APPENDIX 'F' GEOTECHNICAL REPORT

APPENDIX 'F' – GEOTECHNICAL REPORT

GEOTECHNICAL REPORT FOR:

- I. Mathers Avenue from Ash Street to Waverley Street.
- II. Renfrew Street from Academy Road to Wellington Crescent South
- III. Mulvey Avenue from Stafford Street to Lilac Street
- IV Calrossie Boulevard from Pembina Highway to Riverside Drive
- V. Lyon Street from Oakenwald Avenue to Point Road

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.

2015 REGIONAL STREET RENEWAL PROGRAM

MATHERS AVENUE BETWEEN WAVERLEY STREET AND ASH STREET

GEOTECHNICAL INVESTIGATION



Prepared for: City Of Winnipeg Engineering Division Public Works Department 103 – 1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1

Prepared by: Stantec Consulting Ltd. 199 Henlow Bay Winnipeg, MB R3Y 1G4

January 16, 2015 Project No. 123311671





Stantoc	Project No. 123311671	Drawn by: SB	Figure: 1	Testhole Location Plan 2015 Regional Street Renewal Program
Julie	Date: Dec. 22, 2014	Reviewed by: GL	Scale: NTS	Mathers Avenue between Waverley Street and Ash Street



TABLE 1 2015 REGIONAL STREET RENEWAL PROGRAM MATHERS AVENUE BETWEEN WAVERLEY STREET AND ASH STREET GEOTECHNICAL INVESTIGATION

Testhole	Testhole Location	Paveme	nt Surface	Pavement Struc	cture Material	Sample	Sample	Moisture	Pa	rticle Siz	e Analys	sis	Att	erberg Lim	iits
ID		Туре	Thickness (mm)	Туре	Thickness (mm)	Description	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH1	15.0 m East of Northeast corner of Ash Street and Mathers Avenue, approximately 1.8 m South of North curb	Concrete	215	-	-	-	-	-	-	-	-	-	-	-	-
TH2	59.0 m East of Northeast corner of Ash Street and Mathers Avenue, approximately 2.5 m North of South curb	Concrete	220	-	-	-	-	-	-	-	-	-	-	-	-
TH3	29.0 m East of Northeast corner of Oak Street and Mathers Avenue, approximately 2.5 m South of North curb	Concrete	235	-	-	Clayey Silt	0.9	18	0.0	8.5	69.5	22.0	25	17	8
TH4	60.0 m East of Northeast corner of Oak Street and Mathers Avenue, approximately 2.5 m North of South curb	Concrete	200	-	-	-	-	-	-	-	-	-	-	-	-
TH5	20.0 m East of Northeast corner of Elm Street and Mathers Avenue, approximately 2.5 m South of North curb	Concrete	210	Granular Fill	400	-	-	-	-	-	-	-	-	-	-
TH6	57.0 m East of Northeast corner of Ash Street and Mathers Avenue, approximately 2.5 m North of South curb	Concrete	210	-	-	-	-	-	-	-	-	-	-	-	-
TH7	19.0 m East of Northeast corner of Montrose Street and Mathers Avenue, approximately 2.5 m South of North curb	Concrete	245	-	-	Clay	0.6	33	0.0	1.3	11	87.7	83	23	60
TH8	69.0 m East of Northeast corner of Ash Street and Mathers Avenue, approximately 2.5 m North of South curb	Concrete	230	-	-	-	-	-	-	-	-	-	-	-	-

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	•		TESTHOLE LOCATION: 59.0 m East of Northeast corner of Ash Street and Mathers Avenue, approximately 2.5 m North of South curb																				8
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- 3 -	-		 Testhole terminated at a depth of 2.1 m. 																				10
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- 3 -			 No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 																				- - - - 10
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- 3 -			observed during or upon completion of drilling.Testhole terminated at a depth of 2.1 m.																		- 10
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- 2 -	-				AS		40						c							- 6
	-		TESTHOLE LOCATION: 20.0 m East of Northeast corner of Elm Street and Mathers Avenue, approximately 2.5 m South of North		AS		41							0						
	-		 curb. The soil was frozen to a depth of 0.9 m. No groundwater seepage or soil sloughing was 																	- 8 - 8
- 3 -	-		 Testhole terminated at a depth of 2.1 m. 																	- 10
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	-		 The soil was frozen to a depth of 1.2 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 																		-
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- 2 -	-				AS		34					0						- 6 - -
	- - -		TESTHOLE LOCATION: 69.0 m East of Northeast corner of Montrose Street and Mathers Avenue, approximately 2.5 m North of South curb	-	AS		38					Q						- - - - 8
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- 3 -	-		• Testhole terminated at a depth of 2.1 m.															- - - - - -
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Core sample from Testhole TH1



Core sample from Testhole TH2





Core sample from Testhole TH3



Core sample from Testhole TH4





Core sample from Testhole TH5



Core sample from Testhole TH6





Core sample from Testhole TH7



Core sample from Testhole TH8





106-1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

Attention:

Engineering Division, Public Works Department

Derek Teperto

City of Winnipeg

LABORATORY 199 Henlow Bay Winnipeg MB R3Y 1G4

Tel: (204) 488-6999

PARTICLE SIZE ANALYSIS ASTM D422

PROJECT: 2015 Regional Street **Renewal Program** Mathers Street between Waverley Street and Ash Street

PROJECT NO.: 123311671

DATE RECEIVED: January 2, 2015



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



106-1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

Attention:

Engineering Division, Public Works Department

Derek Teperto

City of Winnipeg

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

PARTICLE SIZE ANALYSIS ASTM D422

PROJECT: 2015 Regional Street Renewal Program Mathers Street between Waverley Street and Ash Street

PROJECT NO.: 123311671



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2015 REGIONAL STREET RENEWAL PROGRAM

RENFREW STREET BETWEEN WELLINGTON CRESCENT AND ACADEMY ROAD

GEOTECHNICAL INVESTIGATION



Prepared for: The City Of Winnipeg Engineering Division Public Works Department 103 – 1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1

Prepared by: Stantec Consulting Ltd. 199 Henlow Bay Winnipeg, MB R3Y 1G4

January 20, 2015 Project No. 123311671



1	Stantoc	Project No. 123311671	Drawn by: SB	Figure: 1	Testhole Location Plan 2015 Regional Street Renewal Program
J	Stantec	Date: Dec. 22, 2014	Reviewed by: GL	Scale: NTS	Renfrew Street between Wellington Crescent and Academy Road



TABLE 1 2015 REGIONAL STREET RENEWAL PROGRAM RENFREW STREET BETWEEN WELLINGTON CRESCENT AND ACADEMY ROAD GEOTECHNICAL INVESTIGATION

Testhole	Testhole Location	Paveme	nt Surface	Pavement Mate	Structure rial	Sample	Sample	Moisture	Pa	rticle Siz	ze Analys	sis	Att	erberg Lin	nits
ID		Туре	Thickness (mm)	Туре	Thickness (mm)	Description	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TU1	24.0 m North of Northeast corner of Academy Road and Renfrew Street,	Asphalt	60												
101	approximately 2.5 m West of East curb	Concrete	210	-	-	-	-	-	-	-	-	-	-	-	-
TH2	180.0 m South of Southwest corner of Wellington Crescent and Renfrew Street,	Asphalt	25	-	_		_	_	_	_	_	_	_	_	_
1112	approximately 2.5 m East of West curb	Concrete	205	-	-	_	-		_	-	-	-	_	-	_
тыз	125.0 m South of Southwest corner of Wellington Crescent and Renfrew Street,	Asphalt	40	_		Clavey Silt	15	24	0.0	13	61.3	34.4	35	16	10
1113	approximately 2.5 m West of East curb	Concrete	180	_	_	Ciayey Olit	1.5	24	0.0	4.5	01.5	54.4	- 35	10	13
тна	90.0 m South of Southwest corner of Wellington Crescent and Renfrew Street,	Asphalt	25	-	_	_	_	_	_	_	_	_	_	_	_
1114	approximately 2.5 m East of West curb	Concrete	205												
тыя	52.0 m South of Southwest corner of Wellington Crescent and Renfrew Street,	Asphalt	60	_		Clay Fill	0.6	25	11.3	10.4	18.6	50.7	64	23	11
TH5 52 ap	approximately 2.5 m West of East curb	Concrete	140	-	-		0.0	20	11.3	13.4	10.0	50.7	04	23	41

