

APPENDIX 'F'

GEOTECHNICAL REPORT

APPENDIX 'F' - GEOTECHNICAL REPORT

GEOTECHNICAL REPORT FOR:

- I. Aldine Street from Bruce Avenue to Lodge Avenue.
- II. Thompson Drive from Portage Avenue to Bruce Avenue.
- III. Oakdean Boulevard from Assiniboine Avenue to 138 Oakdean Boulevard
- IV. Armour Crescent from Harris Boulevard to Harris Boulevard
- V. Assiniboine Crescent from 110m south of Portage Avenue to Portage 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.



Stantec Consulting Ltd.
199 Henlow Bay
Winnipeg MB R3Y 1G4
Tel: (204) 488-6999
Fax: (204) 488-6915

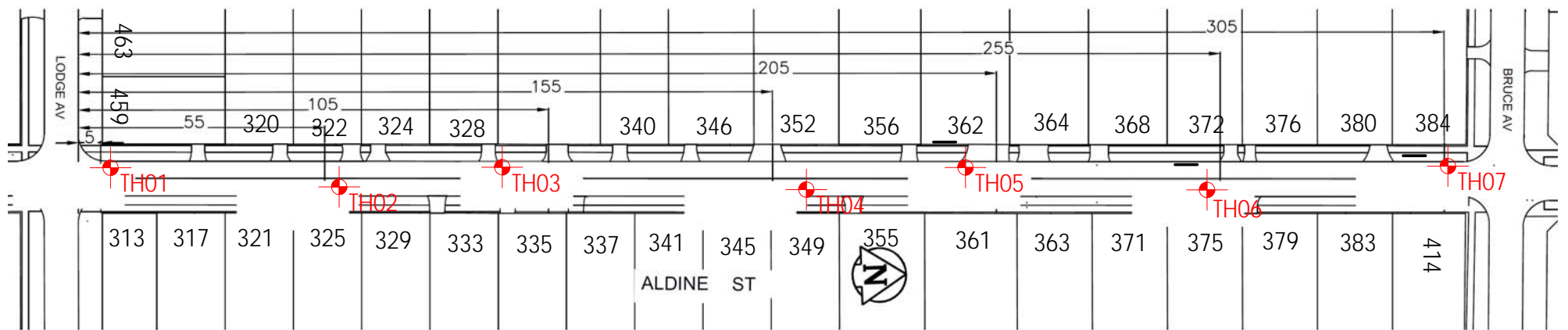


**2014 RESIDENTIAL STREET RENEWALS
GEOTECHNICAL INVESTIGATION
ALDINE STREET
LODGE AVENUE TO BRUCE AVENUE**

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, MANITOBA
R3Y 1G4**

December 17, 2013



Project No.123301054

Drawn by: SB

Figure: 1

Date: Dec. 17, 2013

Reviewed by:GL

Scale: NTS

Testhole Location Plan
2014 Residential Street Renewals
Aldine Street
Lodge Avenue to Bruce Avenue

**TABLE 1
2014 RESIDENTIAL STREET RENEWALS
ALDINE STREET, LODGE AVENUE TO BRUCE STREET
GEOTECHNICAL INVESTIGATION**

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure Material		Sample Description	Sample Depth (m)	Moisture Content (%)	Particle Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH01	Aldine Street 7.0 m North from Northwest corner of Lodge Avenue & Aldine Street 1.0 m East from West curb	Asphalt	35	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	135												
TH02	Aldine Street 5.0 m South from property 325 & 323 Aldine Street 1.0 m West from East curb	Asphalt	75	Granular Fill	125	Clay Fill	0.6	11	21.0	43.9	17.8	17.3	34	13	21
		Concrete	140												
TH03	Aldine Street 0.5 m North from property 328 Aldine Street 1.0 m East from West curb	Asphalt	30	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	165												
TH04	Aldine Street 8.0 m North from property 345 & 349 Aldine Street 1.0 m West from East curb	Asphalt	30	-	-	Clay	0.9	37	0.0	1.9	6.2	91.9	89	27	62
		Concrete	150												
TH05	Aldine Street 10.0 m South from property 362 & 364 Aldine Street 1.0 m East from West curb	Asphalt	25	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	145												
TH06	Aldine Street 7.5 m South from property 379 & 375 Aldine Street 1.0 m West from East curb	Asphalt	20	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	140												
TH07	Aldine Street 9.0 m South from Southwest corner of Aldine Street & Bruce Avenue 1.0 m East from West curb	Asphalt	55	Granular Fill	100	-	-	-	-	-	-	-	-	-	-
		Concrete	160												

TESTHOLE TH01



Project Name: 2014 Residential Street Renewals
Project Location: Aldine Street, Lodge Avenue to Bruce Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 7.0 m North from Northwest corner of Lodge Avenue & Aldine Street, 1.0 m East from West curb

Date Drilled: November 24, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
0.0 - 0.05		Asphalt					
0.05 - 0.1		Concrete					
0.1 - 1.0		Clay Fill - black, firm, moist, medium plasticity - some fine to coarse sand - some fine gravel - some silt	BS	●26			
			BS	●31			
			BS	●31			
1.0 - 2.0		Clay - brown, firm, moist, high plasticity - trace fine to coarse sand - trace silt	BS	●35			
			BS	●38			
			BS	●34			
			BS	●40			

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH02



Project Name: 2014 Residential Street Renewals
Project Location: Aldine Street, Lodge Avenue to Bruce Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 5.0 m South from property 325 & 323 Aldine Street, 1.0 m West from East curb

Date Drilled: November 24, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	Particle Size Distribution				Water Content (%)	
				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	PL	LL
		Asphalt							
		Concrete							
		Granular Fill - 20 mm max size aggregate	BS						●12
0.5		Clay Fill - black, firm, moist, medium plasticity - some fine to coarse sand - some fine gravel - some silt	BS	21.0	43.9	17.8	17.3		●11
1.0		Clay - brown, firm, moist, high plasticity - trace fine to coarse sand - trace silt	BS						●30
1.5			BS						●36
2.0			BS						●37
2.0			BS						●39

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH03



Project Name: 2014 Residential Street Renewals
Project Location: Aldine Street, Lodge Avenue to Bruce Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 0.5 m North from property 328 Aldine Street, 1.0 m East from West curb

Date Drilled: November 24, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
0.0 - 0.1	[Asphalt symbol]	Asphalt					
0.1 - 0.2	[Concrete symbol]	Concrete					
0.2 - 1.4	[Clay Fill symbol]	Clay Fill - black, firm, moist, medium plasticity - some fine to coarse sand - some fine gravel - some silt	BS		●33		
			BS		●34		
			BS		●32		
1.4 - 2.0	[Clay symbol]	Clay - grey, firm, moist, high plasticity - trace fine to coarse sand - trace silt - brown below 1.4 m	BS		●35		
			BS		●35		
			BS		●34		
			BS		●36		

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH04



Project Name: 2014 Residential Street Renewals
Project Location: Aldine Street, Lodge Avenue to Bruce Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 8.0 m North from property 345 & 349 Aldine Street, 1.0 m West from East curb

Date Drilled: November 24, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	Particle Size Distribution				Water Content (%)	
				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	PL	LL
0.0 - 0.1	[Asphalt symbol]	Asphalt							
0.1 - 0.2	[Concrete symbol]	Concrete							
0.2 - 0.6	[Clay Fill symbol]	Clay Fill - black, firm, moist, medium plasticity - some fine to coarse sand - some fine gravel - some silt	BS					41	
0.6 - 1.0	[Clay symbol]	Clay - grey, firm, moist, high plasticity - brown below 1.1 m - some fine to coarse sand below 1.7 m - trace silt	BS	0.0	1.9	6.2	91.9	37	100
1.0 - 1.5	[Clay symbol]		BS					37	
1.5 - 2.0	[Clay symbol]		BS					39	
2.0	[Clay symbol]		BS					33	
2.0	[Clay symbol]		BS					36	

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH05



Project Name: 2014 Residential Street Renewals
Project Location: Aldine Street, Lodge Avenue to Bruce Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 10.0 m South from property 362 & 364 Aldine Street, 1.0 m East from West curb

Date Drilled: November 24, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
		Asphalt					
		Concrete					
		Clay Fill - black, firm, moist, medium plasticity - some fine to coarse sand - some fine gravel - some silt	BS		●26		
0.5							
		Clay - black, firm, moist, high plasticity - trace fine to coarse sand - trace silt - brown below 1.1 m	BS		●36		
1.0			BS		●34		
1.5			BS		●38		
			BS		●39		
			BS		●39		
2.0			BS		●42		

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH06



Project Name: 2014 Residential Street Renewals
Project Location: Aldine Street, Lodge Avenue to Bruce Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 7.5 m South from property 379 & 375 Aldine Street, 1.0 m West from East curb

Date Drilled: November 24, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
		Asphalt					
		Concrete					
		Clay Fill - black, firm, moist, medium plasticity - some fine to coarse sand - some fine gravel - some silt	BS		●31		
0.5		Clay - black, firm, moist, high plasticity - trace fine to coarse sand - trace silt	BS		●32		
1.0		Silty Clay - tan, firm, moist, medium plasticity	BS		●30		
1.5		Clay - brown, firm, moist, high plasticity - trace fine to coarse sand - trace silt	BS		●38		
2.0			BS		●40		
2.0			BS		●39		

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH07



Project Name: 2014 Residential Street Renewals
Project Location: Aldine Street, Lodge Avenue to Bruce Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 9.0 m South from Southwest corner of Aldine Street & Bruce Avenue, 1.0 m East from West curb

Date Drilled: November 24, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
		Asphalt					
		Concrete					
		Granular Fill - 20 mm max size aggregate	BS				
0.5		Clay Fill - black, firm, moist, medium plasticity - some fine to coarse sand - some fine gravel - some silt	BS				
1.0		Clay - brown, firm, moist, high plasticity - trace fine to coarse sand - trace silt	BS				
1.5			BS				
2.0			BS				
			BS				
			BS				

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.



