

APPENDIX 'A'

GEOTECHNICAL REPORT

2025 Regional and Local Street Renewal Program Local Streets Package 25-R-09

Prepared for

AECOM
99 Commerce Drive,
Winnipeg, Canada. R3P 0Y7
AECOM Project Number: 60743827

March 13, 2025

**2025 Regional and Local Street
Renewal Program Local Streets Package 25-R-09**

HMCL Project Number: 112-2503

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Owena St (From Logan Ave to Henry Ave)

Rupert Ave (From Main St to Martha St)

Beacon St (From Alexander Ave to Logan Ave)

Appendix B – Rehabilitation Sites

Bangor Ave (From St. James St to Notre Dame Ave)

Orange St (From Dublin Ave to Bangor Ave)

Introduction

On February 12, 2025, H. Manalo Consulting Ltd. (HMCL) was authorized by Mr. Thomas Findlay of AECOM to proceed with the geotechnical investigation, as outlined in the Subconsultant Agreement dated the same day. The objective was to assess the existing road conditions through pavement coring and subsurface soil sampling.

Field Work Program

The investigation adhered to the City of Winnipeg's guidelines, with core locations designated by AECOM Canada Ltd. Pavement cores were extracted at joints and mid-slab to assess their condition. Coring took place from February 27 to February 28 using a 160 mm diameter coring bit. Afterward, the pavement sections were refilled with aggregates and cold-mix asphalt. All collected samples were sent to HMCL laboratory for analysis.

Laboratory Analysis and Reporting

Subsurface soil samples were tested for moisture content and visually classified, with select samples undergoing plasticity index, particle size distribution, and CBR testing. Asphalt pavement thickness ranged from 20 mm to 100 mm, while concrete pavement thickness varied between 120 mm and 240 mm. Thickness measurements and core sample images were documented for reference.

We appreciated the opportunity to assist you in this project. Please call the undersigned if you require further information.

Prepared by:



Mayumi Kawano, EIT

Geotechnical Engineer Intern
Field and Laboratory Supervisor

Reviewed by:



Paul Bevel

Manager, Field and Laboratory Services

APPENDIX A

Reconstruction Sites

- A.1 Pavement Coring and Subsurface Drilling Locations
- A.2 Pavement Structure Measurement
- A.3 Picture of Cores
- A.4 Soil Logs and Laboratory Test Reports

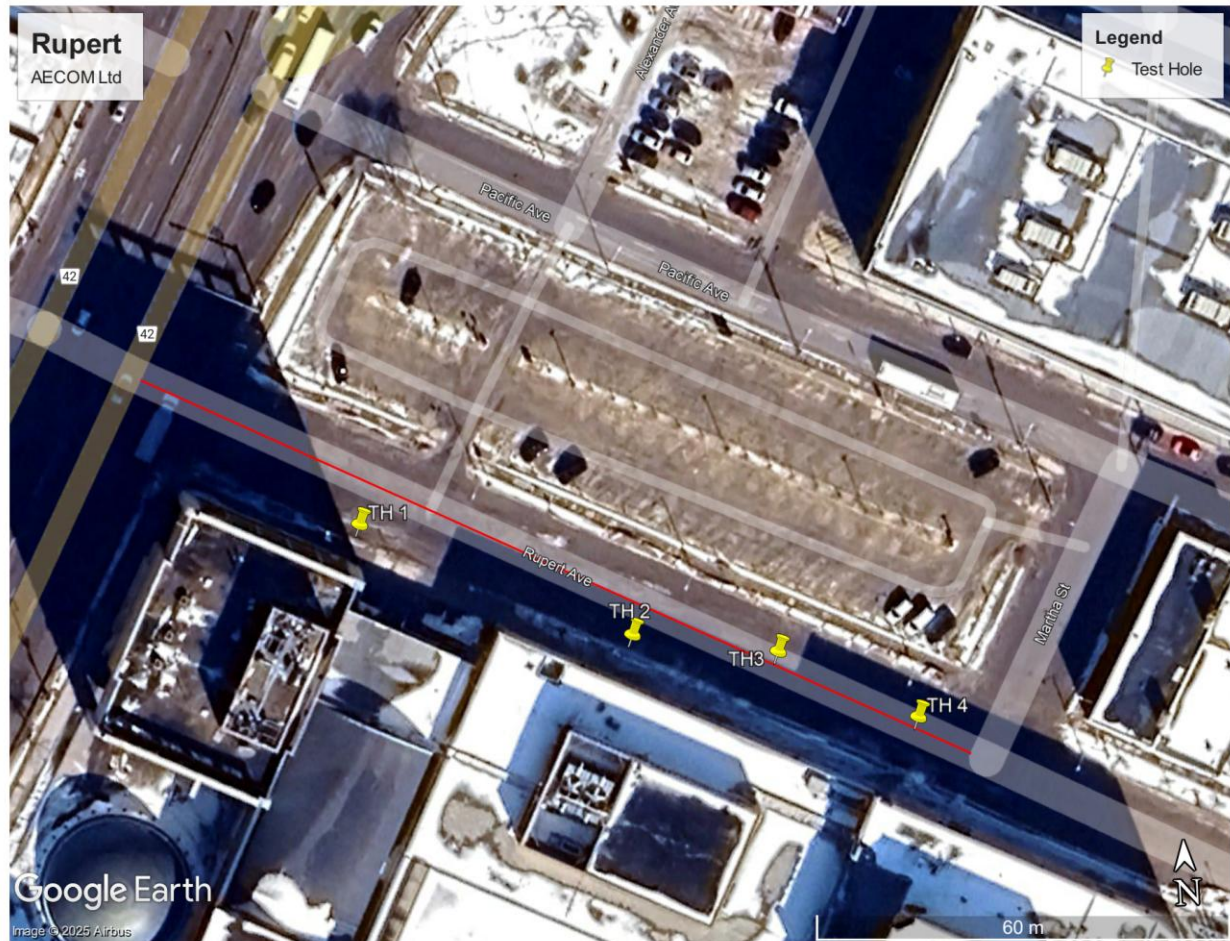
Reconstruction Sites

Pavement Coring and Subsurface Drilling Locations



Reconstruction Sites

Pavement Coring and Subsurface Drilling Locations



Reconstruction Sites

Pavement Coring and Subsurface Drilling Locations



Reconstruction Sites

Pavement Structure Measurement

Test Hole No.	Test Hole Location	Asphalt Thickness (mm)	Concrete Thickness (mm)
Owena St <i>(From Logan Ave to Henry Ave)</i>			
TH1	Near Logan Av, Side of M M Electronics Systems 14U 632516mE 5530127mN	30	200
TH2	Middle of Owena St., near 295 Owena St. 14U 632531mE 5530161mN	90	130
TH3	Near Henry Av, near Kepsco Construction Services 14U 632547mE 5530195mN		170
Rupert Ave <i>(From Main St to Martha St)</i>			
TH1	Near Main St. 14U 633800mE 5529244mN	100	140
TH2	Middle of Rupert Ave. 14U 633836mE 5529229mN	60	160
TH3	Rupert Av near Martha St. 14U 633870mE 5529210mN	70	170
TH4	Rupert Av near Martha St. and Parking Pay by Phone post 14U 633874mE 5529211mN	90	170

Reconstruction Sites

Pavement Structure Measurement

Test Hole No.	Test Hole Location	Asphalt Thickness (mm)	Concrete Thickness (mm)
Beacon St <i>(From Alexander Ave to Logan Ave)</i>			
TH1	Beacon St. near Alexander Ave., Front of House # 248 Beacon St. 14U 632018mE 5530210mN		120
TH2	Middle of Beacon St., Front of House # 258 Beacon St. 14U 632040mE 5530247mN	20	180
TH3	Beacon St. near Logan Ave., side of 870 Logan Ave., 14U 632053mE 5530284mN	20	120

Reconstruction Sites

Picture of Cores

Owena St.

(From Logan Ave to Henry Ave)



Core 1



Core 2



Core 3

Beacon St.

(From Alexander Ave to Logan Ave)



Core 1



Core 2



Core 3

Reconstruction Sites

Picture of Cores

Rupert Ave.
(From Main St. to Martha St.)



Core 1



Core 2



Core 3



Core 4

Reconstruction Sites

Soil Logs and Laboratory Test Reports

Depth ft m	Symbol	Description	Number	Type	Pocket Penetrometer Test (kPa)	Water Content
					20 60 100 140 180 220 260	10 20 30 40 50 60 70 80 90
0		Ground Surface				
		Asphalt and Concrete Asphalt one lift - 30mm Concrete - 200mm	Core 1	Core		
1			1	GS		
2		Clay CH - Silty with sand, moistened, crumbling black	2	GS		
3		Lab Test Result (HM25A), 1-4 FT LL=51, PL 20, PI=31 PSA G=0, S=16, M=47, C=37	3	GS		
4			4	GS		
5		Clay CL - Silty, saturated, loose, crumbling light brown	5	GS		
6			6	GS		
7		Clay CH - Some silt, moist, soft, brown	7	GS		
8		- Stiff, greyish brown below 8 feet	8	GS		
9			9	GS		
10		End of testhole	10	GS		
11		- Test terminated at 10 feet - No seepage - Backfilled with Auger cuttings				

Drill Method: Auger

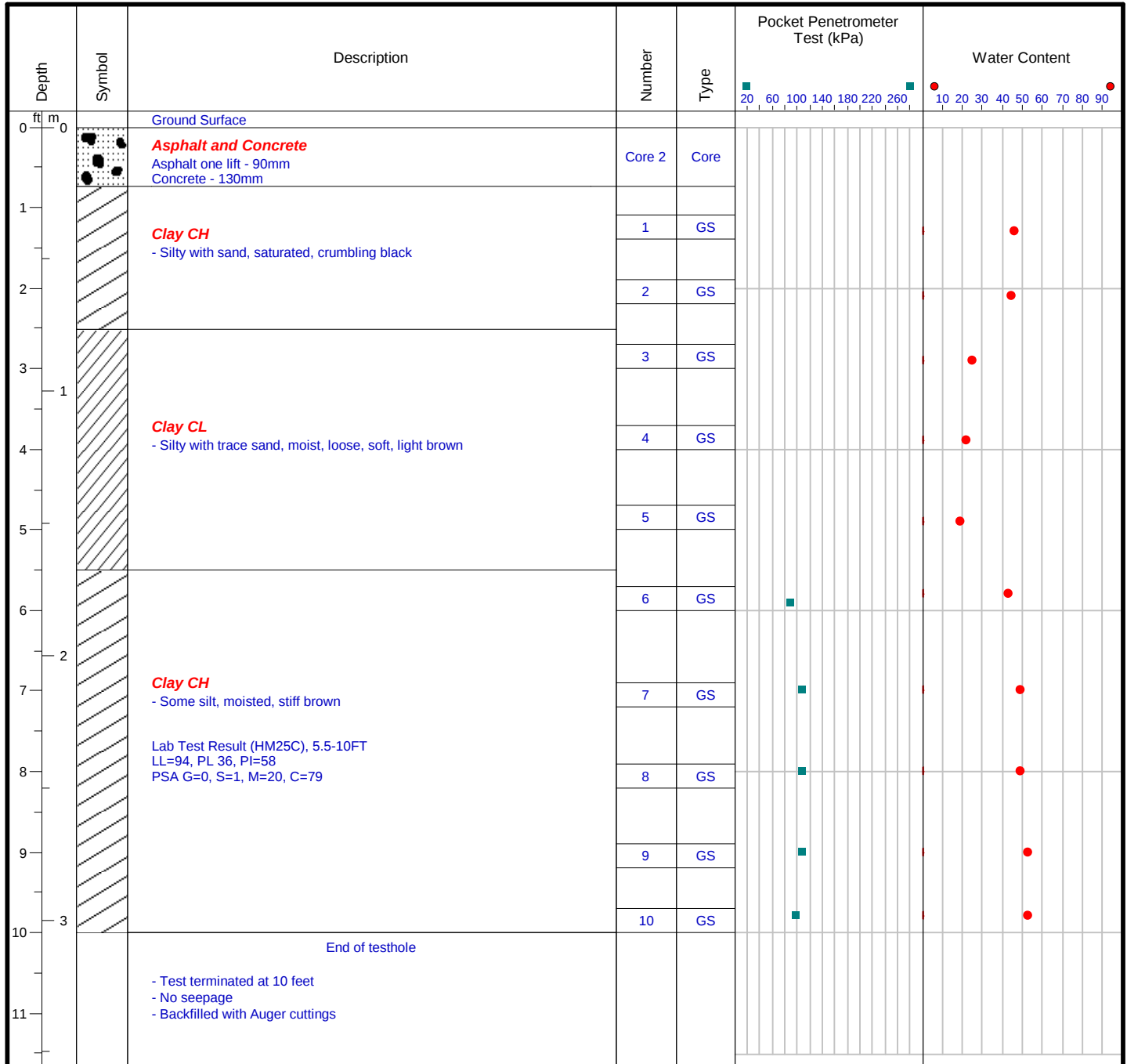
Drill Date: February 29, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Drill Method: Auger

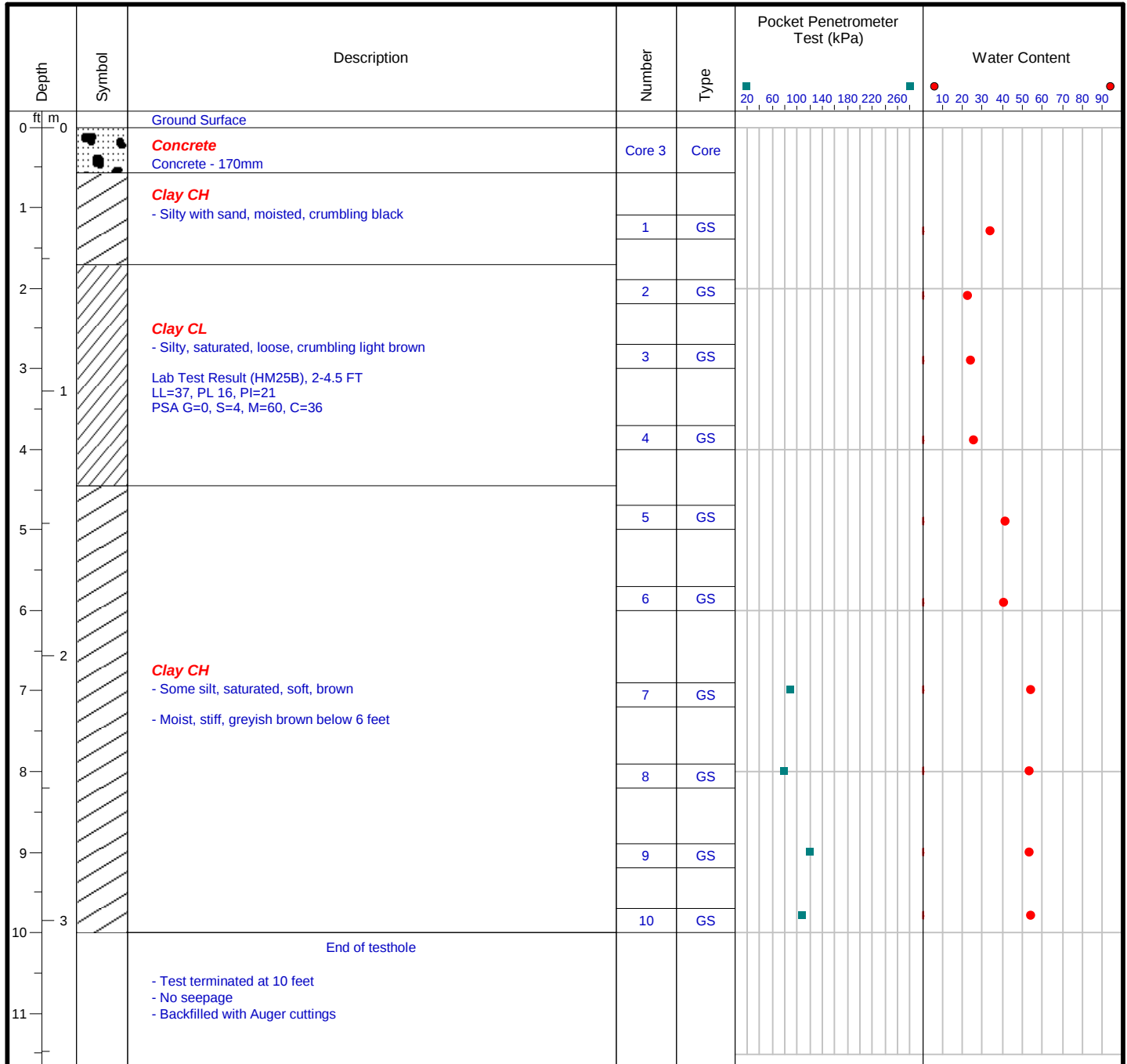
Drill Date: February 29, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Drill Method: Auger