C P	TESTHOLE RECORD TH01 CLIENT City of Winnipeg PROJECT 2015 Regional Street Renewal Program LOCATION Renfrew Street between Wellington Crescent and Academy Road														No.	12	2331	167	L
D	RILI	ING	DATE December 10, 2014 DRILLING CO.	Map	le Le	af D	rilling	Ltd.		DRI	LLING	MET	HOE	<u>1</u>	25 1	nm	SSA	1	
EPTH (m)	USC	IL SYMBOL	SOIL DESCRIPTION	ELL DATA	rype (s	JMBER JMP	ISTURE ISTURE ST	□ Insit △ Poc	tu Shea ket Per 50 W	ar Vane netrom kPa <i>W</i> L	e (kPa) eter (kP 1	a) ★	l Torv	ane d	on Gra	ab Sa	mple:	s (kPa))kPa	EPTH (ft)
		SO		WE		Ĩ	CON	1	0 3		Standar	d Pene	ent & A etratio	Atteri n Te:	st, blo	imits ws/0. 70	3m	0	
- 0	AS CO	4 9.4 9 4 9.4 9	Asphalt	-	COR	E		1				40	50			/0	0		
			Clay Fill - black, firm, moist, high plasticity - some silt		AS		43					o							
	СН	\bigotimes	trace fine to coarse sandsome fine gravel		AS		25			o									- 2
- 1 -		\bigotimes			AS		34				0								
	-	\bigotimes			AS		36				0								- 4
	-		Clay - brown, stiff, moist, high plasticity		AS		36				Ó								
- 2 -	СН				AS		36				o								- 6
	-		TESTHOLE LOCATION: 24.0 m North of Northeast corner of Academy Road and Renfrew Street, approximately 2.5 m West of East curb.	-	AS		36				0								
	-		 The soil was frozen to a depth of 0.8 m. 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
	Sar	mle T		st		т	ogged by	· Nost	or Abar	(a)									
	Pie	zomet kfill	ST - Shelby Tube PT - Piston Tube VT - Shear rype: Bentonite Drill Cuttings Sand	eviewed	by: Gern	nan Leal	l		<u> </u>	ß	S	jt	al	nt	e				

C	CLIENT City of Winnipeg PROJECT No. 123311671 PROJECT 2015 Regional Street Renewal Program DATUM																		
L L	OCA	TION	Renfrew Street between Wellington Cres	scen	t and	Aca	ademy	Road	1			_	ELE	VAT	ION				
D	RILI	LING	DATE December 10, 2014 DRILLING CO.	Mapl	le Le	af D	rilling	Ltd.		DRI	LLIN	GΜ	ETH	DD _	125	mm	SSA	<u>ــــــ</u>	
DEPTH (m)	NSC	SOIL SYMBOL	SOIL DESCRIPTION	WELL DATA	ία TYPE	AMA NUMBER	MOISTURE S CONTENT (%)		itu Shea cket Per 50 W O	$\begin{array}{c} \text{ar Vane} \\ \text{hetrom} \\ \text{kPa} \\ \hline \\ W_{L} \\ \hline \\ H \\ M_{L} \\ \end{array}$	e (kPa eter (k Moistur Standa 30) 100k re Co ard Pe 40	Pa ntent	& Attention T	> on Gr	ab Sa 1 Limits cws/0. 70	mples 200 3m	; (kPa))kPa 1 0 <u>9</u>	DEPTH (ft)
- U	AS CO		Asphalt		COR	E													
- - - - -	СН		Clay Fill - black, firm, moist, high plasticity - some silt - trace fine to coarse sand - some fine sand	-	AS AS		30 30				• •								- - - - - 2
- 1 -			Clay - brown, stiff, moist, high plasticity		AS		28				•								-
-	СН				AS		39					o							- 4
					AS		38					o							
- 2 -	-				AS		41					o							- 6
-	-		TESTHOLE LOCATION: 180.0 m South of Southwest corner of Wellington Crescent and Renfrew Street, approximately 2.5 m East of	-	AS		41					o							
 -	-		 West curb. The soil was frozen to a depth of 0.8 m. No groundwater seepage or soil sloughing was 																- 8 - -
- 3 -	-		 observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 																- 10
-																			
															12				
	Pie	zomet	ST - Shelby Tube PT - Piston Tube VT - Shea ter Type: Bentonite Drill Cuttings Sand	: Nes by: Gen	tor Abar man Lea	ca I		-	Ŋ		St	al	nt	e					

C Pl L	TESTHOLE RECORD TH03 CLIENT City of Winnipeg P PROJECT 2015 Regional Street Renewal Program I LOCATION Renfrew Street between Wellington Crescent and Academy Road F DRILLING DATE December 10, 2014 DRILLING CO Maple Leaf Drilling Ltd DRILLING MET														IECT UM VATI	' No. ON	1	233	116	71	
D	RILI	JNG	DATE December 10, 2014 DRILLING CO. N	Mapl	le Le	af D	rilling	Ltd.		D	RILI	LING	ME	ГНО	D	125	mm	sS/	4		
DEPTH (m)	nsc	SOIL SYMBOL	SOIL DESCRIPTION	WELL DATA	LYPE S	NUMBER	MOISTURE SONTENT (%)	□ Insi △ Poo W _P ⊢	itu She cket Pe 5 W O	ear Va enetro 0kPa W_L W_L	ine (lomete mete Mo Sta	kPa) er (kP 1 isture	ra) 2 00kP Con d Per	Tor a tent 8 netrati	Vane 1. A Atte	on G	rab S a Limit: ows/(ample 20 s).3m	s (kF 0kPa ⊣	Pa) N	DEPTH (ft)
- 0	AS	10 B. S	Asphalt	r				1	0	20	30) ::::	40	50)	60	70	8	80	90	0
	со		Concrete		COR	E															-
		X	Clay Fill - black, stiff, moist, high plasticity - trace organic material		AS		33					o									-
	СН	X	 some sint trace fine to coarse sand some fine sand 		AS		38						J								- 2
- 1 -		X	Claver Silt	_	AS		28				o										- - -
			- tan, soft, moist, medium plasticity - trace fine to coarse sand		AS		24			c											- 4
	CL ML		Particle Size Analysis at 1.5 m: 0.0% Gravel, 4.3% Sand, 61.3% Silt, 34.4% Clay		AS		24			-c											
	-				AS		22			0											- 6
- 2 -	СН		Clay - brown, stiff, moist, moist, high plasticity		AS		39						0								
	-		TESTHOLE LOCATION: 125.0 m South of Southwest corner of Wellington Crescent and Benfrew Street, approximately 2.5 m West of																		-
			• The soil was frozen to a depth of 0.8 m																		- 8
. 3 .	-		 No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 																		- -
· • • •																					- 10 - -
 	-																				12
	Sar	nple T	ype: GS - Grab Sample SPT - Standard Penetration Te ST - Shelby Tube PT - Piston Tube VT - Shea	est ir Van	ne Test	I R	ogged by	: Nes	tor Aba	irca				N		C 4		ní			14
	Pie Bac	zomet kfill	er Type: Bentonite Drill Cuttings Sand		-J. UCI						Ľ		כו	a		IC					

C Pl	TESTHOLE RECORD TH04 CLIENT City of Winnipeg PROJECT No. 123311671 PROJECT 2015 Regional Street Renewal Program DATUM LOCATION Renfrew Street between Wellington Crescent and Academy Road ELEVATION DRILLING DATE December 10, 2014 DRILLING CO. Maple Leaf Drilling Ltd. DRILLING METHOD																				
D	RILI	LING	DATE December 10, 2014 DRILLING CO.	Mapl	le Lea	ıf D	rilling	Ltd.		DI	RILL	ING	ME	ГНС)D_	125	mr	n SS	A		_
DEPTH (m)	nsc	SOIL SYMBOL	SOIL DESCRIPTION	WELL DATA	SA	NUMBER	MOISTURE 3 CONTENT (%)	□ Insi △ Poo Wp I	itu She ket Pe 50 W O	ar Va enetro 0kPa W_L -1 0 20	ne (k mete Moi: Sta 30	Pa) r (kP 10 sture	a) 3 00kP Cont d Pen 40	To a tent a netrai	1 & Attention To 0	on G 50kP rberg est, b	rab S Pa Limi Iows/ 79	Sampl 2 its /0.3m 0	es (k 00kF	Pa) Ya 9(DEPTH (ft)
- U	- AS CO		Asphalt/ Concrete Clay Fill - black, stiff, moist, high plasticity	-	CORI AS	E	35					0									-
	СН		 trace organic material some silt trace fine to coarse sand some fine gravel 		AS		36					0									- - 2
- 1 -	-		Clayey Silt - tan, soft, moist, medium plasticity	-	AS		23			o											-
	-		- trace fine to coarse sand		AS		28				o										- 4 - -
	CL ML				AS		30				•										-
- 2 -	-				AS		23			0		3									- 6 - - -
	-		TESTHOLE LOCATION: 90.0 m South of Southwest corner of Wellington Crescent and Renfrew Street, approximately 2.5 m East of West curb.				52														- - - 8
-	-		 The soil was frozen to a depth of 0.6 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. 																		-
- 3 -			Testhole terminated at a depth of 2.1 m.																		- - 10
																					- - - -
																					12
	Pie Bao	zomet zomet	er Fype: Bentonite Drill Cuttings Sand	sı r Van	e Test	R	eviewed	. Nes by: Gen	ior Aba man Lea	rca al				Ŋ		St	a	n	te	2	1