Core sample from Testhole TH01



Core sample from Testhole TH02



Core sample from Testhole TH03



Core sample from Testhole TH04



Core sample from Testhole TH05



Core sample from Testhole TH06



Core sample from Testhole TH07



PARTICLE SIZE ANALYSIS ASTM D422

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

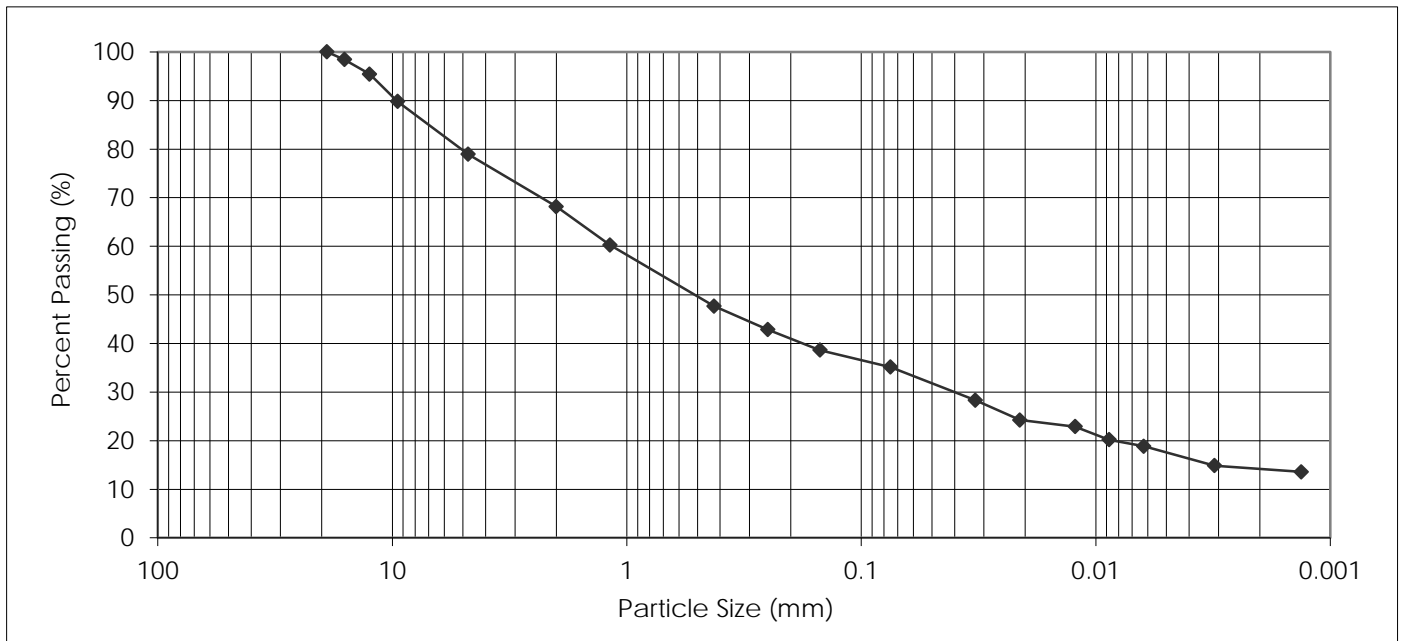
PROJECT: 2014 Residential Street Renewals
 Aldine Street
 Lodge Avenue to Bruce Avenue

Attention: Derek Teperto

PROJECT NO.: 123301054

SAMPLED BY: Sothea Bun
 SAMPLE ID: TH2 at 0.6 m

DATE RECEIVED: November 27, 2013
 TESTED BY: Larry Presado



PARTICLE SIZE	PERCENT PASSING	PARTICLE SIZE	PERCENT PASSING
37.50 mm	100.0	1.18 mm	60.3
25.00 mm	100.0	0.425 mm	47.7
19.00 mm	100.0	0.250 mm	42.8
16.00 mm	98.4	0.150 mm	38.6
12.50 mm	95.4	0.075 mm	35.1
9.50 mm	89.8	0.005 mm	17.3
4.75 mm	79.0	0.002 mm	14.1
2.00 mm	68.2	0.001 mm	NT*

Gravel, % 75 to 4.75 mm	Sand, %			Silt, % <0.075 to 0.005 mm	Clay, % <0.005 mm	Colloids, % < 0.001 mm
	Coarse <4.75 to 2.0 mm	Medium <2.0 to 0.425 mm	Fine <0.425 to 0.075 mm			
21.0	10.8	20.5	12.6	17.8	17.3	NT*

NT* Sample not tested for colloids

December 12, 2013

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



PARTICLE SIZE ANALYSIS ASTM D422

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

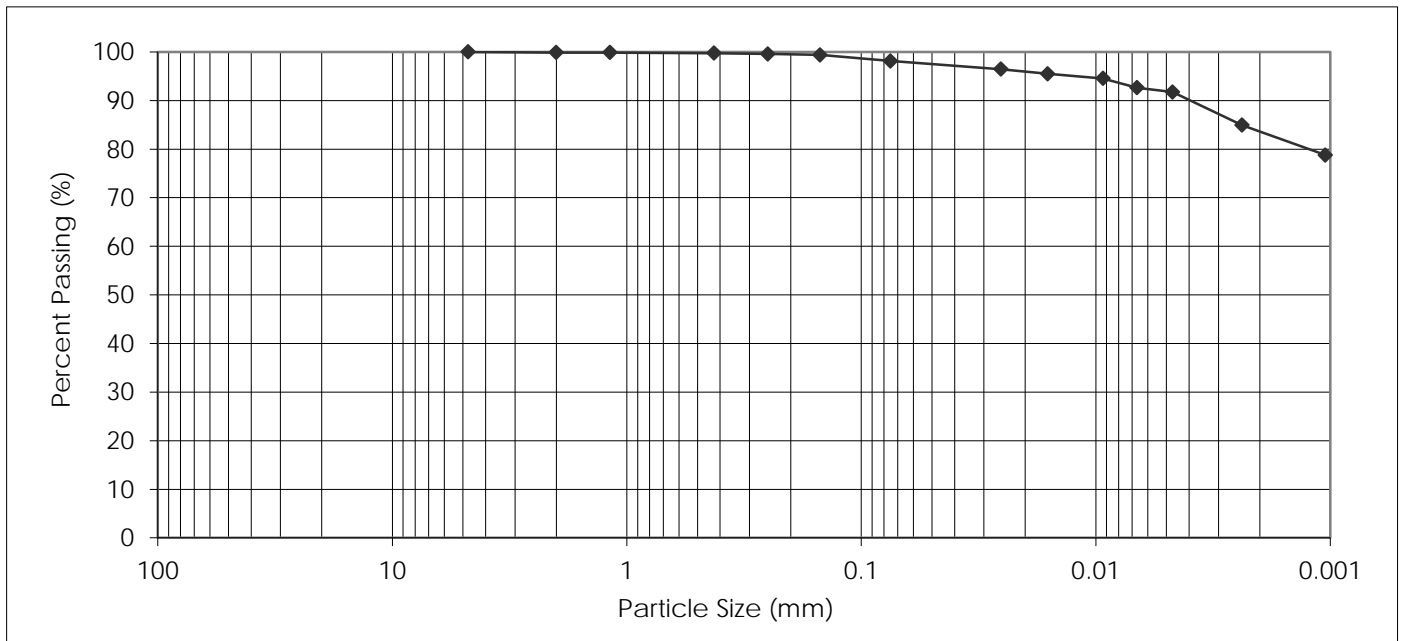
PROJECT: 2014 Residential Street Renewals
 Aldine Street
 Lodge Avenue to Bruce Avenue

Attention: Derek Teperto

PROJECT NO.: 123301054

SAMPLED BY: Sothea Bun
 SAMPLE ID: TH4 at 0.9 m

DATE RECEIVED: November 27, 2013
 TESTED BY: Nestor Abarca



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

PARTICLE SIZE	PERCENT PASSING
1.18 mm	99.9
0.425 mm	99.8
0.250 mm	99.6
0.150 mm	99.4
0.075 mm	98.1
0.005 mm	91.9
0.002 mm	83.2
0.001 mm	NT*

Gravel, % 75 to 4.75 mm	Sand, %			Silt, % <0.075 to 0.005 mm	Clay, % <0.005 mm	Colloids, % < 0.001 mm
	Coarse <4.75 to 2.0 mm	Medium <2.0 to 0.425 mm	Fine <0.425 to 0.075 mm			
0.0	0.1	0.1	1.7	6.2	91.9	NT*

NT* Sample not tested for colloids

December 12, 2013

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



Stantec Consulting Ltd.
199 Henlow Bay
Winnipeg MB R3Y 1G4
Tel: (204) 488-6999
Fax: (204) 488-6947

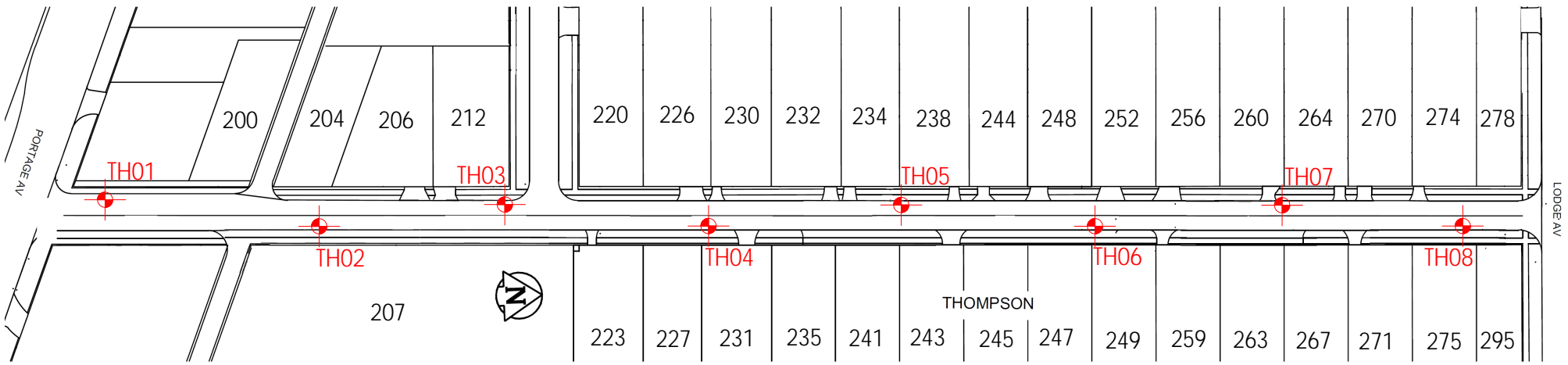


**2014 RESIDENTIAL STREET RENEWALS
GEOTECHNICAL INVESTIGATION
THOMPSON DRIVE
PORTAGE AVENUE TO LODGE AVENUE**

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, MANITOBA
R3Y 1G4**

December 18, 2013



Project No.123301054

Drawn by: NB

Figure: 1

Testhole Location Plan
2014 Residential Street Renewals
Thompson Drive
Portage Avenue to Lodge Avenue

Date: Dec. 17, 2013

Reviewed by: GL

Scale: NTS

TABLE 1
2014 RESIDENTIAL STREET RENEWALS
THOMPSON DRIVE, PORTAGE AVENUE TO LODGE AVENUE
GEOTECHNICAL INVESTIGATION

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure Material		Sample Description	Sample Depth (m)	Moisture Content (%)	Particle Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH01	Thompson Drive 15.0 m North from Northwest corner of Portage Avenue & Thompson Drive 1.5 m East from West curb	Asphalt	30	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	180												
TH02	Thompson Drive 3.5 m South from property 204 & 206 Thompson Drive 1.0 m West from East curb	Asphalt	50	Granular Fill	100	Clay	1.2	37	0.1	6.6	17.1	76.2	86	29	57
		Concrete	160												
TH03	Thompson Drive 5.0 m South from Southwest corner of Nightingale Road & Thompson Drive 1.0 m East from West curb	Asphalt	60	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	170												
TH04	Thompson Drive 2.0 m North from property 227 & 231 Thompson Drive 1.0 m West from East curb	Asphalt	60	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	135												
TH05	Thompson Drive 0.5 m North from property 234 & 238 Thompson Drive 1.0 m East from West curb	Asphalt	45	Granular Fill	50	-	-	-	-	-	-	-	-	-	-
		Concrete	160												
TH06	Thompson Drive 1.0 m North from property 247 & 249 Thompson Drive 1.0 m West from East curb	Asphalt	45	Granular Fill	100	Clay Fill	0.9	30	3.7	22.1	12.0	62.2	66	20	46
		Concrete	140												
TH07	Thompson Drive 0.5 m South from property 260 & 264 Thompson Drive 1.0 m East from West curb	Asphalt	45	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	165												
TH08	Thompson Drive 3.5 m South from property 275 & 295 Thompson Drive 1.0 m West from East curb	Asphalt	30	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	150												

