

APPENDIX 'G'

GEOTECHNICAL REPORT

2025 Pavement Investigation Program

Residential Streets Package 1

8-2025

Prepared for

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

February 24, 2025

**2025 Pavement Investigation Program
Residential Streets Package 1 (8-2025)**

HMCL Project Number: 112-2501

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Appendix A – Reconstruction Sites

Blossom Bay

Oxbow Bend Rd

Pebblewood Ln

Poole Cres

Appendix B – Rehabilitation Sites

Aldrich Ave

Alenbrook Bay

Allard Ave

Haultain Cres

McDowell Dr

Oxbow Bend Rd

Raquette St

Westlund Way

Introduction

On January 14, 2025, H. Manalo Consulting Ltd. (HMCL) received authorization from Mr. Ryan Cunningham, representing AECOM, to proceed with the scope of work as described in the Subconsultant Agreement dated January 14, 2025. The purpose of the work is to gather information by obtaining pavement cores and sub surface soil samples to help assess the existing road condition.

Field Work Program

The investigation program was performed following the guidelines listed in the City of Winnipeg. Plans for core location reference were provided by AECOM Canada Ltd. As directed by AECOM, all sites to be rehabilitated were to have cores taken at the pavement joints to help assess the condition of the concrete at the joints as well as with additional cores taken mid slab for compressive strength testing. Pavement core samples were obtained between February 3 until February 20. The pavement samples were cored with 160 mm diameter coring bit using a coring equipment. The pavement section was backfilled with aggregates and asphalt cold mix. All pavement samples were returned to HMCL's laboratory for further review.

Sample Review and Data Reporting

The subsurface soil samples were tested for moisture content and visual soil classification with selected samples tested for plasticity index, particle size distribution analysis and CBR testing. The asphalt pavement ranged from 80 mm to 180 mm and the concrete pavement thickness ranges from 125 mm to 185 mm. Thickness measurements are documented for each core samples including pictures for reference.

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

Prepared by:

A handwritten signature in black ink, appearing to read 'Timothy Soneye' with a stylized flourish at the end.

Timothy Soneye, EIT

Geotechnical Engineer Intern

Reviewed by:

A handwritten signature in black ink, appearing to read 'P. Bevel'.

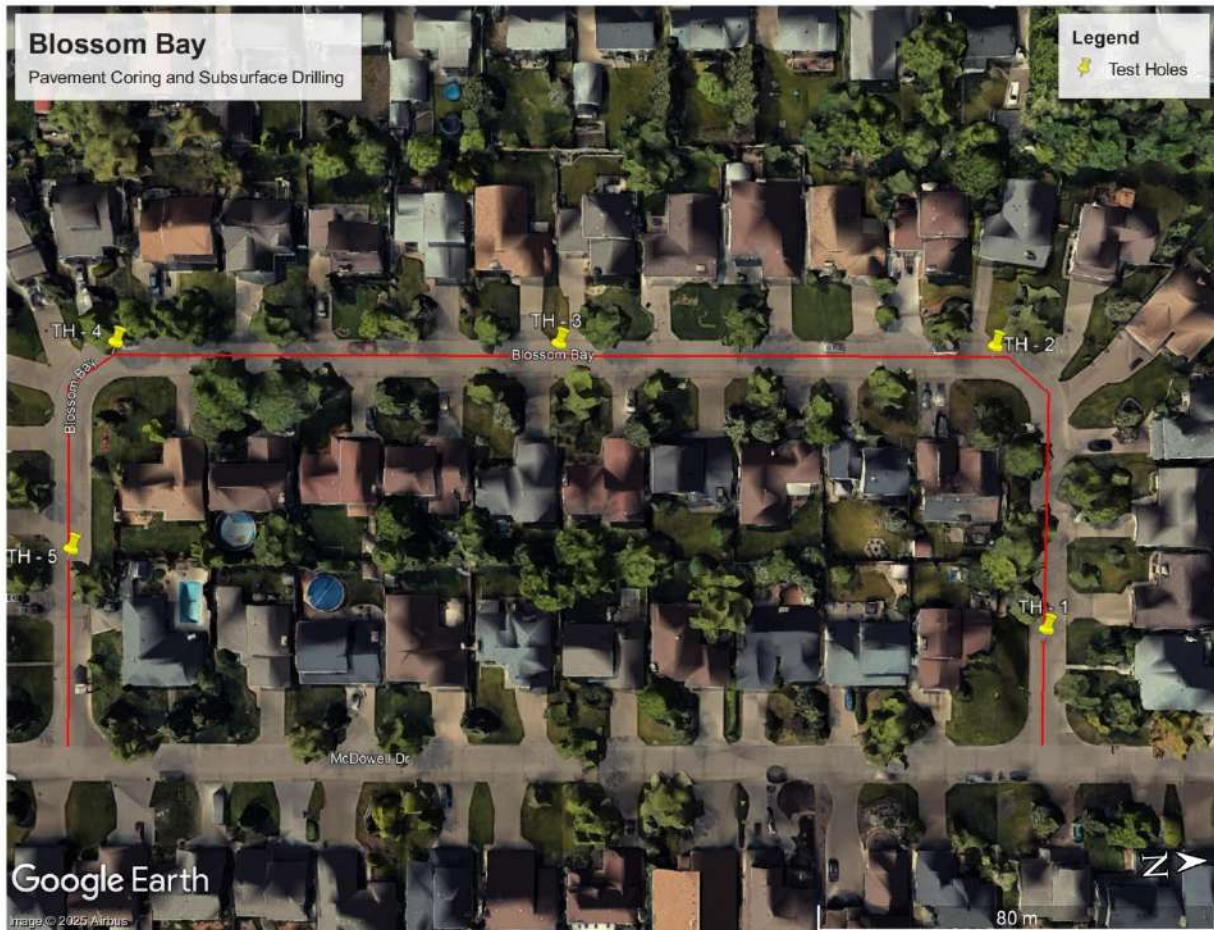
Paul Bevel

Manager, Field and Laboratory Services

APPENDIX A

Reconstruction Sites

Pavement Coring and Subsurface Drilling Locations



Test Hole 1



Test Hole 2



Test Hole 3



Test Hole 4

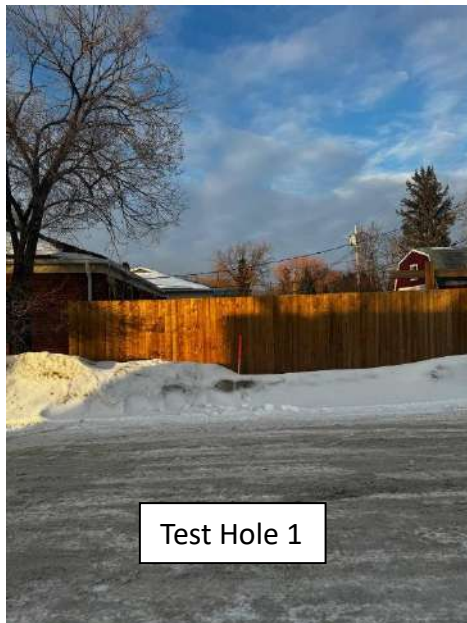


Test Hole 5

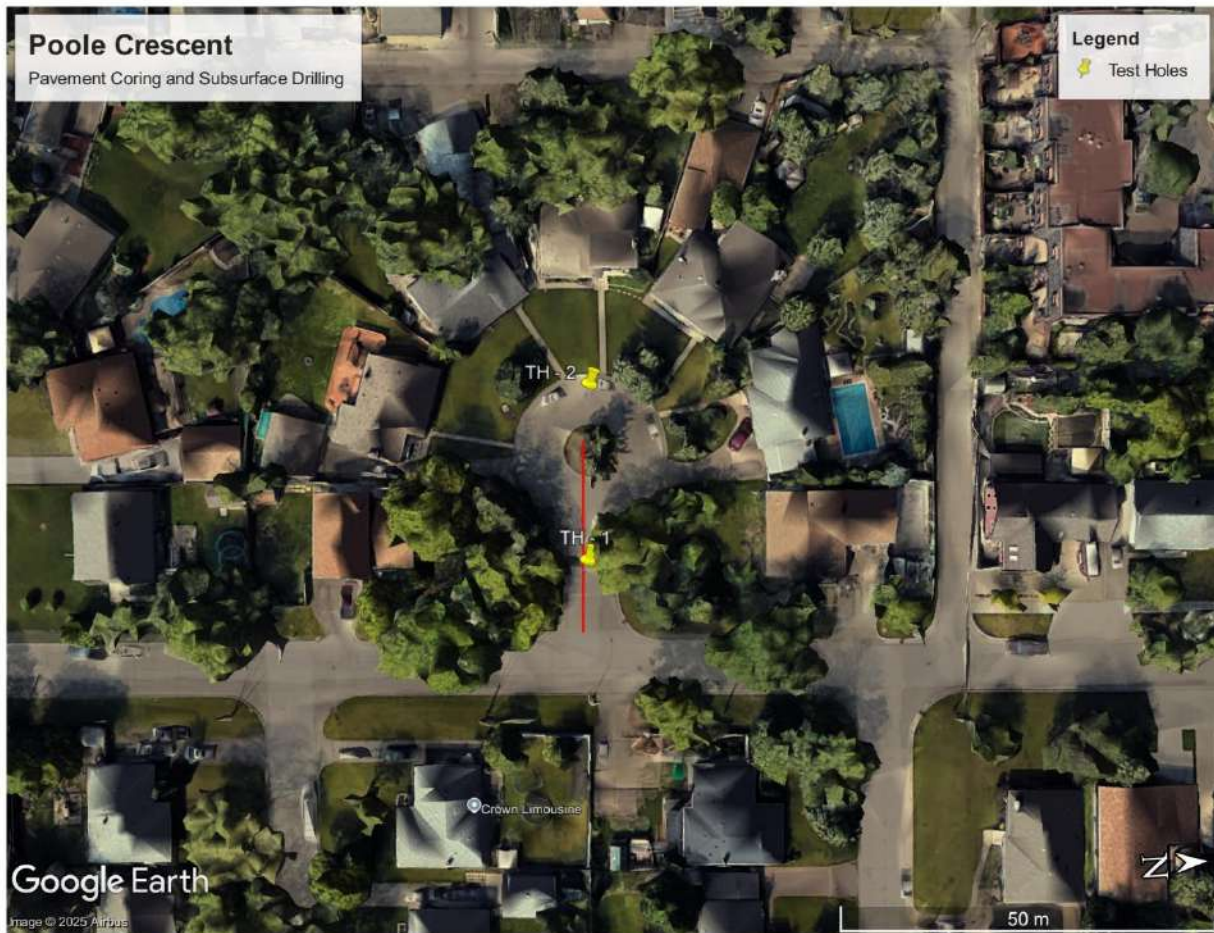
Pavement Coring and Subsurface Drilling Locations



Pavement Coring and Subsurface Drilling Locations



Pavement Coring and Subsurface Drilling Locations



Blossom Bay - SUMMARY TABLE			
TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
TH1	Front of House # 2 Blossom Bay 14 U, 624404 E, 5523500 N		160
TH2	Front of House # 26 Blossom Bay 14 U, 624346 E, 5523491 N		170
TH3	between the front of House # 46 and House # 50 Blossom Bay 14 U, 624342 E, 5523402 N		150
TH4	Front of House # 70 Blossom Bay 14 U, 624339 E, 5523312 N		176
TH5	Front of House # 90 Blossom Bay 14 U, 624381 E, 5523301 N		158