TESTHOLE RECORD TH05 CLIENT City of Winnipeg PROJECT 2015 Regional Street Renewal Program LOCATION Ranfray Street between Wallington Crossent and Academy Read)JEC TUM	T No		1233	1167	'1
L D	OCA RILI	TION .ING	Renfrew Street between Wellington Cres	scen Mapl	<u>t and</u> le Le	Aca af D	idemy rilling	Road Ltd.		DRI	LLIN	G M	ELE ETHO	VAT	10N 125	m	n SS.	4	
DEPTH (m)	nsc	SOIL SYMBOL	SOIL DESCRIPTION	WELL DATA	TYPE	NUMBER	MOISTURE CONTENT (%)	\square Insi \triangle Poc W_P	tu Shea ket Per 50 W O	ar Vane hetrom kPa W_L M_L	e (kPa eter (k Moistu Standa 30) 100k re Co ard Pe	Pa Pa ntent	& Att tion	e on G	Pa Lim Iows 7	Sample 20 its /0.3m 0 {	s (kPa 0kPa ⊣ 30	a) (#) (#) (#) (#) (#) (#) (#) (#) (#) (#
- U	AS CO CH		Asphalt Concrete Clay Fill - black, stiff, moist, high plasticity - trace organic material - some silt - trace fine to coarse sand - some fine gravel		COR AS AS	E	36 31				9	•							- 2
- 1 -	СН		Particle Size Analysis at 0.6 m: 11.3% Gravel, 19.4% Sand, 18.6% Silt, 50.7% Clay Clay - brown, stiff, moist, high plasticity		AS		30 29				0 0								- - - - - - - - - - 4
- <u>-</u> .	-				AS AS		32 36				Ō)							- - - - 6
- 2 -			TESTHOLE LOCATION: 52.0 m South of Southwest corner of Wellington Crescent and Renfrew Street, approximately 2.5 m West of East curb.		AS		40					0							- 8
- 3 -	-		 No groundwater seepage or soil slougning was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 																- 10
	Sar Pie Bao	nple T zomet	ype: GS - Grab Sample SPT - Standard Penetration Te ST - Shelby Tube PT - Piston Tube VT - Shea er Fype: Bentonite Drill Cuttings Sand	est ir Van	ne Test	t R	ogged by eviewed	: Nest by: Gerr	or Abar nan Lea	ca			T T	Â	St	ia	n	te	12 C



Core sample from Testhole TH1



Core sample from Testhole TH2





Core sample from Testhole TH3



Core sample from Testhole TH4





Core sample from Testhole TH5





LABORATORY 199 Henlow Bay Winnipeg MB R3Y 1G4

Tel: (204) 488-6999

PARTICLE SIZE ANALYSIS ASTM D422



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



LABORATORY 199 Henlow Bay

Winnipeg MB R3Y 1G4 Tel: (204) 488-6999 PARTICLE SIZE ANALYSIS ASTM D422

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

PROJECT: 2015 Regional Street Renewal Program Renfrew St between Wellington Cres and Academy Rd

PROJECT NO.: 123311671

SAMPLED BY: Nestor Abarca SAMPLE ID: TH05 @ 0.61 m DATE RECEIVED: January 2, 2015 TESTED BY: Sothea Bun, C.E.T.



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

2015 REGIONAL STREET RENEWAL PROGRAM

MULVEY AVENUE BETWEEN STAFFORD STREET AND LILAC STREET

GEOTECHNICAL INVESTIGATION



Prepared for: The City Of Winnipeg Engineering Division Public Works Department 103 – 1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1

Prepared by: Stantec Consulting Ltd. 199 Henlow Bay Winnipeg, MB R3Y 1G4

January 19, 2015 Project No. 123311671





Stantoc	Project No. 123311671	Drawn by: SB	Figure: 1	Testhole Location Plan 2015 Regional Street Renewal Program
Julie	Date: Dec. 22, 2014	Reviewed by: GL	Scale: NTS	Mulvey Avenue between Stafford Street and Lilac Street



TABLE 1 2015 REGIONAL STREET RENEWAL PROGRAM MULVEY AVENUE BETWEEN STAFFORD STREET AND LILAC STREET GEOTECHNICAL INVESTIGATION

Testhole	Testhole Location	Paveme	nt Surface	Pavement Strue	cture Material	Sample	Sample	Moisture	Pa	rticle Siz	ze Analys	sis	Att	erberg Lin	iits
ID		Туре	Thickness (mm)	Туре	Thickness (mm)	Description	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH1	15.0 m East of Northeast corner of Stafford Street and Mulvey Avenue,	Asphalt	30	_	_	_	-						-	_	-
	approximately 1.5 m South of North curb	Concrete	150												
TH2	60.0 m East of Northeast corner of Stafford Street and Mulvey Avenue,	Asphalt	40		_	Silt	0.0	17	0.0	27	71 7	25.6	20	17	12
THZ	approximately 1.5 m North of South curb	Concrete	160	-	- Silt 0.9 17	17	0.0	2.1	11.1	25.0	29	17	12		
тнз	109.0 m East of Northeast corner of Stafford Street and Mulvey Avenue,	Asphalt	20	_	_	_	_							_	
1113	approximately 1.5 m South of North curb	Concrete	140	-	-	-	-	-	-	-	-	-	-	-	-
TUA	154.0 m East of Northeast corner of Stafford Street and Mulvey Avenue,	Asphalt	45												
1 🗆 4	approximately 1.5 m South of North curb	Concrete	145	-	-	-	-	-	-	-	-	-	-	-	-
ТЦБ	200.0 m East of Northeast corner of Stafford Street and Mulvey Avenue,	Asphalt	40												
THS	approximately 1.5 m South of North curb	Concrete	145	-	-	-	-	-	-	-	-	-	-	-	-
тце	250.0 m East of Northeast corner of Stafford Street and Mulvey Avenue,	Asphalt	45												
TH6	approximately 1.5 m North of South curb	Concrete	155	_	-	-	-	-	-	-	-	-	-	-	-
ТН7 ^{305.} арр	305.0 m East of Northeast corner of Stafford Street and Mulvey Avenue,	Asphalt	160			Clay Fill	0.6	20	2.0	000	22.4	57.2	55	10	26
	approximately 1.5 m South of North curb	Concrete	140	-	-	Giay Fill	0.0	20	2.0	0.0	52.4	51.5	55	19	50

C P L	CLIENT City of Winnipeg PROJECT No. 123311671 PROJECT 2015 Regional Street Renewal Program DATUM DATUM LOCATION Mulvey Avenue between Stafford Street and Lilac Street ELEVATION ELEVATION DRILLING DATE December 11, 2014 DRILLING CO. Maple Leaf Drilling Ltd. DRILLING METHOD 125 mm SSA																						
D	RILI	LING	DATE December 11, 2014 DRILLING CO.	Map	le Le	af D	rilling	Ltd	•		D	RILI	LINC	6 ME	ETH	OD	1	25	mn	n SS	SA		
(m) H	SC	YMBOL		DATA	S/ ш	AMP	LES (%) T (%) T	□ In △ Po	situ S ocke	Shea t Per 50	ar Va netro IkPa	ane (l omete	kPa) er (kF 1	Pa) 00kl	□ т Х Ра	orva	ane c	on G 0kP	rab S a	iampl	les (l	кРа) Ра	(ft)
DEPT	ň	SOIL S	SUIL DESCRIPTION	WELL	ТҮР	NUME	MOIST	Wp F	- W 	2	$W_{\rm L}$ \neg \bullet 20	Mo Sta 30	isture andar 0	e Cor d Pe 40	ntent	t & A atioi 50	Attert n Tes 6	oerg st, bl	Limit ows/ 7(ts 0.3m)	80	91	DEP1
- 0	AS CO		Asphalt	/	COR	Е																	- 0
	CH		Clay Fill - black, stiff, moist, high plasticity - silty		AS		30				c	,,										-
			- trace fine to medium sand - trace fine gravel		AS		28					o											- 2
- 1 -	СН		- brown, stiff, moist, high plasticity		AS		28					o											
			Silt	-	AS		25					S											4
	ML		 tan, soft, moist, low plasticity clayey trace fine to medium sand 		AS		24			• • • • • •	C)											-
- 2 -					AS		22				0												- 6 - -
	- - -		TESTHOLE LOCATION: 15.0 m East of Northeast corner of Stafford Street and Mulvey Avenue, approximately 1.5 m South of North	_	AS		21				o												-
	-		 • The soil was frozen to a depth of 0.9 m. • No groundwater seepage or soil cloughing was 																				- 8 - -
- 3 -	-		 To groundwater scepage of son storgring was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 																				-
	-																						- 10 - - -
																							- 12
Sample Type: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube Logged by: N Piezometer Backfill Type: Bentonite Drill Cuttings															Ŋ	6	S	St	a	n	te	36	1
			TEST	ΉC)LF	£]	REC	COR	D	Т	HO	2					1000						
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	LIEN ROJF	ГТ _ 7СТ	<u>City of Winnipeg</u> 2015 Regional Street Renewal Program										PR(DA)JEC TI M	Г No		1233	11671					
L L	OCA	TION	Mulvey Avenue between Stafford Street	t and	Lila	c Str	eet						ELI	EVAT	ION								
D	RILL	ING	DATE December 11, 2014 DRILLING CO.	Map	le Lea	af D	rilling	Ltd.		DF	RILLI	NG N	METH	OD_	125	mr	n SS/	A					
					S/	AMP	LES	🗆 Insi	tu Shea	ar Va	ne (kF	Pa)	Π.Τ	orvane	e on G	Grab (Sample	es (kPa))				
Ē		1BOL		TA		~	щ%	△ Poc	ket Pe 5(netro 0kPa	meter	(kPa 100) 🗙 OkPa	1	50 <u>k</u> F	a	20)0kPa	(ff)				
PTH	nsc	SYN	SOIL DESCRIPTION	L DA	Ц	ABEF	STUF ENT (Wp	W/	- Wi					+			4	PTH				
E E E	-	SOIL		WEL	F	NUN	MOIS		-0		Mois	ture C		& Atte	erberg	J Limi	its		DE				
		0.					- 2	1	0	20	30	daru 4	Peneu 10	30000 1 50	еst, ы 60	10w5/ 7	0.3m 0 {	80 9	90				
Γ υ.	AS	р В. Д Д	Asphalt	/	COR	E													T V				
				-																			
.	СН		- black, stiff, moist, high plasticity		AS		27				0												
	 	X	- silty	h																			
Γ.	CH	//	- trace fine gravel				33					,											
.			Clay																				
.			- brown, firm, moist, high plasticity - some silt	1																			
			Silt		AS		17		Φ														
.			- tan, soft, moist, low plasticity									· · · ·											
.			- trace fine to medium sand		AS		33					>							4				
.			Particle Size Analysis at 0.9 m ⁻ 0.0% Gravel																				
	ML		2.7% Sand, 71.7% Silt, 25.6% Clay																				
					AS		23			0													
.					AS		23			0									- 6				
2												· · · ·											
– .							24																
.			TESTHOLE LOCATION: 60.0 m East of	1	AS		24																
.			Northeast corner of Stafford Street and Mulvey Avenue, approximately 1.5 m North of South									· · · ·											
			curb.																- 8				
.			• The soil was frozen to a depth of 0.8 m.																				
.			• 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				
.																			-				
-																							
_																							
.																			- 12				
	San	nple]	ST - Shelby Tube PT - Piston Tube VT - She	est ar Var	ne Test	L	ogged by	: Nest	tor Aba	rca			g		C 1	L			12				
	Piez Bac	zome ^t kfill	er Type: Bentonite Drill Cuttings Sand	u vun	10 1050	R	eviewed	by: Gerr	nan Lea	ıl				5	51	a	INI						