TESTHOLE TH01



Project Name: 2014 Residential Street Renewals
Project Location: Thompson Drive, Portage Avenue to Lodge Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 15.0 m North from Northwest corner of Portage Ave & Thompson Dr, 1.5 m East from West curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
0.0 - 0.05	[Asphalt symbol]	Asphalt					
0.05 - 0.1	[Concrete symbol]	Concrete					
0.1 - 0.6	[Clay Fill symbol]	Clay Fill - brown, firm, moist, high plasticity - some fine to coarse sand - trace fine gravel	BS	●28			
0.6 - 0.9	[Clay symbol]	Clay - black, firm, moist, high plasticity - some silt - trace sand - brown below 1.2 m	BS	●33			
0.9 - 1.1	[Clay symbol]		BS	●32			
1.1 - 1.6	[Clay symbol]		BS	●34			
1.6 - 1.9	[Clay symbol]		BS	●39			
1.9 - 2.0	[Clay symbol]		BS	●39			
2.0			BS	●48			

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH02



Project Name: 2014 Residential Street Renewals
Project Location: Thompson Drive, Portage Avenue to Lodge Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 3.5 m South from property 204 & 206 Thompson Drive, 1.0 m West from East curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	Particle Size Distribution				Water Content (%)	
				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	PL	LL
		Asphalt							
		Concrete							
		Granular Fill - 20 mm maximum size aggregate	BS					12	
0.5		Clay Fill - brown, firm, moist, high plasticity - some medium to coarse sand	BS					36	
1.0		Clay - black, firm, moist, high plasticity - some silt - trace sand - brown below 1.7 m	BS					32	
			BS	0.1	6.6	17.1	76.2	37	
1.5			BS					36	
			BS					36	
2.0			BS					39	

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH03



Project Name: 2014 Residential Street Renewals
Project Location: Thompson Drive, Portage Avenue to Lodge Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 5.0 m South from Southwest corner of Nightingale Rd & Thompson Dr, 1.0 m East from West curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
0.0 - 0.1		Asphalt					
0.1 - 0.2		Concrete					
0.2 - 0.6		Clay Fill - grey, firm, moist, high plasticity - some fine to medium sand	BS		●34		
0.6 - 0.9			BS		●35		
0.9 - 1.1			BS		●35		
1.1 - 1.9		Clay - black, firm, moist, high plasticity - some silt - trace sand - brown below 1.1 m - silty below 1.9 m	BS		●35		
1.9 - 2.0			BS		●40		
			BS		●37		
			BS		●43		

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH04



Project Name: 2014 Residential Street Renewals
Project Location: Thompson Drive, Portage Avenue to Lodge Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 2.0 m North from property 227 & 231 Thompson Drive, 1.0 m West from East curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
0.0 - 0.05	[Asphalt symbol]	Asphalt					
0.05 - 0.1	[Concrete symbol]	Concrete					
0.1 - 1.5	[Clay Fill symbol]	Clay Fill - brown, firm, moist, high plasticity - some fine to coarse sand - trace fine gravel	BS	●36			
			BS	●33			
			BS	●36			
			BS	●36			
1.5 - 2.0	[Clay symbol]	Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS	●35			
			BS	●41			
			BS	●40			
		<ul style="list-style-type: none"> No groundwater seepage or soil sloughing was observed during or upon completion of drilling. The soil was frozen to a depth of 0.6 m. Testhole terminated at a depth of 2.0 m. 					

TESTHOLE TH05



Project Name: 2014 Residential Street Renewals
Project Location: Thompson Drive, Portage Avenue to Lodge Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 0.5 m North from property 234 & 238 Thompson Drive, 1.0 m East from West curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
0.0 - 0.1	[Stippled]	Asphalt					
0.1 - 0.2	[Dotted]	Concrete					
0.2 - 0.6	[Cross-hatched]	Granular Fill - 20 mm maximum size aggregate	BS		●33		
0.6 - 1.0	[Diagonal lines]	Clay Fill - black, firm, moist, high plasticity - some medium to coarse sand	BS		●43		
1.0 - 1.5	[Diagonal lines]	Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS		●41		
1.5 - 1.8	[Diagonal lines]		BS		●37		
1.8 - 2.0	[Diagonal lines]		BS		●40		
2.0	[Diagonal lines]		BS		●35		
2.0	[Diagonal lines]		BS		●38		

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH06



Project Name: 2014 Residential Street Renewals
Project Location: Thompson Drive, Portage Avenue to Lodge Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 1.0 m North from property 247 & 249 Thompson Drive, 1.0 m West from East curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	Particle Size Distribution				Water Content (%)	
				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	PL	LL
		Asphalt							
		Concrete							
		Granular Fill - 20 mm maximum size aggregate	BS						●13
0.5		Clay Fill - black, firm, moist, high plasticity - some sand, some silt - trace fine gravel	BS						●30
1.0		Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS	3.7	22.1	12.0	62.2		●30
1.5			BS						●37
			BS						●39
			BS						●44
2.0			BS						●37

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH07



Project Name: 2014 Residential Street Renewals
Project Location: Thompson Drive, Portage Avenue to Lodge Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 0.5 m South from property 260 & 264 Thompson Drive, 1.0 m East from West curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
0.0 - 0.05	[Asphalt symbol]	Asphalt					
0.05 - 0.1	[Concrete symbol]	Concrete					
0.1 - 1.0	[Clay Fill symbol]	Clay Fill - black, firm, moist, high plasticity - some medium to coarse sand	BS		35		
			BS		40		
			BS		30		
1.0 - 2.0	[Clay symbol]	Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS		36		
			BS		39		
			BS		44		
			BS		44		

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH08



Project Name: 2014 Residential Street Renewals
Project Location: Thompson Drive, Portage Avenue to Lodge Avenue
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 3.5 m South from property 275 & 295 Thompson Drive, 1.0 m West from East curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
		Asphalt					
		Concrete					
		Clay Fill - black, firm, moist, high plasticity - some medium to coarse sand	BS	●31			
0.5	BS		●33				
1.0	BS		●29				
1.5	BS		●34				
		Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS	●39			
1.5	BS		●39				
2.0	BS		●38				

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.



Core sample from Testhole TH01



Core sample from Testhole TH02



Core sample from Testhole TH03



Core sample from Testhole TH04



Core sample from Testhole TH05



Core sample from Testhole TH06



Core sample from Testhole TH07



Core sample from Testhole TH08



PARTICLE SIZE ANALYSIS ASTM D422

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

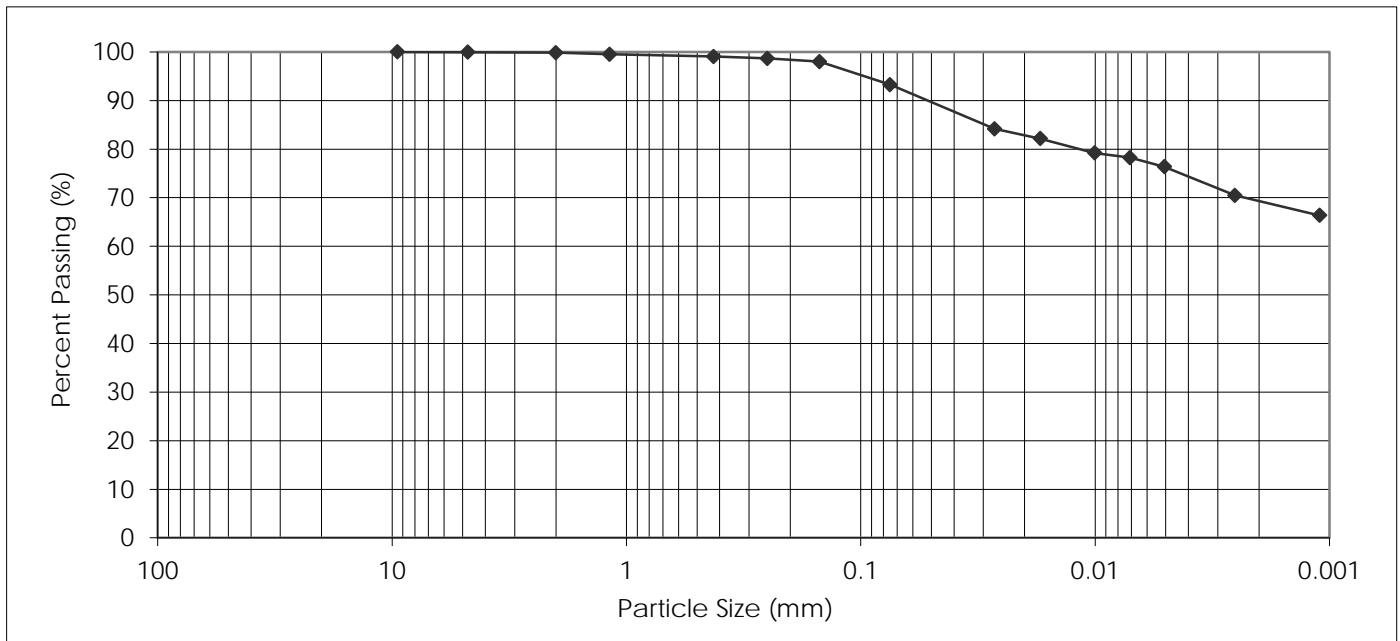
PROJECT: 2014 Residential St. Renewals
 Thompson Dr. between
 Portage Ave. and Lodge Ave.

Attention: Derek Teperto

PROJECT NO.: 123301054

SAMPLED BY: Sothea Bun
 SAMPLE ID: TH2 at 1.2 m

DATE RECEIVED: November 27, 2013
 TESTED BY: Nestor Abarca



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

PARTICLE SIZE	PERCENT PASSING
1.18 mm	99.5
0.425 mm	99.1
0.250 mm	98.7
0.150 mm	98.0
0.075 mm	93.3
0.005 mm	76.2
0.002 mm	69.0
0.001 mm	NT*

Gravel, % 75 to 4.75 mm	Sand, %			Silt, % <0.075 to 0.005 mm	Clay, % <0.005 mm	Colloids, % < 0.001 mm
	Coarse <4.75 to 2.0 mm	Medium <2.0 to 0.425 mm	Fine <0.425 to 0.075 mm			
0.1	0.0	0.8	5.8	17.1	76.2	NT*