Reconstruction Sites

Pavement Structure Measurement

Oxbow Bend Road - SUMMARY TABLE			
TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
TH1	side of House # 550 St. Charles St 14 U, 620658 E, 5526696 N	125	
TH2	side of House # of 527 Gagnon St 14 U, 620615 E, 5526685 N	146	

Pebblewood Lane - SUMMARY TABLE			
TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
TH1	side of House # 19 Heritage Blvd 14 U, 623365 E, 5527671 N		142
TH2	side of House # 40 Pebblewood Lane 14 U, 623392 E, 5527670 N		175

Reconstruction Sites

Pavement Structure Measurement

Poole Crescent - SUMMARY TABLE			
TEST HOLE NO	TEST HOLE LOCATION	PAVEMENT STRUCTURE	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
TH1	Front of House # 313 Poole Crescent 14 U, 622706 E, 5526091 N		145
TH2	Front of House # 310 Poole Crescent 14 U, 622682 E, 5526093 N		165

Reconstruction Sites

Picture of Cores

BLOSSOM BAY PICTURE OF CORES



TH1 - Front of House # 2 Blossom Bay



TH2 - Front of House # 26 Blossom Bay

Reconstruction Sites

Picture of Cores

BLOSSOM BAY PICTURE OF CORES



TH3 - between the front of House # 46 and House # 50 Blossom Bay



TH4 - Front of House # 70 Blossom Bay

Reconstruction Sites

Picture of Cores

BLOSSOM BAY PICTURE OF CORES



TH5 - Front of House # 90 Blossom Bay

Reconstruction Sites

Picture of Cores

OXBOW BEND ROAD PICTURE OF CORES



TH1 - Side of House # 550 St. Charles St

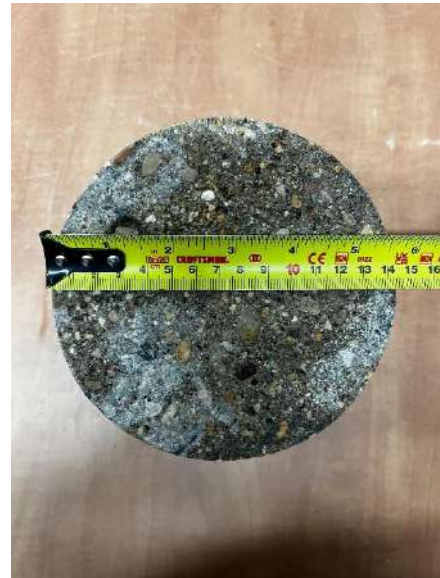


TH2 - Side of House # of 527 Gagnon St

Reconstruction Sites

Picture of Cores

PEBBLEWOOD LANE PICTURE OF CORES



TH1 - Side of House # 19 Heritage Blvd



TH2 - Side of House # 40 Pebblewood Lane

Reconstruction Sites

Picture of Cores

POOLE CRESCENT PICTURE OF CORES



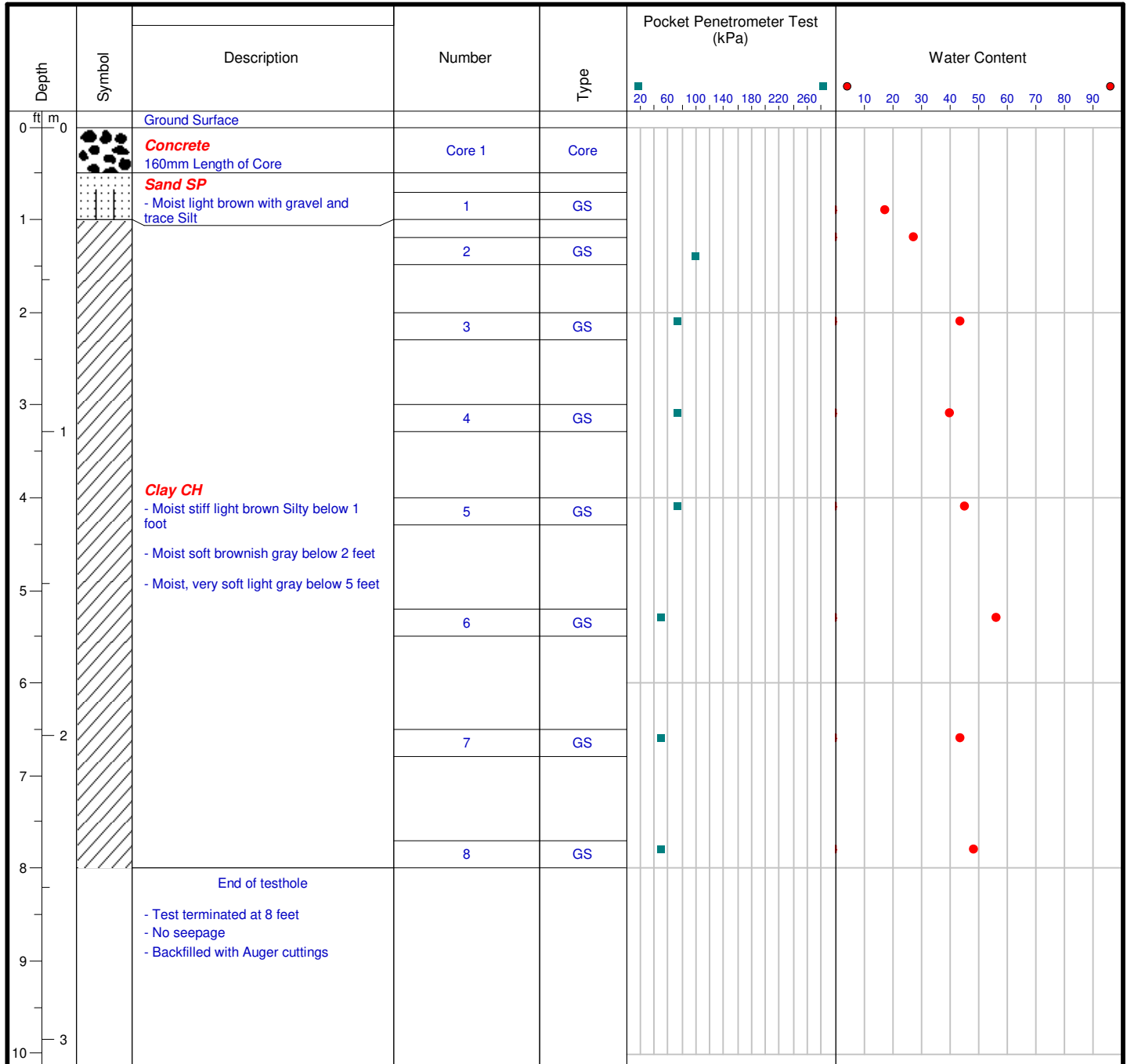
TH1 - Front of House # 313 Poole Crescent



TH2 - Front of House # 310 Poole Crescent

Reconstruction Sites

Soil Logs and Laboratory Test Reports



Drill Method: Auger

Drill Date: February 10, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Project No: 112-2501

Project: Pavement Investigation Program

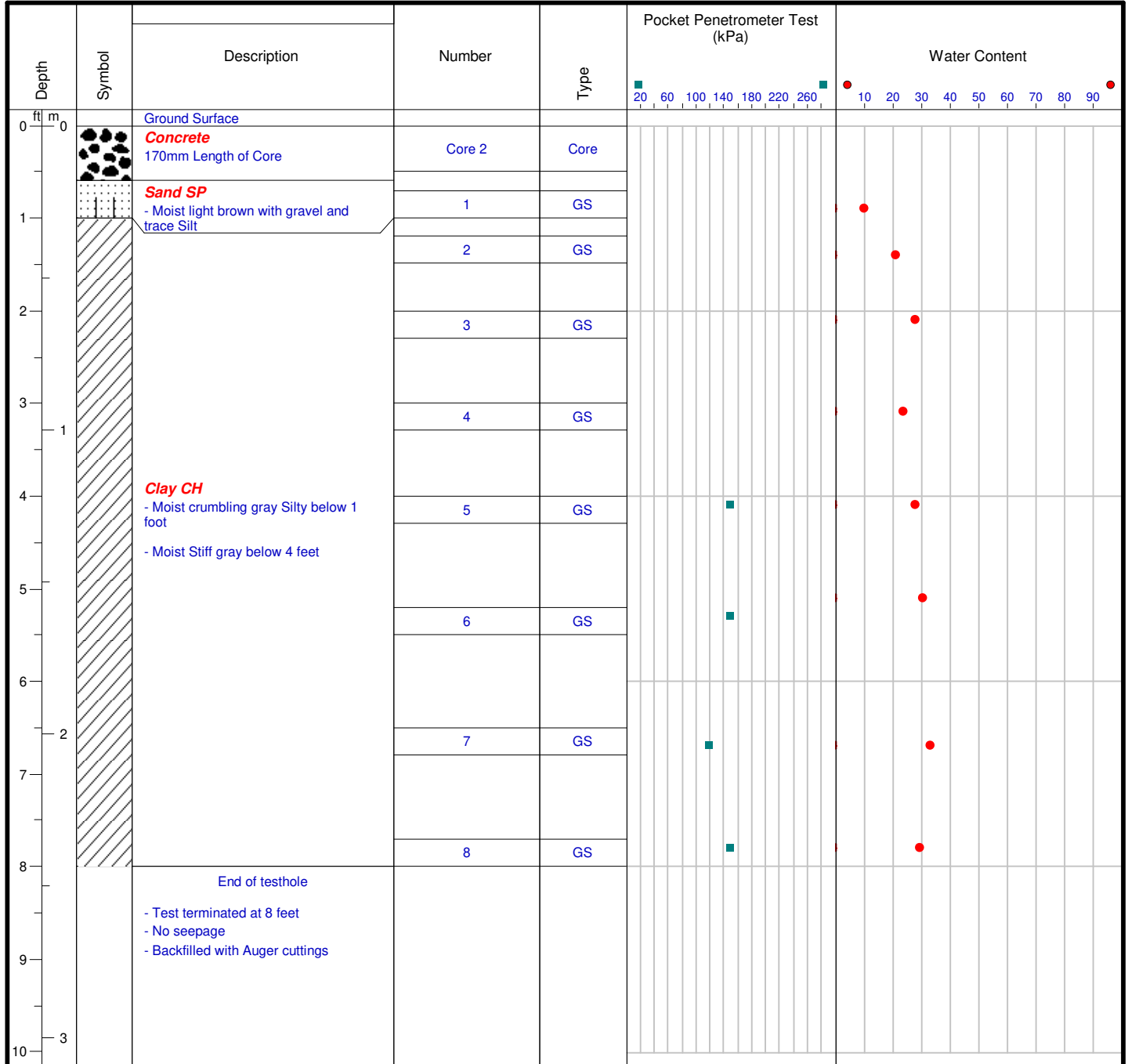
Client: Aecom Canada ULC

Location: Front of House #26 Blossom Bay

TH2

Logged By: Tim

Engineer: T Soneye EIT



Drill Method: Auger

Drill Date: February 10, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Project No: 112-2501