C P	LIEN ROJI	JT _ ECT	TEST City of Winnipeg 2015 Regional Street Renewal Program	ΥHC)LF	E]	REC	COF	RD]	ΓH	03	PR(DA) JECI TUM	No.	1	233	11671	
	OCA	TION	Mulvey Avenue between Stafford Street	<u>t and</u> Man	Lila	<u>e Str</u>	eet	- I td		г	וזותי		ELE	EVATI	ON 125		- 55,	۸	
			DATE DRILLING CO						itu Ch						123	<u></u>			
DEPTH (m)	nsc	SOIL SYMBOL	SOIL DESCRIPTION	WELL DATA	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)		ket F W 10	Penetr 50kP W_1 W_1 W_2 W_2	rane (romet 'a Mo Sta 3	kPa) er (kPa 10 sisture (andard 0 4	0kPa Content Penetra	1 : & Atte ation To 50	on Gi	Limit:	20) s 0.3m	s (кРа) 0kРа ⊣ 30 9	DEPTH (ft)
	- AS - CO		Asphalt	Γ	COR	E													
. .	СН		Clay Fill - black, stiff, moist, high plasticity - silty - trace fine to medium sand		AS		29				o				- -				
			- trace fine gravel		AS		24				0								- 2
- 1 -	ML		- tan, firm, moist, low plasticity - clayey - trace fine to medium sand	,	AS		20			•									
	-		Clay - brown, stiff, moist, high plasticity - some silt below 1.7 m		AS		34					¢							4
	- CH				AS		37					o							
- 2 -	-				AS		36					0							- 6
	-		TESTHOLE LOCATION: 109.0 m East of Northeast corner of Stafford Street and Mulvey Avenue, approximately 1.5 m South of North curb.	_	AS		37					0							8
	-		 The soil was frozen to a depth of 0.8 m. 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	ype: GS - Grab Sample SPT - Standard Penetration Te ST - Shelby Tube PT - Piston Tube VT - Sher	est ar Var	ne Test		ogged by	V: Nes	stor Ab	barca			Ą		C1		-		
	Pie: Bac	zomet ckfill	er Type: Bentonite Drill Cuttings Sand			K	eviewed	oy. Ger	111df1 L	cal				5	JL	d		.8(

C P	LIEN	NT _ ECT	City of Winnipeg 2015 Regional Street Renewal Program	'HC		<u>}</u>]	REC	CO]	RD		T	H(04		PR(DA)jec fum	ז ד. 1	No.	1	233	116	71	
L D	OCA RILI	LING	DATE December 11, 2014 DRILLING CO.	<u>Map</u>	le Le	<u>c Su</u> af D	rilling	<u>, Ltd</u>			DF	RILL	INC	- i Ml	ELE ETH	VA1 OD_	ГЮг 12	N 25 1	mm	I SS	A		_
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	- - -		TESTHOLE LOCATION: 154.0 m East of Northeast corner of Stafford Street and Mulvey Avenue, approximately 1.5 m South of North curb.	_	AS		25				c)											- - - - 8
	-		 The soil was frozen to a depth of 0.8 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 																				- - -
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	Sar Pie Ba	nple 7	Type: GS - Grab Sample SPT - Standard Penetration Te ST - Shelby Tube PT - Piston Tube VT - Shea ter Type: Bentonite Drill Cuttings Sand	est 1r Var	ne Test	t R	logged by	7: Ne by: Ge	estor A	Abarc Leal	a	· · I			J	Ì	S	iti	a	n	te	K	12

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	RILI	LING	DATE December 11, 2014 DRILLING CO.	Mapl	le Le	af D	rilling	<u>Ltd</u>			D	RIL	LIN	IG N	AETI	HOI	АП О	125	m	m S	SA		
PTH (m)	USC	SYMBOL	SOIL DESCRIPTION	L DATA	, SV BE	AMP	STURE ST ENT (%) SS	□ In △ Po Wp	ocket	Shea Pei 50	ar Va netro)kPa ////////////////////////////////////	ane omei a	(kPa ter (a) kPaj 10(□) ★)kPa	Torv	vane 15	on G	Frab Pa	Sam	ples 2001	(kPa) kPa	PTH (ft)
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			Silt	_	AS		20				0												-
- 1 -			- tan, soft, moist, low plasticity - clayey - trace fine to medium sand Clay - basene stiff moist, high relativity	r	AS		27					o		· · · · · · · · · · · · · · · · · · ·									- - - 4
 -	СН		- brown, stiff, moist, high plasticity		AS		31						o										
- 2 -	-				AS		31						o										- 6
	-		TESTHOLE LOCATION: 200.0 m East of Northeast corner of Stafford Street and Mulvey Avenue, approximately 1.5 m South of North curb.	-	AS		38							o					· ·				- 8
	-		 The soil was frozen to a depth of 0.8 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Teathola terminated at a depth of 2.1 m. 																				-
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D	RILI	JNG	DATE December 11, 2014 DRILLING CO.	Map	le Lea	af D	rilling	; Ltd.	·		DRI	LLING	ME	ГНО	D_1	25 m	ım SS	SA		
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			Avenue, approximately 1.5 m North of South																	-
	-		curb.																	8
			• The soil was frozen to a depth of 0.8 m.																	F
			• No groundwater seepage or soil sloughing was																	F
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	Pie	zome	ST - Shelby Tube PT - Piston Tube VT - Shea ter Bentonite Drill Cuttings Sand	ır Var	ne Test	ⁱ R	.eviewed	by: Ge	rman	Leal			6) S	sta	30	te	Ċ	
	Bac	ckfill '	Type:											-						

C P L	LIEN ROJI OCA	IT _ ECT TION	City of Winnipeg 2015 Regional Street Renewal Program Mulvey Avenue between Stafford Street	' HC] c Sti	REC	COI	RD	,	TH	07	- P D E	RO. DAT	JECT UM VATI(No.	1233	51167	1
D	RILI	LING	DATE <u>December 11, 2014</u> DRILLING CO. <u>N</u>	Mapl	le Le	af D	rilling	ttd.			DRIL	LING	MET	ΉO	D	l 25 m	ım SS	A	
DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	VELL DATA	TYPE	NUMBER	AOISTURE A	□ Ins △ Po W _P ⊢	situ Sl ocket f W O	near Pene 50kl	Vane trome Pa VL Mo	(kPa) ter (kPa 10 Disture	a) X 0kPa Conte	l Tor C 1 ent &	15 & Atter	on Grat	¹ Sampl 2(mits	es (kPa) 00kPa —	DEPTH (ft)
- 0		0)					20		10	20	3	andard	Pene 40	etrati	ion le	st, blow 60	s/0.3m	80	<u>90</u> 0
	AS		Asphalt		COR	E													
	СО		Concrete Clay Fill - black, stiff, moist, high plasticity silty	_	AS		19			o									· - - - -
	СН		 - stray - trace fine to medium sand - trace fine gravel Particle Size Analysis at 0.6 m: 2.0% Gravel		AS		23			· · · F	o								- 2
- 1 -	-		8.3% Sand, 32.4% Silt, 57.3% Clay Clay	_	AS		24				o								· - -
	-		 brown, stiff, moist, high plasticity trace fine to coarse sand 		AS		26				Θ								- 4 - -
	СН				AS		27				0								- - -
- 2 -	-				AS		21			0	•								
	-		TESTHOLE LOCATION: 305.0 m East of Northeast corner of Stafford Street and Mulvey Avenue, approximately 1.5 m South of North curb.		AS		20				Ŷ								- - - - 8
	-		 The soil was frozen to a depth of 0.8 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 																- - - -
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	Sar	nple T	ype: GS - Grab Sample SPT - Standard Penetration Te ST - Shelby Tube PT - Piston Tube VT - Shea	est ur Var	ne Test	L R	ogged by	7: Ne by: Ge	stor A	barca .eal			Ŀ	7 1	à (5 t :	311 '	to	
	Bac	zomet kfill	er Type: Bentonite Drill Cuttings Sand						_					Ľ	"	710			



Core sample from Testhole TH1



Core sample from Testhole TH2





Core sample from Testhole TH3



Core sample from Testhole TH4





Core sample from Testhole TH5



Core sample from Testhole TH6





Core sample from Testhole TH7





Winnipeg, Manitoba

R3E 3P1

Attention:

City of Winnipeg

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

PARTICLE SIZE ANALYSIS ASTM D422

PROJECT: 2015 Regional Street Renewal Program Mulvey Avenue between Stafford Street and Lilac Street

PROJECT NO.: 123311671

SAMPLED BY: Nestor Abarca SAMPLE ID: TH02 @ 0.91 m

Engineering Division, Public Works Department

Derek Teperto

DATE RECEIVED: January 2, 2015 TESTED BY: Sothea Bun, C.E.T.





