depth of 2.1 m.															
																		-
-																		
- 3 -																		10
			Type: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Va	ne Tes	t –	ogged by eviewed		tor Aba man Le				0		C	+	h	teo	
		zome kfill	ter Type: Bentonite Drill Cuttings Sand Slou	gh			-1. 001	nun Le					ノ	3				-

Pl L	ROЛ ОСА	ECT	TH02TESTCity of Winnipeg2016 Residential Street Renewal Program2016 Residential Street Renewal ProgramA Carruthers Ave from Powers St and Salter StDATEDecember 15, 2015 DRILLING CO. Paddo		I E	DATUM	Ι ΓΙΟΝ					NOI EAS	DJECT RTHIN STING D 12	VG		31230	
			DATE <u>Dovember 12, 2019</u> DALLING CO. <u>1 and 2</u>				D Insi								o Sample	(kDa)	
(m)	ЪЕ	SYMBOL		0,				ket Pe		•	r (kPa			on Grai 50jkPa	·	es (kPa) 0 <u>kPa</u>	(ft)
DEPTH (m)	SOIL TYPE	SOIL SYN	SOIL DESCRIPTION	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	W _P		WL	Mois				rberg Li		4	DEPTH
		S S			2	ČČ	1	0	• 20		dard I	Penetra	ation T	est, N V	alue	30 90	
- 0	AS		ASPHALT				-				•						0
	-		Black firm fat CLAY (CH) with trace organic and sand, some silt														
	-			GS		29				0							
			1														
-				GS		38					0						- 2
	СН																
	-																
- 1 -	-			GS	<u> </u>	38					0						
	-																
-				XGS	<u> </u>	30				•							- 4
-																	
			Soft tan CLAYEY SILT (ML) with trace sand														
	ML	·		GS		23			0								
-			Firm brown SILTY CLAY (CL-ML)														
-				MCG	<u> </u>	20											- 6
-	CL ML		1	GS		28				0							_
- 2 -				GS	<u> </u>	35					0						-
	<u> </u>	ΗM	TESTHOLE LOCATION: 80.5 m East of Southeast	Ngs		33					0						
			corner Carruthers Avenue and Powers Street, 1.0 m														-
.			North of property line 359 Lansdowne Avenue.														- 8
			• No groundwater seepage or soil sloughing was														
-			observed during or upon completion of drilling.Testhole terminated at a depth of 2.1 m.														
-																	-
- 3 -																	10
	Sar	nple T	Type: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Var	ne Tes	<u>+</u>	ogged by		or Aba				1		C+			10
	Pie Ba	ezomet ckfill	ter Domtomito X Duill Cuttings Court 60 Stars		R	eviewed	by: Gerr	nan Lea	al			L		31	ant	lec	•

Pl L	ROЛ ОСА	ECT TION	TH03TESTCity of Winnipeg2016 Residential Street Renewal Program2016 Residential Street Renewal ProgramCarruthers Ave from Powers St and Salter StDATEDecember 15, 2015 DRILLING CO. Padded		I E	DATUM	ι					NOF EAS	DJECT RTHIN TING D 125	G		31230	5
						LES		itu Sh cket P	ear Va enetro	ane (k omete	:Pa) r (kPa	D To a)	orvane	on Grab	Sample	es (kPa)	
DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	₩p		W_L	Mois	sture (& Atter	0kPa	nits	0kPa	DEPTH (ft)
- 0	AS		ASPHALT			0	1	10	20	30	4	10 5	50 (50 7	70 8	0 9	0 0
			CONCRETE														
																	-
-			Black firm fat CLAY (CH) with trace organic and sand, some silt	GS		36					0						-
			sand, some site														-
				Mag		22											- 2
-				GS		32				I C)						-
																	-
	СН		Particle Size Analysis at 0.9 m: 0.0% Gravel, 5.1%	GS		36					0						-
- 1 -			Sand, 28.4% Silt, 66.5% Clay														F
																	- 4
	-			GS		32				C	>						-
-																	_
				GS		34					0						-
						51					Ţ						-
-			Firm brown SILTY CLAY (CL-ML)														-
	CL			GS		31				p							- 6
- 2 -	ML																-
-				GS		44						0					-
			TESTHOLE LOCATION: 132.5 m East of Southeast corner Carruthers Avenue and Powers														-
			Street, 1.0 m North of property line 347 Lansdowne														_
			Avenue.														- 8
			• No groundwater seepage or soil sloughing was														-
-			observed during or upon completion of drilling.														-
-	-		• Testhole terminated at a depth of 2.1 m.														F
-	-																-
- 3 -			Time: C.C. Crob Comple CDT Stordard Develoption The		т	orgend 1	r. N T										- 10
		nple I	SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Va:		. –	ogged by eviewed		tor Ab man Le				$\left(\right)$		Sta	ant	tec	
	Bac	kfill	Type: Bentonite Drill Cuttings Sand	gh								Y					