NT* Sample not tested for colloids

December 12, 2013

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



PARTICLE SIZE ANALYSIS ASTM D422

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

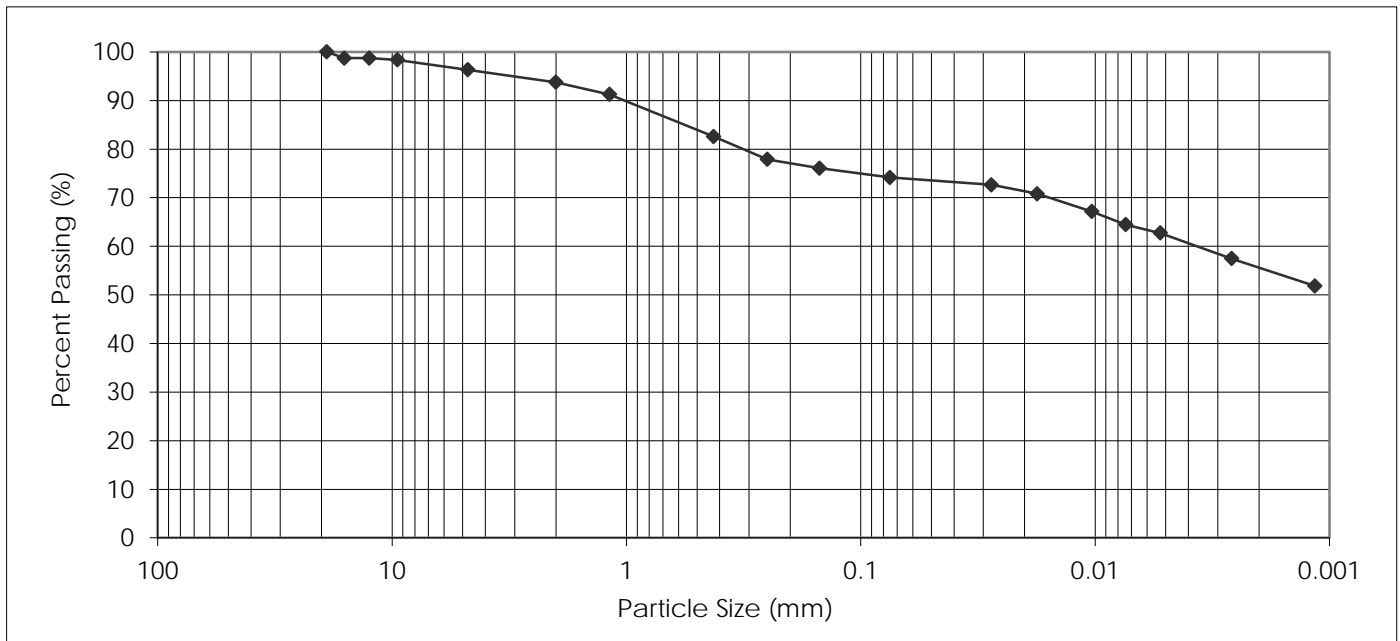
PROJECT: 2014 Residential St. Renewals
 Thompson Dr. between
 Portage Ave. and Lodge Ave.

Attention: Derek Teperto

PROJECT NO.: 123301054

SAMPLED BY: Sothea Bun
 SAMPLE ID: TH6 at 0.9 m

DATE RECEIVED: November 27, 2013
 TESTED BY: Nestor Abarca



PARTICLE SIZE	PERCENT PASSING
37.50 mm	100.0
25.00 mm	100.0
19.00 mm	100.0
16.00 mm	98.7
12.50 mm	98.7
9.50 mm	98.4
4.75 mm	96.3
2.00 mm	93.8

PARTICLE SIZE	PERCENT PASSING
1.18 mm	91.3
0.425 mm	82.6
0.250 mm	77.9
0.150 mm	76.1
0.075 mm	74.2
0.005 mm	62.2
0.002 mm	55.1
0.001 mm	NT*

Gravel, % 75 to 4.75 mm	Sand, %			Silt, % <0.075 to 0.005 mm	Clay, % <0.005 mm	Colloids, % < 0.001 mm
	Coarse <4.75 to 2.0 mm	Medium <2.0 to 0.425 mm	Fine <0.425 to 0.075 mm			
3.7	2.5	11.2	8.4	12.0	62.2	NT*

NT* Sample not tested for colloids

December 12, 2013

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



Stantec Consulting Ltd.
199 Henlow Bay
Winnipeg MB R3Y 1G4
Tel: (204) 488-6999
Fax: (204) 488-6947



**2014 RESIDENTIAL STREET RENEWALS
GEOTECHNICAL INVESTIGATION
OAKDEAN BOULEVARD
ASSINIBOINE AVENUE TO 138 OAKDEAN BOULEVARD**

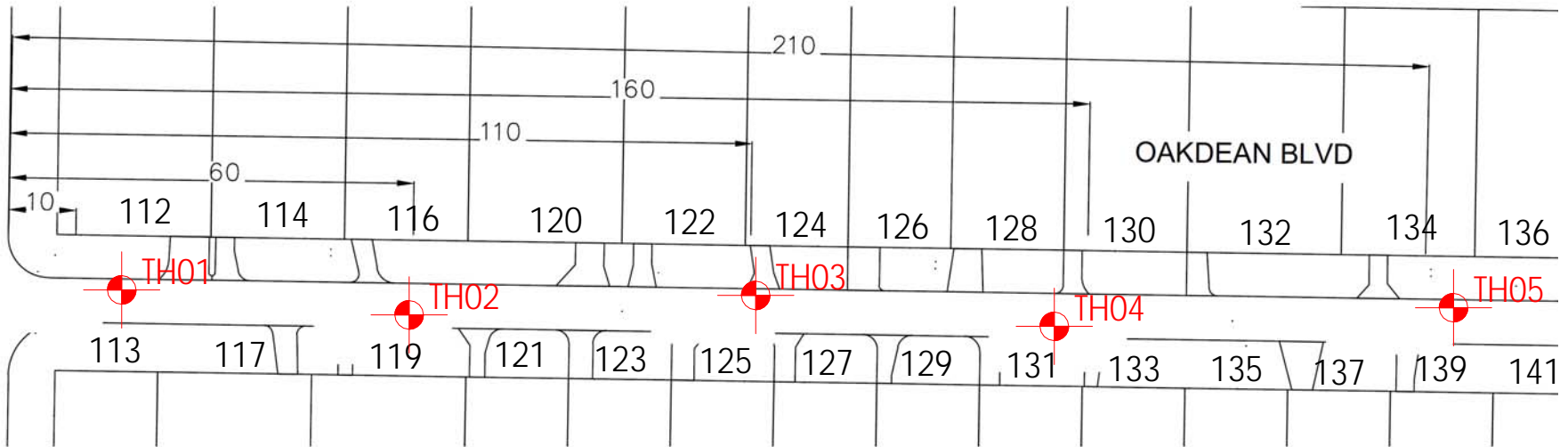
Prepared for
**CITY OF WINNIPEG
ENGINEERING DIVISION
PUBLIC WORKS DEPARTMENT
106-1155 PACIFIC AVENUE
WINNIPEG, MANITOBA
R3E 3P1**

Prepared by
**STANTEC CONSULTING LTD.
199 HENLOW BAY
WINNIPEG, MANITOBA
R3Y 1G4**

December 12, 2013



ASSINIBOINE AV



Stantec

Project No. 123301054

Drawn by: SB

Figure: 1

Date: Dec. 12, 2013

Reviewed by: GL

Scale: NTS

Testhole Location Plan
2014 Residential Street Renewals
Oakdean Blvd
Assiniboine Ave to 138 Oakdean Blvd

TABLE 1
2014 RESIDENTIAL STREET RENEWALS
OAKDEAN BOULEVARD, ASSINIBOINE AVENUE TO 138 OAKDEAN BOULEVARD
GEOTECHNICAL INVESTIGATION

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure Material		Sample Description	Sample Depth (m)	Moisture Content (%)	Particle Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH01	Oakdean Boulevard 13.0 m South from property 112 & 114 Oakdean Boulevard, 1.0 m East from West curb	Asphalt	60	Granular Fill	75	Clay Fill	0.6	27	4.9	25.2	18.3	51.6	65	23	42
TH02	Oakdean Boulevard 8.0 m South from property 121 & 119 Oakdean Boulevard, 1.0 m West from East curb	Asphalt	55	Granular Fill	75	-	-	-	-	-	-	-	-	-	-
TH03	Oakdean Boulevard 1.5 m North from property 122 & 124 Oakdean Boulevard, 1.0 m East from West curb	Asphalt	140	-	-	-	-	-	-	-	-	-	-	-	-
TH04	Oakdean Boulevard 4.0 m South from property 131 & 133 Oakdean Boulevard, 1.0 m West from East curb	Asphalt	80	Granular Fill	75	-	-	-	-	-	-	-	-	-	-
TH05	Oakdean Boulevard 3.0 m South from property 134 & 136 Oakdean Boulevard, 1.0 m East from West curb	Asphalt	150	-	-	Clay	0.9	35	0.0	1.2	11.3	87.5	76	24	52

TESTHOLE TH01



Project Name: 2014 Residential Street Renewals
Project Location: Oakdean Blvd, Assiniboine Ave to 138 Oakdean Blvd
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 13.0 m South from property 112 & 114 Oakdean Boulevard, 1.0 m East from West curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	Particle Size Distribution				Water Content (%)	
				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	PL	LL
		Asphalt							
		Granular Fill - 20 mm max size aggregate	BS					● 8	
		Clay Fill - black, firm, moist, high plasticity - some fine to coarse sand - trace fine gravel - some silt	BS					● 11	
0.5			BS	4.9	25.2	18.3	51.6	● 27	—
1.0			BS					● 28	
1.5			BS					● 35	
		Clay - brown, firm, moist, high plasticity - trace fine to medium sand - some silt	BS					● 36	
			BS					● 34	
2.0			BS					● 37	

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH02



Project Name: 2014 Residential Street Renewals
Project Location: Oakdean Blvd, Assiniboine Ave to 138 Oakdean Blvd
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 8.0 m South from property 121 & 119 Oakdean Boulevard, 1.0 m West from East curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
		Asphalt					
		Granular Fill - 20 mm max size aggregate - some clay	BS	●10			
		Clay Fill - black, firm, moist, high plasticity - some fine to coarse sand - trace fine gravel - some silt	BS	●16			
0.5			BS	●20			
		Clay - black, firm, moist, high plasticity - trace fine to medium sand - some silt - brown below 1.2 m	BS	●37			
1.0			BS	●34			
1.5			BS	●35			
			BS	●33			
2.0			BS	●38			

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH03



Project Name: 2014 Residential Street Renewals
Project Location: Oakdean Blvd, Assiniboine Ave to 138 Oakdean Blvd
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 1.5 m North from property 122 & 124 Oakdean Boulevard, 1.0 m East from West curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
0.0 - 0.05		Asphalt					
0.05 - 0.8		Clay Fill - black, firm, moist, high plasticity - some fine to coarse sand - trace fine gravel - some silt	BS	●9			
			BS	●21			
0.5			BS	●27			
0.8 - 2.0		Clay - black, firm, moist, high plasticity - trace fine to medium sand - some silt - brown below 1.4 m	BS	●34			
1.0			BS	●32			
1.5			BS	●32			
2.0			BS	●32			
			BS	●37			

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH04



Project Name: 2014 Residential Street Renewals
Project Location: Oakdean Blvd, Assiniboine Ave to 138 Oakdean Blvd
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 4.0 m South from property 131 & 133 Oakdean Boulevard, 1.0 m West from East curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
0.0 - 0.05		Asphalt					
0.05 - 0.15		Granular Fill - 20 mm max size aggregate	BS	●5			
0.15 - 0.6		Clay Fill - black, firm, moist, high plasticity - some fine to coarse sand - trace fine gravel - some silt	BS	●16			
0.6 - 1.0		Clay - black, firm, moist, high plasticity - trace fine to medium sand - some silt - brown below 1.2 m	BS	●29			
1.0 - 1.2			BS	●36			
1.2 - 1.5			BS	●30			
1.5 - 1.8			BS	●33			
1.8 - 2.0			BS	●37			
2.0			BS	●39			

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH05



Project Name: 2014 Residential Street Renewals
Project Location: Oakdean Blvd, Assiniboine Ave to 138 Oakdean Blvd
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 3.0 m South from property 134 & 136 Oakdean Boulevard, 1.0 m East from West curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	Particle Size Distribution				Water Content (%)	
				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	PL	LL
0.0 - 0.05		Asphalt							
0.05 - 2.0		Clay - black, firm, moist, high plasticity - trace fine to medium sand - some silt - brown below 0.9 m	BS					36	
			BS					38	
			BS					35	
			BS	0.0	1.2	11.3	87.5	34	40
			BS					40	
			BS					40	
			BS					43	
			BS						

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.