Drill Date: February 29, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

Client: AECOM Canada ULC
99 Commerce Drive, Winnipeg
MB R3P 0Y7

Project No: 112-2503

Lab No: HM 25

Attention: Ryan Cunningham

Date sampled: February 27, 2025

Project 2025 Regional and Local Street Renewal Program

Date Received: February 27, 2025

Location: Local Streets Pkg 25-R-09

Date Tested /By: March 5, 2025 JJ

SAMPLE DATA

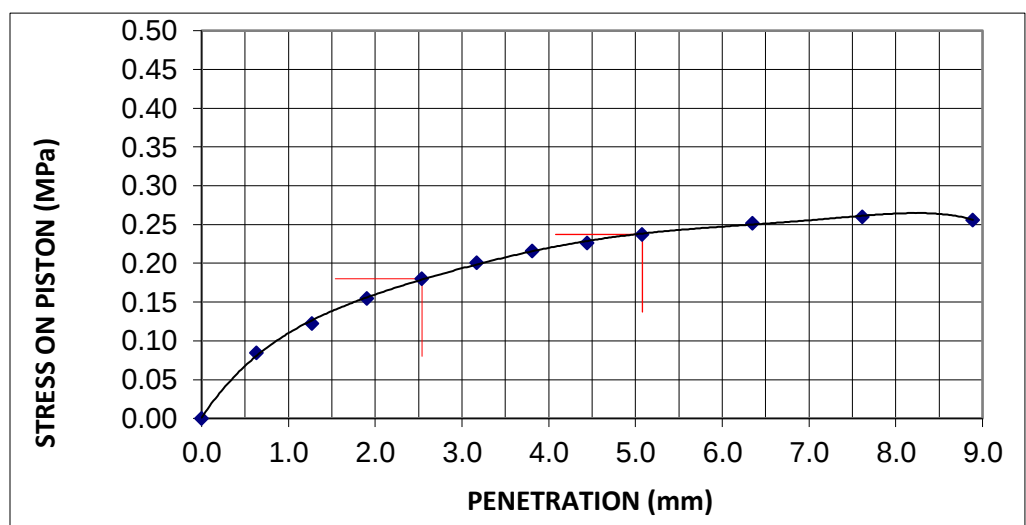
SPECIMEN DATA

Sample Type:	CH - Fat Clay	DESCRIPTION	Before Soaking	After Testing
Source:	Owena St., TH 2 at 1-4 ft	Moisture Content (MC), %	31.0	33.7
Sampled by:	Mayumi Kawano	MC of top 25mm layer, %		
Optimum Moisture Content:	28.5 %	Dry Density, kg/m ³	1339	1352
Maximum Dry Density:	1410 kg/cm ³	Compaction, %	95%	
Method of Compaction:	Standard Proctor	CBR (at 2.5 mm penetration), %		2.6
Tested by:	JJ	Swell, %		2.6
	Date Tested: 05-Mar-25			

LOAD DATA

LOAD PENETRATION CURVE

PENETRATION mm	STRESS MPa
0	0.00
0.64	0.08
1.27	0.12
1.91	0.15
2.54	0.18
3.18	0.20
3.81	0.22
4.45	0.23
5.08	0.24
6.35	0.25
7.62	0.26
8.89	0.26



PENETRATION mm	STANDARD LOAD MPa	TEST LOAD		BEARING RATIO (soaked)	
		ACTUAL MPa	CORRECTED MPa	at 2.5 mm penetration	at 5.1 mm penetration
2.54	6.9	0.18	0.18	2.6	-
5.08	10.3	0.24	0.24	-	2.3

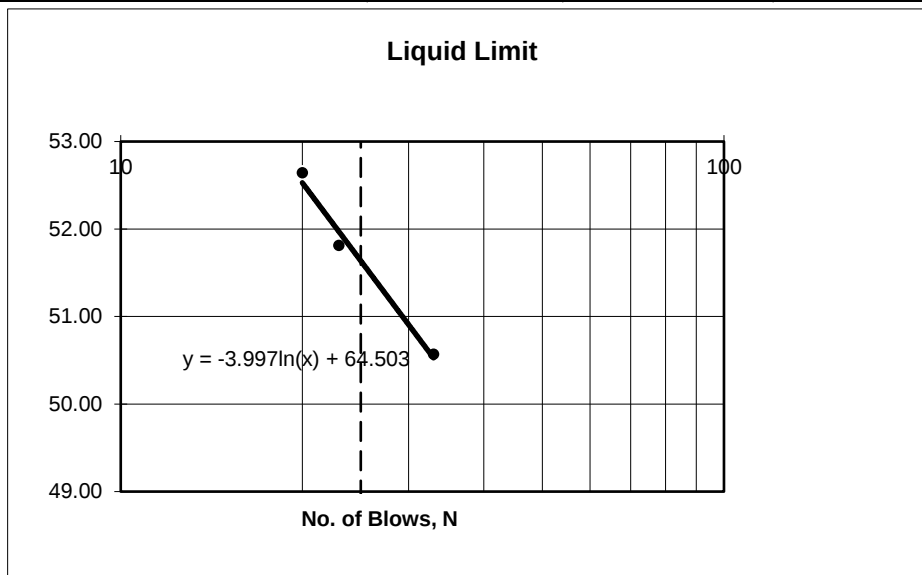
Remarks:

P. Bevel
Reviewed by: Paul Bevel

Atterberg Limits (ASTM D4318)

CLIENT:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.: 112-2503 PSA Test No.: 1 Lab No.: HM 25A
ATTENTION:	Ryan Cunningham	
PROJECT:	2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	

Liquid Limit Determination					Liquid Limit 25 Blows
Dish No.:	2	2	3	Feb 29, 2025	
Wet Soil + Dish:	48.53	49.99	50.24		
Dry Soil + Dish:	45.84	46.99	47.14		
Moisture:	2.69	3	3.1		
Dish:	40.73	41.2	41.01		
Dry Soil:	5.11	5.79	6.13		
% Moisture:	52.64	51.81	50.57		
No. of Blows:	20	23	33		
Liquid Limit:					51



Material ID:
CH - Fat Clay
Owena St.
TH 1 at 1-4ft

Liquid Limit, %: **51**
Plastic Limit, %: **20**
Plasticity Index: **31**
(LL-PL)

Plastic Limit Determination					
Dish No.:	1	2	3		
Wet Soil + Dish:	47.11	47.56	47.97		
Dry Soil + Dish:	46.07	46.51	46.80		
Moisture:	1.04	1.05	1.17		
Dish:	41.13	41.35	40.9		
Dry Soil:	4.94	5.16	5.9		
% Moisture:	21.05	20.35	19.83		
				Average:	20

Test Method : ASTM: D4318, D2216

Remarks:

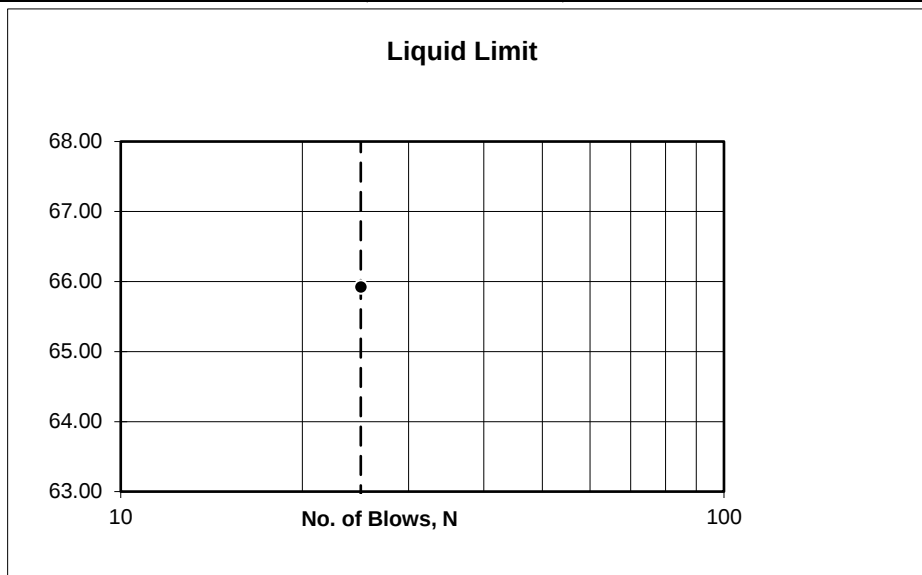
P. Bevel

Reviewed by: Paul Bevel

Atterberg Limits (ASTM D4318)

CLIENT: AECOM Canada ULC	Project No.: 112-2503
99 Commerce Drive, Winnipeg	PSA Test No.: 1
MB R3P 0Y7	Lab No.: HM 25A'
ATTENTION: Ryan Cunningham	
PROJECT: 2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	

Liquid Limit Determination					Liquid Limit 25 Blows
Dish No.:	1	Sample Prepared: Non dried A. LL (oven dried) = 51 B. LL (non dried) = 66 A / B = 0.77 Non-organic			
Wet Soil + Dish:	19.27				
Dry Soil + Dish:	13.37				
Moisture:	5.9				
Dish:	4.42				
Dry Soil:	8.95				
% Moisture:	65.92				
No. of Blows:	25				
Liquid Limit:					66



Material ID:
CH - Fat Clay
Owena St.
TH 1 at 1-4 ft

Liquid Limit, %: **66**

Liquid limit test of non-dried sample is conducted to determine if material is Organic Clay or Silt. According to ASTM D287 Section 11.3.1, a soil is an organic silt or clay if the liquid limit after oven drying is less than 75% of the liquid limit of the original specimen determined before oven drying.

The comparison confirms that the sample is inorganic, as the liquid limit difference does not meet the criteria for organic silt or clay.

Organic : $\left(\frac{LL - \text{ovendried}}{LL - \text{non dried}} \right) < 0.75$

Test Method : ASTM: D4318, D2216

P. Bevel

Reviewed by:

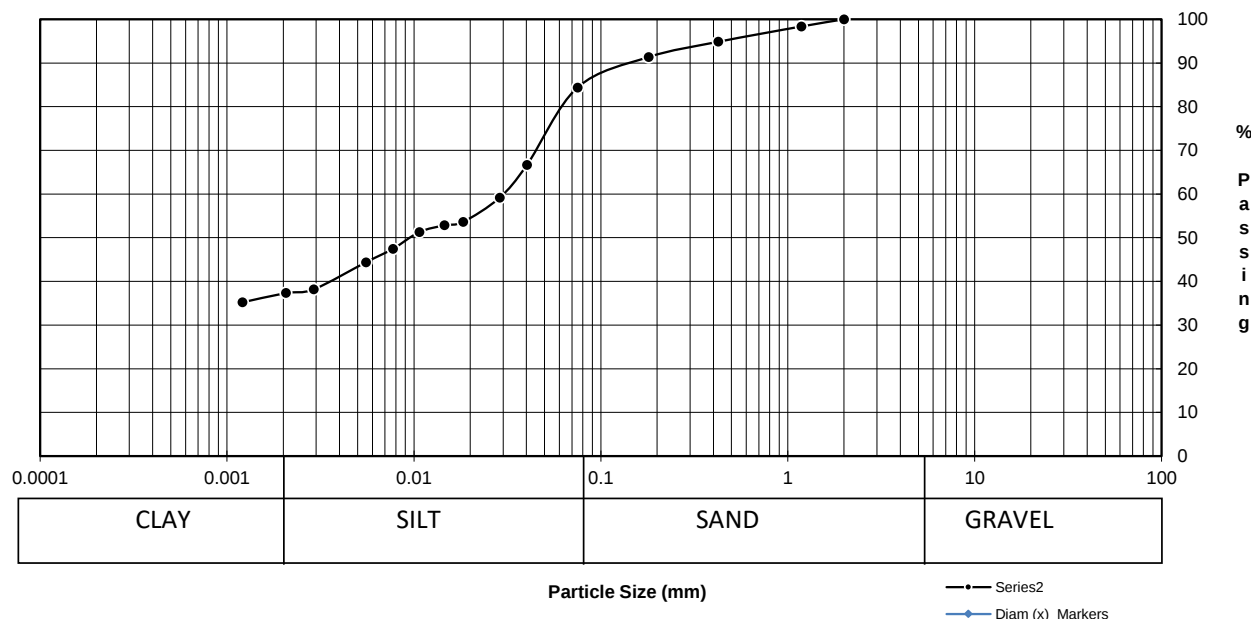
Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada ULC Project No.: 112-2503
99 Commerce Drive, Winnipeg PSA Test No.: 1
MB R3P 0Y7 Lab No.: HM 25B
ATTENTION: Ryan Cunningham
PROJECT: 2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09

Date Sampled: 28-Feb-25	Date Received: Feb 28, 2025	Sieve Analysis		Hydrometer Analysis	
Sampled By: MK	Date Tested: Feb 29, 2025	Sieve (mm)	% Passing	Diameter	% Finer
Material ID CH - Fat Clay	Sample Source Owena Street (From Logan to Henry Ave)	B.H./T.H. No. TH 1 at 1-4ft	50.00	100.0	
			37.50	100.0	
			25.00	100.0	
			19.00	100.0	
			16.00	100.0	
			12.50	100.0	0.0403 66.7
			9.50	100.0	0.0287 59.1
			4.75	100.0	0.0183 53.6
			2.00	100.0	0.0145 52.8
			1.18	98.4	0.0107 51.3
			0.425	94.9	0.0077 47.4
			0.18	91.4	0.0055 44.4
			0.075	84.4	0.0012 35.2

Grain Size Analysis



% Composition		D10
0.00	Gravel	D30
15.62	Sand	D60
47.21	Silt	Cu
37.17	Clay	Cc

Remarks:

P. Bevel

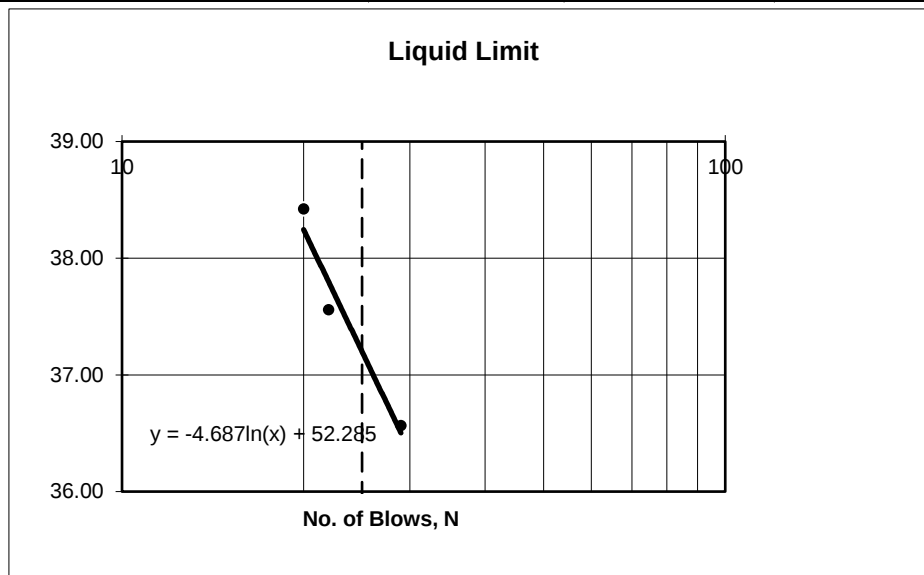
Technician: MK

Reviewed by Paul Bevel

Atterberg Limits (ASTM D4318)

CLIENT: AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7 ATTENTION: Ryan Cunningham PROJECT: 2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	Project No.: 112-2503 PSA Test No.: 2 Lab No.: HM 25B
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Liquid Limit Determination					Liquid Limit 25 Blows
Dish No.:	2	2	3	Feb 29, 2025	
Wet Soil + Dish:	34	47.19	46.10		
Dry Soil + Dish:	32.68	45.56	44.54		
Moisture:	1.32	1.63	1.56		
% Moisture:	29.07	41.22	40.48		
Dry Soil:	3.61	4.34	4.06		
	36.57	37.56	38.42		
No. of Blows:	29	22	20		
Liquid Limit:					37



Material ID:
CL - Lean Clay
Owena St.
TH 3 at 2-4.5 ft

Liquid Limit, %: **37**
 Plastic Limit, %: **16**
 Plasticity Index: **21**
 (LL-PL)

Plastic Limit Determination					
Dish No.:	1	2	3		
Wet Soil + Dish:	47.62	35.9	47.55		
Dry Soil + Dish:	46.7	34.93	46.53		
Moisture:	0.92	0.97	1.02		
Dish:	40.81	29.18	40.52		
Dry Soil:	5.89	5.75	6.01		
% Moisture:	15.62	16.87	16.97		
				Average:	16

Test Method : ASTM: D4318, D2216

Remarks:

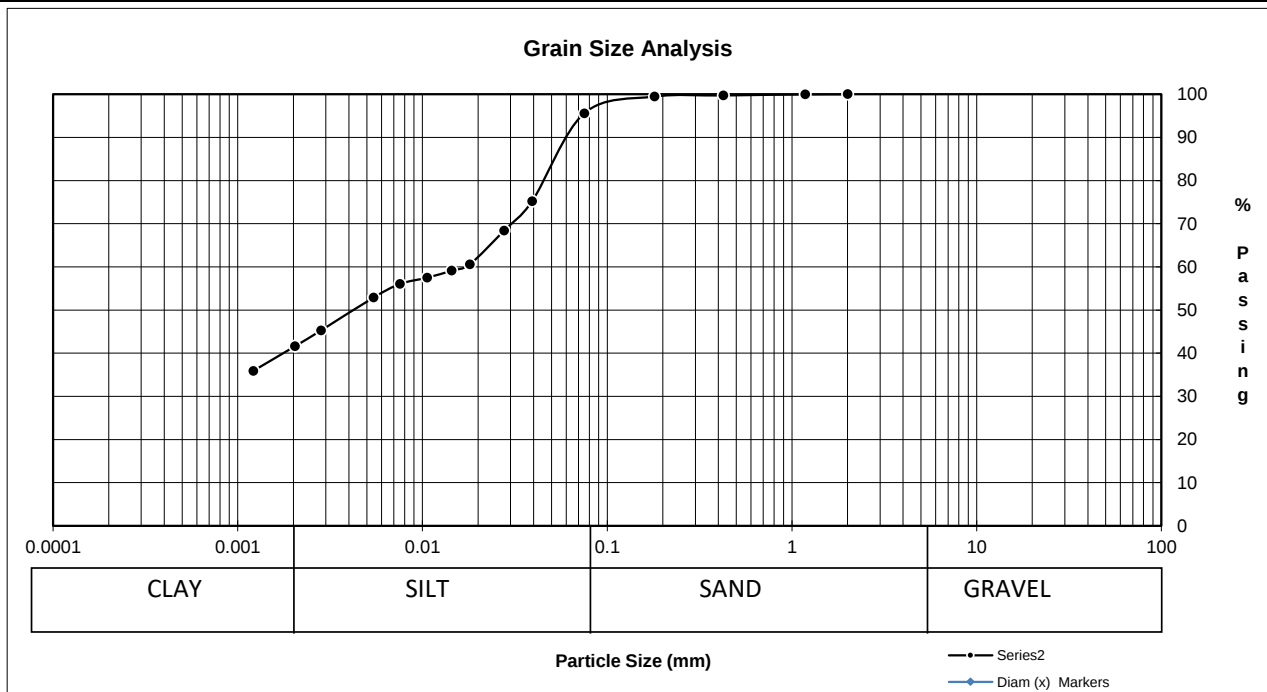
P. Bevel

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7 ATTENTION: Ryan Cunningham PROJECT: 2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	Project No.: 112-2503 PSA Test No.: 2 Lab No.: HM 25B
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Date Sampled: 28-Feb-25	Date Received: Feb 28, 2025	Sieve Analysis	Hydrometer Analysis
Sampled By: MK	Date Tested: Feb 29, 2025	Sieve (mm) % Passing	Diameter % Finer
Material ID CL - Lean Clay Sample Source Owena Street (From Logan to Henry Ave) B.H./T.H. No. TH 3 at 2-4.5 ft		50.00 100.0	
		37.50 100.0	
		25.00 100.0	
		19.00 100.0	
		16.00 100.0	
		12.50 100.0	0.0392 75.2
		9.50 100.0	0.0276 68.4
		4.75 100.0	0.0180 60.6
		2.00 100.0	0.0144 59.1
		1.18 100.0	0.0106 57.5
		0.425 99.7	0.0075 56.0
		0.180 99.5	0.0054 52.9
		0.075 95.6	0.0012 35.9