Pl L	ROЛ ОСА	ECT ATION	TH04 TEST City of Winnipeg 2016 Residential Street Renewal Program Carruthers Ave from Powers St and Salter St DATE December 15, 2015 DRILLING CO. Paddo		I F	DATUM	ί				NOF EAS	DJECT THING D_125	G	_1233 SSA	31230	5
		Ļ		SA	AMP	LES	🗆 Insi	itu She ket Pe	ear Vane enetrome 0kPa	(kPa) ter (kPa	D To	orvane o		Sample	es (kPa) 0kPa	
DEPTH (m)	SOIL TYPE	SOIL SYI	SOIL DESCRIPTION	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	₩ _P ⊢	-0		andard	Content Penetra	ition Te	st, N Va		0 9	DEPTH (ft)
- 0	AS CO			r												
	-		FILL: tan sand with gravel	GS		7	0									-
-	-			GS		9	С									- 2
- 1 -	SP			GS		8	0									-
-	-			GS		4	0									- 4 - -
			Soft brown fat CLAY (CH) with trace silt	GS		3	O									-
- 2 -	СН			XGS XGS		29			o	o						- 6
	-		TESTHOLE LOCATION: 11.0 m West of Southwest corner Carruthers Avenue and Salter Street, 1.0 m North of property line 337 Lansdowne Avenue.													8
	-		NOTE: All underground utilities were cleared at testhole location.													-
- 3 -	-		 No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 													-
	Pie	zomet	Fype: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Var ter Type: Bentonite Drill Cuttings Sand Sloug		t R	ogged by		tor Aba nan Le			Q		Sta	ant	cec	10





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



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

PARTICLE SIZE ANALYSIS ASTM D422

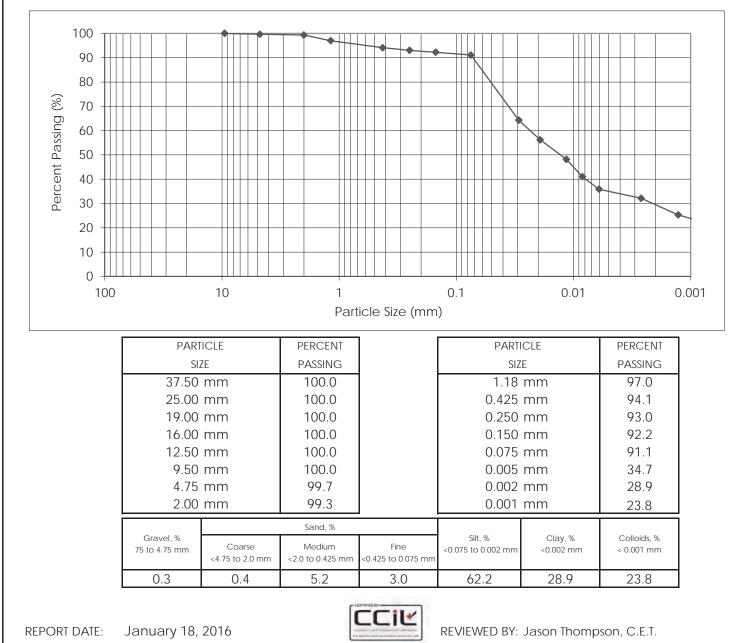
City of Winnipeg Engineering Division, Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1 PROJECT: 2016 Residential Street Renewal Program Carruthers Avenue from Powers Street to Salter Street

PROJECT NO.: 123312305

Attention: Brad Besyk

SAMPLED BY:Nestor AbarcaSAMPLE ID:TH01 @ 0.9 m

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





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

PARTICLE SIZE ANALYSIS ASTM D422

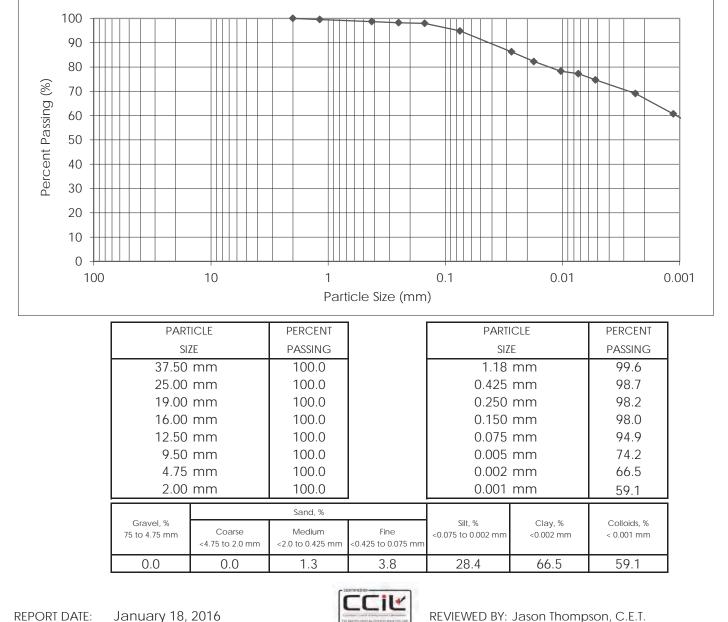
City of Winnipeg Engineering Division, Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1 PROJECT: 2016 Residential Street Renewal Program Carruthers Avenue from Powers Street to Salter Street

PROJECT NO.: 123312305

Attention: Brad Besyk

SAMPLED BY:Nestor AbarcaSAMPLE ID:TH03 @ 0.6 m

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



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



ORIGINAL SHEET - ISO 8.5x11 H - v14.06



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 BURROWS AVENUE TO REDWOOD AVENUE