Core sample from Testhole TH01



Core sample from Testhole TH02



Core sample from Testhole TH03



Core sample from Testhole TH04



Core sample from Testhole TH5



PARTICLE SIZE ANALYSIS ASTM D422

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

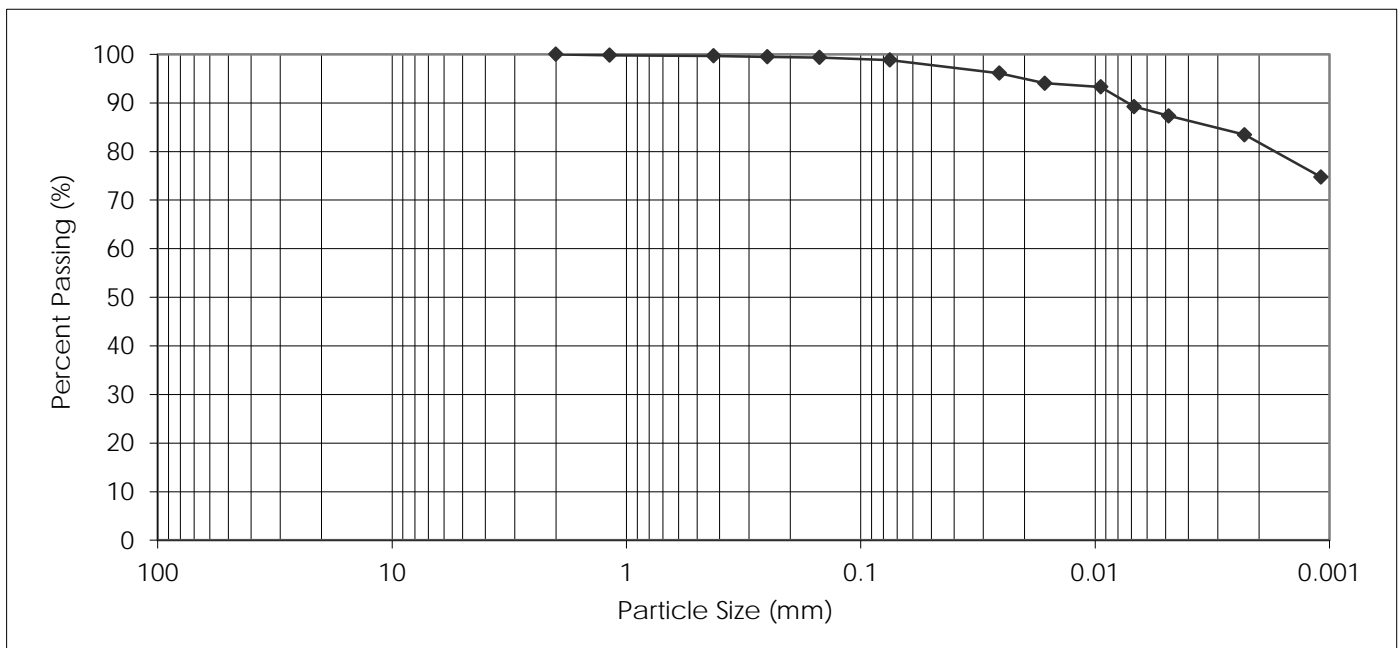
PROJECT: 2014 Residential St. Renewals,
 Oakdean Blvd, Assiniboine Ave
 to 138 Oakdean Blvd

Attention: Derek Teperto

PROJECT NO.: 123301054

SAMPLED BY: Sothea Bun
 SAMPLE ID: TH05 @ 0.9 m

DATE RECEIVED: December 4, 2013
 TESTED BY: Larry Presado



PARTICLE SIZE	PERCENT PASSING	PARTICLE SIZE	PERCENT PASSING
37.50 mm	100.0	1.18 mm	99.8
25.00 mm	100.0	0.425 mm	99.7
19.00 mm	100.0	0.250 mm	99.5
16.00 mm	100.0	0.150 mm	99.3
12.50 mm	100.0	0.075 mm	98.8
9.50 mm	100.0	0.005 mm	87.5
4.75 mm	100.0	0.002 mm	81.3
2.00 mm	100.0	0.001 mm	NT*

Gravel, % 75 to 4.75 mm	Sand, %			Silt, % <0.075 to 0.005 mm	Clay, % <0.005 mm	Colloids, % < 0.001 mm
	Coarse <4.75 to 2.0 mm	Medium <2.0 to 0.425 mm	Fine <0.425 to 0.075 mm			
0.0	0.0	0.3	0.9	11.3	87.5	NT*

NT* Sample not tested for colloids

December 10, 2013

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



PARTICLE SIZE ANALYSIS ASTM D422

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

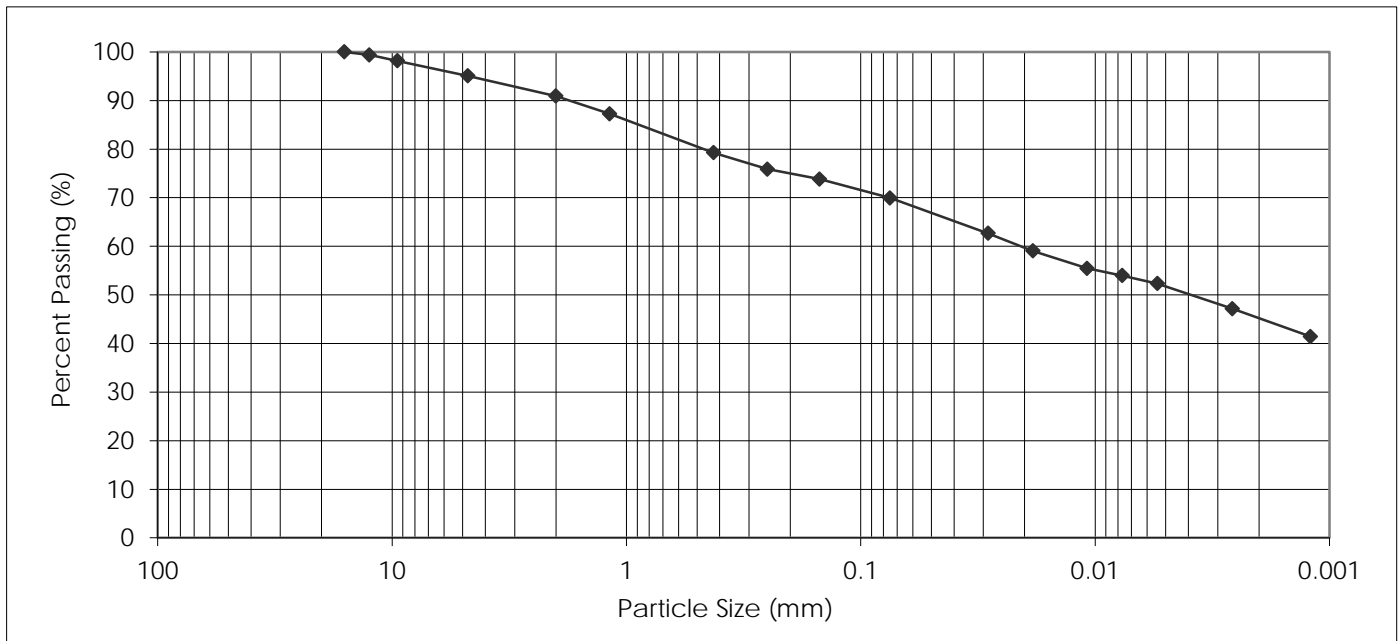
PROJECT: 2014 Residential St. Renewals,
 Oakdean Blvd, Assiniboine Ave
 to 138 Oakdean Blvd

Attention: Derek Teperto

PROJECT NO.: 123301054

SAMPLED BY: Sothea Bun
 SAMPLE ID: TH1 @ 0.6 m

DATE RECEIVED: December 4, 2013
 TESTED BY: Larry Presado



PARTICLE SIZE	PERCENT PASSING	PARTICLE SIZE	PERCENT PASSING
37.50 mm	100.0	1.18 mm	87.3
25.00 mm	100.0	0.425 mm	79.3
19.00 mm	100.0	0.250 mm	75.9
16.00 mm	100.0	0.150 mm	73.8
12.50 mm	99.4	0.075 mm	69.9
9.50 mm	98.2	0.005 mm	51.6
4.75 mm	95.1	0.002 mm	44.7
2.00 mm	90.9	0.001 mm	NT*

Gravel, % 75 to 4.75 mm	Sand, %			Silt, % <0.075 to 0.005 mm	Clay, % <0.005 mm	Colloids, % < 0.001 mm
	Coarse <4.75 to 2.0 mm	Medium <2.0 to 0.425 mm	Fine <0.425 to 0.075 mm			
4.9	4.2	11.6	9.4	18.3	51.6	NT*

NT* Sample not tested for colloids

December 10, 2013

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



Stantec Consulting Ltd.
199 Henlow Bay
Winnipeg MB R3Y 1G4
Tel: (204) 488-6999
Fax: (204) 488-6947



**2014 REGIONAL STREET RENEWALS
GEOTECHNICAL INVESTIGATION
ARMOUR CRESCENT
HARRIS BOULEVARD TO HARRIS BOULEVARD**

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, MANITOBA
R3Y 1G4**

December 19, 2013



Project No.123301054

Drawn by: NB

Figure: 1

Date: Dec. 17, 2013

Reviewed by: GL

Scale: NTS

Testhole Location Plan
2014 Residential Street Renewals
Armour Crescent
Harris Boulevard to Harris Boulevard

**TABLE 1
2014 RESIDENTIAL STREET RENEWALS
ARMOUR CRESCENT, HARRIS BOULEVARD TO HARRIS BOULEVARD
GEOTECHNICAL INVESTIGATION**