Winnipeg, Manitoba

R3E 3P1

Attention:

City of Winnipeg

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

PARTICLE SIZE ANALYSIS ASTM D422

PROJECT: 2015 Regional Street Renewal Program Mulvey Avenue between Stafford Street and Lilac Street

PROJECT NO.: 123311671

SAMPLED BY: Nestor Abarca SAMPLE ID: TH07 @ 0.61 m

Engineering Division, Public Works Department

Derek Teperto

DATE RECEIVED: January 2, 2015 TESTED BY: Sothea Bun, C.E.T.



2015 REGIONAL STREET RENEWAL PROGRAM

CALROSSIE BOULEVARD BETWEEN PEMBINA HIGHWAY AND RIVERSIDE DRIVE

GEOTECHNICAL INVESTIGATION



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

Prepared by: Stantec Consulting Ltd. 199 Henlow Bay Winnipeg, MB R3Y 1G4

January 15, 2015 Project No. 123311671





Stantoc	Project No. 123311671	Drawn by: SB	Figure: 1	Testhole Location Plan 2015 Regional Street Renewal Program
Stantec	Date: Dec. 17, 2014	Reviewed by: GL	Scale: NTS	Highway to Riverside Drive Winnipeg, Manitoba



TABLE 1 2015 REGIONAL STREET RENEWAL PROGRAM CALROSSIE BOULEVARD BETWEEN PEMBINA HIGHWAY AND RIVERSIDE DRIVE GEOTECHNICAL INVESTIGATION

Testhole	Testhole Location	Paveme	nt Surface	Pavement Strue	cture Material	Sample	Sample	Moisture	Ра	rticle Siz	e Analys	sis	Att	erberg Lin	nits
ID		Туре	Thickness (mm)	Туре	Thickness (mm)	Description	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH1	15.0 m East of Pembina Highway, approximately 1.5 m South of North curb	Asphalt	65	Granular Fill	2035	-	-	-	-	-	-	-	-	-	-
TH2	50.0 m East of Pembina Highway, approximately 1.5 m North of South curb	Asphalt	75	Granular Fill	480	-	-	-	-	-	-	-	-	-	-
TH3	105.0 m East of Pembina Highway, approximately 1.5 m South of North curb	Asphalt	70	Granular Fill	800	-	-	-	-	-	-	-	-	-	-
TH4	155.0 m East of Pembina Highway, approximately 1.5 m South of North curb	Asphalt	45	Granular Fill	405	-	-	-	-	-	-	-	-	-	-
тна	200.0 m East of Pembina Highway,	Asphalt	65	Granular Fill	205	Clay Fill	0.6	24	0.4	8.2	22	69.4	59	18	41
1110	approximately 1.5 m South of North curb	Asphan	00		200	Clay	1.2	32	0.0	0.9	9.1	90.0	85	24	61
TH6	251.0 m East of Pembina Highway, approximately 1.5 m South of North curb	Asphalt	60	Granular Fill	1765	-	-	-	-	-	-	-	-	-	-
TH7	300.0 m East of Pembina Highway, approximately 1.5 m South of North curb	Asphalt	60	Granular Fill	850	-	-	-	-	-	-	-	-	-	-

C Pl L	LIEN ROJH DCA	IT _ ECT TION	TEST City of Winnipeg 2015 Regional Street Renewal Program Calrossie Boulevard between Pembina F	HC)LF way a	E and I	REC Rivers	C OI	RD Drive	Т	H()1	PR DA ELI	OJEC TUM EVA	CT No 1 _ FION).	123	311	671	
D	RILI	ING	DATE December 11, 2014 DRILLING CO.	Mapl	e Le	af D	rilling	Ltd.		DF	RILL	ING N	METH	OD _	12:	<u>5 m</u>	<u>n S</u>	<u>SA</u>		
(m)	0	MBOL		ATA	S	AMP	LES	□ Ins △ Pc	situ She ocket Pe 5	ear Va enetro 0kPa	ne (k mete	Pa) r (kPa 100	□ ٦) ★ 0kPa	orvar	ne on (150k	Grab Pa	Samp)les (200]	kPa) Pa	(ft)
DEPTH	nsc	SOIL SYI	SOIL DESCRIPTION	WELL D	ТҮРЕ	NUMBE	MOISTU CONTENT	₩ _P ⊢	W 		Mois Star	sture (ndard	Conten Penetr	t & At ation	terber Test, I	g Lim plows	iits ;/0.3m	1	0	DEPTH
- 0	AS	00	Asphalt		COR	E			10	20	30	4	FO	50	60	7	0	80	9	0
-			Granular Fill - 20 mm maximum size aggregate - medium to coarse sand below 1.8 m		AS		3	0												-
					AS		3	0												- 2
- 1 -	GW	20,000			AS		4	0												
- - 					AS		5	0												- 4 - -
					AS		4	0												- - - 6
- 2 -		0000	TESTHOLE LOCATION : 15.0 m East of	-	AS		8	Ģ)											
			Pembina Highway, approximately 1.5 m South of North curb.The soil was frozen to a depth of 1.2 m.																	- 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
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	San Piez Bac	nple T zomet kfill 7	ype: GS - Grab Sample SPT - Standard Penetration Te ST - Shelby Tube PT - Piston Tube VT - Shear er Гуре: Bentonite Drill Cuttings Sand	st r Van	e Test	R	ogged by eviewed	": Ne by: Ge	stor Aba rman Le	arca al			Here and Constant	6	S	ta	n	t	90	•

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L D	OCA RILI	TION LING	Calrossie Boulevard between Pembina H DATE December 11, 2014 DRILLING CO.	High Mapl	way : le Le	and af D	Rivers rilling	ide D Ltd.	rive	DR	RILLI	NG N	EI METI	LEVA HOD	TIC)N 25 1	nm \$	SSA		
m)		BOL		LA	S	AMP	LES	□ Ins △ Poo	itu She cket Pe	ar Va netro	ne (kl meter	Pa) (kPa	D) X	Torva	ane c	on Gra	ıb Sar	nples	(kPa)	ff)
DEPTH (nsc	SOIL SYM	SOIL DESCRIPTION	WELL DA	ТҮРЕ	NUMBER	MOISTURI	₩ _P	W -0		Mois Star	ture C		nt & A tratior	Attert	berg L	imits ws/0.3	200 8m	NI a	DEPTH (
- 0	AS		Asphalt		COR	E		1	10	20	30	4	0	50	e	0	70	80	9	0 0
	GW		Granular Fill - 20 mm maximum size aggregate		AS		8	Ó											• •	-
	СН		Clay Fill - black, stiff, moist, high plasticity - trace fine to coarse sand - trace fine gravel		AS		30				•									- 2
- 1 -			- some silt Silt	-	AS		24			0										-
· · 			- tan, son, moist, low plasticity		AS		19 23			0										- 4 - -
	ML				AS		20			•										- 6
- 2 -			TESTHOLE LOCATION : 50.0 m East of		AS		24			o										-
			Pembina Highway, approximately 1.5 m North of South curb.																	- 8
- - -			 The soll was frozen to a depth of 0.9 m. 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 Piez	nple T zomet	ype: GS - Grab Sample SPT - Standard Penetration Te ST - Shelby Tube PT - Piston Tube VT - Shea ver Bentonite X Drill Cuttings Sand	est ir Van	ne Tes	t R	ogged by	: Nes by: Gen	tor Aba man Lea	rca al			ي	A	S	Sta	ar	nt	ec	

C Pl Le	LIEN ROJH ЭСА	TT _ ECT TION	TEST City of Winnipeg 2015 Regional Street Renewal Program Calrossie Boulevard between Pembina H	HC		E]	REC	COR	D	TI	103	3	PH DJ EI	ROJ ATU LEV	IECT UM /ATI	No. 		1233	311	671	
D	RILI	JNG	DATE December 11, 2014 DRILLING CO. M	1apl	le Le	af D	rilling	Ltd.		DRI		IG N	/IET	HO	D	125	mr	n SS	А.		
DEPTH (m)	NSC	SOIL SYMBOL	SOIL DESCRIPTION	WELL DATA	TYPE	NUMBER	MOISTURE CONTENT (%)	\square Insi \triangle Poc W_P \square 1	tu Shea ket Per 50 W O	ar Vane hetrom W_{L} $W_$	e (kPa eter (Moistu Stand 30	a) kPa) 100 ire C ard I 4	Conte Pene 0	nt 8 trati	Vane 1: & Atter ion Te	on G 50kP berg est, bl	rab § a Limi lows/ 7(Sampl 2 ts 0.3m	es (H	(Pa) Pa 9(DEPTH (ft)
- U - - -	AS		Asphalt Granular Fill - 20 mm maximum size aggregate		COR AS	E	2	o													-
	GW				AS		4	0													- 2
- 1 -			Clay Fill - black, stiff, moist, high plasticity - trace organic material		AS		26			0											-
-		X	trace fine to coarse sandtrace fine gravelsome silt		AS		31				o										- - 4 -
	СН	X			AS		34				C	· · · · · · · · · · · · · · · · · · ·									-
- 2 -					AS		32				o										- 6 - -
-		XX	TESTHOLE LOCATION : 105.0 m East of Pembina Highway, approximately 1.5 m South of North curb.		AS		36					0									
 - -			 The soil was frozen to a depth of 1.1 m. 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
-																					
																					12
	San Piez Bac	nple T zomet kfill 7	ype: GS - Grab Sample SPT - Standard Penetration Tes ST - Shelby Tube PT - Piston Tube VT - Shear er Fype: Bentonite Drill Cuttings Sand	st Van	ie Test	t R	ogged by eviewed	: Nest by: Gerr	tor Abar nan Lea	ca 1			e V		à	St	a	n	te	36	1