Client/Project

CITY OF WINNIPEG 2016 RESIDENTIAL STREET RENEWAL PROGRAM WINNIPEG, MB Figure No. 1 Title TESTHOLE LOCATION PLAN January, 2016 123312305

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

Testhole		Paveme	nt Surface	Pavemen	t Structure	Sample	Sample	Moisture		Particle Siz	e Analysis		A	tterberg Lim	its
ID	Testhole Location	Туре	Thickness (mm)	Туре	Thickness (mm)	Description	Depth (m)	Content (%)	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	_	-	-	-	-	-	_	-	-	-	-	-
	Powers Street	Asphalt	30												
TH03	27.0 m North of Northwest corner Powers Street and Alfred Avenue 2.0 m East of West curb	Concrete	150	-	-	Clay	0.9	29	0.1	5.8	29.3	64.8	79	22	57
	Powers Street	Asphalt	50												
TH04	5.5 m South of Southeast corner Powers Street and Aberdeen Avenue 2.0 m West of East curb	Concrete	195	-	-	-	-	-	-	-	-	-	-	-	-
	Powers Street	Asphalt	20												
TH05	43.0 m North of Northwest corner Powers Street and Aberdeen Avenue 1.5 m East of West curb	Concrete	170	-	-	-	-	-	-	-	-	-	-	-	-
	Powers Street	Asphalt	60	Crushed											
TH06	5.0 m South of Southeast corner Powers Street and Redwood Avenue 2.0 m West of East curb	Concrete	160	Limestone	540	Clay	0.9	32	0.4	9.6	29.9	60.1	86	26	60



Pl L	ROЛ ОСА	ECT TION	TH01TESTCity of Winnipeg2016 Residential Street Renewal ProgramA Powers St from Burrows Ave to Redwood Ave	2	I F	DATUM	ί				NOF EAS	DECT RTHING TING	G		312305	
D	RILI	LING	DATE December 16, 2015 DRILLING CO. Paddo	ock D	rilliı	ng Ltd	•		DRIL	LING M	ETHO	D_125	mm	SSA		
DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	TYPE 0	AMP NUMBER	MOISTURE T CONTENT (%)		ket Pe	netron	ie (kPa) neter (kPa 10(Moisture (i))kPa	150)kPa		es (kPa) DkPa ⊣	DEPTH (ft)
		SC			Z	CON			•	Standard	Penetra	ation Tes	st, N Va	alue		
- 0		6 K :	CONCRETE				1	0	20	30 4	0 5	6 6	0 7	70 8	0 90	0
	со															-
-	FL	\bigotimes	FILL: black silty clay with trace organic, sand and gravel	Mag		10										-
			Soft tan SILT (ML) with trace clay, sand and gravel	GS		18		C								-
			Soft tail STET (WE) with trace clay, sand and graver													- 2
				GS		27			C	>						
																-
- 1 -			Particle Size Analysis at 0.9 m: 0.2% Gravel, 8.0%	GS		20		ŀ	0 							
1	ML		Sand, 77.8% Silt, 14.0% Clay													-
-																4
				GS		20			0							-
				GS		24			0							-
				1												-
			Firm brown fat CLAY (CH)													-
	СН			GS		29				0						- 6
- 2 -																-
-				GS		40				(Þ					F
-			TESTHOLE LOCATION: 4.0 m North of Northeast corner Powers Street and Burrows Avenue, 2.0 m													-
-			West of East curb.													F
																- 8
			• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.													
			• Testhole terminated at a depth of 2.1 m.													
-																-
- 3 -	San	 nple [Type: GS - Grab Sample SPT - Standard Penetration Test		1	ogged by	r: Nes	tor Aba	rca							10
		zome	ST - Shelby Tube PT - Piston Tube VT - Shear Van	eviewed							Sta	ant	cec			
	Bac	kfill	ter Type: Bentonite Drill Cuttings Sand	gh												

PI Lo	ROJE OCA	ECT TION	TH02TESTCity of Winnipeg2016 Residential Street Renewal Program2016 Residential Street Renewal ProgramN Powers St from Burrows Ave to Redwood AveDATEDecember 16, 2015 DRILLING CO. Paddo	e	. D E	DATUM	Ι ΓΙΟΝ				NOF EAS	DJECT RTHIN TING 125	G		312305	
						-										
DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	TYPE	NUMBER	MOISTURE G CONTENT (%)		ket Per 50	netror)kPa <i>W</i> L	Moisture C) DkPa Content	15 & Atter	0kPa	200 mits	es (kPa) 0kPa ⊣	DEPTH (ft)
		S				≥ 0 0	1	.0 2	• 20	Standard I 30 4					30 90	0
- 0 - -	AS CO	D A S	ASPHALT CONCRETE FILL: black silty clay with trace organic, sand and													0
-	FL	\bigotimes	gravel	GS		30				0						
		\bigotimes	Firm black fat CLAY (CH) with some silt, trace sand and gravel	-						Ţ						
	СН		4	GS		36				0						- 2
-			Soft tan SILT (ML) with trace clay, sand and gravel													-
- 1 -				GS		22			0							-
-																- 4
-	ML			GS	, 	22			0							- 4
				GS		21			0							
-	-															-
_			Firm brown fat CLAY (CH)	GS		33				o						- 6
- 2 -	СН			GS		35				o						-
-	-		TESTHOLE LOCATION: 12.5 m South of Southwest corner Powers Street and Alfred Avenue, 2.0 m East of West curb.													- - - 8
	-		 No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 													-
- 3 -																- 10
	San	ple 7	Type: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Var	ne Tes	-+	ogged by					1					
	Piez Bac	zomet ckfill			R	eviewed	by: Gen	nan Lea	.1		Q		516	int	tec	•