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure Material		Sample Description	Sample Depth (m)	Moisture Content (%)	Particle Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH01	Armour Crescent 15.0 m West from Southwest corner of Harris Boulevard & Armour Crescent 1.0 m North from South curb	Concrete	185	Crushed Limestone	405	-	-	-	-	-	-	-	-	-	-
TH02	Armour Crescent 18.0 m West from property 206 Harris Boulevard & 39 Armour Crescent 1.0 m South from North curb	Asphalt	40	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	180												
TH03	Armour Crescent 2.0 m East from property 42 & 44 Armour Crescent 1.0 m Northwest from Southeast curb	Asphalt	70	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	160												
TH04	Armour Crescent 2.0 m South from property 36 & 38 Armour Crescent 1.0 m East from West curb	Asphalt	30	-	-	Clay	0.6	34	0.0	2.4	15.6	82.0	83	29	54
		Concrete	160												
TH05	Armour Crescent 8.0 m South from property 31 & 33 Armour Crescent 1.0 m West from East curb	Asphalt	70	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	150												
TH06	Armour Crescent 12.0 m North from property 24 & 26 Armour Crescent 1.0 m East from West curb	Asphalt	35	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	170												
TH07	Armour Crescent 4.0 m North from property 21 & 23 Armour Crescent 1.0 m West from East curb	Asphalt	55	-	-	Clay Fill	0.6	25	0.5	13.7	43.7	42.1	45	16	29
		Concrete	145												
TH08	Armour Crescent 5.0 m South from property 16 & 18 Armour Crescent 1.0 m East from West curb	Asphalt	40	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	170												
TH09	Armour Crescent 5.0 m East from property 6 & 8 Armour Crescent 1.0 m South from North curb	Asphalt	35	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	200												
TH10	Armour Crescent 7.0 m West from Southwest corner of Harris Boulevard & Armour Crescent 1.0 m North from South curb	Asphalt	35	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	160												

TESTHOLE TH01



Project Name: 2014 Residential Street Renewals
Project Location: Armour Crescent, Harris Boulevard to Harris Boulevard
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 15.0 m West from Southwest corner of Harris Blvd & Armour Cr, 1.0 m North from South curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
		Concrete					
		Crushed Limestone - 20 mm maximum size aggregate	BS	●6			
0.5		Clay Fill - grey, firm, moist, medium plasticity - silty - some fine to coarse sand	BS	●7			
1.0		Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS	●35			
1.5		Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS	●36			
2.0		Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS	●41			
			BS	●42			
			BS	●46			

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH02



Project Name: 2014 Residential Street Renewals
Project Location: Armour Crescent, Harris Boulevard to Harris Boulevard
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 18.0 m West from property 206 Harris Blvd & 39 Armour Cr, 1.0 m South from North curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
0.0 - 0.1		Asphalt					
0.1 - 0.2		Concrete					
0.2 - 0.6		Clay Fill - black, firm, moist, medium plasticity - silty - some fine to coarse sand - trace organic material	BS		●36		
0.6 - 1.2		Clay - black, firm, moist, high plasticity - some silt - trace sand - brown below 1.2 m	BS		●34		
1.2 - 1.5			BS		●36		
1.5 - 1.8			BS		●35		
1.8 - 2.0			BS		●34		
2.0			BS		●35		
2.0			BS		●39		

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH03



Project Name: 2014 Residential Street Renewals
Project Location: Armour Crescent, Harris Boulevard to Harris Boulevard
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 2.0 m East from property 42 & 44 Armour Crescent, 1.0 m Northwest from Southeast curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
		Asphalt					
		Concrete					
0.5		Clay Fill - black, firm, moist, medium plasticity - silty - some fine to coarse sand - brown below 0.9 m	BS		●39		
			BS		●40		
1.0			BS		●32		
1.5		Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS		●28		
			BS		●36		
			BS		●37		
2.0			BS		●41		
<ul style="list-style-type: none"> No groundwater seepage or soil sloughing was observed during or upon completion of drilling. The soil was frozen to a depth of 0.6 m. Testhole terminated at a depth of 2.0 m. 							

TESTHOLE TH04



Project Name: 2014 Residential Street Renewals
Project Location: Armour Crescent, Harris Boulevard to Harris Boulevard
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 2.0 m South from property 36 & 38 Armour Crescent, 1.0 m East from West curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	Particle Size Distribution				Water Content (%)	
				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	PL	LL
0.0 - 0.1	[Asphalt symbol]	Asphalt							
0.1 - 0.2	[Concrete symbol]	Concrete							
0.2 - 0.6	[Clay Fill symbol]	Clay Fill - black, firm, moist, medium plasticity - silty - some fine to coarse sand	BS						● 38
0.6 - 2.0	[Clay symbol]	Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS	0.0	2.4	15.6	82.0		● 34
			BS						● 35
			BS						● 35
			BS						● 37
			BS						● 39
			BS						● 42

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH05



Project Name: 2014 Residential Street Renewals
Project Location: Armour Crescent, Harris Boulevard to Harris Boulevard
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 8.0 m South from property 31 & 33 Armour Crescent, 1.0 m West from East curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
		Asphalt					
		Concrete					
		Clay Fill - black, firm, moist, medium plasticity - silty - some fine to coarse sand	BS		●38		
0.5		Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS		●37		
1.0			BS		●37		
1.5			BS		●37		
2.0			BS		●39		
2.0			BS		●43		

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH06



Project Name: 2014 Residential Street Renewals
Project Location: Armour Crescent, Harris Boulevard to Harris Boulevard
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 12.0 m North from property 24 & 26 Armour Crescent, 1.0 m East from West curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
		Asphalt					
		Concrete					
		Clay Fill - black, firm, moist, medium plasticity - silty - some fine to coarse sand	BS		●36		
0.5			BS		●25		
		Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS		●32		
1.0			BS		●36		
1.5			BS		●38		
			BS		●42		
2.0			BS		●41		

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH07



Project Name: 2014 Residential Street Renewals
Project Location: Armour Crescent, Harris Boulevard to Harris Boulevard
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 4.0 m North from property 21 & 23 Armour Crescent, 1.0 m West from East curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	Particle Size Distribution				Water Content (%)	
				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	PL	LL
		Asphalt							
		Concrete							
		Clay Fill - black, firm, moist, medium plasticity - silty - some fine to coarse sand	BS						● 21
0.5			BS	0.5	13.7	43.7	42.1		● 25-1
			BS						● 20
			BS						● 26
1.5		Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS						● 36
			BS						● 38
2.0			BS						● 40

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH08



Project Name: 2014 Residential Street Renewals
Project Location: Armour Crescent, Harris Boulevard to Harris Boulevard
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 5.0 m South from property 16 & 18 Armour Crescent, 1.0 m East from West curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
0.0 - 0.1	[Stippled]	Asphalt					
0.1 - 0.2	[Stippled]	Concrete					
0.2 - 1.2	[Cross-hatched]	Clay Fill - black, firm, moist, medium plasticity - silty - some fine to coarse sand	BS	●30			
0.5			BS	●24			
1.0			BS	●21			
1.2 - 1.7	[Diagonal lines]	Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS	●35			
1.5			BS	●40			
2.0			BS	●37			
2.0			BS	●42			

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH09



Project Name: 2014 Residential Street Renewals
Project Location: Armour Crescent, Harris Boulevard to Harris Boulevard
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 5.0 m East from property 6 & 8 Armour Crescent, 1.0 m South from North curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
0.0 - 0.1		Asphalt					
0.1 - 0.2		Concrete					
0.2 - 1.3		Clay Fill - black, firm, moist, medium plasticity - silty - some fine to coarse sand	BS	●32			
0.5			BS	●25			
1.0			BS	●23			
1.3			BS	●21			
1.3 - 2.0		Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS	●33			
1.5			BS	●27			
2.0			BS	●38			

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH10



Project Name: 2014 Residential Street Renewals
Project Location: Armour Crescent, Harris Boulevard to Harris Boulevard
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 7.0 m West from Southwest corner of Harris Blvd & Armour Cr, 1.0 m North from South curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
		Asphalt					
		Concrete					
		Clay Fill - black, firm, moist, medium plasticity - silty - some fine to coarse sand	BS		●35		
0.5			BS		●32		
1.0			BS		●24		
		Clay - brown, firm, moist, high plasticity - some silt - trace sand	BS		●29		
1.5			BS		●32		
			BS		●37		
2.0			BS		●38		

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.



Core sample from Testhole TH01



Core sample from Testhole TH02



Core sample from Testhole TH03



Core sample from Testhole TH04



Core sample from Testhole TH05



Core sample from Testhole TH06



Core sample from Testhole TH07



Core sample from Testhole TH08



Core sample from Testhole TH09



Core sample from Testhole TH10



PARTICLE SIZE ANALYSIS ASTM D422

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

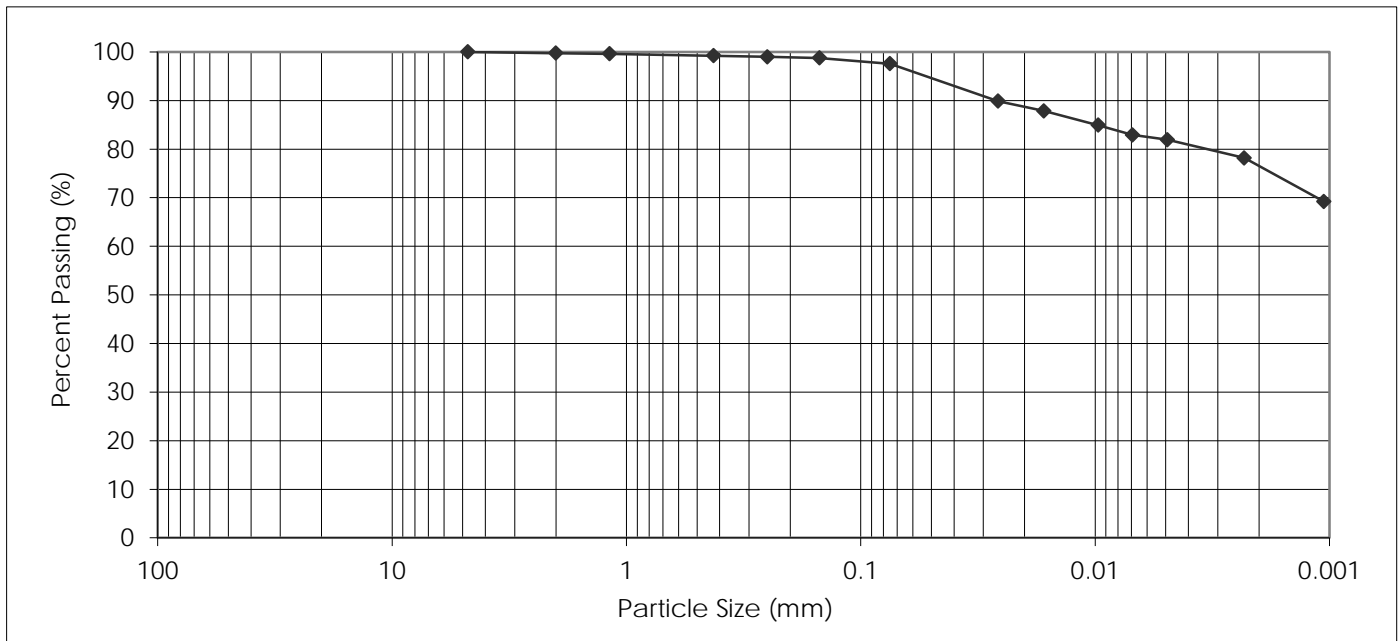
PROJECT: 2014 Residential St. Renewals
 Armour Cr. between
 Harris Blvd. and Harris Blvd.