	% Composition	D10 D30 D60 Cu Cc
	0.00 Gravel	
	4.45 Sand	
	59.91 Silt	
	35.65 Clay	

Remarks:

P. Bevel

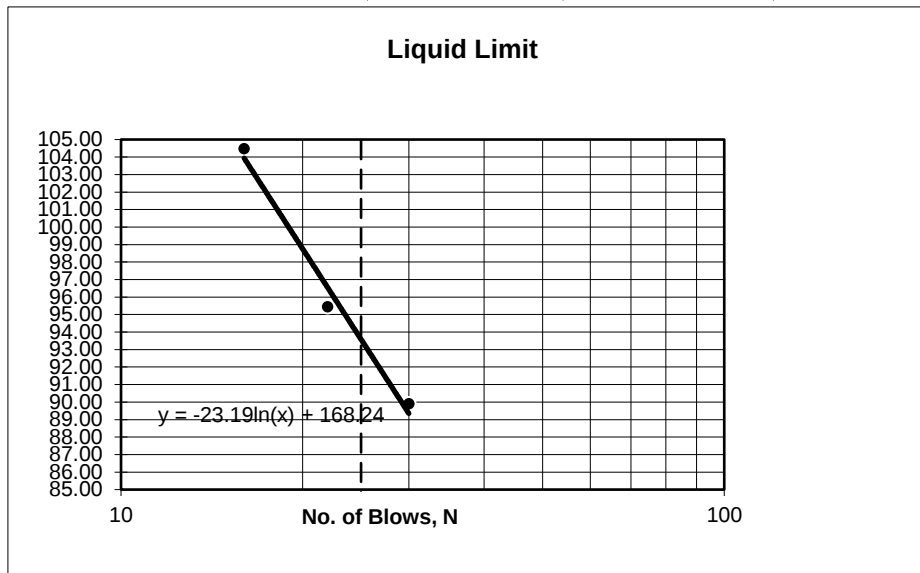
Technician: MK

Reviewed by: Paul Bevel

Atterberg Limits (ASTM D4318)

CLIENT:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.: 112-2503 PSA Test No.: 3 Lab No.: HM 25C
ATTENTION:	Ryan Cunningham	
PROJECT:	2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	

Liquid Limit Determination					Liquid Limit 25 Blows
Dish No.:	2	2	3	Feb 29, 2025	
Wet Soil + Dish:	12.71	13.45	12.20		
Dry Soil + Dish:	8.79	9.04	8.23		
Moisture:	3.92	4.41	3.97		
Dish:	4.43	4.42	4.43		
Dry Soil:	4.36	4.62	3.8		
% Moisture:	89.91	95.45	104.47		
No. of Blows:	30	22	16		
Liquid Limit:					94



Material ID:
CH - Fat Clay
Owena St.
TH 2 at 5.5-10 ft

Liquid Limit, %: **94**
Plastic Limit, %: **36**
Plasticity Index: **58**
(LL-PL)

Plastic Limit Determination					
Dish No.:	1	2	3		
Wet Soil + Dish:	8.7	9.53	9.88		
Dry Soil + Dish:	7.6	8.20	8.36		
Moisture:	1.1	1.33	1.52		
Dish:	4.41	4.39	4.28		
Dry Soil:	3.19	3.81	4.08		
% Moisture:	34.48	34.91	37.25		
				Average:	36

Test Method : ASTM: D4318, D2216

Remarks:

P. Bevel

Reviewed by: Paul Bevel

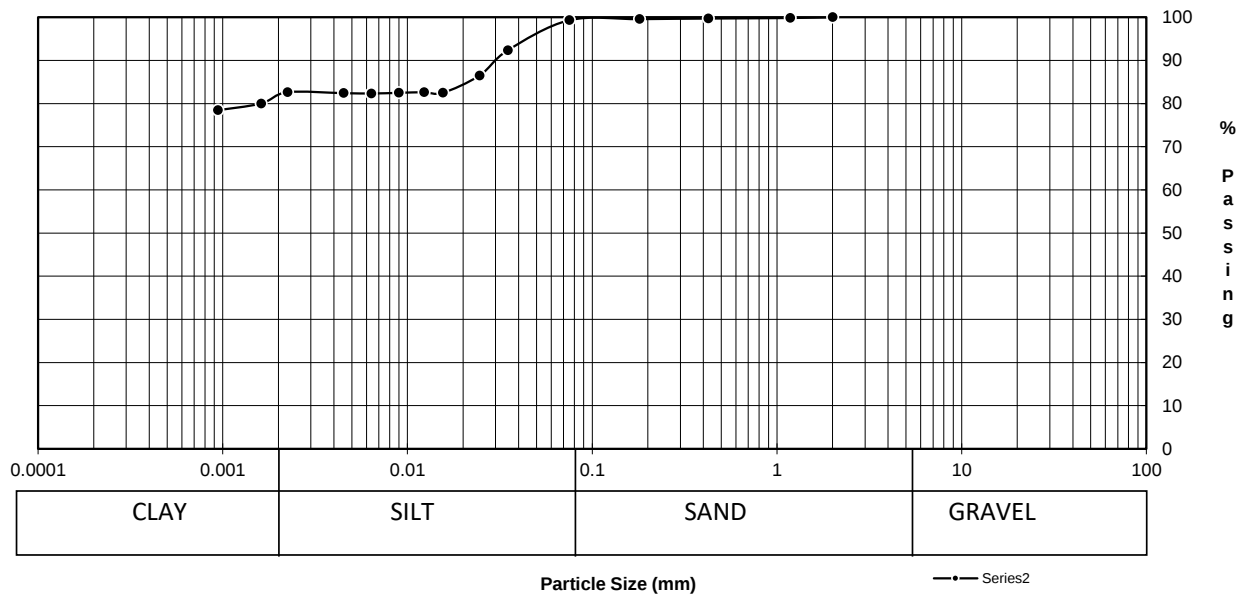
PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada ULC
99 Commerce Drive, Winnipeg
MB R3P 0Y7
ATTENTION: Ryan Cunningham
PROJECT: 2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09

Project No.: 112-2503
PSA Test No.: 3
Lab No.: HM 25C

Date Sampled:	28-Feb-25	Date Received:	Feb 28, 2025	Sieve Analysis	Hydrometer Analysis
Sampled By:	MK	Date Tested:	Feb 29, 2025	Sieve (mm) % Passing	Diameter % Finer
Material ID CH - Fay Clay Sample Source Owena Street (From Logan to Henry Ave) B.H./T.H. No. TH 2 at 5.5-10 ft			50.00	100.0	
			37.50	100.0	
			25.00	100.0	
			19.00	100.0	
			16.00	100.0	
			12.50	100.0	0.0349 92.3
			9.50	100.0	0.0245 86.5
			4.75	100.0	0.0155 82.5
			2.00	100.0	0.0123 82.6
			1.18	99.8	0.0090 82.5
			0.425	99.7	0.0064 82.3
			0.180	99.6	0.0045 82.4
			0.075	99.3	0.0009 78.5

Grain Size Analysis



	% Composition		D10
			D30
	0.71	Gravel	D60
	19.88	Sand	Cu
	79.42	Silt	Cc
		Clay	

Remarks:

P. Bevel

Technician: MK

Reviewed by: Paul Bevel

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada ULC	Project No:	112-2503
	99 Commerce Drive, Winnipeg	Test No.:	1
	MB R3P 0Y7	Lab No.:	HM 25 - (Owena St.)
Attention:	Ryan Cunningham	Date Sampled / By:	27-Feb-25 Mayumi Kawar
Project:	2025 Regional and Local Str	Date Received:	27-Feb-25
		Date Tested / By:	28-Feb-25 Carla Labadan

Test Hole No.	TH - 1	TH - 1	TH - 1	TH - 1	TH - 1
Depth	0'-1'	1'-2'	2'-3.5'	3.5'-4'	4'-5'
Tare No.	6-23	M25	60	M7	HM-1
Wt Wet Sample + Tare	207.9	239.9	240.3	148.3	211
Wt Dry Sample + Tare	156.3	196.6	194.3	118.5	150
Wt Water	51.6	43.3	46.0	29.8	61.0
Wt Tare	4.6	4.6	4.4	4.9	4.0
Wt Dry Sample	151.7	192.0	189.9	113.6	146.0
Moisture Content (%)	34.0	22.6	24.2	26.2	41.8
Test Hole No.	TH - 1	TH - 1	TH - 1	TH - 1	TH - 1
Depth	5'-6'	6'-7'	7'-8'	7'-9'	9'-10'
Tare No.	HM-11	T106	T1091	T109	T106
Wt Wet Sample + Tare	213	210.1	204.3	203.2	210.1
Wt Dry Sample + Tare	152	137.6	134.5	133.6	137.6
Wt Water	61.0	72.5	69.8	69.6	72.5
Wt Tare	4.0	4.2	4.0	4.0	4.2
Wt Dry Sample	148.0	133.4	130.5	129.6	133.4
Moisture Content (%)	41.2	54.3	53.5	53.7	54.3
Test Hole No.	TH - 2	TH - 2	TH - 2	TH - 2	TH - 2
Depth	0'-1.5'	1.5'-2'	2'-3'	3'-3.5'	3.5'-4'
Tare No.	M51	G1	T110	T125	T118
Wt Wet Sample + Tare	238.1	229	263.8	222	226.5
Wt Dry Sample + Tare	164.3	159.3	211.2	182	190.9
Wt Water	73.8	69.7	52.6	40.0	35.6
Wt Tare	4.7	4.3	4.1	4.4	4.2
Wt Dry Sample	159.6	155.0	207.1	177.6	186.7
Moisture Content (%)	46.2	45.0	25.4	22.5	19.1
Test Hole No.	TH - 2	TH - 2	TH - 2	TH - 2	TH - 2
Depth	4'-6'	6'-7'	7'-8'	8'-9'	9'-10'
Tare No.	BR22	695	68	T107A	T107
Wt Wet Sample + Tare	214.2	205.4	206.5	225.4	226.4
Wt Dry Sample + Tare	151.4	138.9	139.9	148.9	149.4
Wt Water	62.8	66.5	66.6	76.5	77.0
Wt Tare	4.9	4.4	4.4	4.7	4.7
Wt Dry Sample	146.5	134.5	135.5	144.2	144.7
Moisture Content (%)	42.9	49.4	49.2	53.1	53.2

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada ULC	Project No:	112-2503
	99 Commerce Drive, Winnipeg	Test No.:	1
	MB R3P 0Y7	Lab No.:	HM 25 - (Owena St)
Attention:	Ryan Cunningham	Date Sampled / By:	27-Feb-25 Mayumi Kawar
Project:	2025 Regional and Local Str	Date Received:	27-Feb-25
		Date Tested / By:	28-Feb-25 Carla Labadan

Test Hole No.	TH - 3	TH - 3	TH - 3	TH - 3	TH - 3
Depth	0-1'	1'-2'	2'-3'	3'-4'	4'-5'
Tare No.	Y04	Y01	KD10	KD11	M18
Wt Wet Sample + Tare	195.1	196.2	208.1	207.2	235.3
Wt Dry Sample + Tare	145.7	144.9	155.9	156.2	186
Wt Water	49.4	51.3	52.2	51.0	49.3
Wt Tare	4.4	4.4	4.8	4.8	5.0
Wt Dry Sample	141.3	140.5	151.1	151.4	181.0
Moisture Content (%)	35.0	36.5	34.5	33.7	27.2
Test Hole No.	TH - 3	TH - 3	TH - 3	TH - 3	TH - 3
Depth	5'-6'	6'-7'	7'-8'	8'-9'	9'-10'
Tare No.	T115	T100	T112	T124	T125
Wt Wet Sample + Tare	222.1	224.1	223.9	234.3	236
Wt Dry Sample + Tare	169.5	161.2	152.3	153.3	152.7
Wt Water	52.6	62.9	71.6	81.0	83.3
Wt Tare	4.6	4.1	4.3	4.2	4.2
Wt Dry Sample	164.9	157.1	148.0	149.1	148.5
Moisture Content (%)	31.9	40.0	48.4	54.3	56.1
Test Hole No.					
Depth					
Tare No.					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					
Test Hole No.					
Depth					
Tare No.					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					

Depth ft m	Symbol	Description	Number	Type	Pocket Penetrometer Test (kPa)	Water Content
					20 60 100 140 180 220 260	10 20 30 40 50 60 70 80 90
0		Ground Surface Asphalt and Concrete Asphalt one lift - 100mm Concrete - 140mm	Core 1	Core		
1		Clay CL - With silt and trace sand, moist, loose crumbling black	1	GS		
2		- Silty, light brown below 2 ft	2	GS		
3		Lab Test Result (HM27B), 2-3 FT LL=46, PL 18, PI=28 S=2, M=50, C=48	3	GS		
4		Clay CL-ML - Silty clay, moist, stiff, light yellow brown	4	GS		
5			5	GS		
6			6	GS		
7		Clay CH - Silty, moist, stiff, brown	7	GS		
8		- With stratified silt and trace sand in light yellow and brown below 7 feet	8	GS		
9		- Brown below 8 feet	9	GS		
10		End of testhole	10	GS		
11		- Test terminated at 10 feet - No seepage - Backfilled with Auger cuttings				

Drill Method: Auger

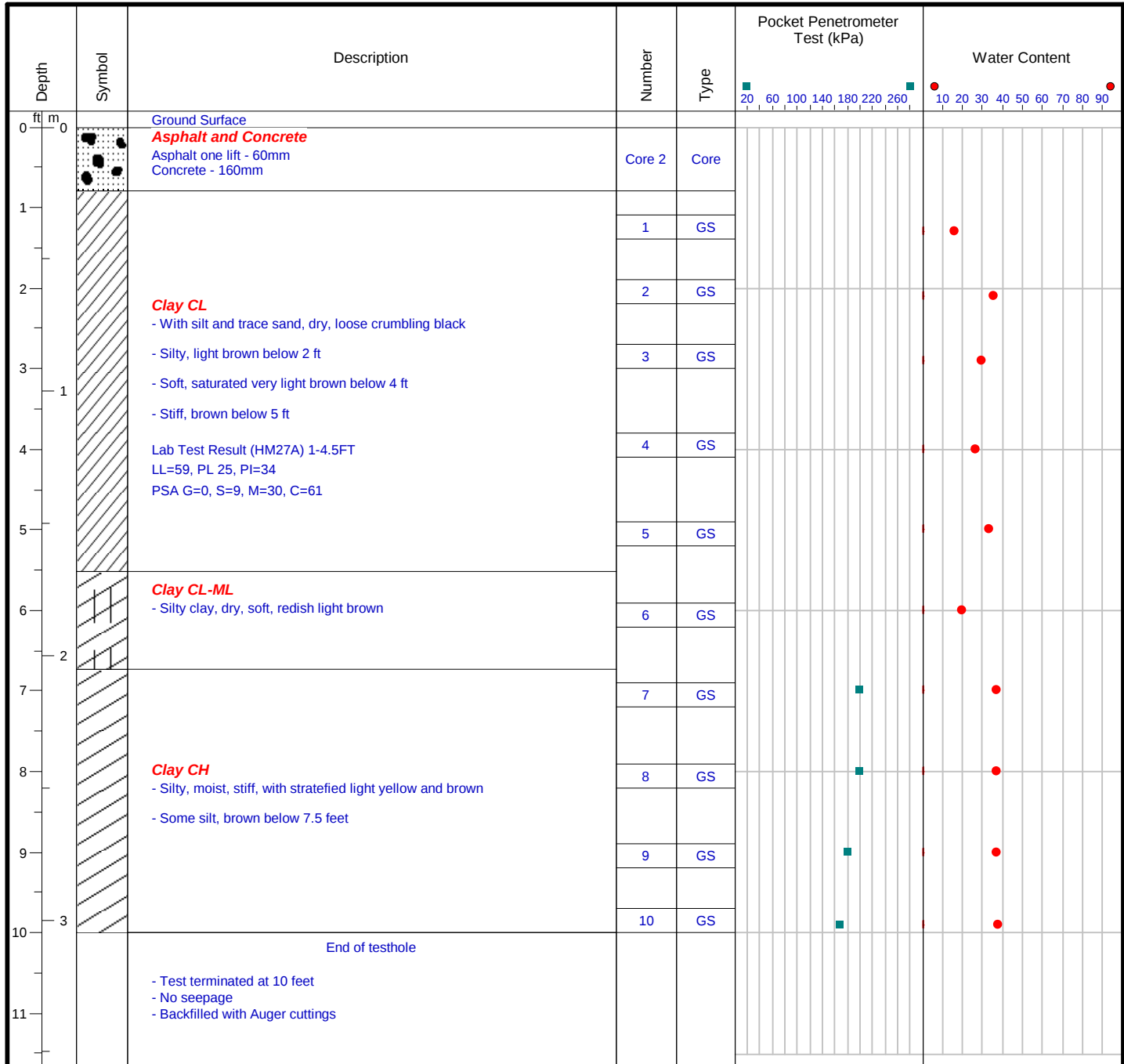
Drill Date: February 29, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Drill Method: Auger