C Pl	LIEN ROJI	IT _ ECT	City of Winnipeg 2015 Regional Street Renewal Program	'HC		E]	REC	C OR	D	T	H04	1	PI D.	ROJE ATU	ECT M	No.	12	2331	1671	
D	RILI	.ING	DATE December 11, 2014 DRILLING CO.	Map	le Le	af D	rilling	Ltd.		DR	ILLIN	IG N	EI (ET)	HOD	<u>1</u>	125 r	nm	SSA	1	
4 (m)	0	MBOL		ATA	S	AMP	LES	□ Ins △ Poo	itu Shea ket Per 5(ar Van netrom)kPa	e (kPa neter (a) kPa) 100	∎ × kPa	Torv	ane o 15	on Gra 0kPa	ab Sa	mples	s (kPa))kPa	H (ft)
DEPTH	NSU NSU	SOIL SY	SOIL DESCRIPTION	MELL D	ТҮРЕ	NUMBE	MOISTU	₩ _P	W •	$W_{\rm L}$ -1 \bullet 20	Moistu Stand	ure C ard F 4	onte Pene	nt & / tratio 50	Attert n Te:	berg L st, blo	imits ws/0.3	3m 8(, J 9	DEPT
- 0	AS		Asphalt	r	COR	E					50									
	GW		Granular Fill - 20 mm maximum size aggregate		AS		5	0												
	СН		 Clay Fill black, stiff, moist, high plasticity trace fine to coarse sand trace fine gravel some silt 		AS		28				o									- 2
- 1 -	-		Clay - brown, stiff, moist, high plasticity - trace fine to medium sand	_	AS		19			>										-
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					AS		31				٥									- - - 6
- 2 -	-		TESTHOLE LOCATION : 155.0 m East of Pembina Highway, approximately 1.5 m South		AS		40					¢)							-
	-		of North curb.The soil was frozen to a depth of 1.1 m.No groundwater seepage or soil sloughing was					····································											• •	- 8 - 8
- 3 -	-		• Testhole terminated at a depth of 2.1 m.																	-
																				- 10 - - -
	0	mla	imor CQ Crak Sourch ODT Start 10			 	000													12
	Pie: Bac	zomet	ST - Shelby Tube PT - Piston Tube VT - Shea er Fype: Bentonite Drill Cuttings Sand	est ar Var	ne Tes	t \mathbb{R}	eviewed	. Nes oy: Geri	tor Abai man Lea	ica 1			9	B	5	St	ar	nt	ec	•

C Pl L	LIEN ROJI DCA	IT _ ECT TION	TEST City of Winnipeg 2015 Regional Street Renewal Program Calrossie Boulevard between Pembina F	HC Highv	DLF way a	E	REC Rivers	C OF	RD Drive	T	HO	5	PF D/ EI	ROJE ATUN LEVA	CT 1 M .TIO	No. N _	123	311	.671	
D	RILI	JNG	DATE December 11, 2014 DRILLING CO.	Mapl	le Le	af D	rilling	g Ltd.		DR	ILLN	NG N	/IETI	HOD	1;	25 m	ım S	SA		
DEPTH (m)	nsc	SOIL SYMBOL	SOIL DESCRIPTION	WELL DATA	TYPE	NUMBER	MOISTURE SI CONTENT (%)	□ Ins △ Po Wp	itu She cket Pe 5 W O	ear Var enetron 0kPa W_L -1	ne (kP neter Moist Stanc	a) (kPa) 100 ure C dard I	kPa kPa	Torva	ne or 150 tterb	n Grat)kPa erg Lir t, blow	nits	oles (200k →	kPa) Pa	DEPTH (ft)
- 0	AS		_Asphalt,		COR	E			10	20	30	4	0	50	6	0	70	80	9	0 0
-	GW		Granular Fill - 20 mm maximum size aggregate	_	AS		4	o												
	СН		 black, stiff, moist, high plasticity trace organic material trace fine to coarse sand trace fine gravel 		AS		24			1 0										- 2
- 1 -			- some silt Particle Size Analysis at 0.6 m: 0.4% Gravel, \8.2% Sand, 22.0% Silt, 69.4% Clay	r	AS		28				0									-
-			Clay - brown, stiff, moist, high plasticity - trace fine to medium sand - trace silt		AS		32				- 0									- 4
	СН		Particle Size Analysis at 1.2 m: 0.0% Gravel, 0.9% Sand, 9.1% Silt, 90.0% Clay		AS		35					0								-
- 2 -					AS		30				•	c								- 6 - -
-			TESTHOLE LOCATION : 200.0 m East of Pembina Highway, approximately 1.5 m South of North curb.				57													- - - 8
			 The soil was frozen to a depth of 1.1 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. 																	-
- 3 -			• Testhole terminated at a depth of 2.1 m.																	- - - 10
-																				
																				12
	San Piez Bac	nple T zomet kfill 7	ype: GS - Grab Sample SPT - Standard Penetration Te ST - Shelby Tube PT - Piston Tube VT - Shea er Гуре: Bentonite Drill Cuttings Sand	est ir Van	ne Test	t R	ogged by	7: Nes by: Ger	tor Aba man Lea	al			<u>y</u>	B	S	ita	31	t	90	•

C P! L/	LIEN ROJE OCA RILI	IT _ ECT TION	TESTH City of Winnipeg 2015 Regional Street Renewal Program Calrossie Boulevard between Pembina Hi DATE December 11, 2014 DRILLING CO	HC ghy apl)Ll way a	E and af D	REC Rivers	COF	RD Drive	;)6	. P E E ME1	PRO DAT ELE FHO	DJEC FUM VAT	CT N I FIOT 12	No. N 25 1		233 	116 	571	
		L L		- F	S	AMP	LES		itu Sh cket P	ear Pene	Van	e (kl	Pa)	E a) X] To	orvar	ne or	n Gra	ıb Sa	ample	es (k	:Pa)	
DEPTH (m)	nsc	SOIL SYMBC	SOIL DESCRIPTION	WELL DATA	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	W _P	W 0	50k V 20		Mois Star 30	10 sture ndard	0kP: Cont Pen	a ent etra	& At	150 terbe Test 60	kPa erg L , blo	imits ws/0 70	20 .3m	00kF ⊣ 80	' a 91	DEPTH (ft)
- 0	AS		Asphalt Granular Fill - 20 mm maximum size aggregate		COR AS	E	4	0															- 0 - - - - -
					AS		4	O															- 2
- 1 -	GW				AS		3	0															-
					AS		3	0															- 4
	ML		Silt - tan, soft, moist, low plasticity		AS AS		5	O)													- - - 6
- 2 -	СН		Clay - brown, stiff, moist, high plasticity - trace fine to medium sand - trace silt		AS		37						o		· · · · · · · · · · · · · · · · · · ·								-
			TESTHOLE LOCATION : 251.0 m East of Pembina Highway, approximately 1.5 m South of North curb.												· · · · · · · · · · · · · · · · · · ·								- - 8 -
- 3 -	-		 The soil was frozen to a depth of 1.1 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole was terminated at a depth of 2.1 m. 																				
	-																						- 10 - - -
																							- 12
	San Piez Bac	nple T zomet kfill 7	ype: GS - Grab Sample SPT - Standard Penetration Test ST - Shelby Tube PT - Piston Tube VT - Shear V er Type: Bentonite Drill Cuttings Sand	: Van	e Tes	t R	ogged by	: Ne: by: Gei	stor Ab man L	oarca eal	1			ي پا	Ŋ	A	S	t	a	n	te	£	1