Attention: Derek Teperto

PROJECT NO.: 123301054

SAMPLED BY: Sothea Bun
 SAMPLE ID: TH4 at 2'

DATE RECEIVED: December 11, 2013
 TESTED BY: Nestor Abarca



PARTICLE SIZE	PERCENT PASSING
37.50 mm	100.0
25.00 mm	100.0
19.00 mm	100.0
16.00 mm	100.0
12.50 mm	100.0
9.50 mm	100.0
4.75 mm	100.0
2.00 mm	99.8

PARTICLE SIZE	PERCENT PASSING
1.18 mm	99.6
0.425 mm	99.2
0.250 mm	99.0
0.150 mm	98.8
0.075 mm	97.6
0.005 mm	82.0
0.002 mm	76.0
0.001 mm	NT*

Gravel, % 75 to 4.75 mm	Sand, %			Silt, % <0.075 to 0.005 mm	Clay, % <0.005 mm	Colloids, % < 0.001 mm
	Coarse <4.75 to 2.0 mm	Medium <2.0 to 0.425 mm	Fine <0.425 to 0.075 mm			
0.0	0.2	0.6	1.6	15.6	82.0	NT*

NT* Sample not tested for colloids

December 17, 2013

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



PARTICLE SIZE ANALYSIS ASTM D422

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

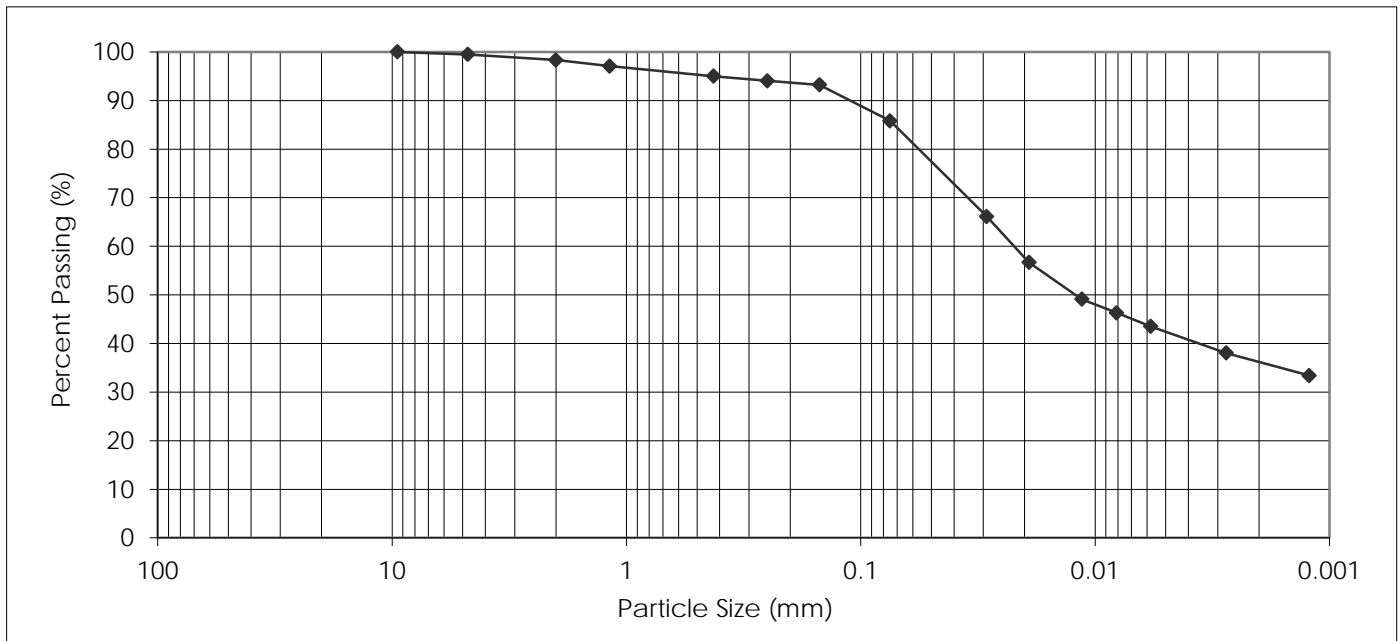
PROJECT: 2014 Residential St. Renewals
 Armour Cr. between
 Harris Blvd. and Harris Blvd.

Attention: Derek Teperto

PROJECT NO.: 123301054

SAMPLED BY: Sothea Bun
 SAMPLE ID: TH7 at 2'

DATE RECEIVED: December 11, 2013
 TESTED BY: Nestor Abarca



PARTICLE SIZE	PERCENT PASSING
37.50 mm	100.0
25.00 mm	100.0
19.00 mm	100.0
16.00 mm	100.0
12.50 mm	100.0
9.50 mm	100.0
4.75 mm	99.5
2.00 mm	98.3

PARTICLE SIZE	PERCENT PASSING
1.18 mm	97.1
0.425 mm	95.0
0.250 mm	94.0
0.150 mm	93.2
0.075 mm	85.8
0.005 mm	42.1
0.002 mm	35.8
0.001 mm	NT*

Gravel, % 75 to 4.75 mm	Sand, %			Silt, % <0.075 to 0.005 mm	Clay, % <0.005 mm	Colloids, % < 0.001 mm
	Coarse <4.75 to 2.0 mm	Medium <2.0 to 0.425 mm	Fine <0.425 to 0.075 mm			
0.5	1.2	3.3	9.2	43.7	42.1	NT*

NT* Sample not tested for colloids

December 17, 2013

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



Stantec Consulting Ltd.
199 Henlow Bay
Winnipeg MB R3Y 1G4
Tel: (204) 488-6999
Fax: (204) 488-6947

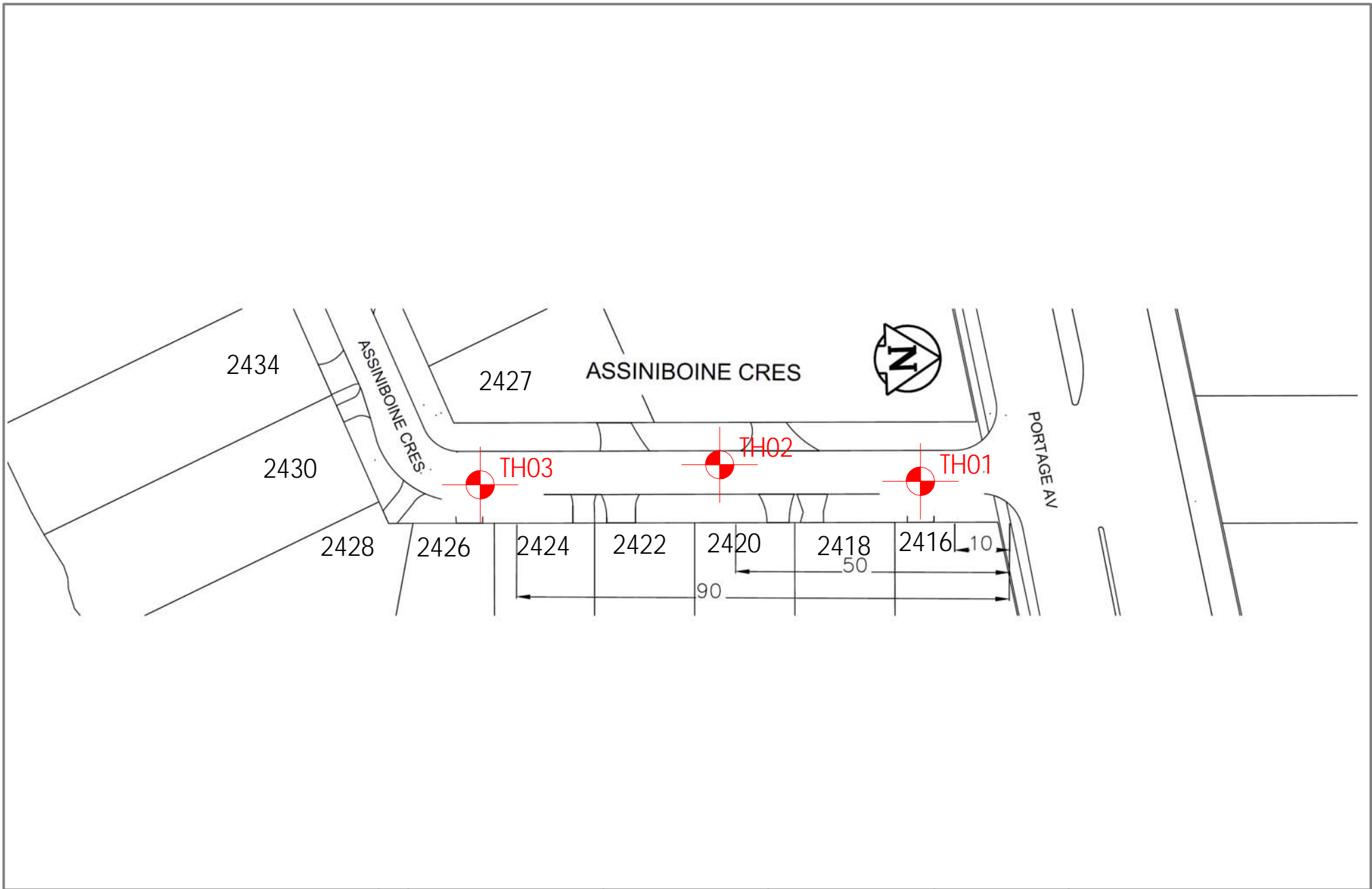


**2014 RESIDENTIAL STREET RENEWALS
GEOTECHNICAL INVESTIGATION
ASSINIBOINE CRESCENT
110 m SOUTH OF PORTAGE AVENUE TO PORTAGE AVENUE**

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, MANITOBA
R3Y 1G4**

December 12, 2013



Project No. 123301054

Drawn by: SB

Figure: 1

Testhole Location Plan
 2014 Residential Street Renewals
 Assiniboine Cres.
 110 m South of Portage Ave to Portage Ave

Date: Dec. 12, 2013

Reviewed by: GL

Scale: NTS

TABLE 1
2014 RESIDENTIAL STREET RENEWALS
ASSINIBOINE CRESCENT, 110 m SOUTH OF PORTAGE AVENUE TO PORTAGE AVENUE
GEOTECHNICAL INVESTIGATION

Testhole ID	Testhole Location	Pavement Surface		Pavement Structure Material		Sample Description	Sample Depth (m)	Moisture Content (%)	Particle Size Analysis				Atterberg Limits		
		Type	Thickness (mm)	Type	Thickness (mm)				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	Liquid Limit	Plastic Limit	Plasticity Index
TH01	Assiniboine Crescent 4.0 m North from property 2418 & 2416 Assiniboine Crescent, 1.0 m West from East curb	Asphalt	50	Granular Fill	65	Clay Fill	0.6	33	4.6	23.8	25.4	46.2	59	22	37
		Concrete	140												
TH02	Assiniboine Crescent 5.0 m North from property 2420 & 2422 Assiniboine Crescent, 1.0 m East from West curb	Asphalt	30	-	-	-	-	-	-	-	-	-	-	-	-
		Concrete	160												
TH03	Assiniboine Crescent 2.0 m South from property 2424 & 2426 Assiniboine Crescent, 2.0 m West from East curb	Asphalt	30	Granular Fill	50	Silty Clay	0.9	34	0.0	6.5	32.9	60.6	91	32	59
		Concrete	130												

TESTHOLE TH01



Project Name: 2014 Residential Street Renewals
Project Location: Assiniboine Cres, 110 m South of Portage Ave to Portage Ave
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 4.0 m North from property 2418 & 2416 Assiniboine Crescent, 1.0 m West from East curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	Particle Size Distribution				Water Content (%)	
				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	PL	LL
		Asphalt							
		Concrete							
		Granular Fill - 20 mm max size aggregate							
0.5		Clay Fill - black, firm, moist, medium plasticity - some fine to coarse sand - trace fine gravel - some silt	BS						●27
			BS	4.6	23.8	25.4	46.2		●33
1.0			BS						●32
		Silty Clay - brown, firm, moist, high plasticity - trace fine to coarse sand	BS						●41
1.5			BS						●41
			BS						●42
2.0			BS						●46

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH02



Project Name: 2014 Residential Street Renewals
Project Location: Assiniboine Cres, 110 m South of Portage Ave to Portage Ave
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 5.0 m North from property 2420 & 2422 Assiniboine Crescent, 1.0 m East from West curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	● Water Content (%)			
				25	50	75	100
0.0 - 0.1	[Asphalt symbol]	Asphalt					
0.1 - 0.2	[Concrete symbol]	Concrete					
0.2 - 1.0	[Clay Fill symbol]	Clay Fill - black, firm, moist, medium plasticity - some fine to coarse sand - trace fine gravel - some silt	BS		●34		
			BS		●33		
			BS		●35		
1.0 - 2.0	[Silty Clay symbol]	Silty Clay - brown, firm, moist, high plasticity - trace fine to coarse sand	BS		●34		
			BS		●34		
			BS		●35		
			BS		●37		

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.