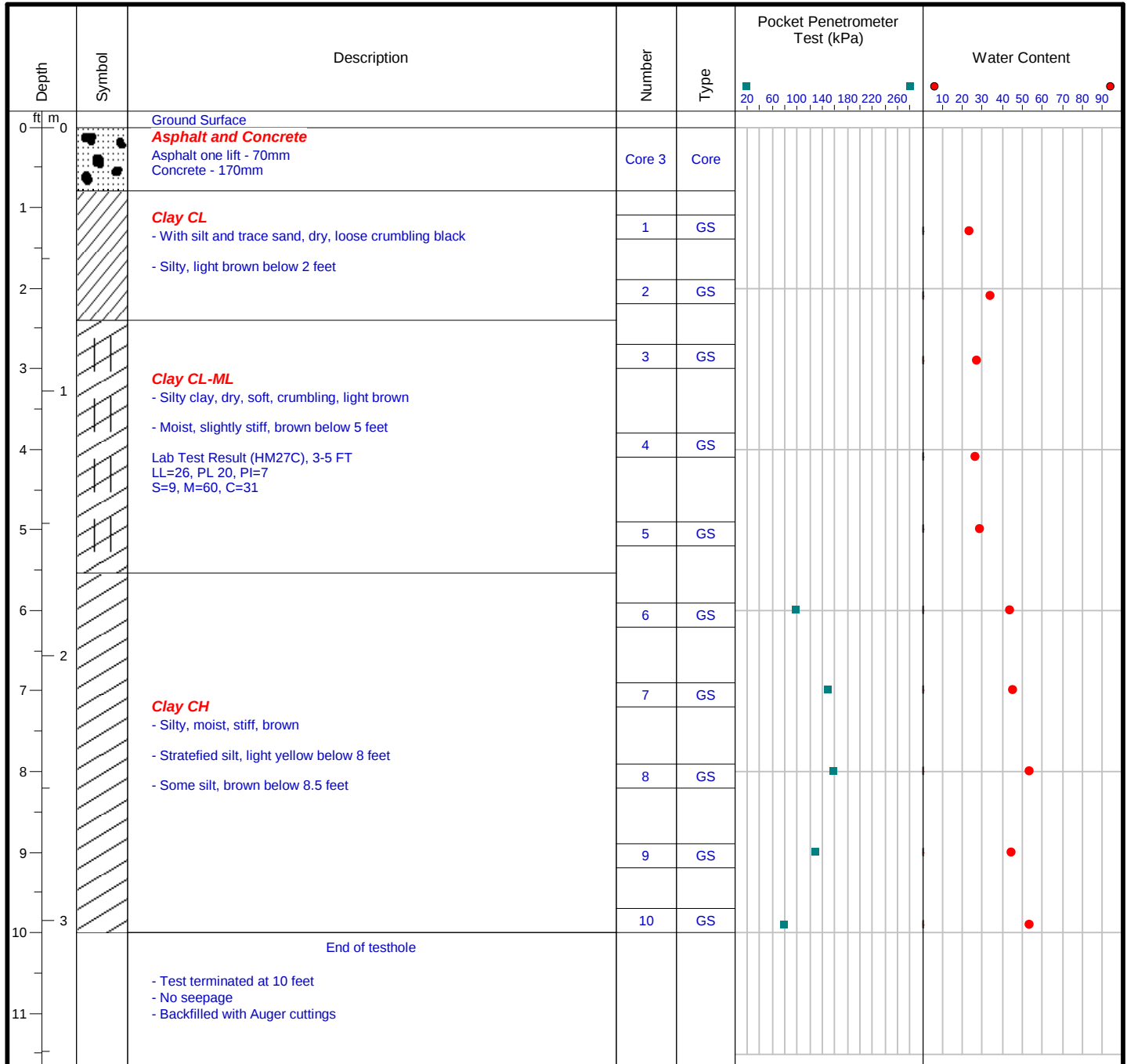
Drill Date: February 29, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Drill Method: Auger

Drill Date: February 29, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1

Depth ft m	Symbol	Description	Number	Type	Pocket Penetrometer Test (kPa)	Water Content
					20 60 100 140 180 220 260	10 20 30 40 50 60 70 80 90
0		Ground Surface Asphalt and Concrete Asphalt one lift - 90mm Concrete - 170mm	Core 4	Core		
1		Clay CL - With silt and trace sand, dry, loose crumbling black - Silty, brown below 2 feet	1	GS		
2			2	GS		
3			3	GS		
4		Clay CL-ML - Silty clay, dry, soft, crumbling, light brown with oxidated iron staining - Moist, slightly stiff, brown below 5 feet	4	GS		
5			5	GS		
6			6	GS		
7		Clay CH - Silty, moist, stiff, greyish brown - some silt, below 8.5 feet	7	GS		
8		Lab Test Result (HM27D), 5.5-8FT LL=55, PL 22, PI=33 S=1, M=58, C=41	8	GS		
9			9	GS		
10		End of testhole - Test terminated at 10 feet - No seepage - Backfilled with Auger cuttings	10	GS		

Drill Method: Auger

Drill Date: February 29, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

Client: AECOM Canada ULC	Project No: 112-2503
99 Commerce Drive, Winnipeg	
MB R3P 0Y7	Lab No: HM 27-1
Attention: Ryan Cunningham	Date sampled: 28-Feb-25
Project 2025 Regional and Local Street Renewal Program	Date Received: 28-Feb-25
Location: Local Streets Pkg 25-R-09	Date Tested /By: 07-Mar-25 JJ

SAMPLE DATA		SPECIMEN DATA		
Sample Type: CL Lean Clay		DESCRIPTION	Before Soaking	After Testing
Source: Rupert Ave, TH-1 at 1-4 ft		Moisture Content (MC), %	33.1	34.9
Sampled by: Mayumi Kawano		MC of top 25mm layer, %		
Optimum Moisture Content: 32.4 %		Dry Density, kg/m ³	1334	1328
Maximum Dry Density: 1397 kg/cm ³		Compaction, %	95%	
Method of Compaction: Standard Proctor		CBR (at 2.5mm penetration), %		3.7
Tested by: MK	Date Tested: Feb 29, 2025	Swell, %		0.82

LOAD DATA		LOAD PENETRATION CURVE	
PENETRATION mm	STRESS MPa		
0	0.00		
0.64	0.16		
1.27	0.22		
1.91	0.24		
2.54	0.25		
3.18	0.26		
3.81	0.27		
4.45	0.28		
5.08	0.28		
5.62	0.29		
6.25	0.29		
6.88	0.29		
8.77	0.29		

PENETRATION mm	STANDARD LOAD MPa	TEST LOAD		BEARING RATIO (soaked)	
		ACTUAL MPa	CORRECTED MPa	at 2.5 mm penetration	at 5.1 mm penetration
2.54	6.9	0.25	0.25	3.7	-
5.08	10.3	0.28	0.28	-	2.7

Remarks:

P. Bevel
Reviewed by: Paul Bevel

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

Client: AECOM Canada ULC
99 Commerce Drive, Winnipeg
MB R3P 0Y7

Project No: 112-2503

Lab No: HM 27-2

Attention: Ryan Cunningham

Date sampled: 28-Feb-25

Project 2025 Regional and Local Street Renewal Program

Date Received: 28-Feb-25

Location: Local Streets Pkg 25-R-09

Date Tested /By: 07-Mar-25 JJ

SAMPLE DATA

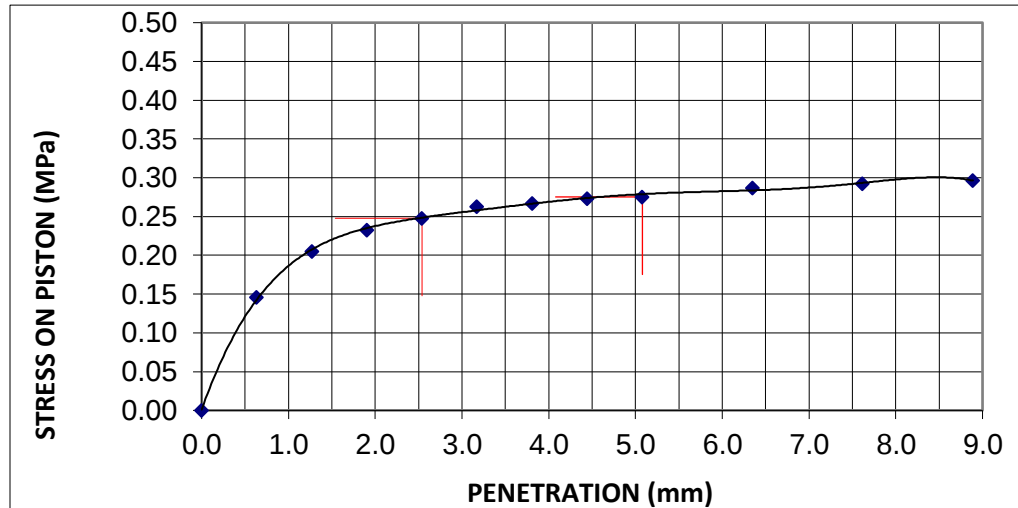
SPECIMEN DATA

Sample Type: CL Lean Clay	DESCRIPTION	Before Soaking	After Testing
Source: Rupert Ave, TH-4 at 1-4 ft	Moisture Content (MC), %	34.6	35.2
Sampled by: Mayumi Kawano	MC of top 25mm layer, %		
Optimum Moisture Content: 32.4 %	Dry Density, kg/m ³	1304	1318
Maximum Dry Density: 1376 kg/cm ³	Compaction, %	95%	
Method of Compaction: Standard Proctor	CBR (at 2.5mm penetration), %		3.6
Tested by: MK	Swell, %		1.39
Date Tested: Feb 29, 2025			

LOAD DATA

LOAD PENETRATION CURVE

PENETRATION mm	STRESS MPa
0	0.00
0.64	0.15
1.27	0.21
1.91	0.23
2.54	0.25
3.18	0.26
3.81	0.27
4.45	0.27
5.08	0.28
6.35	0.29
7.62	0.29
8.89	0.30



PENETRATION mm	STANDARD LOAD MPa	TEST LOAD		BEARING RATIO (soaked)	
		ACTUAL MPa	CORRECTED MPa	at 2.5 mm penetration	at 5.1 mm penetration
2.54	6.9	0.25	0.25	3.6	-
5.08	10.3	0.28	0.28	-	2.7

Remarks:

P. Bevel

Reviewed by: Paul Bevel

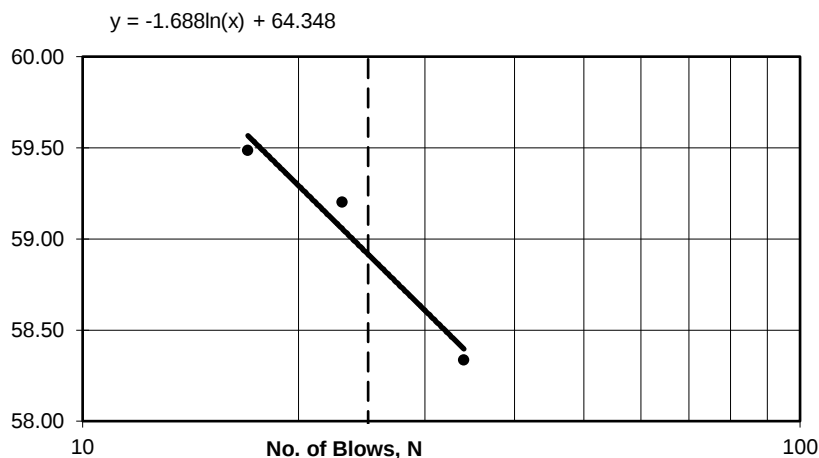
Atterberg Limits (ASTM D4318)

CLIENT:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.: 112-2503
ATTENTION:	Ryan Cunningham	PSA Test No.: 7
PROJECT:	2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	Lab No.: HM 27A

Liquid Limit Determination

Dish No.:	2	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	10.86	12.53	11.28		
Dry Soil + Dish:	8.48	9.57	8.74		
Moisture:	2.38	2.96	2.54		
Dish:	4.4	4.57	4.47		
Dry Soil:	4.08	5	4.27		
% Moisture:	58.33	59.20	59.48		
No. of Blows:	34	23	17		
Liquid Limit:					59

Liquid Limit



Material ID:
CL - Lean Clay
Rupert Ave
TH2 at 1-4.5 ft

Liquid Limit, %: **59**
Plastic Limit, %: **25**
Plasticity Index: **34**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	10.8	10.49	10.48		
Dry Soil + Dish:	9.46	9.31	9.33		
Moisture:	1.34	1.18	1.15		
Dish:	4.42	4.43	4.44		
Dry Soil:	5.04	4.88	4.89		
% Moisture:	26.59	24.18	23.52		
				Average:	25

Test Method : ASTM: D4318, D2216

Remarks:

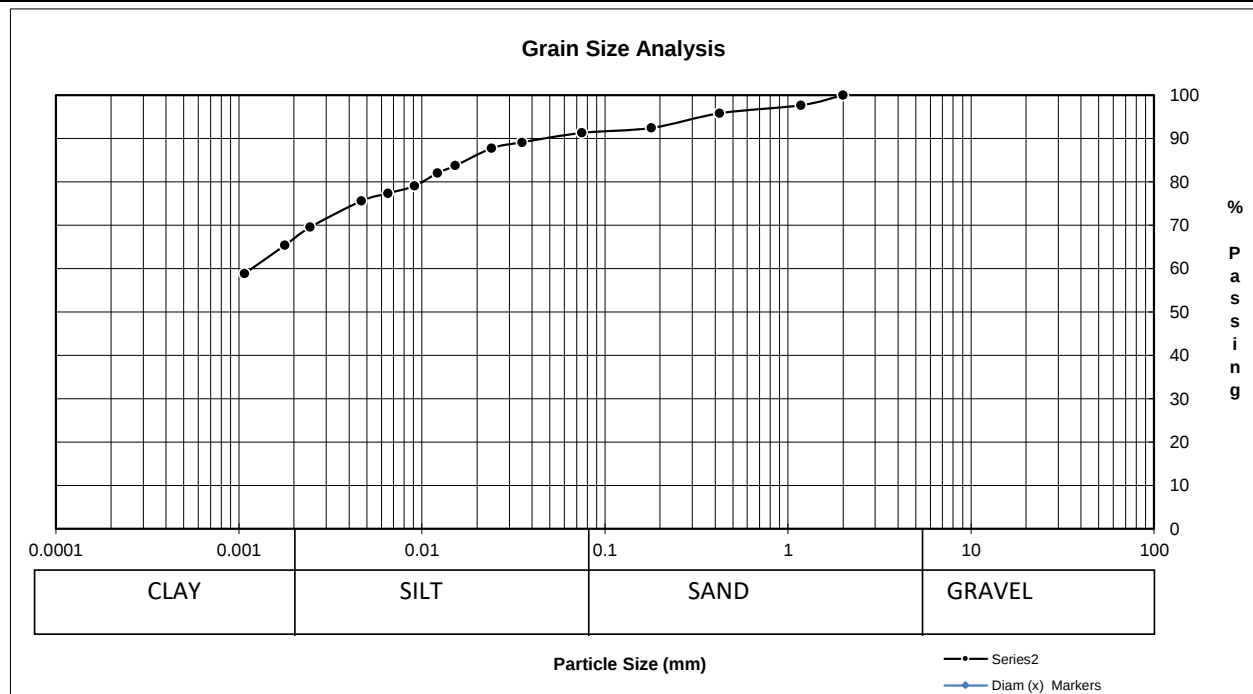
P. Bevel

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7 ATTENTION: Ryan Cunningham PROJECT: 2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	Project No.: 112-2503 PSA Test No.: 7 Lab No.: HM 27A
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Date Sampled:	Feb 29 2025	Date Received:	Feb 29 2025	Sieve Analysis	Hydrometer Analysis
Sampled By:	MK	Date Tested:	Feb 29 2025	Sieve (mm) % Passing	Diameter % Finer
Material ID CL - Lean Clay Sample Source Rupert Ave (From Main St to Martha St) B.H./T.H. No. TH2 at 1-4.5 ft				50.00 100.0	
				37.50 100.0	
				25.00 100.0	
				19.00 100.0	
				16.00 100.0	
				12.50 100.0	0.0353 89.1
				9.50 100.0	0.0241 87.8
				4.75 100.0	0.0152 83.8
				2.00 100.0	0.0122 82.1
				1.18 97.7	0.0091 79.1
				0.425 95.8	0.0065 77.4
				0.180 92.4	0.0047 75.6
				0.075 91.3	0.0011 58.9



	% Composition	
	0.00 Gravel	D10
	8.71 Sand	D30
	30.34 Silt	D60
	60.95 Clay	Cu
		Cc

Remarks:

P. Bevel

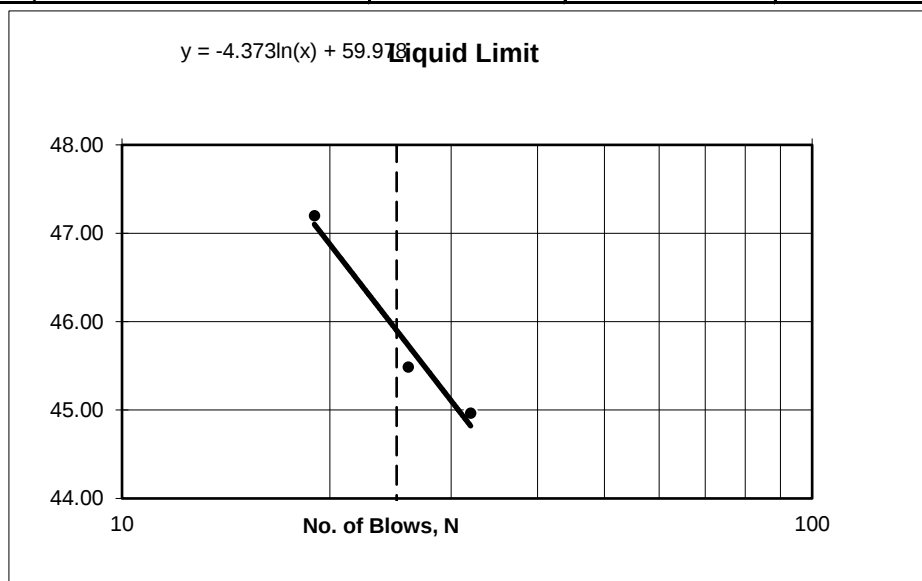
Technician: MK

Reviewed by Paul Bevel

Atterberg Limits (ASTM D4318)

CLIENT:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.: 112-2503
ATTENTION:	Ryan Cunningham	PSA Test No.: 8
PROJECT:	2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	Lab No.: HM 27B

Liquid Limit Determination				Liquid Limit 25 Blows
Dish No.:	2	2	3	
Wet Soil + Dish:	10.9	12.28	12.63	
Dry Soil + Dish:	8.89	9.81	10.02	
Moisture:	2.01	2.47	2.61	
Dish:	4.42	4.38	4.49	
Dry Soil:	4.47	5.43	5.53	
% Moisture:	44.97	45.49	47.20	
No. of Blows:	32	26	19	
Liquid Limit:				46



Material ID:
CL - Lean clay
Rupert Ave
TH1 at 2-3 ft

Liquid Limit, %: **46**
Plastic Limit, %: **18**
Plasticity Index: **28**
(LL-PL)

Plastic Limit Determination				
Dish No.:	1	2	3	
Wet Soil + Dish:	10.67	10.95	10.94	
Dry Soil + Dish:	9.7	10.00	9.95	
Moisture:	0.97	0.95	0.99	
Dish:	4.43	4.5	4.43	
Dry Soil:	5.27	5.5	5.52	
% Moisture:	18.41	17.27	17.93	
			Average:	18

Test Method : ASTM: D4318, D2216

Remarks:

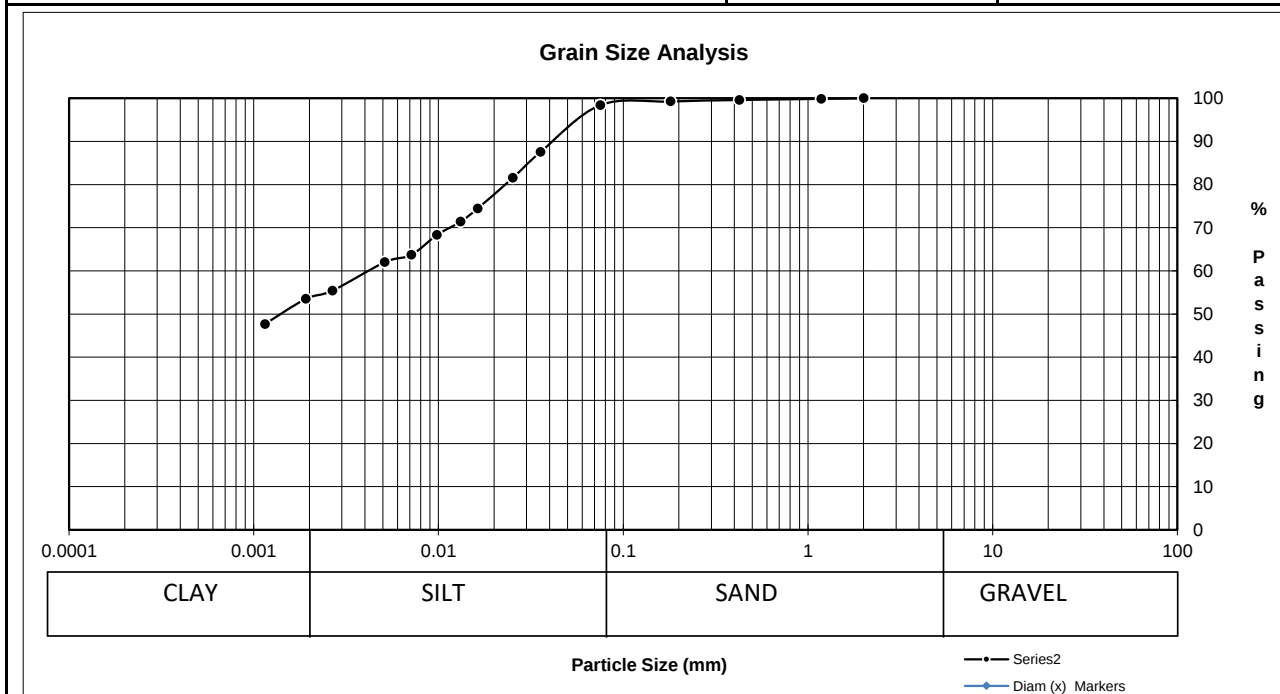
P. Bevel

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada ULC
99 Commerce Drive, Winnipeg
MB R3P 0Y7
Project No.: 112-2503
PSA Test No.: 8
Lab No.: HM 27B
ATTENTION: Ryan Cunningham
PROJECT: 2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09

Date Sampled:	Feb 29 2025	Date Received:	Feb 29 2025	Sieve Analysis		Hydrometer Analysis	
Sampled By:	MK	Date Tested:	Feb 29 2025	Sieve (mm)	% Passing	Diameter	% Finer
Material ID Sample Source B.H./T.H. No.	CL - Lean Clay Rupert Ave (From Main St to Martha St) TH1 at 2-3 ft			50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
				12.50	100.0	0.0357	87.5
				9.50	100.0	0.0252	81.5
				4.75	100.0	0.0163	74.4
				2.00	100.0	0.0131	71.4
				1.18	99.8	0.0098	68.3
				0.425	99.6	0.0071	63.7
				0.180	99.2	0.0051	62.0
				0.075	98.4	0.0011	47.7



% Composition		D10
1.62	Gravel	D30
50.00	Sand	D60
48.38	Silt	Cu
	Clay	Cc

Remarks:

P. Bevel

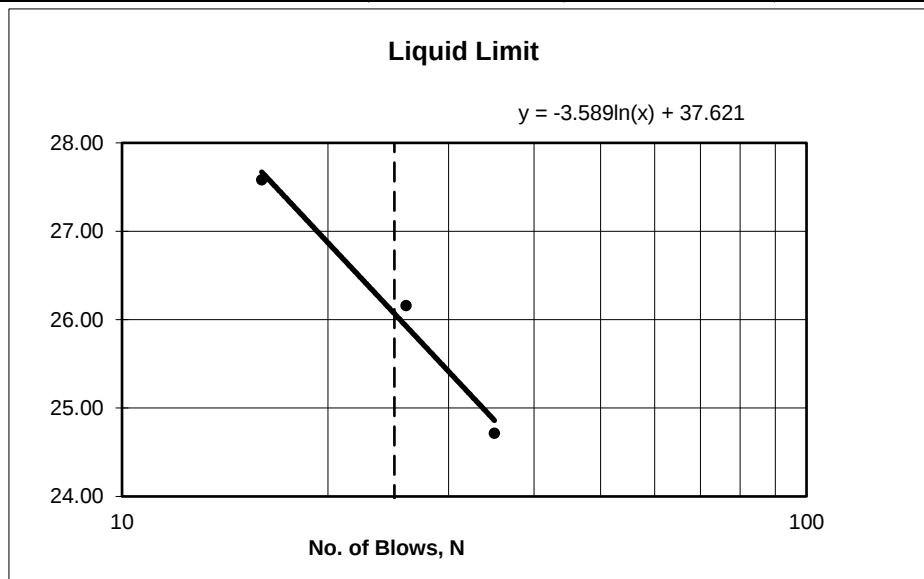
Technician: MK

Reviewed by: Paul Bevel

Atterberg Limits (ASTM D4318)

CLIENT:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.: 112-2503
ATTENTION:	Ryan Cunningham	PSA Test No.: 9
PROJECT:	2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	Lab No.: HM 27C

Liquid Limit Determination					Liquid Limit 25 Blows
Dish No.:	2	2	3		
Wet Soil + Dish:	36.82	49.22	13.07		
Dry Soil + Dish:	35.30	47.53	11.2		
Moisture:	1.52	1.69	1.87		
Dish:	29.15	41.07	4.42		
Dry Soil:	6.15	6.46	6.78		
% Moisture:	24.72	26.16	27.58		
No. of Blows:	35	26	16		
Liquid Limit:					26



Material ID:
CL-ML Silty Clay
Rupert Ave
TH3 at 3-5 ft

Liquid Limit, %: **26**
Plastic Limit, %: **20**
Plasticity Index: **7**
(LL-PL)

Plastic Limit Determination					
Dish No.:	1	2	3		
Wet Soil + Dish:	11.4	11.67	11.74		
Dry Soil + Dish:	10.26	10.49	10.56		
Moisture:	1.14	1.18	1.18		
Dish:	4.44	4.42	4.54		
Dry Soil:	5.82	6.07	6.02		
% Moisture:	19.59	19.44	19.60		
				Average:	20

Test Method : ASTM: D4318, D2216

Remarks:

P. Bevel

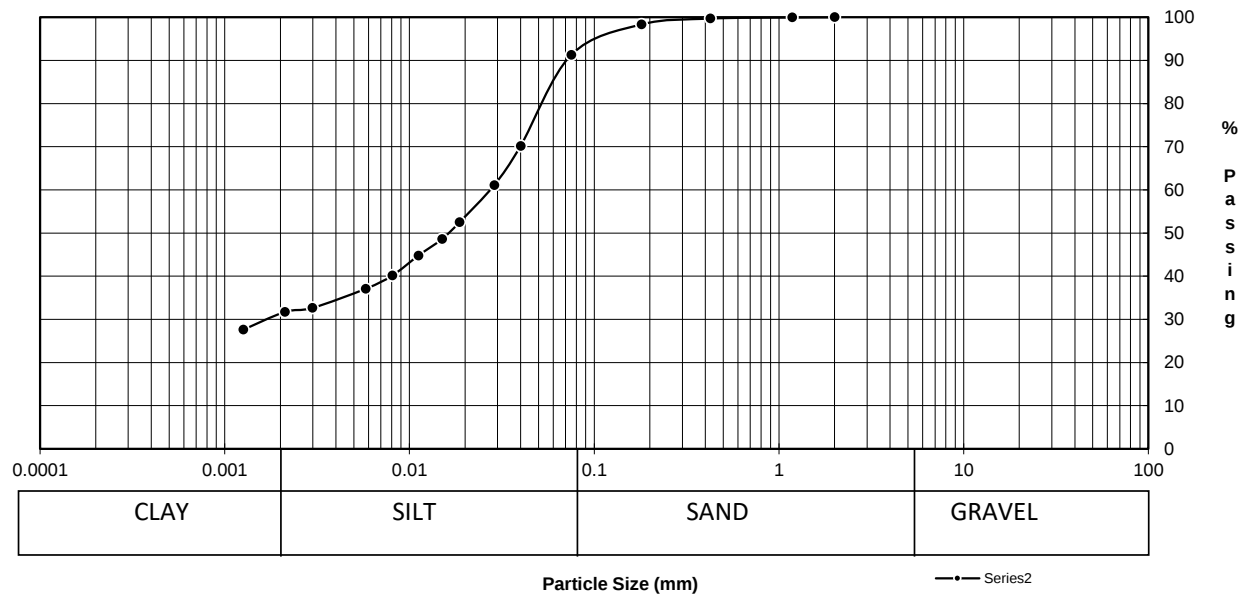
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada ULC
99 Commerce Drive, Winnipeg
MB R3P 0Y7
Project No.: 112-2503
PSA Test No.: 9
Lab No.: HM 27C
ATTENTION: Ryan Cunningham
PROJECT: 2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09

Date Sampled:	Feb 29 2025	Date Received:	Feb 29 2025	Sieve Analysis		Hydrometer Analysis	
Sampled By:	MK	Date Tested:	Feb 29 2025	Sieve (mm) % Passing		Diameter	% Finer
Material ID Sample Source B.H./T.H. No.	CL-ML Silty Clay with trace sand Rupert Ave (From Main St to Martha St) TH3 at 3-5 ft			50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
				12.50	100.0	0.0399	70.2
				9.50	100.0	0.0287	61.1
				4.75	100.0	0.0186	52.5
				2.00	100.0	0.0150	48.6
				1.18	99.9	0.0112	44.8
				0.425	99.7	0.0081	40.2
				0.180	98.3	0.0058	37.1
				0.075	91.2	0.0013	27.6

Grain Size Analysis



	% Composition		D10
			D30
	8.75	Gravel	D60
	60.08	Sand	Cu
	31.17	Silt	Cc
		Clay	

Remarks:

P. Bevel

Technician: MK

Reviewed by: Paul Bevel

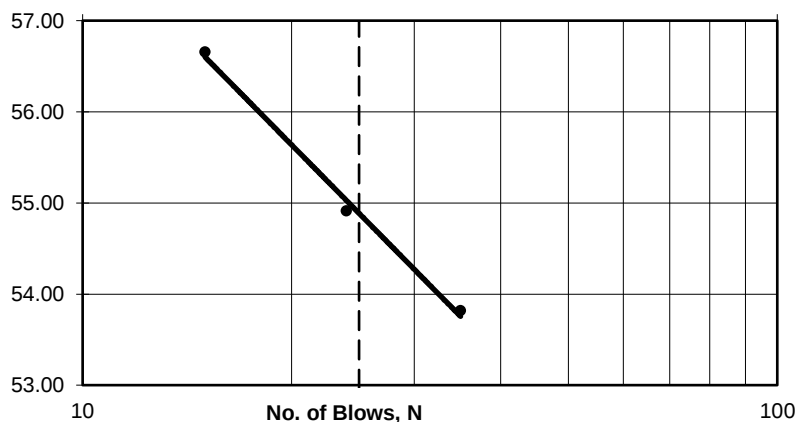
Atterberg Limits (ASTM D4318)

CLIENT:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.: 112-2503
ATTENTION:	Ryan Cunningham	PSA Test No.: 10
PROJECT:	2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	Lab No.: HM 27D

Liquid Limit Determination

Dish No.:	2	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	12.26	13.7	11.28		
Dry Soil + Dish:	9.51	10.57	8.81		
Moisture:	2.75	3.13	2.47		
Dish:	4.4	4.87	4.45		
Dry Soil:	5.11	5.7	4.36		
% Moisture:	53.82	54.91	56.65		
No. of Blows:	35	24	15		
Liquid Limit:					55

$$y = -3.361 \ln(x) + 65.70$$



Material ID:
CH - Fat Clay
Rupert Ave
TH4 at 5.5-10 ft

Liquid Limit, %: **55**
Plastic Limit, %: **22**
Plasticity Index: **33**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	10.94	11.2	10.78		
Dry Soil + Dish:	9.85	10.08	9.67		
Moisture:	1.09	1.12	1.11		
Dish:	4.85	5.07	4.66		
Dry Soil:	5	5.01	5.01		
% Moisture:	21.80	22.36	22.16		
				Average:	22

Test Method : ASTM: D4318, D2216

Remarks:

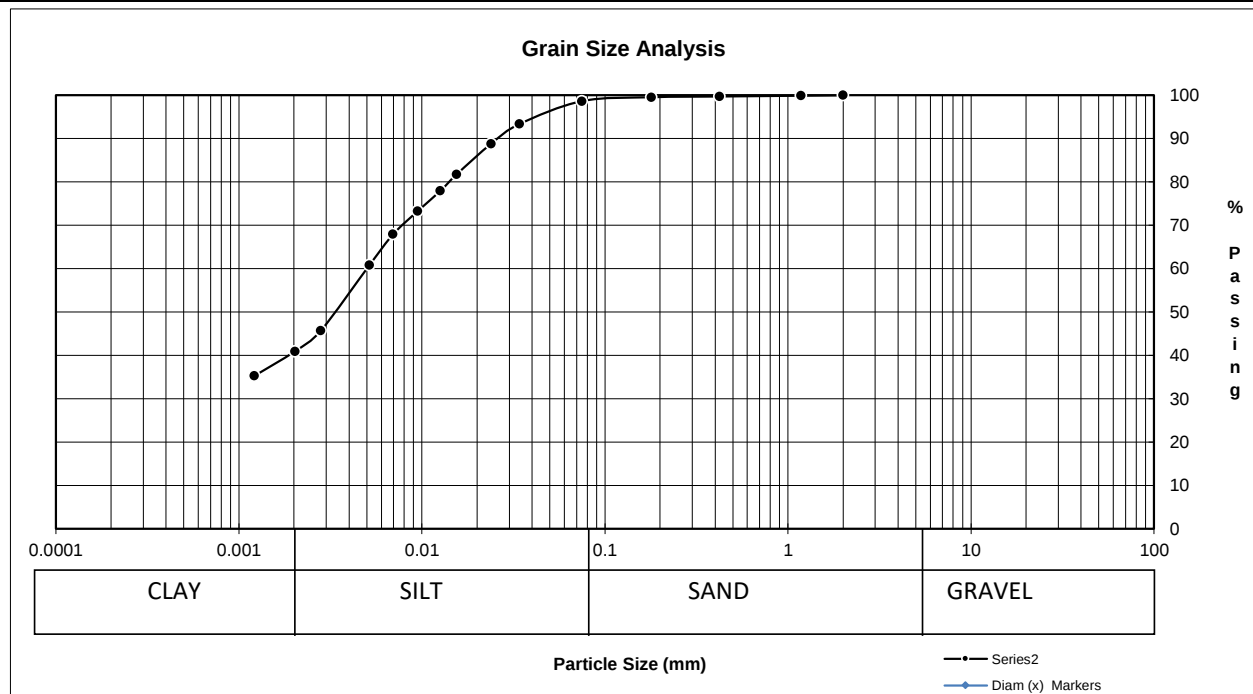
P. Bevel

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7 ATTENTION: Ryan Cunningham PROJECT: 2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	Project No.: 112-2503 PSA Test No.: 10 Lab No.: HM 27D
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Date Sampled:	Feb 29 2025	Date Received:	Feb 29 2025	Sieve Analysis	Hydrometer Analysis
Sampled By:	MK	Date Tested:	Feb 29 2025	Sieve (mm) % Passing	Diameter % Finer
Material ID CH - Fat Clay Sample Source Rupert Ave (From Main St to Martha St) B.H./T.H. No. TH4 at 5.5-10 ft				50.00 100.0	
				37.50 100.0	
				25.00 100.0	
				19.00 100.0	
				16.00 100.0	
				12.50 100.0	0.0343 93.4
				9.50 100.0	0.0240 88.8
				4.75 100.0	0.0155 81.8
				2.00 100.0	0.0126 77.9
				1.18 99.9	0.0095 73.3
				0.425 99.7	0.0070 67.9
				0.180 99.5	0.0052 60.8
				0.075 98.6	0.0012 35.3