P. L	ROЛ ОСА	ECT TION	TH03 TEST City of Winnipeg 2016 Residential Street Renewal Program 2016 Residential Street Renewal Program 2016 Residential Street Renewal Program Powers St from Burrows Ave to Redwood Ave 2015 Results and a street Renewal Program	e	I	DATUM	Ι ΓΙΟΝ				NOF EAS	DECT RTHIN TING	IG	<u>1233</u>	<u>12305</u>	<u>5</u>
D	RILI T	JNG	DATE December 16, 2015 DRILLING CO. Paddo			-										
DEPTH (m)	_ TYPE	SYMBOL	SOIL DESCRIPTION		NUMBER	TURE NT (%)		50	netrom	eter (kPa			on Grab	Samples	s (kPa) kPa	(ft)
	. NOS	SOIL		ТҮРЕ	NUM	MOISTURE CONTENT (%)		_0	• S	loisture (itandard 30 4	Penetra	tion Te	est, N Va) 90	DEPTH
- 0	AS	DAS	ASPHALT													- 0
		A. 7. A.	CONCRETE Firm black fat CLAY (CH) with trace organic, some	-												-
	-		silt, trace sand and gravel	GS		20										_
	-			Vas		29				S						_
	1															-
				GS		33				0						- 2
	СН															_
	_															_
- 1 -	-		Particle Size Analysis at 0.9 m: 0.1% Gravel, 5.8% Sand, 29.3% Silt, 64.8% Clay	GS		29)						-
	-		, _, _,,,,													_
	-			GS		28										- 4
				Ads		20										_
			Soft brown SILTY CLAY (CL-ML)													-
				GS		27			o							_
																-
	CL ML															- 6
				GS		22			0							-
- 2 -	-															_
	⊨	КЦ		GS		24			0							_
	1		TESTHOLE LOCATION: 27.0 m North of Northwest corner Powers Street and Alfred Avenue,													_
			2.0 m East of West curb.													_
L .																- 8
	-		• No groundwater seepage or soil sloughing was observed during or upon completion of drilling.													_
	-		• Testhole terminated at a depth of 2.1 m.													_
	-															-
	-															
- 3 -			ima: CS Crack Samuels SDT Standard Demotration Toot			oggod by										10
		nple I zomet	Sype: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Var		t 🗌	ogged by eviewed					$\left(\right)$		Sta	ant	ec	
			Frype: Bentonite Drill Cuttings Sand Sloug	gh												1

Pl	ROJE	ECT	TH04 TEST City of Winnipeg 2016 Residential Street Renewal Program Powers St from Burrows Ave to Redwood Ave		. E	DATUN	ſ				_ NO	DJECT RTHIN STING	IG	_1233		5
			DATE December 16, 2015 DRILLING CO. Paddo											SSA		
(m) H	ГУРЕ	SYMBOL			AMP			cket Pe		ne (kPa) neter (kF 1(on Grab	Samples	s (kPa))kPa	
DEPTH (m)	SOIL TYPE	SOIL SY	SOIL DESCRIPTION	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	₩ _P ⊢	-0		Moisture Standarc 30	Penetra	ation Te	est, N Va) 90	DEPTH (ft)
- 0 	AS		ASPHALT CONCRETE	-												0
-	CO		Firm black fat CLAY (CH) with trace organic, some	_												-
-			silt, trace sand and gravel	GS		35				0						-
																-
-	СН			GS		32				0						- 2
- 1 -	-			GS		30				0						-
-			Soft tan SILT (ML) with trace clay, sand and gravel	-												-
-	-			GS		27			¢	D						- 4
	ML			GS		25			0							
- 2 -	-			GS	1	23			0							- 6
- 2 -				GS		23			0							-
-	-		TESTHOLE LOCATION: 5.5 m South of Southeast corner Powers Street and Aberdeen Avenue, 2.0 m West of East curb.													- - - 8
	-		 No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 													-
- 3 -	-															-
			Type: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Var	ne Tes		Logged by Leviewed					1		C+-	ant	·••	- 10
	Piez Bac	zomet kfill			K		oy. Ger	man Lea	1)	JL		ec.	•