TESTHOLE TH03



Project Name: 2014 Residential Street Renewals
Project Location: Assiniboine Cres, 110 m South of Portage Ave to Portage Ave
Client: City of Winnipeg
Drilling Contractor: Active Drilling and Piling
Drilling Method: 125 mm Solid Stem Auger
Testhole Location: 2.0 m South from property 2424 & 2426 Assiniboine Crescent, 2.0 m West from East curb

Date Drilled: November 27, 2013
Depth of Testhole: 2.0 m
Logged by: Sothea Bun
Reviewed by: German Leal

Depth (m)	Symbol	Description	Sample Type	Particle Size Distribution				Water Content (%)	
				Gravel (%)	Sand (%)	Silt (%)	Clay (%)	PL	LL
		Asphalt							
		Concrete							
		Granular Fill - 20 mm max size aggregate							
0.5		Clay Fill - black, firm, moist, medium plasticity - some medium to coarse sand - trace fine gravel - some silt	BS					35	
		Silty Clay - brown, firm, moist, high plasticity - trace fine to coarse sand	BS					29	
1.0			BS	0.0	6.5	32.9	60.6	34	
1.5			BS					37	
			BS					38	
			BS					38	
2.0			BS					34	

- No groundwater seepage or soil sloughing was observed during or upon completion of drilling.
- The soil was frozen to a depth of 0.6 m.
- Testhole terminated at a depth of 2.0 m.



Core sample from Testhole TH01



Core sample from Testhole TH02



Core sample from Testhole TH03



PARTICLE SIZE ANALYSIS ASTM D422

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

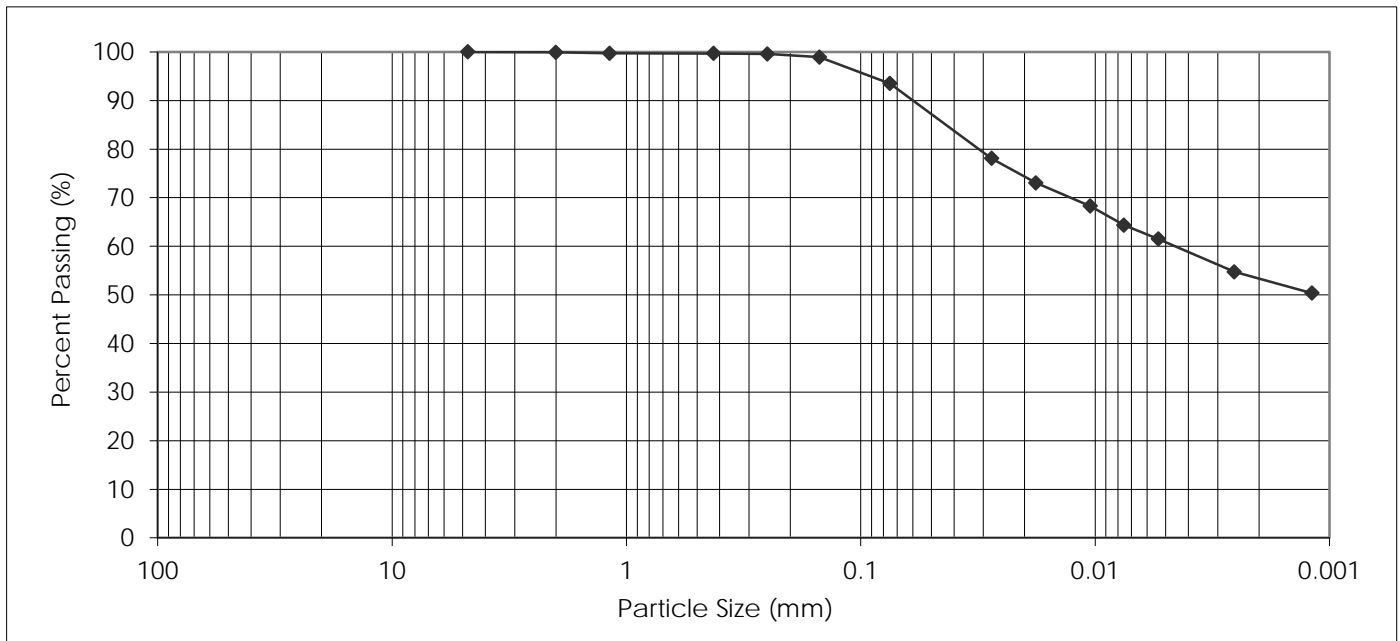
PROJECT: 2014 Residential St. Renewals
 Assiniboine Crescent, 110 m South
 of Portage Ave to Portage Ave

Attention: Derek Teperto

PROJECT NO.: 123301054

SAMPLED BY: Sothea Bun
 SAMPLE ID: TH3 @ 0.9 m

DATE RECEIVED: December 4, 2013
 TESTED BY: Larry Presado



PARTICLE SIZE	PERCENT PASSING	PARTICLE SIZE	PERCENT PASSING			
37.50 mm	100.0	1.18 mm	99.7			
25.00 mm	100.0	0.425 mm	99.7			
19.00 mm	100.0	0.250 mm	99.6			
16.00 mm	100.0	0.150 mm	98.9			
12.50 mm	100.0	0.075 mm	93.5			
9.50 mm	100.0	0.005 mm	60.6			
4.75 mm	100.0	0.002 mm	53.0			
2.00 mm	99.9	0.001 mm	NT*			
Gravel, % 75 to 4.75 mm	Sand, %			Silt, % <0.075 to 0.005 mm	Clay, % <0.005 mm	Colloids, % < 0.001 mm
	Coarse <4.75 to 2.0 mm	Medium <2.0 to 0.425 mm	Fine <0.425 to 0.075 mm			
0.0	0.1	0.2	6.2	32.9	60.6	NT*

NT* Sample not tested for colloids

December 10, 2013

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



PARTICLE SIZE ANALYSIS ASTM D422

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

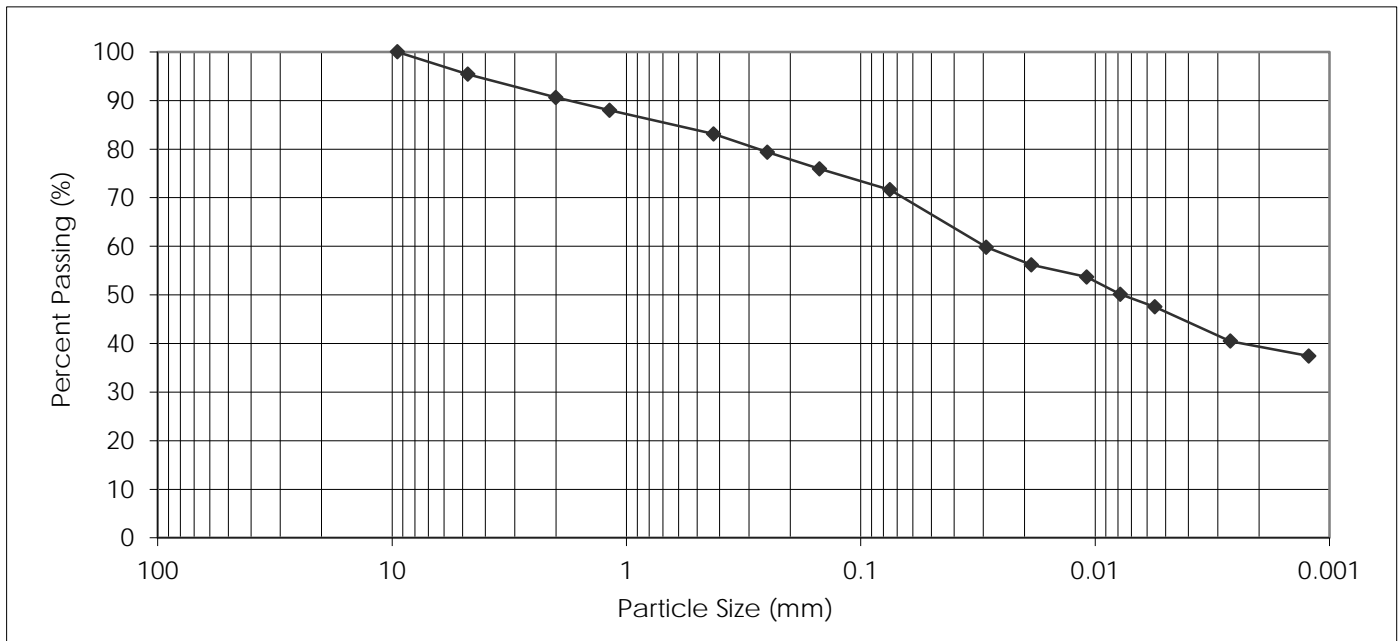
PROJECT: 2014 Residential St. Renewals
 Assiniboine Crescent, 110 m South
 of Portage Ave to Portage Ave

Attention: Derek Teperto

PROJECT NO.: 123301054

SAMPLED BY: Sothea Bun
 SAMPLE ID: TH1 @ 0.6 m

DATE RECEIVED: December 4, 2013
 TESTED BY: Larry Presado



PARTICLE SIZE	PERCENT PASSING
37.50 mm	100.0
25.00 mm	100.0
19.00 mm	100.0
16.00 mm	100.0
12.50 mm	100.0
9.50 mm	100.0
4.75 mm	95.4
2.00 mm	90.6

PARTICLE SIZE	PERCENT PASSING
1.18 mm	88.0
0.425 mm	83.1
0.250 mm	79.4
0.150 mm	76.0
0.075 mm	71.6
0.005 mm	46.2
0.002 mm	39.1
0.001 mm	NT*

Gravel, % 75 to 4.75 mm	Sand, %			Silt, % <0.075 to 0.005 mm	Clay, % <0.005 mm	Colloids, % < 0.001 mm
	Coarse <4.75 to 2.0 mm	Medium <2.0 to 0.425 mm	Fine <0.425 to 0.075 mm			
4.6	4.8	7.5	11.5	25.4	46.2	NT*

NT* Sample not tested for colloids

December 10, 2013

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