	% Composition	
	Gravel	D10
	1.37 Sand	D30
	57.88 Silt	D60
	40.75 Clay	Cu
		Cc

Remarks:

P. Bevel

Technician: MK

Reviewed by Paul Bevel

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada ULC	Project No:	112-2503
	99 Commerce Drive, Winnipeg	Test No.:	
	MB R3P 0Y7	Lab No.:	HM 27 - (Rupert Ave)
Attention:	Ryan Cunningham	Date Sampled / By:	27-Feb-25 Mayumi Kaway
Project:	2025 Regional and Local Str	Date Received:	27-Feb-25
		Date Tested / By:	28-Feb-25 Le Yang

Test Hole No.	TH-1	TH-1	TH-1	TH-1	TH-1
Depth	0'-0.5'	0.5'-1'	1'-2'	2'-3'	3'-4'
Tare No.	MT4	T103	M42	T119	SE7
Wt Wet Sample + Tare	239.6	182.8	164.5	203.6	260.7
Wt Dry Sample + Tare	216.6	148.3	130.4	161.5	203.4
Wt Water	23.0	34.5	34.1	42.1	57.3
Wt Tare	4.8	4.4	4.8	4.5	4.5
Wt Dry Sample	211.8	143.9	125.6	157.0	198.9
Moisture Content (%)	10.9	24.0	27.1	26.8	28.8
Test Hole No.	TH-1	TH-1	TH-1	TH-1	TH-1
Depth	4'-5'	5'-6'	6'-7'	7'-8'	8'-10'
Tare No.	TX	H-200	M50	M31	KD22
Wt Wet Sample + Tare	212.7	249.9	236	201.7	172.7
Wt Dry Sample + Tare	167.6	186.8	173.1	137.2	117.5
Wt Water	45.1	63.1	62.9	64.5	55.2
Wt Tare	5.0	4.4	4.9	4.6	4.3
Wt Dry Sample	162.6	182.4	168.2	132.6	113.2
Moisture Content (%)	27.7	34.6	37.4	48.6	48.8
Test Hole No.	TH-2	TH-2	TH-2	TH-2	TH-2
Depth	0'-0.5'	0.5'-1'	1'-2.5'	2.5'-3'	3'-4'
Tare No.	M56	M1	M35	4-23	G5
Wt Wet Sample + Tare	241.8	112.9	190.1	112.3	174.4
Wt Dry Sample + Tare	208.2	84.5	147.4	87.5	138.4
Wt Water	33.6	28.4	42.7	24.8	36.0
Wt Tare	5.0	4.6	4.8	4.8	4.6
Wt Dry Sample	203.2	79.9	142.6	82.7	133.8
Moisture Content (%)	16.5	35.5	29.9	30.0	26.9
Test Hole No.	TH-2	TH-2	TH-2	TH-2	TH-2
Depth	4'-4.5'	4.5'-5.5'	5.5'-6'	6'-7'	7'-10'
Tare No.	321	Y-03	M42	M16	M52
Wt Wet Sample + Tare	188	171.3	191.8	233.1	183.5
Wt Dry Sample + Tare	142.3	129.2	160.3	171.1	134.9
Wt Water	45.7	42.1	31.5	62.0	48.6
Wt Tare	4.5	4.1	4.6	5.2	4.9
Wt Dry Sample	137.8	125.1	155.7	165.9	130.0
Moisture Content (%)	33.2	33.7	20.2	37.4	37.4

MOISTURE CONTENT OF SOIL (ASTM D2216)

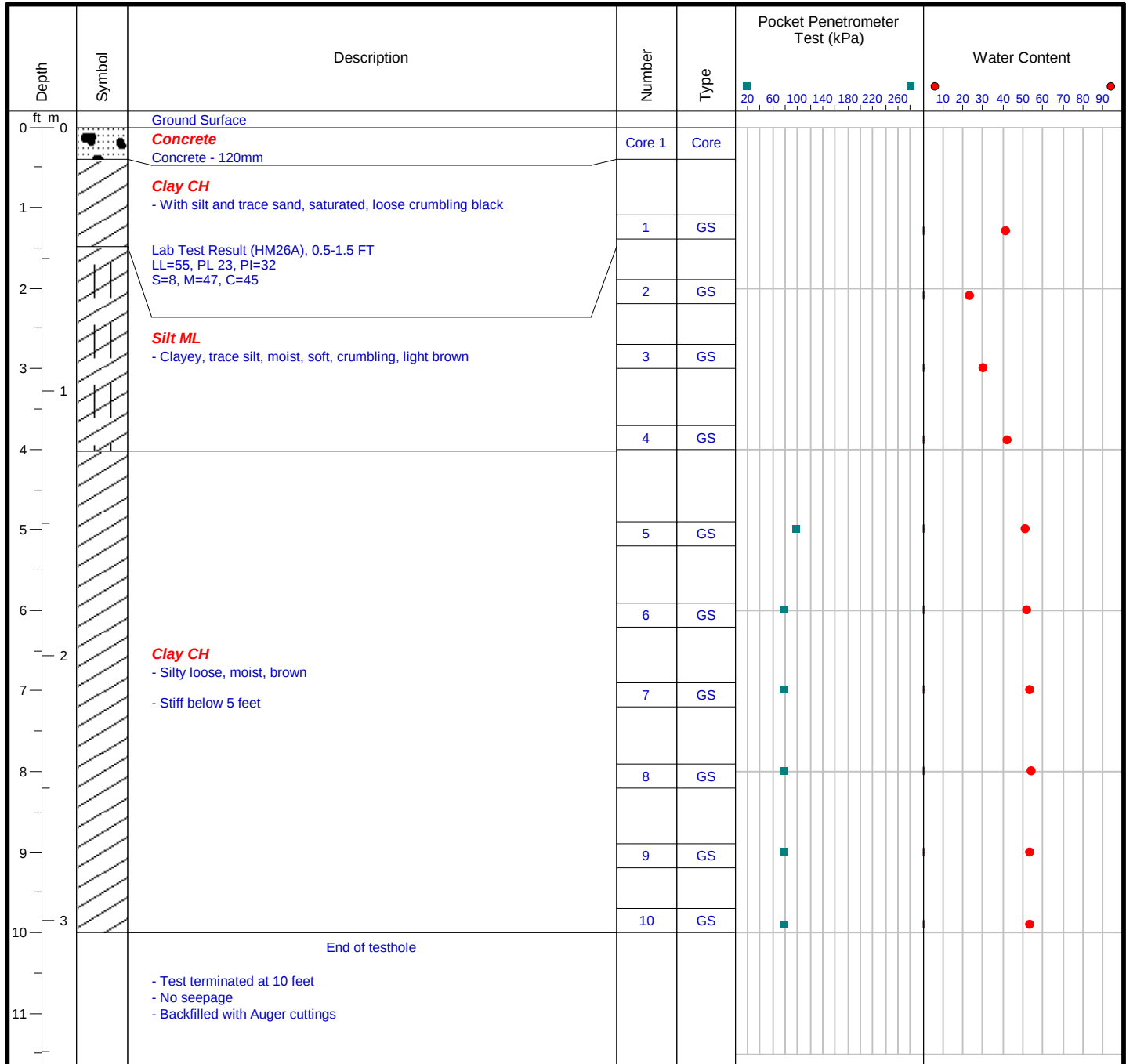
Client:	AECOM Canada ULC	Project No:	112-2503
	99 Commerce Drive, Winnipeg	Test No.:	
	MB R3P 0Y7	Lab No.:	HM 27 - (Rupert Ave)
Attention:	Ryan Cunningham	Date Sampled / By:	27-Feb-25 Mayumi Kawar
Project:	2025 Regional and Local Str	Date Received:	27-Feb-25
		Date Tested / By:	28-Feb-25 Le Yang

Test Hole No.	TH-2				
Depth	7.5'-10'				
Tare No.	K066				
Wt Wet Sample + Tare	146.1				
Wt Dry Sample + Tare	99.3				
Wt Water	46.8				
Wt Tare					
Wt Dry Sample	99.3				
Moisture Content (%)	47.1				
Test Hole No.	TH-3	TH-3	TH-3	TH-3	TH-3
Depth	0'-0.5'	0.5'-1'	1'-2'	2'-3.5'	3.5'-4.5'
Tare No.	T105	M10	SE4	M24	31C
Wt Wet Sample + Tare	277.4	132.8	110.6	153.5	122.6
Wt Dry Sample + Tare	225.5	100.3	85.9	121.4	107
Wt Water	51.9	32.5	24.7	32.1	15.6
Wt Tare	4.4	4.7	4.4	5.0	42.2
Wt Dry Sample	221.1	95.6	81.5	116.4	64.8
Moisture Content (%)	23.5	34.0	30.3	27.6	24.1
Test Hole No.	TH-3	TH-3	TH-3	TH-3	TH-3
Depth	4.5'-5.5'	5.5'-6'	6'-7'	7'-8'	8'-8.5'
Tare No.	12C	4C	22	21	29
Wt Wet Sample + Tare	159.6	127.6	155	141.5	135.6
Wt Dry Sample + Tare	130.5	101.1	119.3	110.4	106.5
Wt Water	29.1	26.5	35.7	31.1	29.1
Wt Tare	29.7	40.8	40.8	52.3	41.4
Wt Dry Sample	100.8	60.3	78.5	58.1	65.1
Moisture Content (%)	28.9	43.9	45.5	53.5	44.7
Test Hole No.	TH-3				
Depth	8.5'-10'				
Tare No.	20C				
Wt Wet Sample + Tare	123.1				
Wt Dry Sample + Tare	94.3				
Wt Water	28.8				
Wt Tare	40.8				
Wt Dry Sample	53.5				
Moisture Content (%)	53.8				

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada ULC	Project No:	112-2503
	99 Commerce Drive, Winnipeg	Test No.:	
	MB R3P 0Y7	Lab No.:	HM 27 - (Rupert Ave)
Attention:	Ryan Cunningham	Date Sampled / By:	27-Feb-25 Mayumi Kawar
Project:	2025 Regional and Local Str	Date Received:	27-Feb-25
		Date Tested / By:	28-Feb-25 Camille Barela

Test Hole No.	TH-4	TH-4	TH-4	TH-4	TH-4
Depth	0'-1'	1'-1.5'	1.5'-2'	2'-4'	4'-5'
Tare No.	C1	C2	C3	C4	C5
Wt Wet Sample + Tare	218.3	223.4	244.4	227.9	239.6
Wt Dry Sample + Tare	176.1	175.2	189.8	176.3	188
Wt Water	42.2	48.2	54.6	51.6	51.6
Wt Tare	4.4	4.4	4.4	4.4	4.4
Wt Dry Sample	171.7	170.8	185.4	171.9	183.6
Moisture Content (%)	24.6	28.2	29.4	30.0	28.1
Test Hole No.	TH-4	TH-4	TH-4	TH-4	TH-4
Depth	5'-5.5'	5.5'-6	6'-7'	7'-8'	8'-10'
Tare No.	C6	C7	C8	C9	C10
Wt Wet Sample + Tare	235.8	247.8	244.2	229.8	226.7
Wt Dry Sample + Tare	179.5	196.1	186.6	157	149.6
Wt Water	56.3	51.7	57.6	72.8	77.1
Wt Tare	4.4	4.5	4.4	4.4	4.5
Wt Dry Sample	175.1	191.6	182.2	152.6	145.1
Moisture Content (%)	32.2	27.0	31.6	47.7	53.1
Test Hole No.					
Depth					
Tare No.					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					
Test Hole No.					
Depth					
Tare No.					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					



Drill Method: Auger

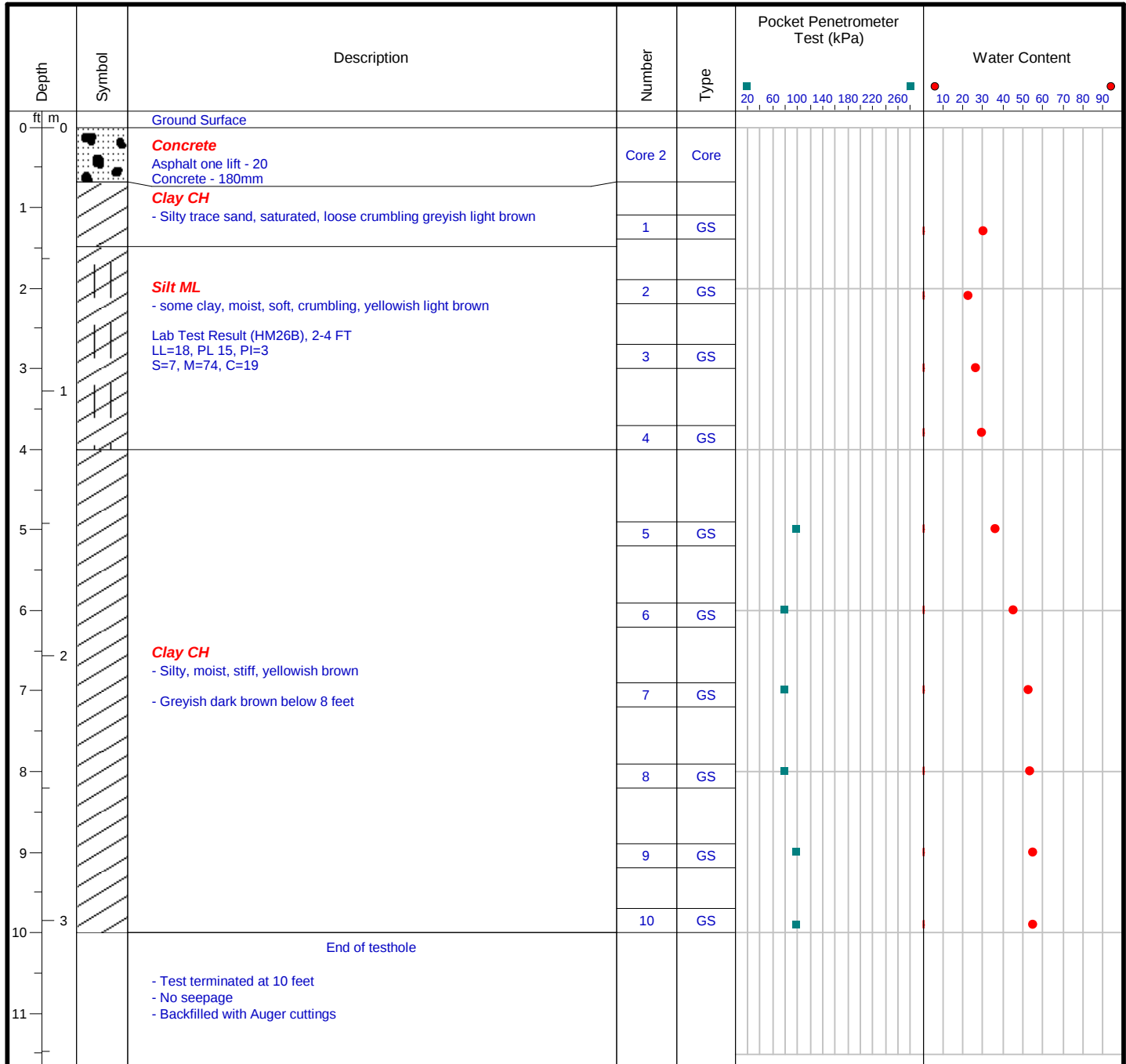
Drill Date: February 29, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Drill Method: Auger