P	RОЛ	ECT	TH05 TEST City of Winnipeg 2016 Residential Street Renewal Program Powers St from Burrows Ave to Redwood Ave		Γ	DATUN	1				_ N	ORT	ECT THIN	G _		31230:	
			DATE _December 16, 2015 DRILLING CO. Paddo			ELEVA ng Ltd						AST 10D					
я ш	Ш	BOL		S		LES	1	ket Pe		ne (kPa) meter (k				on Gral 0kPa	-	es (kPa) 00kPa	
DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	₩ _P		<i>W</i> L	Moistur	e Cont	ent &	Atter	berg Li	imits		DEPTH (ft)
- 0						- 0	1	0 2	20	Standar 30	40	50 etratio				30 9	0
	AS CO		ASPHALT														
			Firm black fat CLAY (CH) with trace organic, some														
-			silt, trace sand and gravel	GS		41					o						
	СН																
				GS		49						0					- 2
			Soft tan SILT (ML) with trace clay, sand and gravel	-													
	ML			GS		21			0								
- 1 -				Ags		21											
		Firm brown fat CLAY (CH) with some silt, trace sand and gravel															4
	-			GS		33				0							- 4
	СН			GS		29				o							
	-																
	-			GS		41					o						- 6
- 2 -																	
				GS		48						0					
			TESTHOLE LOCATION: 43.0 m North of Northwest corner Powers Street and Aberdeen														
	_		Avenue, 1.5 m East of West curb.														- 8
			• No groundwater seepage or soil sloughing was														o
			observed during or upon completion of drilling.Testhole terminated at a depth of 2.1 m.														
	-																
	-																
- 3 -	Sar	nple 7	Type: GS - Grab Sample SPT - Standard Penetration Test		L	ogged by	/: Nest	or Aba	rca			7					10
	Pie	zome	ST - Shelby Tube PT - Piston Tube VT - Shear Var			eviewed								Sta	ant	tec	-

P. L	ROJI OCA	ECT ATION	Powers St from Burrows Ave to Redwood Av	e	I E	DATUM	ί				NOF EAS	JECT THIN TING	G	_1233	31230	<u>5</u>
D	RIL	LING	DATE December 16, 2015 DRILLING CO. Padde	ock D	rilliı	ng Ltd			DRILL	ING M	ETHO	D <u>125</u>	5 mm	SSA		
1 (m)	YPE	SYMBOL				LES (%)		ket Pe	ear Vane enetrome 0kPa	eter (kPa			on Grab 0kPa	o Sample 200	es (kPa) 0kPa	(H)
DEPTH (m)	SOIL TYPE	SOIL SY	SOIL DESCRIPTION	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	₩ _P ⊢	-0	• St	tandard	Content Penetra	ition Te	st, N Va	alue		DEPTH (
- 0	AS		ASPHALT				1	0	20 3	30 2	6 5	0 6	50 7	70 8	0 9	0
	со		CONCRETE													
		1001	CRUSHED LIMESTONE													
				GS		4	0									
	GW															
		00		X GS		7	о									- 2
		00				/	v									
			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%	GS		32			F	0						
			Sand, 29.9% Silt, 60.1% Clay													-
																- 4
				X GS		28			0							- '
.	СН															
				GS		30										
				A03		50				Ĭ						
				GS		23			0							- 6
- 2 -																
				GS		27			0							
			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													- 8
			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.													
	-		Ĩ													-
- 3 -																10
	Sar	nple]	Fype: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Va	ane Tes	t p	ogged by eviewed		tor Aba			1		C+-	ant		
	Pie	zome		eviewed	oy. Gerr	nan Le	al		V	· /	310	1111	.90	-		





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



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

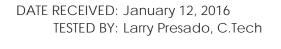
PARTICLE SIZE ANALYSIS ASTM D422

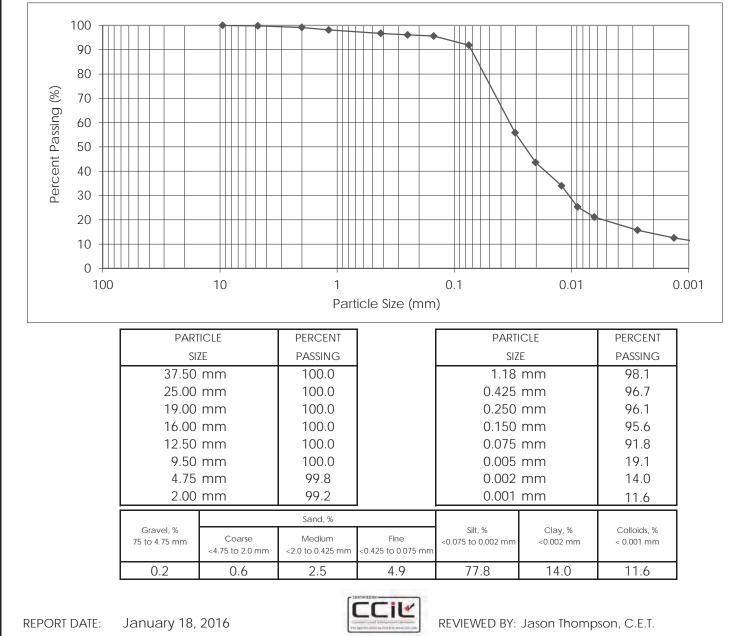
City of Winnipeg Engineering Division, Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1 PROJECT: 2016 Residential Street Renewal Program Powers Street from Burrows Avenue to Redwood Avenue