Project: Pavement Investigation Program

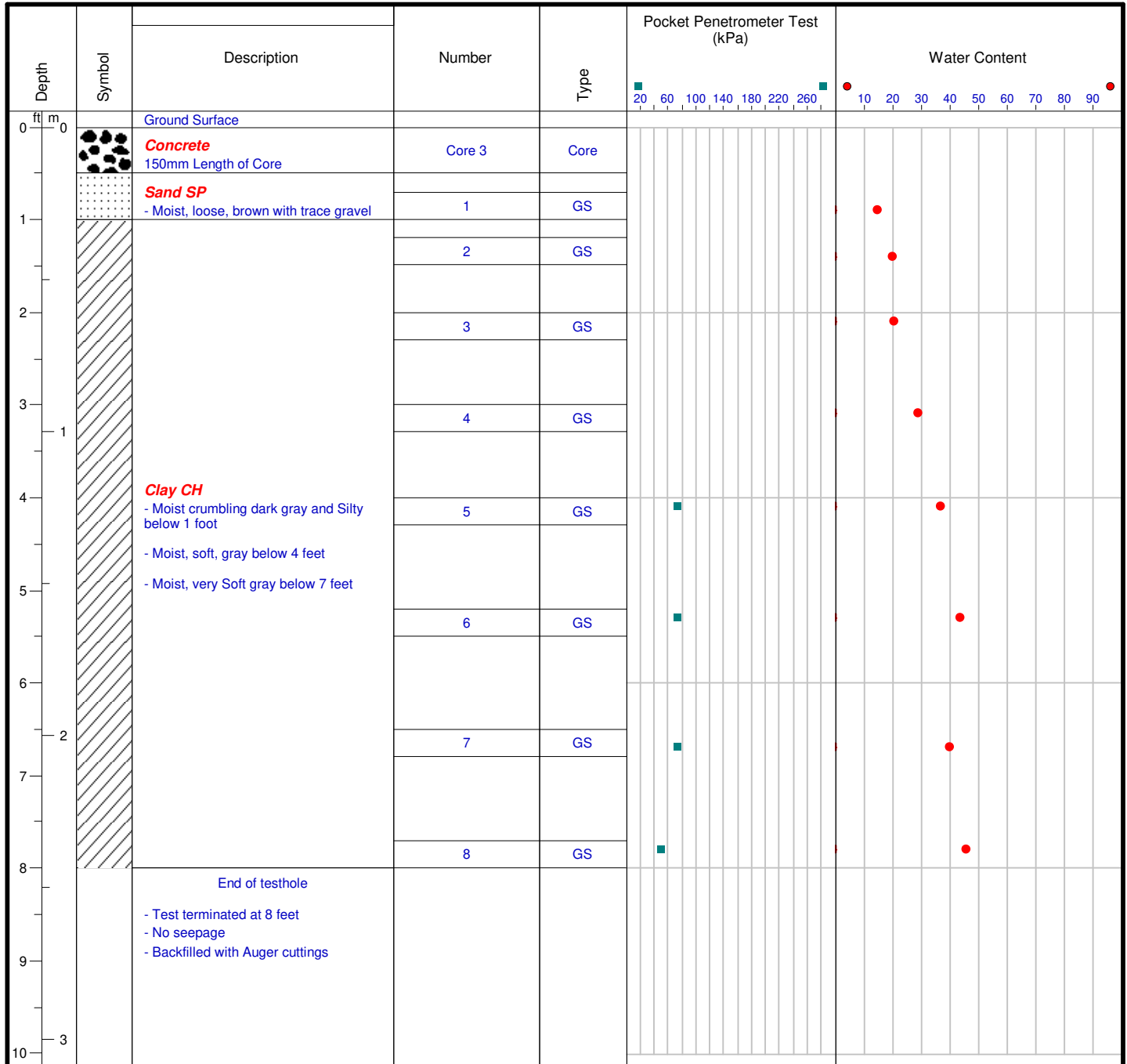
Client: Aecom Canada ULC

Location: Front of House #46 & #50 Blossom Bay

TH3

Logged By: Tim

Engineer: T Soneye EIT



Drill Method: Auger

Drill Date: February 10, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Project No: 112-2501

Project: Pavement Investigation Program

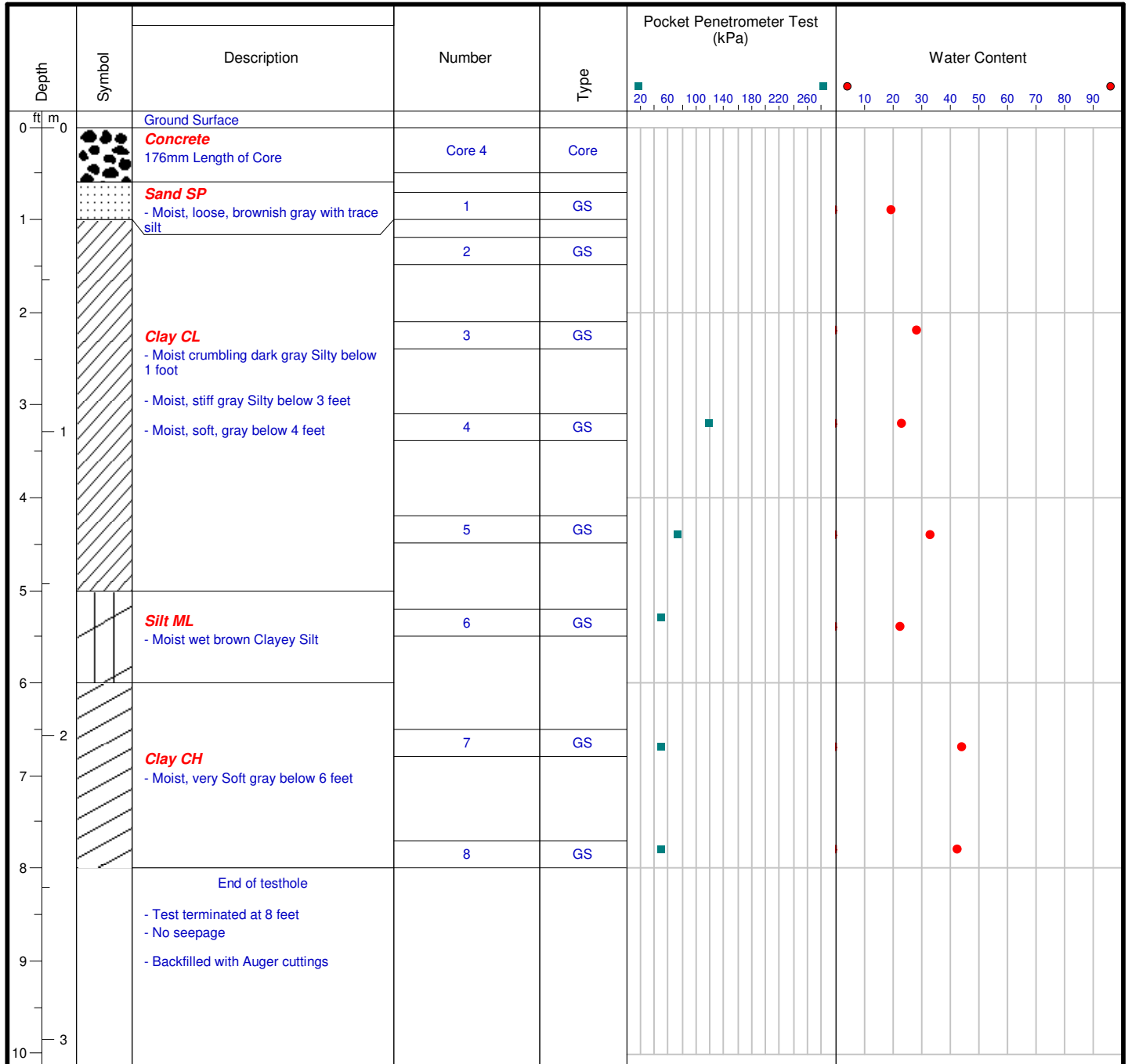
Client: Aecom Canada ULC

Location: Front of House #70 Blossom Bay

TH4

Logged By: Tim

Engineer: T Soneye EIT



Drill Method: Auger

Drill Date: February 10, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Project No: 112-2501

Project: Pavement Investigation Program

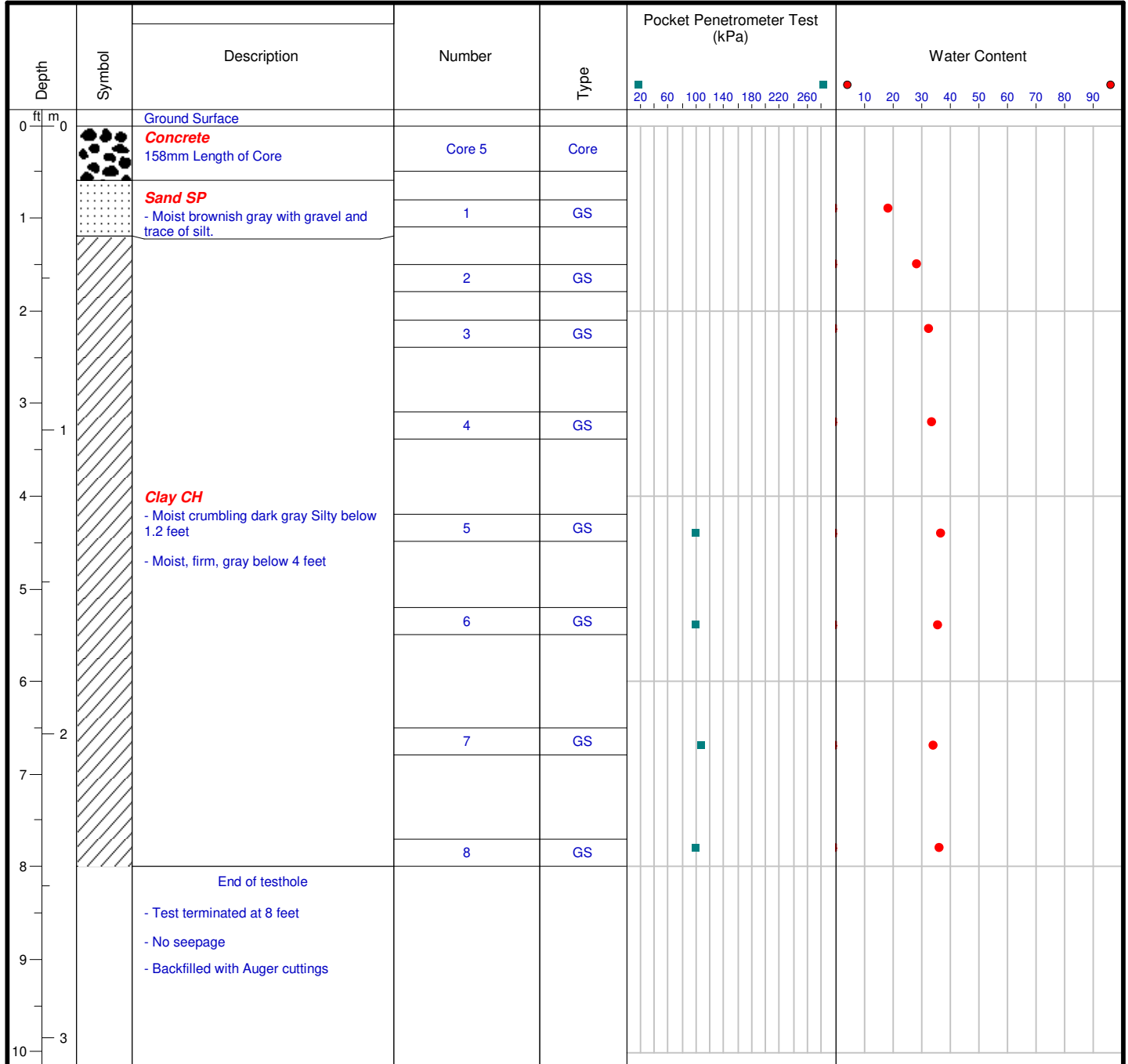
Client: Aecom Canada ULC

Location: Front of House #90 Blossom Bay

TH5

Logged By: Tim

Engineer: T Soneye EIT



Drill Method: Auger

Drill Date: February 10, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Project No: 112-2501