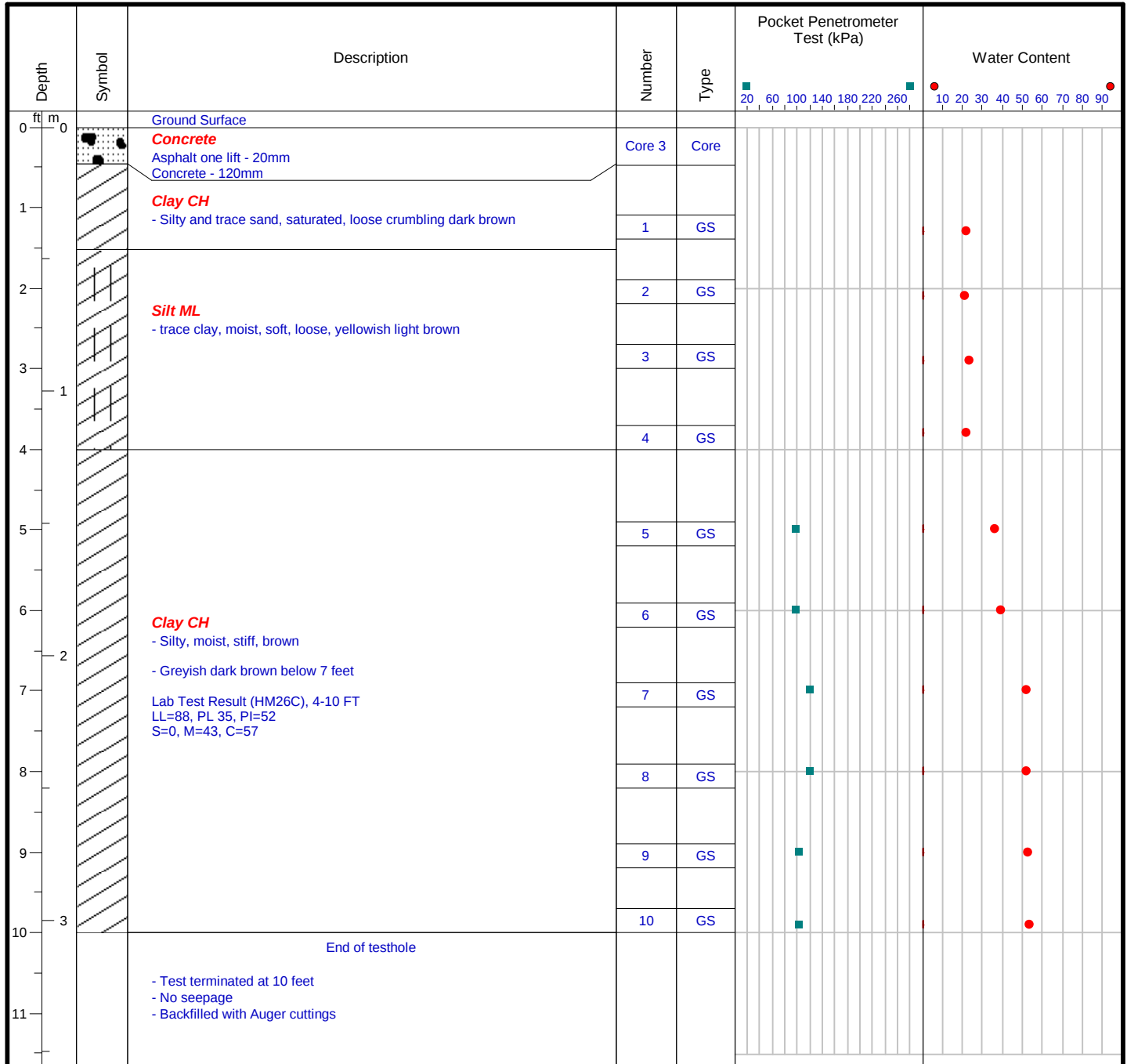
Drill Date: February 29, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Drill Method: Auger

Drill Date: February 29, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

Client: AECOM Canada ULC
99 Commerce Drive, Winnipeg
MB R3P 0Y7

Project No: 112-2503

Attention: Ryan Cunningham

Lab No: HM 26

Date sampled: February 27, 2025

Project 2025 Regional and Local Street Renewal Program –

Date Received: February 27, 2025

Location: Local Streets Pkg 25-R-09

Date Tested /By: March 5, 2025 JJ

SAMPLE DATA

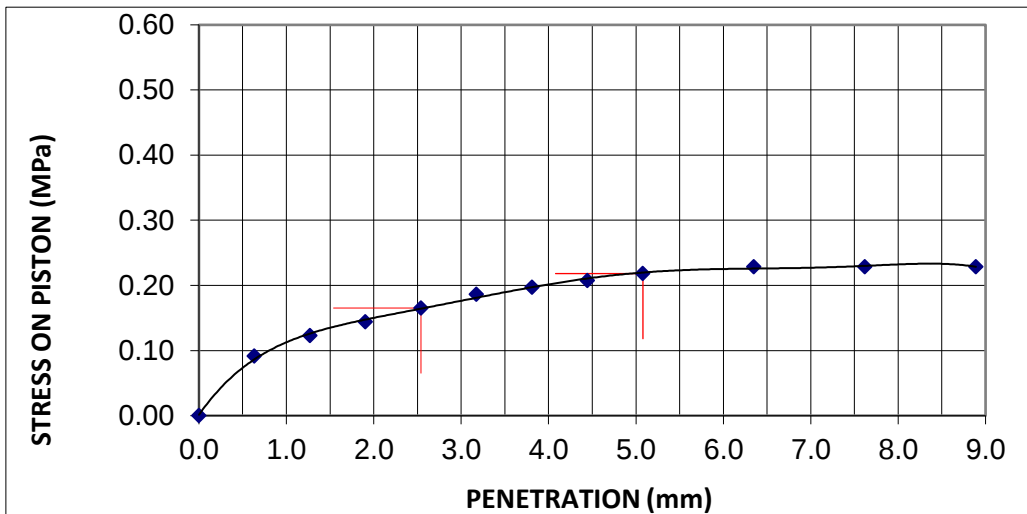
SPECIMEN DATA

Sample Type: CH - Fat Clay	DESCRIPTION	Before Soaking	After Testing
Source: Beacon Street, TH 2 at 4-6 ft	Moisture Content (MC), %	32.0	42.5
Sampled by: Mayumi Kawano	MC of top 25mm layer, %		
Optimum Moisture Content: 32.0 %	Dry Density, kg/m ³	1441	1365
Maximum Dry Density: 1405 kg/cm ³	Compaction, %	103%	
Method of Compaction: Standard Proctor	CBR (at 2.5 mm penetration), %		2.4
Tested by: MK	Swell, %		6.5
Date Tested: 28-Feb-25			

LOAD DATA

LOAD PENETRATION CURVE

PENETRATION mm	STRESS MPa
0	0.00
0.64	0.09
1.27	0.12
1.91	0.14
2.54	0.17
3.18	0.19
3.81	0.20
4.45	0.21
5.08	0.22
6.35	0.23
7.62	0.23
8.89	0.23



PENETRATION mm	STANDARD LOAD MPa	TEST LOAD		BEARING RATIO (soaked)	
		ACTUAL MPa	CORRECTED MPa	at 2.5 mm penetration	at 5.1 mm penetration
2.54	6.9	0.17	0.17	2.4	-
5.08	10.3	0.22	0.22	-	2.1

Remarks:

Reviewed by: *P. Bevel*
Paul Bevel

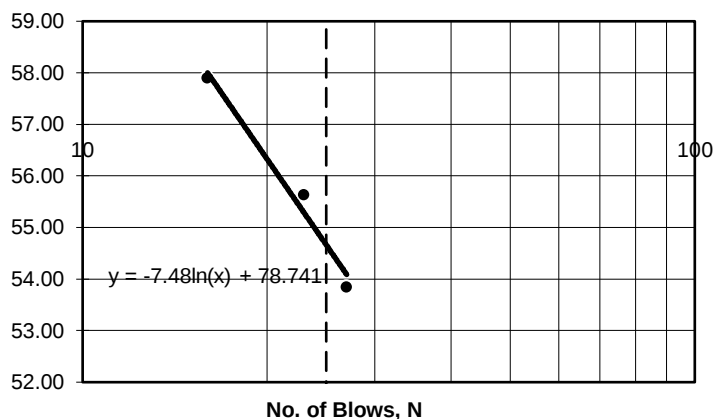
Atterberg Limits (ASTM D4318)

CLIENT:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.: 112-2503
ATTENTION:	Ryan Cunningham	PSA Test No.: 4
PROJECT:	2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	Lab No.: HM 26A

Liquid Limit Determination

Dish No.:	2	2	3	Feb 29, 2025	Liquid Limit 25 Blows
Wet Soil + Dish:	46.02	45.58	45.52		
Dry Soil + Dish:	44.20	44.00	43.76		
Moisture:	1.82	1.58	1.76		
Dish:	40.82	41.16	40.72		
Dry Soil:	3.38	2.84	3.04		
% Moisture:	53.85	55.63	57.89		
No. of Blows:	27	23	16		
Liquid Limit:					55

Liquid Limit



Material ID:
CH - Fat Clay
Beacon St.
TH 1 at 1-2 ft

Liquid Limit, %: **55**
Plastic Limit, %: **23**
Plasticity Index: **32**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3	
Wet Soil + Dish:	10.74	10.97	10.83	
Dry Soil + Dish:	9.62	9.71	9.65	
Moisture:	1.12	1.26	1.18	
Dish:	4.45	4.36	4.4	
Dry Soil:	5.17	5.35	5.25	
% Moisture:	21.66	23.55	22.48	
				Average:
				23

Test Method : ASTM: D4318, D2216

Remarks:

P. Bevel

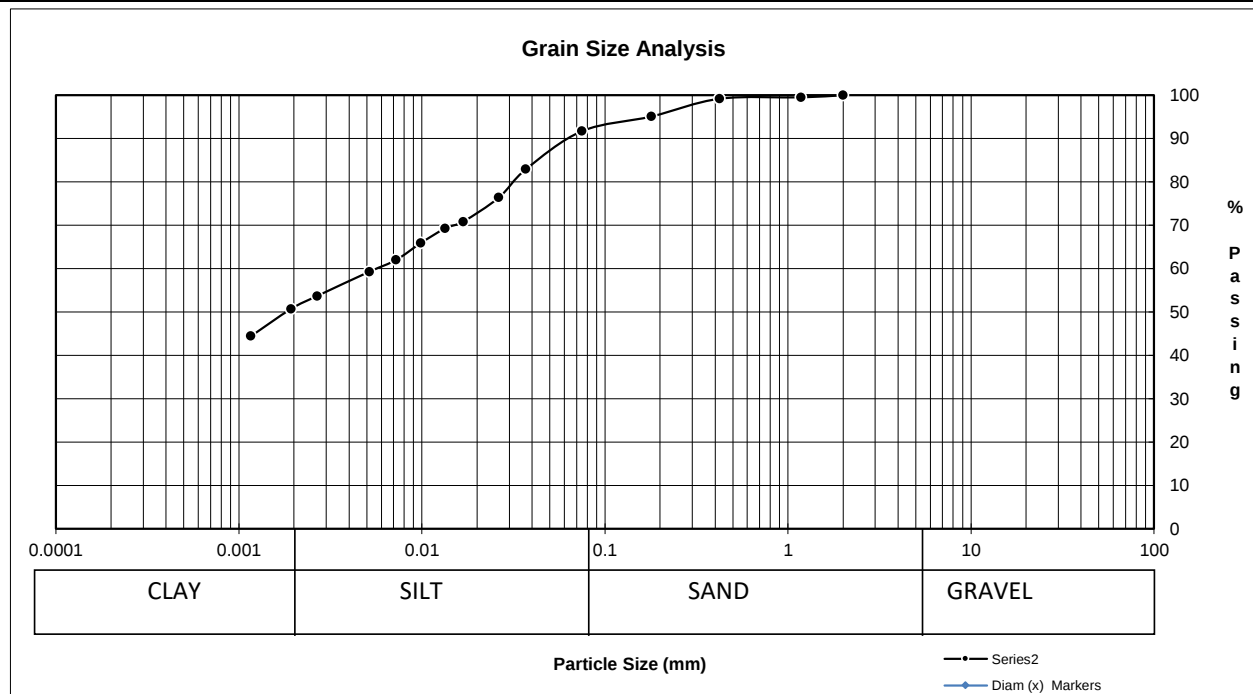
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada ULC
99 Commerce Drive, Winnipeg
MB R3P 0Y7
ATTENTION: Ryan Cunningham
PROJECT: 2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09

Project No.: 112-2503
PSA Test No.: 4
Lab No.: HM 26A

Date Sampled:	28-Feb-25	Date Received:	Feb 28, 2025	Sieve Analysis		Hydrometer Analysis	
Sampled By:	MK	Date Tested:	Feb 29, 2025	Sieve (mm)	% Passing	Diameter	% Finer
Material ID	CH - Fat Clay			50.00	100.0		
Sample Source	Beacon Street			37.50	100.0		
	(From Logan Ave to Alexander Ave)			25.00	100.0		
B.H./T.H. No.	TH 1 at 1-2 ft			19.00	100.0		
				16.00	100.0		
				12.50	100.0	0.0370	82.9
				9.50	100.0	0.0263	76.4
				4.75	100.0	0.0168	70.8
				2.00	100.0	0.0134	69.3
				1.18	99.5	0.0099	65.9
				0.425	99.2	0.0072	62.0
				0.180	95.1	0.0052	59.3
				0.075	91.7	0.0012	44.4



	% Composition		D10
	0.00	Gravel	D30
	8.29	Sand	D60
	46.66	Silt	Cu
	45.04	Clay	Cc

Remarks:

P. Bevel

Technician: MK

Reviewed by Paul Bevel

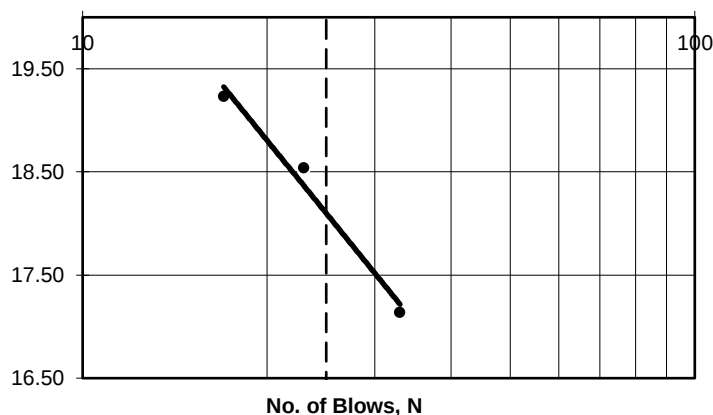
Atterberg Limits (ASTM D4318)

CLIENT:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.: 112-2503
ATTENTION:	Ryan Cunningham	PSA Test No.: 5
PROJECT:	2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	Lab No.: HM 26B

Liquid Limit Determination

Dish No.:	2	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	47.5	51	50.32		
Dry Soil + Dish:	46.53	49.43	48.82		
Moisture:	0.97	1.57	1.5		
Dish:	40.87	40.96	41.02		
Dry Soil:	5.66	8.47	7.8		
% Moisture:	17.14	18.54	19.23		
No. of Blows:	33	23	17		
Liquid Limit:					18

$$y = -3.178 \ln(x) + 28.33 \quad \text{Liquid Limit}$$



Material ID:

ML - Silt
Beacon St.
TH 2 at 2-4 ft

Liquid Limit, %: **18**
Plastic Limit, %: **15**
Plasticity Index: **3**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	11.33	11.38	11.2		
Dry Soil + Dish:	10.44	10.48	10.30		
Moisture:	0.89	0.90	0.9		
Dish:	4.43	4.41	4.37		
Dry Soil:	6.01	6.07	5.93		
% Moisture:	14.81	14.83	15.18		
				Average:	15

Test Method : ASTM: D4318, D2216

Remarks:

P. Bevel

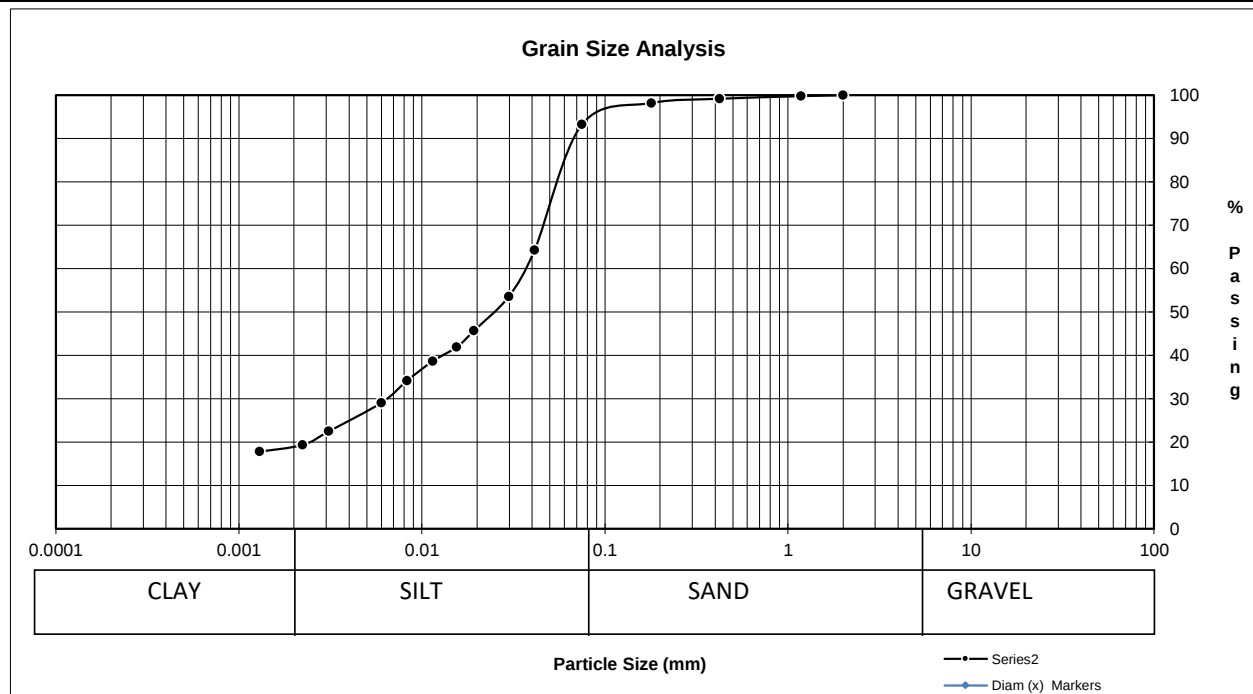
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada ULC
99 Commerce Drive, Winnipeg
MB R3P 0Y7
ATTENTION: Ryan Cunningham
PROJECT: 2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09

Project No.: 112-2503
PSA Test No.: 5
Lab No.: HM 26B

Date Sampled:	28-Feb-25	Date Received:	Feb 28, 2025	Sieve Analysis		Hydrometer Analysis	
Sampled By:	MK	Date Tested:	Feb 29, 2025	Sieve (mm)	% Passing	Diameter	% Finer
Material ID	ML - Silt			50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
Sample Source	Beacon Street			16.00	100.0		
	(From Logan Ave to Alexander Ave)			12.50	100.0	0.0413	64.3
B.H./T.H. No.	TH 2 at 2-4 ft			9.50	100.0	0.0299	53.6
				4.75	100.0	0.0193	45.7
				2.00	100.0	0.0155	41.9
				1.18	99.8	0.0115	38.7
				0.425	99.2	0.0083	34.2
				0.180	98.2	0.0060	29.1
				0.075	93.3	0.0013	17.8