С	LIEN	IT _	City of Winnipeg	Ή)LI	£	REC	COR	XD	TH	107	PRO)JECT	No.	123	3116	71
P L	ROJI ОСА	ECT TION	Calrossie Boulevard between Pembina F	ligh	way	and	Rivers	ide D	rive			DAT ELE	ΓUΜ VATI	ON			
D	RILI	ING	DATE December 11, 2014 DRILLING CO.	Map	le Le	af D	rilling	Ltd.		DRII	LLING	METHO	DD	125 n	ım S	SA	
PTH (m)	USC	SYMBOL	SOIL DESCRIPTION	L DATA	S LPE	AMP MBER	STURE ENT (%) S	□ Ins △ Poo	itu She ket Pe 50	ar Vane netrome OkPa W	(kPa) eter (kPa 100	□ ⊤) ★ 0kPa	orvane	on Gra	b Sam	ples (kF 200kP	ia) (H) HTT
DE		SOIL		WEI	ŕ	INN	CONTE		- 0	⊣ м ● s 20	loisture (itandard 30 ²	Content Penetra	& Atte ation Te 50	rberg Li est, blov 60	mits vs/0.3r 70	n 80	90 90
- 0	AS		Asphalt		COR	E											- 0
	GW		- 20 mm maximum size aggregate		AS		3	0									
			Clay Fill		AS		5	0									- 2
- 1 -	СН		- black, firm, moist, medium plasticity - trace organic material	Г	AS		23			o							-
			 trace fine to coarse sand trace fine gravel some silt 		AS		41					o					- 4
	СН		brown, stiff, moist, high plasticitytrace fine to medium sandtrace silt		AS		40					3					
- 2 -					AS		35				0						- 6 - -
	-		TESTHOLE LOCATION : 300.0 m East of Pembina Highway, approximately 1.5 m South of North curb.		AS		41					o					
	-		 The soil was frozen to a depth of 1.1 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole was terminated at a depth of 2.1 m. 														- - - -
- 3 -																	- 10
																	12
	San Piez Bac	nple T zomet kfill 7	ype: GS - Grab Sample SPT - Standard Penetration Te ST - Shelby Tube PT - Piston Tube VT - Shea er Гуре: Bentonite Drill Cuttings Sand	est ir Var	ne Tes	t R	ogged by eviewed	: Nes by: Gen	tor Aba man Lea	rca 11		T	À	Sta	an	te	C



Core sample from Testhole TH1



Core sample from Testhole TH2



Core sample from Testhole TH3





Core sample from Testhole TH4



Core sample from Testhole TH5



Core sample from Testhole TH6





Core sample from Testhole TH7





Winnipeg, Manitoba

R3E 3P1

Attention:

City of Winnipeg

LABORATORY

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

PARTICLE SIZE ANALYSIS ASTM D422

PROJECT: 2015 Regional Street Renewal Program Calrossie Blvd between Pembina Hwy and Riverside Dr

PROJECT NO.: 123311671



Engineering Division, Public Works Department

Derek Teperto

DATE RECEIVED: January 2, 2015 TESTED BY: Sothea Bun, C.E.T.





Winnipeg, Manitoba

R3E 3P1

Attention:

Engineering Division, Public Works Department

Derek Teperto

City of Winnipeg

LABORATORY

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

PARTICLE SIZE ANALYSIS ASTM D422

PROJECT: 2015 Regional Street Renewal Program Calrossie Blvd between Pembina Hwy and Riverside Dr

PROJECT NO.: 123311671

SAMPLED BY: Nestor Abarca SAMPLE ID: TH05 @ 1.2 m DATE RECEIVED: January 2, 2015 TESTED BY: Sothea Bun, C.E.T.



2015 REGIONAL STREET RENEWAL PROGRAM

LYON STREET BETWEEN POINT ROAD AND OAKENWALD AVENUE

GEOTECHNICAL INVESTIGATION



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

Prepared by: Stantec Consulting Ltd. 199 Henlow Bay Winnipeg, MB R3Y 1G4

January 15, 2015 Project No. 123311671



Stantoc	Project No. 123311671	Drawn by: SB	Figure: 1	Testhole Location Plan 2015 Regional Street Renewal Program
Stantec	Date: Dec. 22, 2014	Reviewed by: GL	Scale: NTS	Lyon Street between Point Road and Oakenwald Avenue



TABLE 1 2015 REGIONAL STREET RENEWAL PROGRAM LYON STREET BETWEEN POINT ROAD AND OAKENWALD AVENUE GEOTECHNICAL INVESTIGATION

Testhole	Testhole Location	Paveme	ent Surface	Pavement Mate	Structure erial	Sample	Sample	Moisture	Pa	rticle Siz	ze Analy	sis	Att	erberg Lin	nits
ID		Туре	Thickness (mm)	Туре	Thickness (mm)	Description	Depth (m)	Content (%)	Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH1	17.0 m North of Northwest corner of Oakenwald Avenue and Lyon Street, approximately 2.5 m East of West curb	Asphalt	95	Crushed Limestone	800	-	-	-	-	-	-	-	-	-	-
TH2	30.0 m South of Southwest corner of Riverwood Avenue and Lyon Street, approximately 2.5 m East of West curb	Asphalt	70	-	-	Silt	1.2	19	0.3	6.4	71.1	22.2	26	16	10
TH3	9.0 m North of Northeast corner of Riverwood Avenue and Lyon Street, approximately 2.4 m West of East curb	Asphalt	60	-	-	Clay Fill	0.6	21	2.5	11	34.2	52.3	48	15	33
TH4	47.0 m North of Northwest Corner of Riverwood Avenue and Lyon Street, approximately 2.3 m East of West curb	Asphalt	50	-	-	-	-	-	-	-	-	-	-	-	-
TH5	29.0 m South of Southeast corner of Point Road and Lyon Street, approximately 2.5 m West of East curb	Asphalt	65	-	-	-	-	-	-	-	-	-	-	-	-

C P	LIEN ROJI	√T _ ECT	City of Winnipeg 2015 Regional Street Renewal Program	HC)LF	<u> </u>	REC	COI	RD)	Т	H	01	. F I	PRO DAT	JECI UM	ſ N	0.	123	311	671	
	OCA RILI	.TION	Lyon Street between Point Road and Oal	<u>kenv</u> Mapl	<u>vald</u> le Le:	<u>Ave</u> af D	nue rilling	Ltd			DF	ыл	ING	E ME	ELEV THC	VATI חו	ON 12	- 5 mi		SA		
					S		LES	□ In	situ S	Shea	r Va	ne (k	(Pa)		To	rvane	on	Grab	Samp	les (kPa)	
E)		ABOL		ATA		2	ЧЕ (%)	ΔPo	ocket	Pen 50l	etro kPa	mete	er (kPa 10	a))0kP	€ a	1	50k	Pa	2	200 k	Pa	(f t)
EPTH	nsc	IL SYI	SOIL DESCRIPTION	ELL D/	ТҮРЕ	JMBE	ISTUF	Wp	W	r	WL	140		-		° 440		- 1 im	•••	-		EPTH
		SO		WE		ž	CON		10	- (Sta	sture ndard	Pen	en e ietrat	s Alle tion Te	est, l	g Lim blows 7	its /0.3m /0	90	Q	
- 0	AS		Asphalt		COR	E			10	2		50)	40			00	/		80		- - -
			Crushed Limstone - 20 mm maximum size aggregate																			+
	-		20 1111 114/111411 2:22 100-00-0		AS		8	•••••••••••••••••••••••••••••••••••••••	5	· · · · · ·												
	GW	00																				
		2000			AS		6	C C														- 2
·	-		Clay Fill	-			21				2											
- 1 -	-		 black, firm, moist, medium plasticity silty 		AS		21															_
	СН		- trace fine to coarse sand		AS		23				0				· · · · · · · · · · · · · · · · · · ·							4
							22				>											
·			Silt - tan, soft, moist, low plasticity		AS		2.0			G												
.	ML		some claytrace fine to coarse sand																			
			- trace fine gravel		AS		21				0											- 6
2 -				-																		-
- .	СН	\square	Clay - brown, stiff, moist, high plasticity		AS		27					0										-
	-		TESTHOLE LOCATION: 17.0 m North of Northwest corner of Oakenwald Avenue and																			
	-		Lyon Street, approximately 2.5 m East of West curb.																			- 8
			• The soil was frozen to a depth of 0.9 m.																			-
			• 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
	-																					
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	-																					_
	Sar	nple 7	Type: GS - Grab Sample SPT - Standard Penetration Te	st		I	ogged by	r: Ne	estor A	Abarc	a				 ?							- 12
	Pie: Bac	zomet ckfill	er Type: Bentonite Drill Cuttings Sand	r Van	ie Test	R	eviewed	by: Ge	erman	Leal					Ľ	? .	S	ta	n	te	36	*

C. Pl	LIEN ROJI OCA	JT _ ECT TION	TEST City of Winnipeg 2015 Regional Street Renewal Program Lvon Street between Point Road and Oa	HC	DLI vald] Ave	REC	COR	RD	Т	Ή()2	PR DA ELl	ojec Tum Evat	Τ Να [_ ΓΙΟΝ	0.	123	311	671	
D	RILI	LING	DATE December 10, 2014 DRILLING CO.	Map	le Le	af D	rilling	Ltd.		DI	RILL	ING N	METH	IOD _	12:	<u>5 mr</u>	n S	SA		
					S	AMP	LES		itu She sket Pe	ear Va	ne (k mete	Pa) : (kPa		orvan	e on (Grab \$	Samp	ples	(kPa)	
(m) H	Q	MBO		DATA		۲. ۲	JRE (%)		5	0kPa		100)kPa		150k	Pa		2001	cPa	H (#)
DEPTI	SN	SOIL SY	SOIL DESCRIPTION	MELL D	TYPE	NUMB	MOISTL	₩ _P ⊢	W O		Mois Star	sture (ndard	Conten Penetr	t & At	erber Test, l	g Lim ⁱ blows	its /0.3n	n		DEPTI
- 0	AS		Asphalt		COR	E		1		20	30	4	0	50	60	7	0	80	9	0
-	-		Clay Fill - black, firm, moist, medium plasticity - silty - trace fine to coarse sand - trace fine gravel		AS		25			¢	>									-
	СН				AS		25			c)									- 2
- 1 -	-				AS		28				o									-
-			Silt - tan, soft, moist, low plasticity - some clay - trace fine to coarse sand	-	AS		19		F	o	4									- 4
	ML		 trace fine gravel Particle Size Analysis at 1.2 m: 0.3% Gravel, 6.4% Sand, 71.1% Silt, 22.2% Clay 		AS AS		21 23			0 0										- 6
- 2 -	-		TESTHOLE LOCATION: 30.0 m South of	-	AS		29				o									-
	-		Southwest corner of Riverwood Avenue and Lyon Street, approximately 2.5 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 T	ype: GS - Grab Sample SPT - Standard Penetration Te ST - Shelby Tube PT - Piston Tube VT - Shea	st vst	ne Test		logged by	r: Nes	tor Aba	irca			S		<u> </u>					12
	Pie Bac	zomet ckfill '	er [Vpe: Bentonite Drill Cuttings Sand	1 v al	10 105	R	eviewed	by: Ger	man Le	al				6	2	[]	n	IT(90	