Project: Pavement Investigation Program

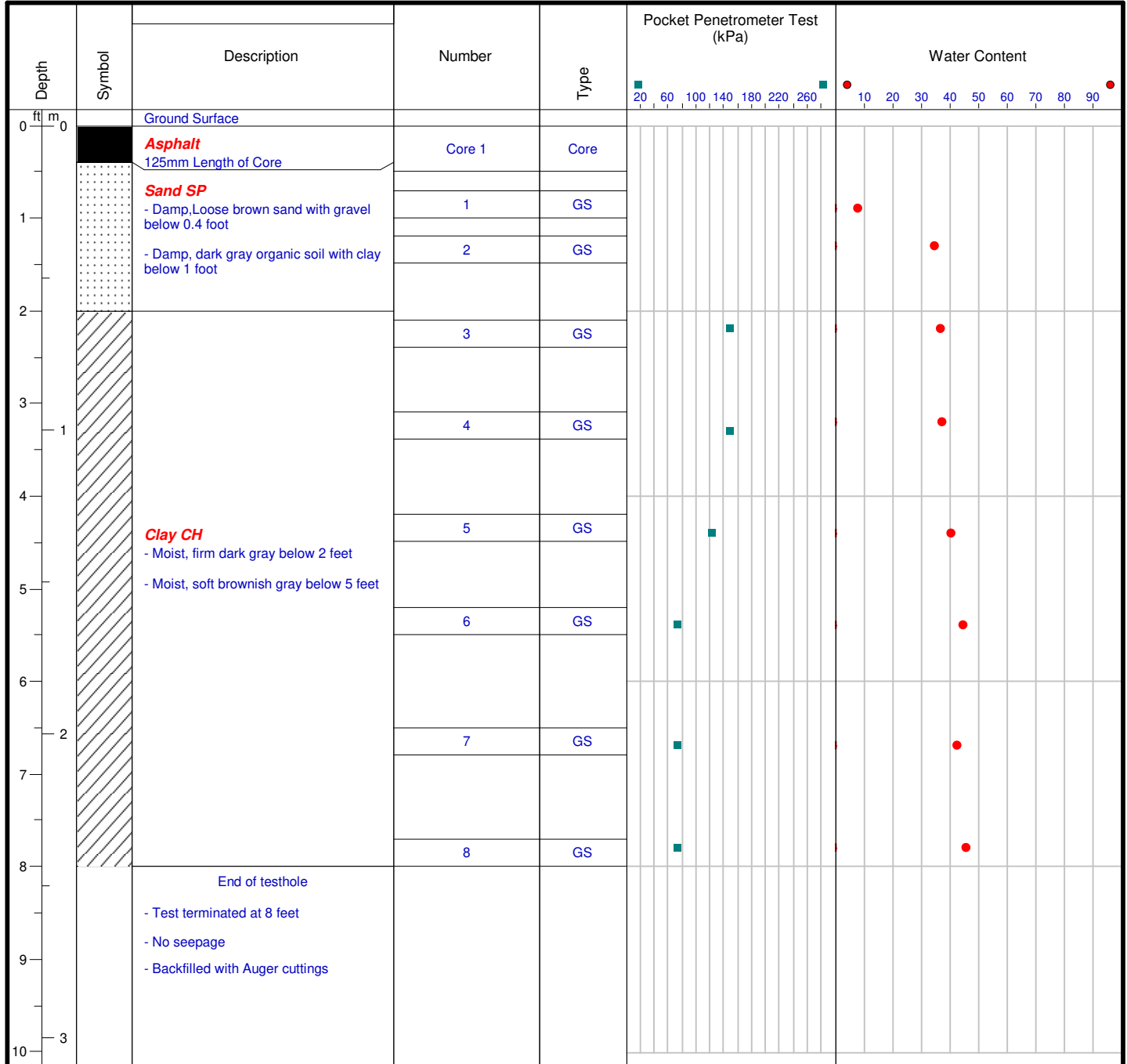
Client: Aecom Canada ULC

Location: Side of #550 St Charles St.- Oxbow Bend

TH1

Logged By: Tim

Engineer: T Soneye EIT



Drill Method: Auger

Drill Date: February 10, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Project No: 112-2501

Project: Pavement Investigation Program

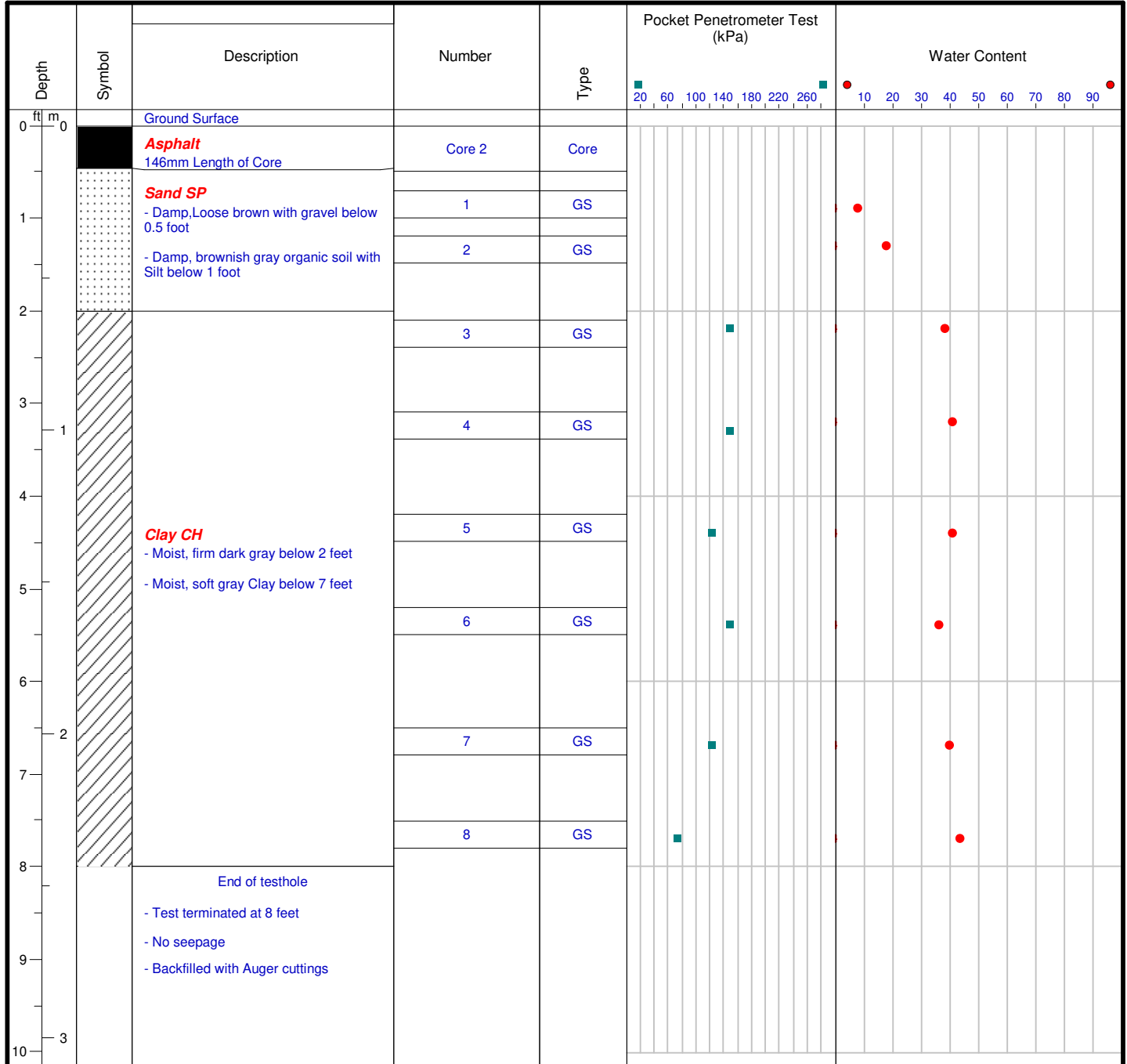
Client: Aecom Canada ULC

Location: Side of #527 Gagnon St.- Oxbow Bend Rd.

TH2

Logged By: Tim

Engineer: T Soneye EIT



Drill Method: Auger

Drill Date: February 10, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Project No: 112-2501