PROJECT NO.: 123312305

Attention: Brad Besyk

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







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

PARTICLE SIZE ANALYSIS ASTM D422

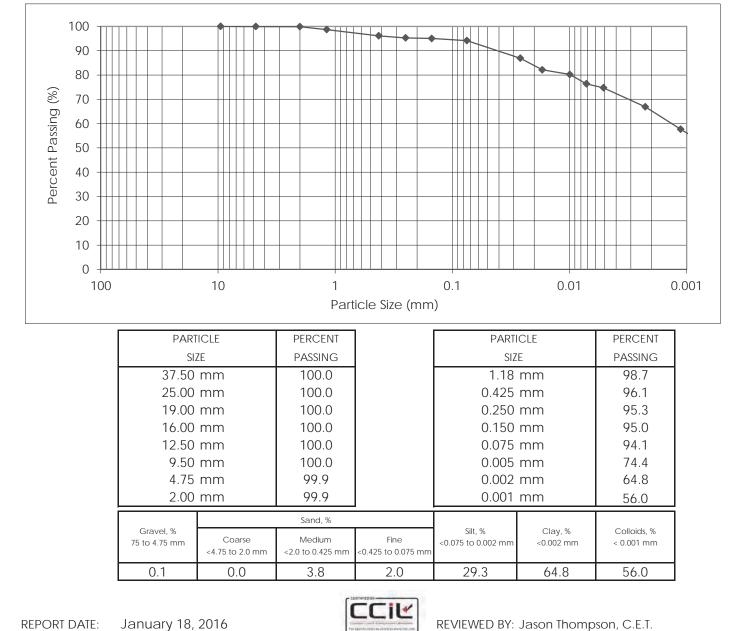
City of Winnipeg Engineering Division, Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1 PROJECT: 2016 Residential Street Renewal Program Powers Street from Burrows Avenue to Redwood Avenue

PROJECT NO.: 123312305

Attention: Brad Besyk

SAMPLED BY:Nestor AbarcaSAMPLE ID:TH03 @ 0.9 m

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





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

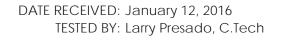
PARTICLE SIZE ANALYSIS ASTM D422

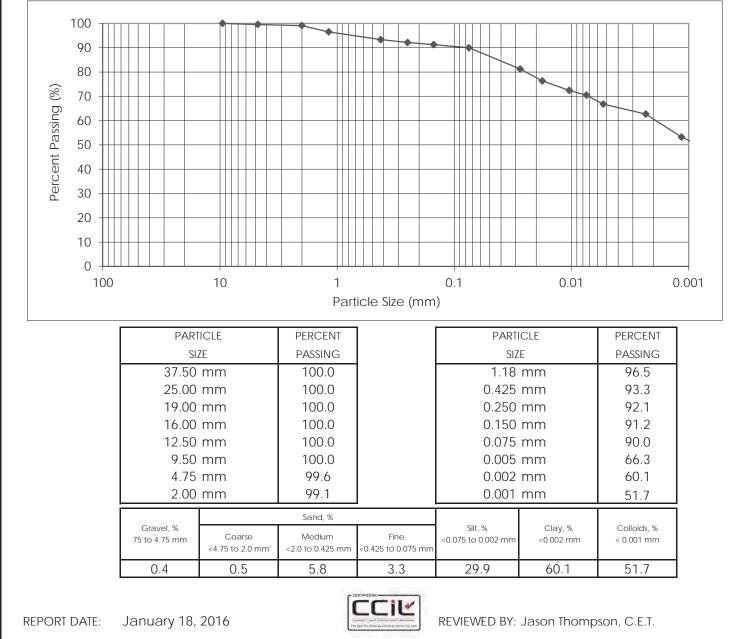
City of Winnipeg Engineering Division, Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1 PROJECT: 2016 Residential Street Renewal Program Powers Street from Burrows Avenue to Redwood Avenue

PROJECT NO.: 123312305

Attention: Brad Besyk

SAMPLED BY:Nestor AbarcaSAMPLE ID:TH06 @ 0.9 m





2016 Residential Street Renewal Program

Geotechnical Investigation -Powers Street from Carruthers Avenue to Smithfield Avenue

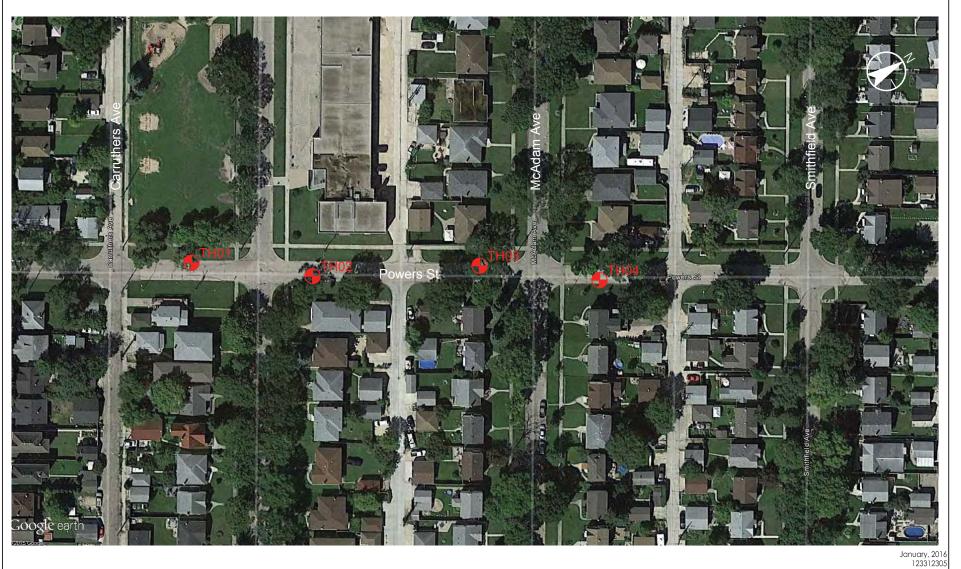


Prepared for: City of Winnipeg Engineering Division Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1