C P L	LIEN ROJI OCA	JT _ ECT TION	City of Winnipeg 2015 Regional Street Renewal Program Lyon Street between Point Road and Oa	'HC	DLF	E] Ave	REC	COF	RD	,	TH	[03	_ F _ I _ F	PRO. DAT ELEV	JECT UM /ATI(No.	Ľ	233	1167	<u>'1</u>
E	RILI	LING	DATE December 10, 2014 DRILLING CO. 1	Mapl	le Lea	af D	rilling	ttd.		_]	DRII	LING	ME	ГНО	D	125 1	mm	SSA	4	
DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	WELL DATA	ТҮРЕ	NUMBER	MOISTURE CONTENT (%)	□ Ins △ Po W _P	itu Sh cket F W O	near ' Pene' 50kl 0 1 20	Vane trome Pa ^V L S	(kPa) ter (kP 10 oisture tandard	[2a) 00kP 00kP ← Cont d Pen 40	Tor a tent 8 netrati	Vane 15 & Atter ion Te	on Gra 0kPa berg I st, blc	ab Sa 	30 30 30 30 30 30 30 30 30 30 30 30 30 3	's (kPa '0kPa ⊣ 30	• DEPTH (ft)
- 0	AS	\otimes	Asphalt	/	COR	E														
	СН		 black, firm, moist, medium plasticity silty trace fine to coarse sand trace fine gravel 		AS		19			o										
			Particle Size Analysis at 0.6 m: 2.5% Gravel, 11.0% Sand, 34.2% Silt, 52.3% Clay		AS		21			P										- 2
- 1 -	ML		Silt - tan, soft, moist, low plasticity - some clay	_	AS		25				o									
	-		- trace fine gravel - trace fine gravel Clay - brown, stiff, moist, high plasticity	ſ	AS		35					o								4
	СН				AS		37					c)							- 6
- 2 -	-				AS		43						o							-
	-		Northeast corner of Riverwood Avenue and Lyon Street, approximately 2.4 m West of East curb.																	- 8
	-		 The soil was frozen to a depth of 0.8 m. 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	ype: GS - Grab Sample SPT - Standard Penetration Te ST - Shelby Tube PT - Piston Tube VT - Shea	est ar Var	ne Test	I	logged by	/: Nes	tor A	barca		1	(7		<u> </u>			 L	12
	Pie Bao	zomet ckfill	er Type: Bentonite Drill Cuttings Sand	u val	ie 1031	R	eviewed	by: Ger	man I	eal				J		5	a		ie	C

C P	LIEN ROJI	IT _ ECT	TEST City of Winnipeg 2015 Regional Street Renewal Program Lyon Street between Point Road and Oa	HC		E	REC	COR	D	Т	Ή	04	_ I . I	PRO DAT	DJEC TUM		No.	12	.331	167	1
D	RILI	JNG	DATE December 10, 2014 DRILLING CO.	Mapl	e Le	af D	rilling	Ltd.		DF	RILI	ING	ME	THC	VAI DD_	12	<u>25 m</u>	m	SSA	1	
					S	AMF	LES		tu She	ar Va	ne (l	(Pa) er (kP	2 a))		orvan	e on	Grat	o Sar	nples	s (kPa)
(m) H	U U	rmbo		DATA		ШК	JRE (%)		5	OkPa		1	00kP	a		150	kPa		200)kPa	H (ff)
DEPT	SN	SOIL S'	SOIL DESCRIPTION	MELL I	ΤΥΡΕ	NUMB	MOISTU	W _P ⊢−	₩ ↔	W_L -1 \bullet 20	Moi Sta	sture Indarc	Cont I Pen 40	tent a netrai	& Att tion T	erbe Test 60	erg Lir , blow	nits /s/0.3 70	3m 80	0	DEPT
- 0	AS	\otimes	Asphalt	-	COR	E														-	
	-		 Clay Fill black, firm, moist, medium plasticity silty trace fine to coarse sand trace fine gravel 		AS		8	o													- - - -
		X			AS		8	O													- 2
- 1 -	СН	X			AS		21			o											·
· ·	-	X			AS		21			o											- 4 - -
· · ·			Clay - brown, stiff, moist, high plasticity	-	AS		34					G	0								- 6
- 2 -			TESTHOLE LOCATION: 47.0 m North of	_	AS		38						>								
	-		Northwest corner of Riverwood Avenue and Lyon Street, approximately 2.3 m East of West curb.																		- - - 8
· · ·	-		 The soil was frozen to a depth of 1.5 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Testhole terminated at a depth of 2.1 m. 																		= = =- =
- 3 -	-		1																		- - 10 -
	San Piez Bac	nple T zomet kfill 7	ype: GS - Grab Sample SPT - Standard Penetration Te ST - Shelby Tube PT - Piston Tube VT - Shea er Гуре: Bentonite Drill Cuttings Sand	est r Van	ie Test	t R	ogged by	: Nest by: Gerr	tor Aba man Lea	rca 11			ي _	Ŋ	À	S	ta	31	nt	e	

C P L	LIEN ROJI OCA	NT _ ECT TION	TEST City of Winnipeg 2015 Regional Street Renewal Program Lvon Street between Point Road and Oa	HC	DLF	[] A <u>ve</u>	REC	COR	2D	T	H()5	P D E	ROJE ATU LEV4	ECT M	No.	1	233	116	71	_
D	RILI	LING	DATE December 10, 2014 DRILLING CO.	Mapl	le Le	af D	rilling	Ltd.		Dł	RILL	ING	MET	HOE)]	25	mm	SSA	4		-
DEPTH (m)	USC	SOIL SYMBOL	SOIL DESCRIPTION	WELL DATA	TYPE	NUMBER	MOISTURE A	□ Insi △ Poo Wp	itu She cket Pe 5 W	ear Va enetro 0kPa W_L	ne (k mete Moi Sta	Pa) r (kPa 10 sture (0kPa	Torv	ane o 15 Atteri n Te:	on Gr 0kPa berg l	ab Sa ı _imits ows/0	ample 20 .3m	s (kP 0kPa ⊣	a)	DEPTH (ft)
- 0	AS CH		Asphalt Clay Fill - black, firm, moist, medium plasticity - silty - trace fine to coarse sand - trace fine gravel	-	COR	E	19	1	0	20 0	30) 4	40	50		50	70	8	0	90	0
	-		Clay		AS		32					Ð									2
- 1 -			- brown, stiff, moist, nign plasticity		AS AS		35 38					0									4
	СН				AS		41						o								
- 2 -	-				AS		40						0								6
	-		TESTHOLE LOCATION: 29.0 m South of Southeast corner of Point Road and Lyon Street, approximately 2.5 m West of East curb.	_	AS		42						O								8
	-		 The soil was frozen to a depth of 0.8 m. 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
· 																					12
	Sar Pie	nple T zomet	ype: GS - Grab Sample SPT - Standard Penetration Te ST - Shelby Tube PT - Piston Tube VT - Shea	est r Van	ie Test	L R	ogged by eviewed	: Nes by: Gen	tor Aba man Le	al			y	A	5	St	a	nf	e	C	14



Core sample from Testhole TH1



Core sample from Testhole TH2




Core sample from Testhole TH3



Core sample from Testhole TH4





Core sample from Testhole TH5





LABORATORY 199 Henlow Bay

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

PARTICLE SIZE ANALYSIS ASTM D422

PROJECT: 2015 Regional Street

Renewal Program

City of Winnipeg Engineering Division, Public Works Department 106-1155 Pacific Avenue Winnipeg, Manitoba R3E 3P1 PROJECT NO.: 123311671 Attention: Derek Teperto

Lyon St between Point Rd and Oakenwald Ave

SAMPLED BY: Nestor Abarca SAMPLE ID: TH02 @ 1.2 m

DATE RECEIVED: January 2, 2015 TESTED BY: Sothea Bun, C.E.T.



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



106-1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

Attention:

City of Winnipeg

LABORATORY

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

PARTICLE SIZE ANALYSIS ASTM D422

PROJECT: 2015 Regional Street Renewal Program Lyon St between Point Rd and Oakenwald Ave

PROJECT NO.: 123311671

SAMPLED BY: Nestor Abarca SAMPLE ID: TH03 @ 0.61 m

Engineering Division, Public Works Department

Derek Teperto

DATE RECEIVED: January 2, 2015 TESTED BY: Sothea Bun, C.E.T.



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