Project: Pavement Investigation Program

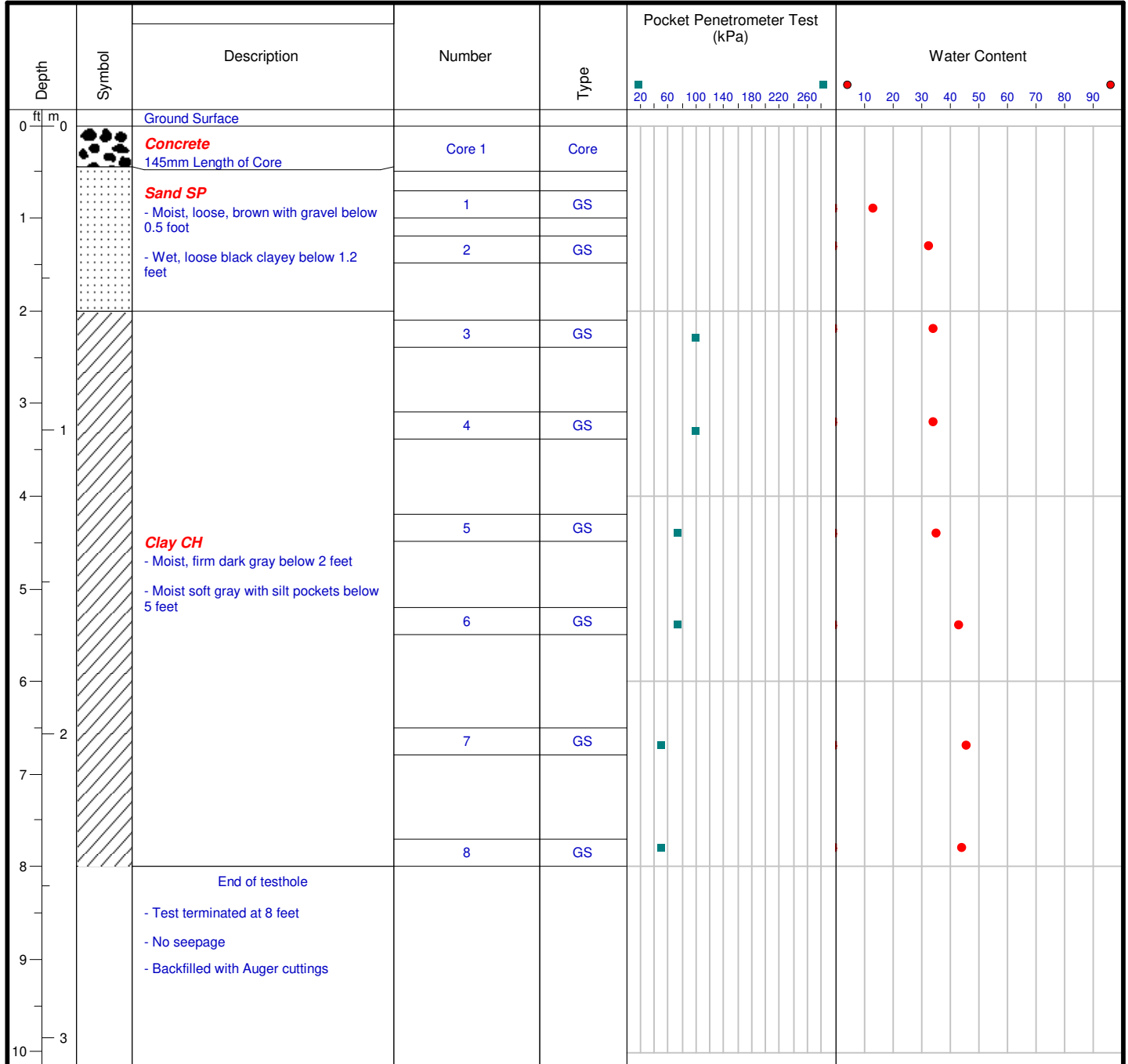
Client: Aecom Canada ULC

Location: Front of House #313 Poole Crescent

TH1

Logged By: Tim

Engineer: T Soneye EIT



Drill Method: Auger

Drill Date: February 11, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Project No: 112-2501

Project: Pavement Investigation Program

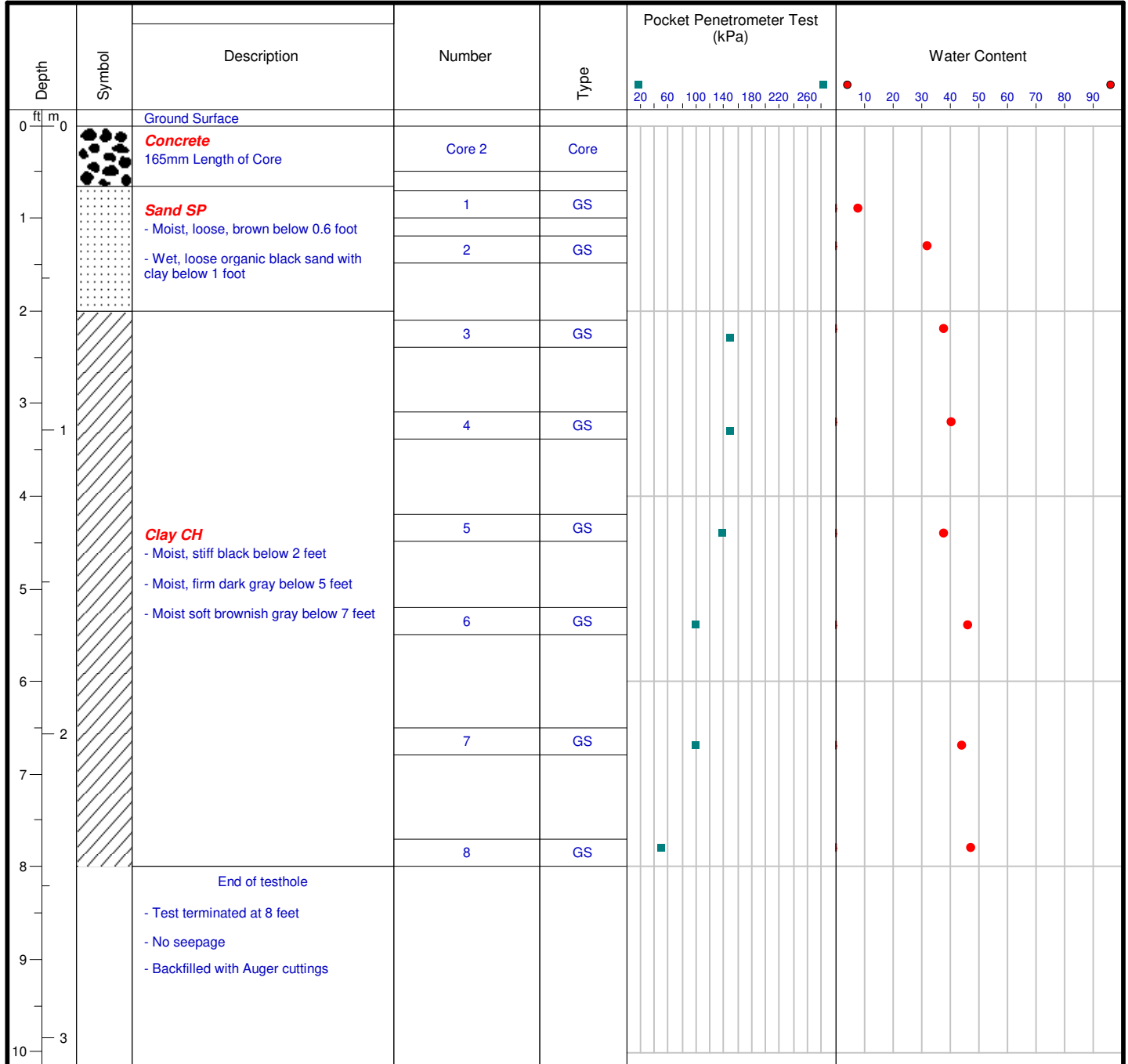
Client: Aecom Canada ULC

Location: Front of House #310 Poole Crescent

TH2

Logged By: Tim

Engineer: T Soneye EIT



Drill Method: Auger

Drill Date: February 11, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Project No: 112-2501

Project: Pavement Investigation Program

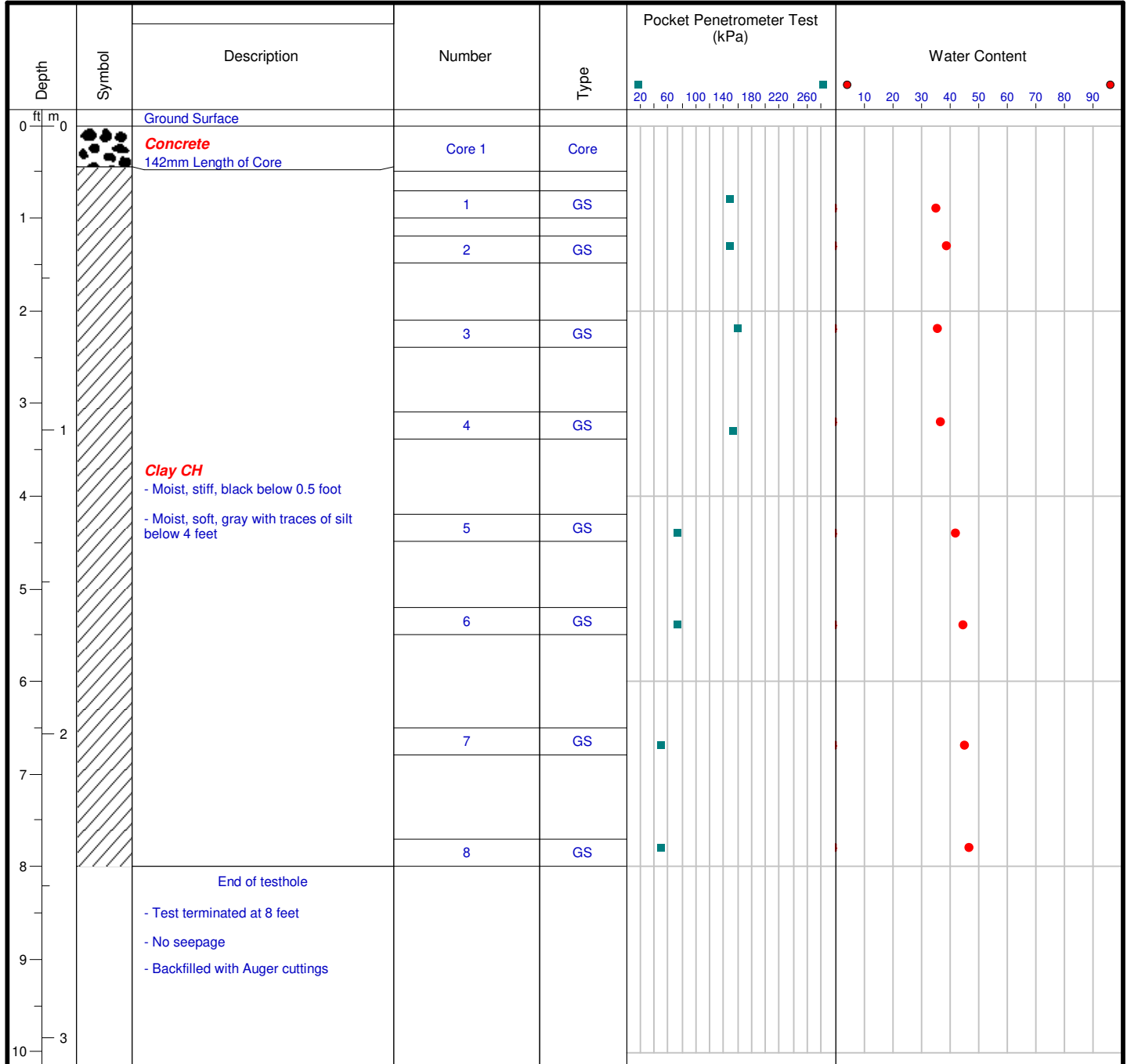
Client: Aecom Canada ULC

Location: Side of #19 Heritage Blvd - Pebblewood

TH1

Logged By: Tim

Engineer: T Soneye EIT



Drill Method: Auger

Drill Date: February 11, 2025

Hole Size: 6 inches

Datum:

Checked by: Paul Bevel

Sheet: 1 of 1



Project No: 112-2501

Project: Pavement Investigation Program

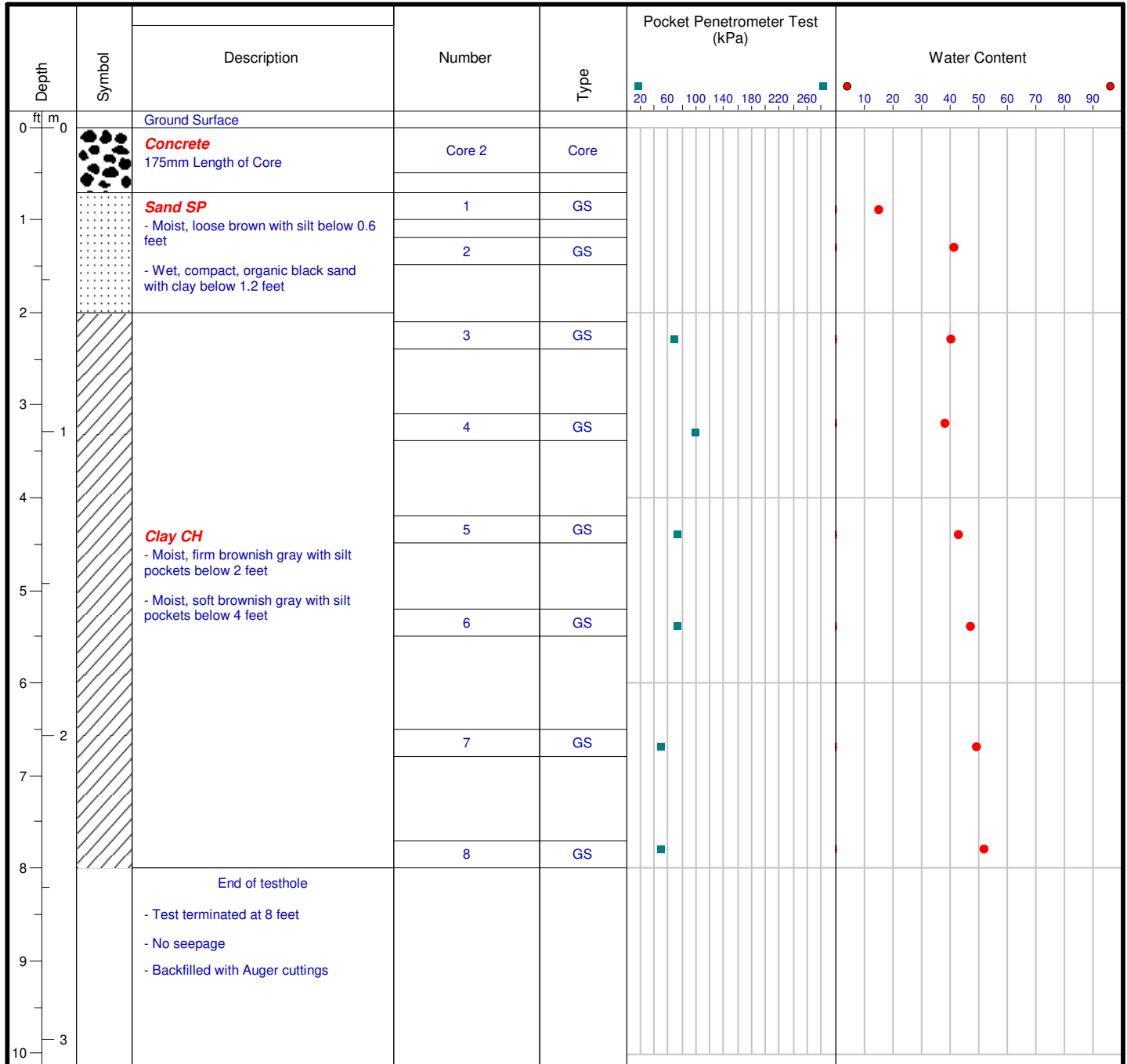
Client: Aecom Canada ULC

Location: Side of House #40 Pebblewood lane

TH2

Logged By: Tim

Engineer: T Soneye EIT



Drill Method: Auger

Drill Date: February 11, 2025

Hole Size: 6 inches

Datum:

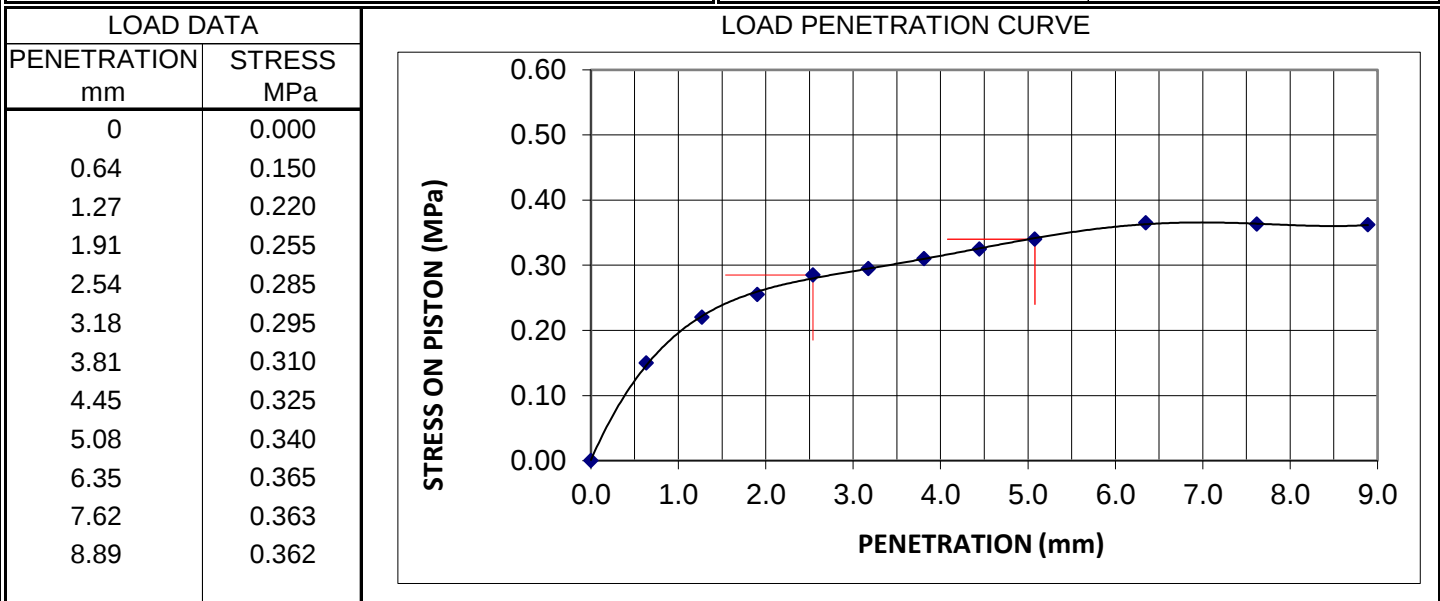
Checked by: Paul Bevel

Sheet: 1 of 1

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

Client: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No: 112-2501
Attention: Ryan Cunningham	Lab No: HM 15
Project: Local Streets Package 25-R-03 (60743827)	

SAMPLE DATA		SPECIMEN DATA		
Sample Type: Clay		DESCRIPTION	Before Soaking	After Testing
Source: Blossom Bay TH1, TH4 (1-3ft)		Moisture Content (MC), %	24.6	27.1
Sampled by: TS		MC of top 25mm layer, %	-	31.5
Optimum Moisture Content: 24.9 %		Dry Density, kg/m ³	1478	
Maximum Dry Density: 1532 kg/cm ³		Compaction, %	96%	
Method of Compaction: Standard Proctor		CBR, %	4.1	3.3
Tested by: JJ	Date Tested: Feb 17, 2025	Swell, %	1.85	



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	0.29	0.29	4.1	-
5.08	10.3	0.34	0.34	-	3.3

Remarks:


 Reviewed by: Paul Bevel

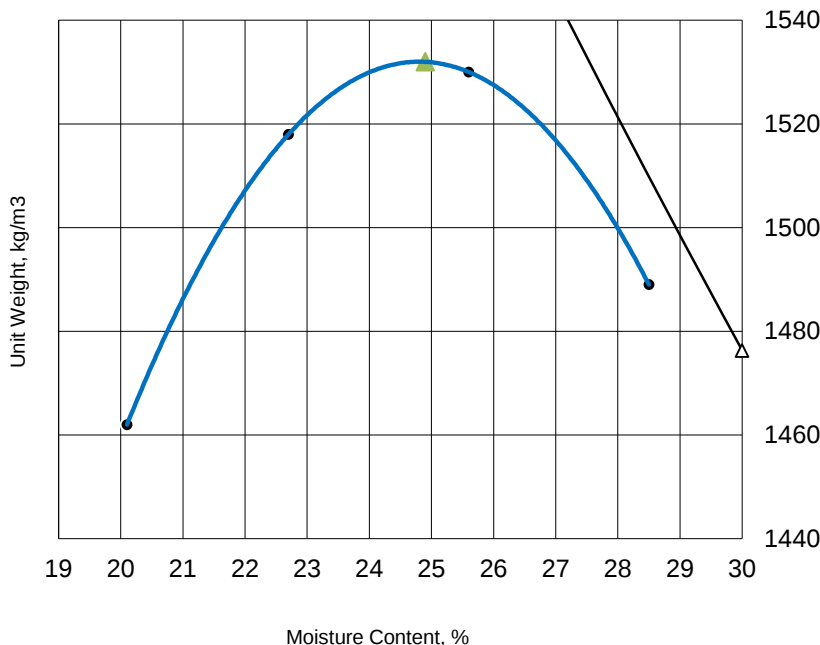
MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2501
ATTENTION:	Ryan Cunningham	Lab No.:	HM 15
PROJECT:	Local Streets Package 25-R-03 (60743827)		

Date Sampled:	Feb 10, 2025	Date Received:	Feb 10, 2025	PROCEDURE	A
Sampled By:	TS	Date Tested:	Feb 11, 2025	PREPARATION	Dry
MATERIAL INFORMATION Material Type: Clay Material Use: Subgrade Material Supplier: N/A Material Source: Blossom Bay Maximum Size: TH1, TH4 (1-3ft)				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
				NO. OF LAYERS	3
				MOLD SIZE	100
				MOLD VOLUME	935
				WEIGHT OF HAMMER	2.5 kg

Test No.	1	2	3	4
Wet Density	1756	1863	1922	1913
Moisture Content	20.1	22.7	25.6	28.5
Dry Density	1462	1518	1530	1489

Moisture - Density Relationship



Maximum Dry Density (MDD):
1532 kg/m³
Optimum Moisture Content
24.9 %

STONE CORRECTION (ASTM D 4718)

Retained on 4.75mm sieve:
_____%
Corrected Moisture:
24.9 %
Corrected Maximum Dry Density:
1532 kg/m³

Remarks:

Tested by: Jaehang Jeong

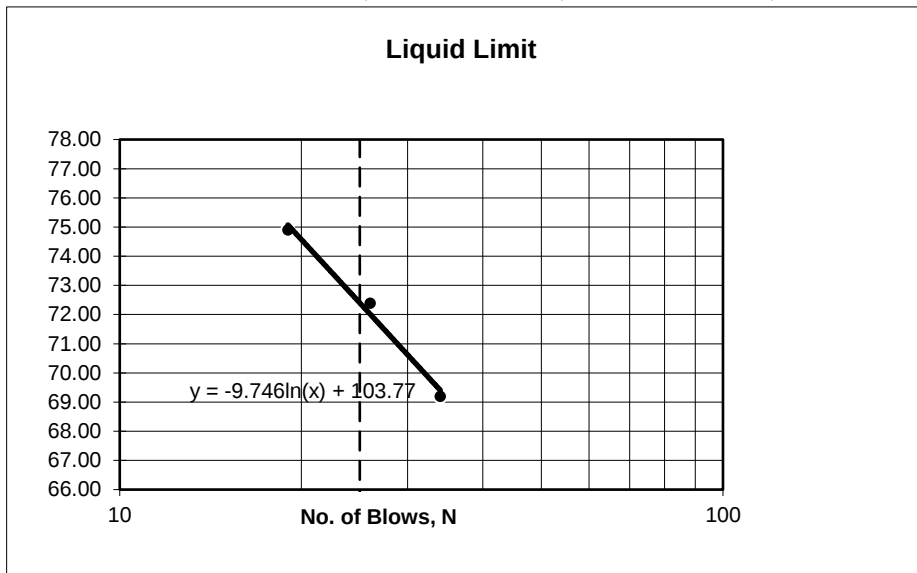
Reviewed by: Paul Bevel



Atterberg Limits (ASTM D4318)

Client: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.: 112-2501
Attention.: Ryan Cunningham	Lab No.: HM 15-1
Project: Local Streets Package 25-R-03 (60743827)	
Tender No. 8-2025	Date Tested / By: Feb 14, 2025 G. Manalo

Liquid Limit Determination				Liquid Limit 25 Blows
Dish No.:	1	2	3	
Wet Soil + Dish:	13.65	12.58	13.29	
Dry Soil + Dish:	10.1	9.25	9.5	
Moisture:	3.55	3.33	3.79	
Dish:	4.97	4.65	4.44	
Dry Soil:	5.13	4.6	5.06	
% Moisture:	69.20	72.39	74.90	
No. of Blows:	34	26	19	
Liquid Limit:				72



Material Identification:

**TH 2
Blossom Bay**

Depth: **2-3 ft**

Liquid Limit, %: **72**
Plastic Limit, %: **23**
Plasticity Index: **49**
(LL-PL)

Plastic Limit Determination				
Dish No.:	1	2	3	
Wet Soil + Dish:	10.23	10.07	9.93	
Dry Soil + Dish:	9.18	9.03	8.93	
Moisture:	1.05	1.04	1	
Dish:	4.67	4.64	4.46	
Dry Soil:	4.51	4.39	4.47	
% Moisture:	23.28	23.69	22.37	
				Average: 23

Test Method : ASTM: D4318, D2216

Remarks:

P. Bevel

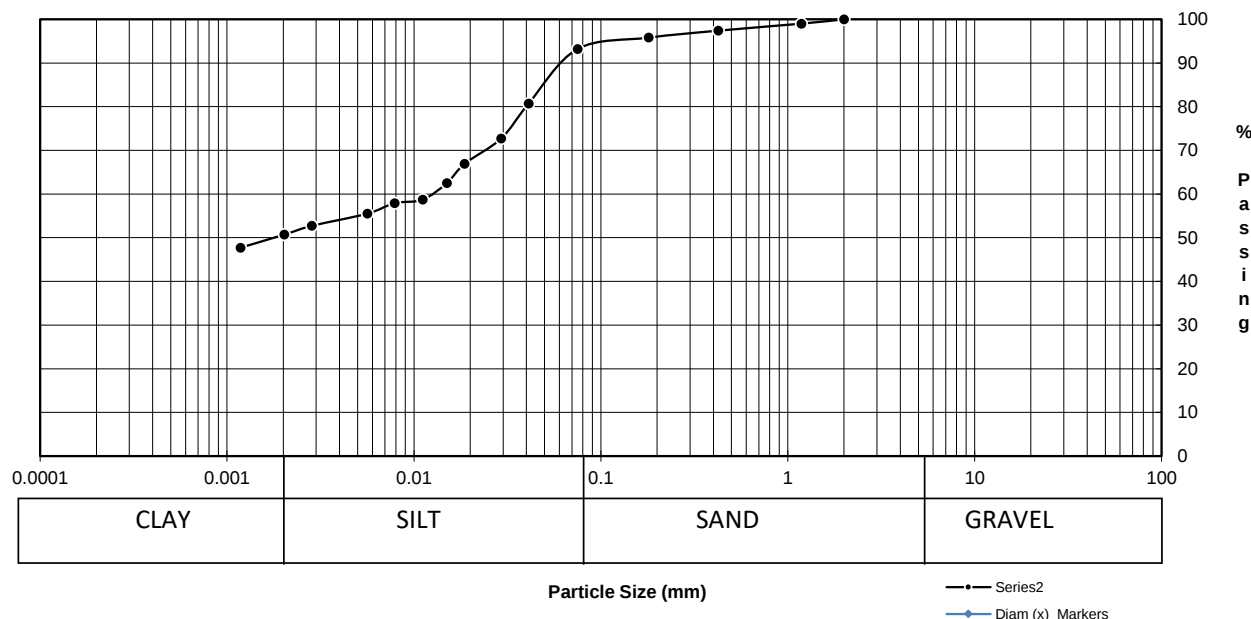
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd.	Project No.: 112-2501
99 Commerce Drive, Winnipeg	
MB R3P 0Y7	Lab No.: HM 15-1
ATTENTION: Ryan Cunningham	
PROJECT: Local Streets Package 25-R-03 (60743827)	
Tender No. 8-2025	

Date Sampled: Feb 10, 2025	Date Received: Feb 10, 2025	Sieve Analysis		Hydrometer Analysis	
Sampled By: TS	Date Tested: Feb 15, 2025	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH 2, 2-3 ft Sample Source Blossom Bay		50.00	100.0		
		37.50	100.0		
		25.00	100.0		
		19.00	100.0		
		16.00	100.0		
		12.50	100.0	0.0411	80.7
		9.50	100.0	0.0293	72.7
		4.75	100.0	0.0186	66.9
		2.00	100.0	0.0150	62.5
		1.18	99.0	0.0111	58.7
		0.425	97.4	0.0079	57.9
		0.180	95.8	0.0056	55.5
		0.075	93.2	0.0012	47.7

Grain Size Analysis



% Composition		D10	
6.80	Gravel	D30	
42.57	Sand	D60	0.04303
50.63	Silt	Cu	
	Clay	Cc	

Remarks:

P. Bevel

Technician: Jaehang Jeong

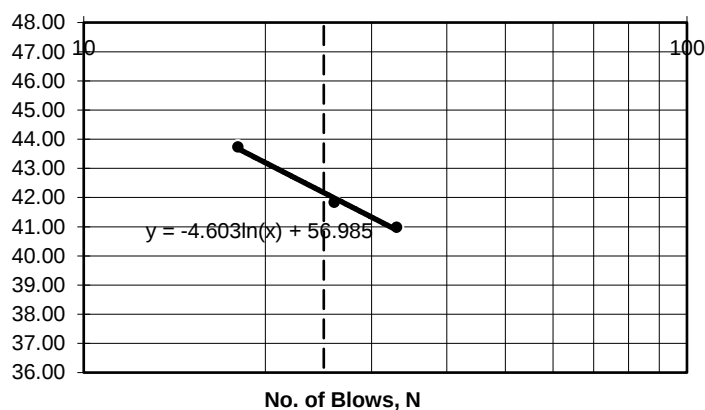
Reviewed by Paul Bevel

Atterberg Limits (ASTM D4318)

Client:	AECOM Canada Ltd.	Project No.:	112-2501
	99 Commerce Drive, Winnipeg		
	MB R3P 0Y7	Lab No.:	HM 15-2
Attention.:	Ryan Cunningham		
Project:	Local Streets Package 25-R-03 (60743827)		
	Tender No. 8-2025	Date Tested / By:	Feb 15, 2025 G. Manalo

Liquid Limit Determination				Liquid Limit 25 Blows
Dish No.:	1	2	3	
Wet Soil + Dish:	13.88	12.21	12.82	
Dry Soil + Dish:	11.29	9.98	10.27	
Moisture:	2.59	2.23	2.55	
Dish:	4.97	4.65	4.44	
Dry Soil:	6.32	5.33	5.83	
% Moisture:	40.98	41.84	43.74	
No. of Blows:	33	26	18	
Liquid Limit:				42

Liquid Limit



Material Identification:

TH3
Blossom Bay

Depth: **1-3ft**

Liquid Limit, %: **42**
Plastic Limit, %: **16**
Plasticity Index: **26**
(LL-PL)

Plastic Limit Determination				
Dish No.:	1	2	3	
Wet Soil + Dish:	10.44	11.02	8.97	
Dry Soil + Dish:	9.65	10.08	8.33	
Moisture:	0.79	0.94	0.64	
Dish:	4.71	4.52	4.39	
Dry Soil:	4.94	5.56	3.94	
% Moisture:	15.99	16.91	16.24	
			Average:	16

Test Method : ASTM: D4318, D2216

Remarks:

P. Bevel

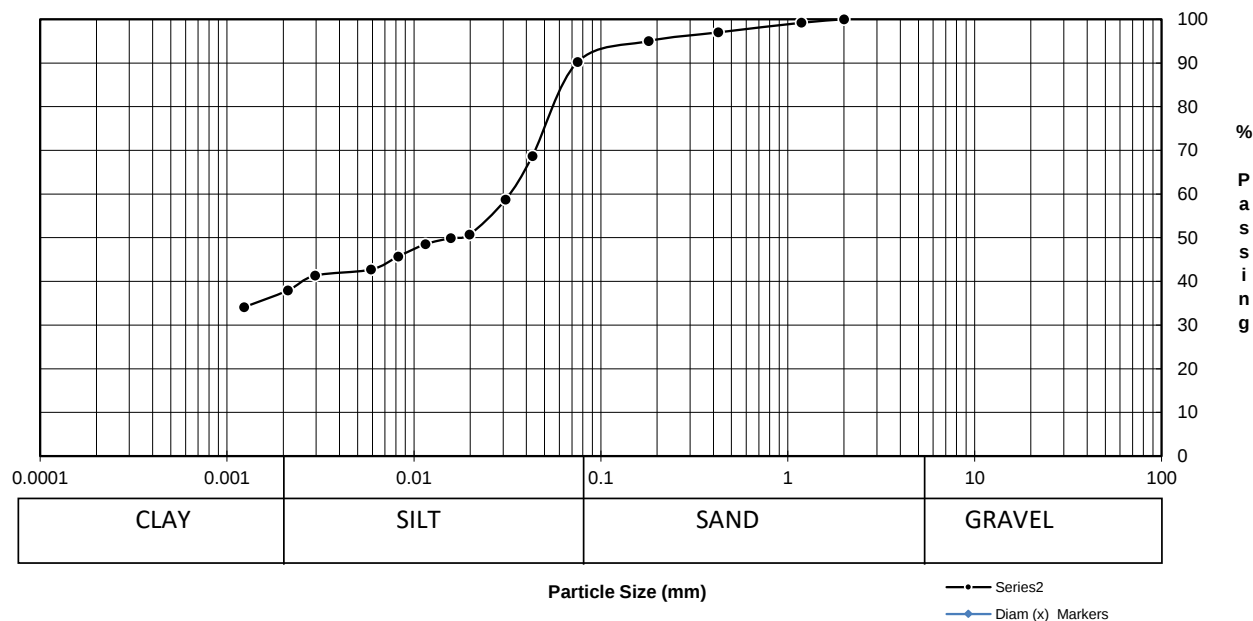
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT:	AECOM Canada Ltd.	Project No.:	112-2501
	99 Commerce Drive, Winnipeg		
	MB R3P 0Y7	Lab No.:	HM 15-2
ATTENTION:	Ryan Cunningham		
PROJECT:	Local Streets Package 25-R-03 (60743827)		
	Tender No. 8-2025		