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

Project No. 123312305

January 21, 2016



ORIGINAL SHEET - ISO 8.5x11 H - v14.06



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		Pavemer	nt Surface	Pavemen	t Structure	Sample	Sample	Moisture		Particle Siz	e Analysis		A	Atterberg Lim	íts
ID	Testhole Location	Туре	Thickness (mm)	Туре	Thickness (mm)	Description	Depth (m)	Content (%)	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



P. L	RОЛ ОСА	ECT TION	TH01TESTCity of Winnipeg2016 Residential Street Renewal Program2016 Residential Street Renewal ProgramPowers St from Carruthers Ave and SmithfieldDATEDecember 15, 2015DRILLING CO.Paddo	<u>l Av</u> e	E	DATUM	ί				NOI EAS	DJECT RTHIN STING D_10	IG			
DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	TYPE	AMP	MOISTURE CONTENT (%)		ket Pe		eter (kPa 10 oisture	a) 0kPa Content	15 t & Atte	on Grab	200 mits	es (kPa) 0kPa ⊣	DEPTH (ft)
- 0	CO		CONCRETE Firm black SILTY CLAY (CL-ML) with trace organic and sand	-			1	0	20	30 4	10	50	60 7	70 8	0 90	0 0
 -	CL ML			GS		41				0	o					- 2
- 1 -	- CH		Firm black fat CLAY (CH)	GS		32				0						
	-		Soft tan SILT (ML) with trace sand and gravel	GS		23			0							- 4
	ML			GS		25			0							
- 2 -	СН		Stiff brown fat CLAY (CH)	GS XGS		22			O	c	>					- 6
-	-		TESTHOLE LOCATION: 17.0 m North of Northwest corner Powers Street and Carruthers Avenue, 2.0 m East of West curb.													- 8
	-		 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 Backfull Type: Bentonite Drill Cuttings Sand Slough													- 10			

P. L	ROЛ OCA	ECT TION	TH02TESTCity of Winnipeg2016 Residential Street Renewal Program2016 Residential Street Renewal ProgramPowers St from Carruthers Ave and SmithfieldDATEDecember 15, 2015DRILLING CO.Padde	d Ave	I	DATUM	ί				NOF EAS	DJECT RTHING TING D 100	G		312305	
			DATE December 12, 2010 DRIELING CO. Tuda			-										
		2		S	AMP T	LES		itu Shea ket Per		(kPa) ter (kPa		orvane o	on Grat	o Sample	s (kPa)	
(E	TYPE	SYMBOL			2	RE (%)			kPa) kPa	15	0kPa	200	0kPa	(£
DEPTH (m)	́⊢ ⊒		SOIL DESCRIPTION	ТҮРЕ	NUMBER	STU	Wp	W	W _L		1		1		7	DEPTH (ft)
В	SOIL	SOIL		٦	NN	MOISTURE CONTENT (%)	⊢ T	ö	H Me	oisture (Ш
						-0	1	0 2		andard 60 4				aiue 70 8	0 90	0
- 0			CONCRETE													0
				_												
		H	Firm black SILTY CLAY (CL-ML) with trace organic and sand													-
				GS		44					0					-
				1												-
	CL	H	Particle Size Analysis at 0.6 m: 0.0% Gravel, 8.0%	GS		36				0						- 2
	ML	H	Sand, 30.6% Silt, 61.4% Clay	Ags		30										-
	-	H														-
																Ĺ
- 1 -	-			GS		27			0							-
			Soft tan SILT (ML) with trace sand and gravel													-
				GS		25			0							-
																-
L.																-
	ML			GS		23			0					• • • • • • • •		
																-
	1			GS		22			0							- 6
				1												
- 2 -	1															
				GS		23			0							-
			TESTHOLE LOCATION: 19.5 m North of Northeast corner Powers Street and Matheson													-
· ·			Avenue, 1.0 m West of East curb.													
																8
			• No groundwater seepage or soil sloughing was													-
			observed during or upon completion of drilling.													-
.	-		• Testhole terminated at a depth of 2.1 m.													Ĺ
																F
																-
- 3 -	-															-
	Sar	nple	Type: GS - Grab Sample SPT - Standard Penetration Test		Ι	l .ogged by	: Nes	tor Abar	ca	1				1.111		- 10
	Pie	zome	ST - Shelby Tube PT - Piston Tube VT - Shear Va		t R	eviewed	by: Geri	nan Leal					Sta	ant	cec	
	Bac	kfill	Type: Bentonite Drill Cuttings Sand	ign							Y					