	% Composition		D10
	6.74	Gravel	D30
	74.31	Sand	D60
	18.95	Silt	Cu
		Clay	Cc

Remarks:

P. Bevel

Technician:

MK

Reviewed by Paul Bevel

Atterberg Limits (ASTM D4318)

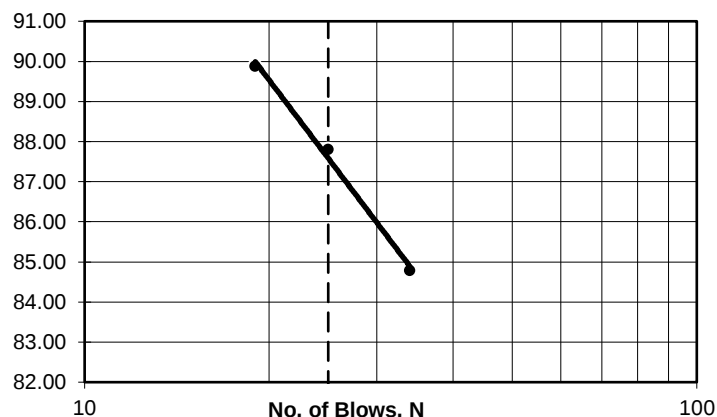
CLIENT:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.: 112-2503
ATTENTION:	Ryan Cunningham	PSA Test No.: 6
PROJECT:	2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	Lab No.: HM 26C

Liquid Limit Determination

Dish No.:	2	2	3		Liquid Limit 25 Blows
Wet Soil + Dish:	11.16	12.25	10.63		
Dry Soil + Dish:	8.04	8.58	7.7		
Moisture:	3.12	3.67	2.93		
Dish:	4.36	4.4	4.44		
Dry Soil:	3.68	4.18	3.26		
% Moisture:	84.78	87.80	89.88		
No. of Blows:	34	25	19		
Liquid Limit:					88

$$y = -8.776 \ln(x) + 115.83$$

Liquid Limit



Material ID:

CH - Fat Clay
Beacon St.
TH 3 at 4-10 ft

Liquid Limit, %: **88**
Plastic Limit, %: **35**
Plasticity Index: **52**
(LL-PL)

Plastic Limit Determination

Dish No.:	1	2	3		
Wet Soil + Dish:	9.36	10.2	9.72		
Dry Soil + Dish:	8.15	8.78	8.16		
Moisture:	1.21	1.42	1.56		
Dish:	4.64	4.61	4.01		
Dry Soil:	3.51	4.17	4.15		
% Moisture:	34.47	34.05	37.59		
				Average:	35

Test Method : ASTM: D4318, D2216

Remarks:

P. Bevel

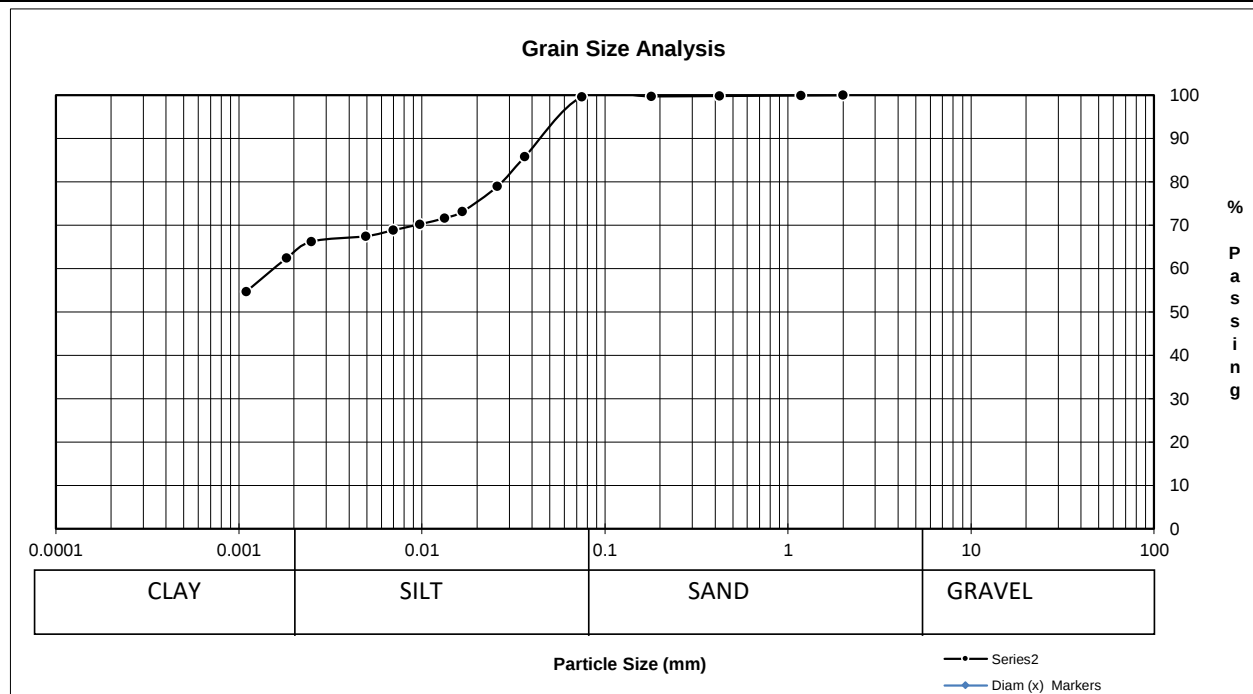
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada ULC
99 Commerce Drive, Winnipeg
MB R3P 0Y7
ATTENTION: Ryan Cunningham
PROJECT: 2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09

Project No.: 112-2503
PSA Test No.: 6
Lab No.: HM 26C

Date Sampled:	28-Feb-25	Date Received:	Feb 28, 2025	Sieve Analysis	Hydrometer Analysis
Sampled By:	MK	Date Tested:	Feb 29, 2025	Sieve (mm) % Passing	Diameter % Finer
Material ID	CH - Fat Clay			50.00 100.0	
				37.50 100.0	
				25.00 100.0	
				19.00 100.0	
Sample Source	Beacon Street			16.00 100.0	
	(From Logan Ave to Alexander Ave)			12.50 100.0	0.0365 85.8
B.H./T.H. No.	TH 3 4-10 ft			9.50 100.0	0.0259 79.0
				4.75 100.0	0.0167 73.2
				2.00 100.0	0.0133 71.6
				1.18 99.9	0.0098 70.2
				0.425 99.8	0.0070 68.9
				0.180 99.7	0.0050 67.5
				0.075 99.6	0.0011 54.7



% Composition		D10
0.35	Gravel	D30
42.91	Sand	D60
56.74	Silt	Cu
	Clay	Cc

Remarks:

P. Bevel

Technician: MK

Reviewed by Paul Bevel

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada ULC	Project No:	112-2503
	99 Commerce Drive, Winnipeg	Test No.:	
	MB R3P 0Y7	Lab No.:	HM 26 - (Beacon St.)
Attention:	Ryan Cunningham	Date Sampled / By:	February 27, 20 Mayumi Kawan
Project:	2025 Regional and Local Str	Date Received:	February 27, 2025
		Date Tested / By:	February 28, 20 Carla Labadan

Test Hole No.	TH-1	TH-1	TH-1	TH-1	TH-1
Depth	0'-1'	1'-2'	2'-4'	4'-6'	6'-8'
Tare No.	T122	5-23	2-23	HM-2	G1
Wt Wet Sample + Tare	234.9	264.7	229.3	220.9	224
Wt Dry Sample + Tare	167.2	214.9	177.1	156.2	149.5
Wt Water	67.7	49.8	52.2	64.7	74.5
Wt Tare	4.8	4.7	4.7	4.1	4.3
Wt Dry Sample	162.4	210.2	172.4	152.1	145.2
Moisture Content (%)	41.7	23.7	30.3	42.5	51.3
Test Hole No.	TH-1				
Depth	8'-10'				
Tare No.	M49				
Wt Wet Sample + Tare	206.1				
Wt Dry Sample + Tare	135.7				
Wt Water	70.4				
Wt Tare	4.7				
Wt Dry Sample	131.0				
Moisture Content (%)	53.7				
Test Hole No.	TH-2	TH-2	TH-2	TH-2	TH-2
Depth	0'-1'	1'-2'	2'-3'	3'-4'	4'-5'
Tare No.	318	M28	M9	M41	BR17
Wt Wet Sample + Tare	214.8	236.4	224.8	218.6	212
Wt Dry Sample + Tare	165.8	192.6	178.6	170	156.5
Wt Water	49.0	43.8	46.2	48.6	55.5
Wt Tare	4.9	4.6	5.0	4.8	4.5
Wt Dry Sample	160.9	188.0	173.6	165.2	152.0
Moisture Content (%)	30.5	23.3	26.6	29.4	36.5
Test Hole No.	TH-2	TH-2	TH-2	TH-2	
Depth	5'-6'	6'-8'	8'-9'	9'-10'	
Tare No.	T118	1-23	M3	M33	
Wt Wet Sample + Tare	247.9	224.3	206.8	204.5	
Wt Dry Sample + Tare	171.9	148.5	135.9	133.3	
Wt Water	76.0	75.8	70.9	71.2	
Wt Tare	4.2	4.6	4.7	5.0	
Wt Dry Sample	167.7	143.9	131.2	128.3	
Moisture Content (%)	45.3	52.7	54.0	55.5	

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada ULC	Project No:	112-2503
	99 Commerce Drive, Winnipeg	Test No.:	
	MB R3P 0Y7	Lab No.:	HM 26 - (Beacon St.)
Attention:	Ryan Cunningham	Date Sampled / By:	February 27, 20 Mayumi Kawanishi
Project:	2025 Regional and Local Streets	Date Received:	February 27, 2025
		Date Tested / By:	February 28, 20 Carla Labadan

Test Hole No.	TH-3	TH-3	TH-3	TH-3	TH-3
Depth	0'-1'	1'-2'	2'-3'	3'-4'	4'-5'
Tare No.	27	5	24	21	30
Wt Wet Sample + Tare	134.2	161.5	136.8	150.3	148.1
Wt Dry Sample + Tare	117.1	137.8	118.6	128.1	119.5
Wt Water	17.1	23.7	18.2	22.2	28.6
Wt Tare	40.7	29.1	41.1	29.0	41.2
Wt Dry Sample	76.4	108.7	77.5	99.1	78.3
Moisture Content (%)	22.4	21.8	23.5	22.4	36.5
Test Hole No.	TH-3	TH-3	TH-3		
Depth	5'-6'	6'-9'	9'-10'		
Tare No.	23	35	17		
Wt Wet Sample + Tare	144.1	154	160		
Wt Dry Sample + Tare	115.1	115.2	118.7		
Wt Water	29.0	38.8	41.3		
Wt Tare	40.9	41.1	40.9		
Wt Dry Sample	74.2	74.1	77.8		
Moisture Content (%)	39.1	52.4	53.1		
Test Hole No.					
Depth					
Tare No.					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					
Test Hole No.					
Depth					
Tare No.					
Wt Wet Sample + Tare					
Wt Dry Sample + Tare					
Wt Water					
Wt Tare					
Wt Dry Sample					
Moisture Content (%)					

APPENDIX B

Rehabilitation Sites

B.1 Pavement Coring Locations

B.2 Pavement Structure Measurement

B.3 Picture of Cores

Rehabilitation Sites

Pavement Coring and Subsurface Drilling Locations



Rehabilitation Sites

Pavement Structure Measurement

Test Hole No.	Test Hole Location	Asphalt Thickness (mm)	Concrete Thickness (mm)
Bangor Ave (From St. James St to Notre Dame Ave)			
CH1	Near St. James St., near front parking of Materials Distribution Agency, 14U 629336mE 5530579mN		200
CH2	Near back parking of Materials Distribution Agency at Bangor Av 14U 629393mE 5530577mN		220
CH3	Near front parking of EPLS Group of Companies at Bangor Av 14U 629427mE 5530574mN		240
CH4	Near back parking of EPLS Group of Companies at Bangor Av 14U 629510mE 5530574mN		200
CH5	Side of Eaton building at Bangor Av 14U 629585mE 5530573mN		195
CH6	Parking entrance in between side of Eaton Building and Tim Hortons at Bangor Av 14U 629672mE 5530571mN		220
CH7	Near Notre Dame Ave, near Tim Hortons at Bangor Av 14U 629749mE 5530585mN		225

Rehabilitation Sites

Pavement Structure Measurement

Test Hole No.	Test Hole Location	Asphalt Thickness (mm)	Concrete Thickness (mm)
Orange St <i>(From Dublin Ave to Bangor Ave)</i>			
CH1	Near Dublin Av, side of Pro Upfitters / Specialty Vehicle Upfitters 14U 629640mE 5530365mN		210
CH2	Side of Dino's Storage near post 14U 629643mE 5530434mN		205
CH3	Side of Dino's Storage near back parking entrance 14U 629643mE 5530470mN		212
CH4	Middle of Orange St. near Winnipeg Police Service Vehicle 14U 629644mE 5530511mN		210
CH5	Near Bangor Av 14U 629641mE 5530554mN		220

Rehabilitation Site

Picture of Cores

Bangor Ave

(From St. James St to Notre Dame Ave)



Core 1



Core 2



Core 3



Core 4



Core 4



Core 5

Rehabilitation Site

Picture of Cores

Bangor Ave

(From St. James St to Notre Dame Ave)



Core 5



Core 6



Core 7

Orange St

(From Dublin Ave to Bangor Ave)



Core 1



Core 2



Core 2

Rehabilitation Site

Picture of Cores

Orange St (From Dublin Ave to Bangor Ave)



Core 3



Core 3



Core 4



Core 4

Rehabilitation Site

Picture of Cores

Orange St
(From Dublin Ave to Bangor Ave)



Core 5

Rehabilitation Sites

Laboratory Test Reports

CONCRETE CORE COMPRESSIVE STRENGTH TEST REPORT (CSA A23.2 14C)

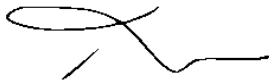
CLIENT:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	DATE:	11-Mar-25
ATTENTION:	Ryan Cunningham	FILE NO:	112-2503
PROJECT:	2025 Regional and Local Street Renewal Program – Local Streets Pkg 25-R-09	REPORT NO:	25-001
STRUCTURE:	Road Slab	TECHNOLOGIST:	M.V., H.A.
		DATE CORES TAKEN:	10-Mar-25
		DOCUMENT NO:	25-335
		DATE RECEIVED IN LAB:	10-Mar-25

Core Location	Length as Drilled (mm)	Core Diameter (mm)	Core Length (mm)	Length / Diameter (mm)	Correction Factor	Mass (kg)	Date of Break	Type of Fracture	Comp. Strength as Calculated (MPa)	Comp. Strength as Corrected (MPa)
BCH-1- WBL Bangor St., 40m W of Notre Dame, 1m S of curb	220	101.1	195	1.93	1	3.54	March 11, 2025	2	51.4	51.4
BCH-2 - EBL Bangor St., 150m E of St. James St., 1m N of curb	205	100.5	197	1.96	1	3.68	March 11, 2025	2	54.0	54.0
O-CH1 - SBL Orange St., 60m S of Bangor Ave., 1m E of curb	170	101.1	155	1.53	0.959	2.72	March 11, 2025	2	28.5	27.3
O-CH2 - NBL Orange St., 60m N of Dublin Ave., 1m W of curb	200	100.8	186	1.85	0.988	3.40	March 11, 2025	2	61.8	61.1

Remarks:

The cores were tested in wet condition in accordance with CSA A23.2 14C. Bangor St. has no correction factor.

Reviewed by:

Mayumi Kawano, Supervisor
Field & Lab Testing Services

Approved by:

Paul Bevel, Manager
Field & Lab Testing Services

CONCRETE CORE COMPRESSIVE STRENGTH TEST REPORT (CSA A23.2 14C)

**Photos of the sample core
Before and after breaking**



Before

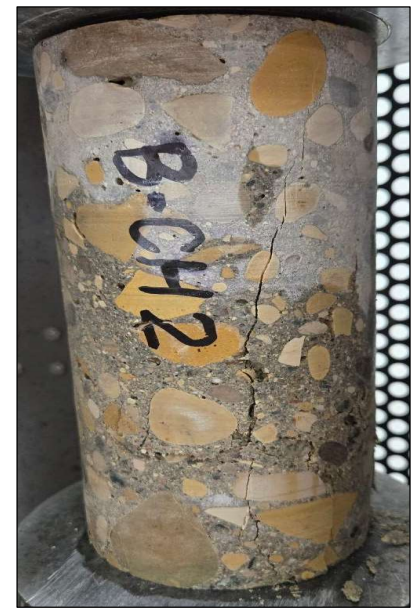


After

BCH-1



Before



After

BCH-2

Attachment 1

CONCRETE CORE COMPRESSIVE STRENGTH TEST REPORT (CSA A23.2 14C)

**Photos of the sample core
Before and after breaking**



Before

O-CH1

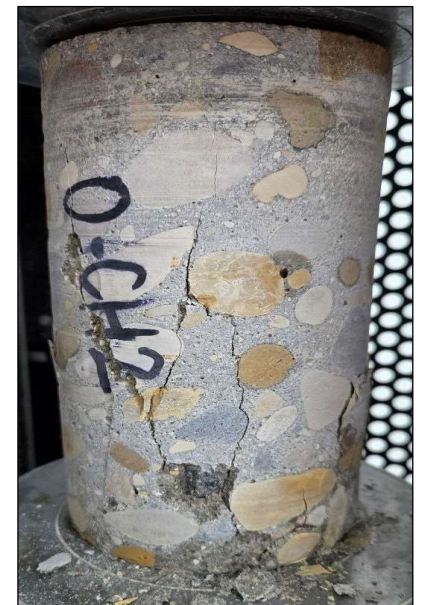


After



Before

O-CH2



After

Attachment 2