P. L	RОЛ ОСА	ECT TION	TH03TESTCity of Winnipeg2016 Residential Street Renewal ProgramN Powers St from Carruthers Ave and SmithfieldDATEDecember 15, 2015DRILLING CO.Paddo	<u>l Av</u> e	; E	DATUM	ι ΓΙΟΝ				– NO – EA	RTHI STIN(ū		31230	
DEPTH (m)	SOIL TYPE	SOIL SYMBOL	SOIL DESCRIPTION	TYPE	AMP	MOISTURE CONTENT (%)		ket Pe	enetron 0kPa W _L	Moisture	Pa) 00kPa	1 nt & Att	e on Grat	20 mits	es (kPa) 0kPa ⊣	DEPTH (ft)
- 0	- CO		CONCRETE			ŏ	1	0	20	30		50			30 9	0
	-		Firm black SILTY CLAY (CL-ML) with trace organic and sand	GS		43					ο					-
	CL ML			GS		39					0					- 2
- 1 -	-		Soft tan SILT (ML) with trace sand and gravel	GS		37				o						-
	-			GS		29				0						- 4 -
	ML			GS		23			o							-
- 2 -	СН		Stiff brown fat CLAY (CH)	GS		21			o							- 6
	-		TESTHOLE LOCATION: 20.0 m South of Southwest corner Powers Street and McAdam Avenue, 2.0 m East of West curb.	GS		39					0					-
	-		 No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 													- 8 - - -
- 3 -			France C.S. Carls Science 2 OPT - Standard Devicement in Tract													- - - 10
	Pie	zome	 Fype: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Van ter Type: Bentonite Orill Cuttings Sand Sloug 			ogged by		tor Aba nan Lea					Sta	ant	tec	

P. L	ROЛ ОСА	ECT TION	TH04TES1City of Winnipeg2016 Residential Street Renewal Program2016 Residential Street Renewal ProgramPowers St from Carruthers Ave and SmithfieldDATE December 15, 2015 DRILLING CO. Padded	<u>d Av</u> e	E E	DATUM	Ι ΓΙΟΝ					NOI EAS	DJECT RTHIN TING D_10	NG		31230	
DEPTH (m)	SOIL TYPE	SYMBOL	SOIL DESCRIPTION	S/ TYPE	NUMBER	MOISTURE CONTENT (%)	□ Insi △ Poo	cket Pe		meter	(kPa			on Grat 50kPa	-	es (kPa) 00kPa ⊣	DEPTH (ft)
DEI DEI		SOIL			NUN	MOIS	É	0	20		dard	Penetra		erberg Li est, N Va 60	alue	30 9	
	- CO		CONCRETE Firm black SILTY CLAY (CL-ML) with trace	_													-
	CL ML		organic and sand	GS		21			ο								-
	-		Soft tan SILT (ML) with trace sand and gravel	GS		20			0								- 2
	ML		Particle Size Analysis et 0.0 mm 1.20/ Oresult (70/	Mag		22											-
- 1 -	-		Particle Size Analysis at 0.9 m: 1.2% Gravel, 6.7% Sand, 74.0% Silt, 18.1% Clay Firm brown fat CLAY (CH)	<u>XGS</u> −		22			1-0-								-
-	-			GS		29				o							- 4
	СН			GS		28				0							-
- 2 -	-			GS		40					¢	Þ					- 6 -
	-		TESTHOLE LOCATION: 19.0 m North of Northeast corner Powers Street and McAdam Avenue, 1.25 m West of East curb.	GS		43						O					-
	-		 No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 														- 8 - -
- 3 -	-																- - - 10
	Pie	zome	Fype: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear Va ter Type: Bentonite Drill Cuttings Sand			logged by		tor Aba man Le				C		Sta	ant	tec	





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



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

PARTICLE SIZE ANALYSIS ASTM D422

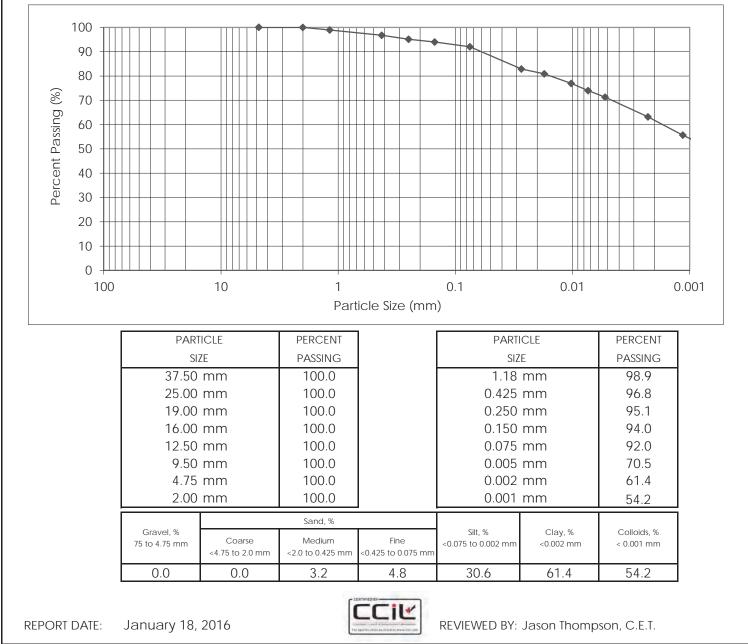
City of Winnipeg Engineering Division, Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1 PROJECT: 2016 Residential Street Renewal Program Powers Street from Carruthers Avenue to Smithfield Avenue

PROJECT NO.: 123312305

Attention: Brad Besyk

SAMPLED BY:Nestor AbarcaSAMPLE ID:TH02 @ 0.6 m

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





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

PROJECT NO.: 123312305

Attention: Brad Besyk

SAMPLED BY:Nestor AbarcaSAMPLE ID:TH04 @ 0.9 m

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