Date Sampled:	Feb 10, 2025	Date Received:	Feb 10, 2025	Sieve Analysis		Hydrometer Analysis	
Sampled By:	TS	Date Tested:	Feb 15, 2025	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH3, 1-3ft Sample Source Blossom Bay				50.00	100.0		
				37.50	100.0		
				25.00	100.0		
				19.00	100.0		
				16.00	100.0		
				12.50	100.0	0.0430	68.7
				9.50	100.0	0.0309	58.7
				4.75	100.0	0.0198	50.7
				2.00	100.0	0.0157	49.9
				1.18	99.2	0.0115	48.5
				0.425	97.0	0.0082	45.7
				0.180	95.0	0.0059	42.6
				0.075	90.2	0.0012	34.1

Grain Size Analysis



	% Composition		D10
	9.80	Gravel	D30
	52.78	Sand	D60
	37.42	Silt	Cu
		Clay	Cc

Remarks:

P. Bevel

Technician: Jaehang Jeong

Reviewed by Paul Bevel

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada ULC	Project No:	112-2501
	99 Commerce Drive, Winnipeg	Test No.:	1
	MB R3P 0Y7	Lab No.:	HM 15
Attention:	Ryan Cunningham	Date Sampled / By:	Feb 10, 2025 H. Abedinzadeh
Project:	Pavement Investigation	Date Received:	Feb 10, 2025
	Program - Residential Streets	Date Tested / By:	Feb 12, 2025 Carla Labadan
	Package 1		

Test Hole No.	BB TH1	BB TH1	BB TH1	BB TH1	BB TH1
Depth	1'	2'	3'	4'	5'
Tare No.	321	69	6-23	Y04	KD10
Wt Wet Sample + Tare	211	207.2	203.7	209.8	205.2
Wt Dry Sample + Tare	180.4	163.5	143.2	151.1	142.5
Wt Water	30.6	43.7	60.5	58.7	62.7
Wt Tare	4.4	4.5	4.7	4.4	4.7
Wt Dry Sample	176.0	159.0	138.5	146.7	137.8
Moisture Content (%)	17.4	27.5	43.7	40.0	45.5
Test Hole No.	BB TH1	BB TH1	BB TH1		
Depth	6'	7'	8'		
Tare No.	T115	T112	T125		
Wt Wet Sample + Tare	209.4	205	205.6		
Wt Dry Sample + Tare	135.6	144	140		
Wt Water	73.8	61.0	65.6		
Wt Tare	4.6	4.2	4.2		
Wt Dry Sample	131.0	139.8	135.8		
Moisture Content (%)	56.3	43.6	48.3		
Test Hole No.	BB TH2	BB TH2	BB TH2	BB TH2	BB TH2
Depth	1'	2'	3'	4'	5'
Tare No.	4-23	T112	T125	M25	65
Wt Wet Sample + Tare	213.8	203.1	206.2	208.4	203.2
Wt Dry Sample + Tare	194.2	168	162	169	159.6
Wt Water	19.6	35.1	44.2	39.4	43.6
Wt Tare	4.8	4.2	4.2	4.6	4.6
Wt Dry Sample	189.4	163.8	157.8	164.4	155.0
Moisture Content (%)	10.3	21.4	28.0	24.0	28.1
Test Hole No.	BB TH2	BB TH2	BB TH3		
Depth	6'	7'	8'		
Tare No.	Y03	Y04	KD10		
Wt Wet Sample + Tare	206.7	200	206.2		
Wt Dry Sample + Tare	159.2	151.3	159.9		
Wt Water	47.5	48.7	46.3		
Wt Tare	4.0	4.4	4.7		
Wt Dry Sample	155.2	146.9	155.2		
Moisture Content (%)	30.6	33.2	29.8		

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada ULC	Project No:	112-2501
	99 Commerce Drive, Winnipeg	Test No.:	1
	MB R3P 0Y7	Lab No.:	HM 15
Attention:	Ryan Cunningham	Date Sampled / By:	Feb 10, 2025 H.Abedinzadeh
Project:	Pavement Investigation	Date Received:	Feb 10, 2025
	Program - Residential Streets	Date Tested / By:	Feb 12, 2025 Carla Labadan
	Package 1		

Test Hole No.	BB TH3	BB TH3	BB TH3	BB TH3	BB TH3
Depth	1'	2'	3'	4'	5'
Tare No.	T107	BR22	M51	T118	M54
Wt Wet Sample + Tare	213.5	211	220	216.2	211.5
Wt Dry Sample + Tare	186.7	176.8	183.1	168.8	155.7
Wt Water	26.8	34.2	36.9	47.4	55.8
Wt Tare	4.6	4.8	4.6	4.4	4.9
Wt Dry Sample	182.1	172.0	178.5	164.4	150.8
Moisture Content (%)	14.7	19.9	20.7	28.8	37.0
Test Hole No.	BB TH3	BB TH3	BB TH3		
Depth	6'	7'	8'		
Tare No.	T103	T122	M7		
Wt Wet Sample + Tare	226.3	223.7	211.3		
Wt Dry Sample + Tare	158.9	160.9	146.2		
Wt Water	67.4	62.8	65.1		
Wt Tare	4.5	4.7	4.8		
Wt Dry Sample	154.4	156.2	141.4		
Moisture Content (%)	43.7	40.2	46.0		
Test Hole No.	BB TH4	BB TH4	BB TH4	BB TH4	BB TH4
Depth	1'	2'	3'	4'	5'
Tare No.	HM-2	M49	T122	M7	M7
Wt Wet Sample + Tare	214.5	214.7	222.8	220.3	221.3
Wt Dry Sample + Tare	180.1	168.1	181.5	166.3	165
Wt Water	34.4	46.6	41.3	54.0	56.3
Wt Tare	3.9	4.7	4.7	4.8	4.8
Wt Dry Sample	176.2	163.4	176.8	161.5	160.2
Moisture Content (%)	19.5	28.5	23.4	33.4	35.1
Test Hole No.	BB TH4	BB TH4	BB TH4		
Depth	6'	7'	8'		
Tare No.	T114	T103	T122		
Wt Wet Sample + Tare	245.2	226.8	226		
Wt Dry Sample + Tare	200.1	158.9	160		
Wt Water	45.1	67.9	66.0		
Wt Tare	3.9	4.5	4.7		
Wt Dry Sample	196.2	154.4	155.3		
Moisture Content (%)	23.0	44.0	42.5		

MOISTURE CONTENT OF SOIL (ASTM D2216)

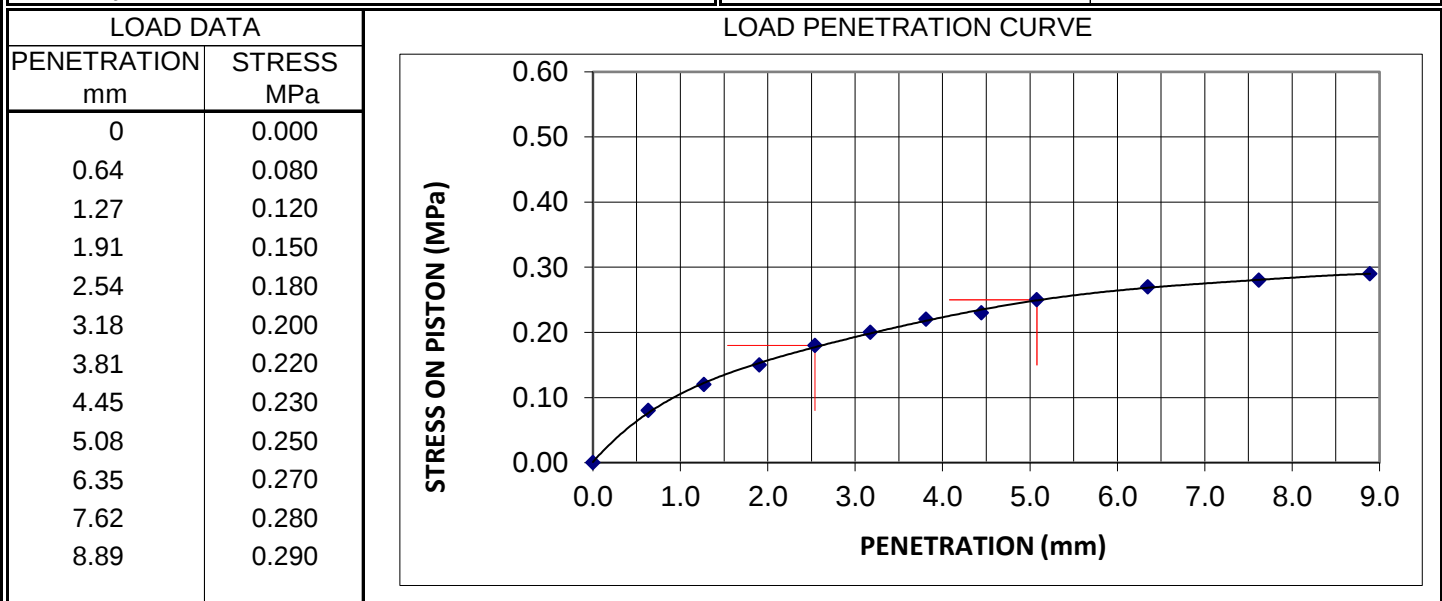
Client:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No:	112-2501
		Test No.:	1
		Lab No.:	HM 15
Attention:	Ryan Cunningham	Date Sampled / By:	Feb 10, 2025 H.Abedinzadeh
Project:	Pavement Investigation Program - Residential Streets Package 1	Date Received:	Feb 10, 2025
		Date Tested / By:	Feb 12, 2025 Carla Labadan

Test Hole No.	BB TH5	BB TH5	BB TH5	BB TH6	BB TH5
Depth	1'	2'	3'	4'	5'
Tare No.	G1	2-23	60	G1	5-23
Wt Wet Sample + Tare	210.7	211.1	210.3	208	218.6
Wt Dry Sample + Tare	178.5	165.2	159.5	156.5	161.2
Wt Water	32.2	45.9	50.8	51.5	57.4
Wt Tare	4.3	4.6	4.4	4.3	4.6
Wt Dry Sample	174.2	160.6	155.1	152.2	156.6
Moisture Content (%)	18.5	28.6	32.8	33.8	36.7
Test Hole No.	BB TH5	BB TH6	BB TH7		
Depth	6'	7'	8'		
Tare No.	M39	HM-2	M49		
Wt Wet Sample + Tare	226.6	225.9	226.1		
Wt Dry Sample + Tare	168.2	169.4	166.8		
Wt Water	58.4	56.5	59.3		
Wt Tare	4.6	3.9	4.7		
Wt Dry Sample	163.6	165.5	162.1		
Moisture Content (%)	35.7	34.1	36.6		

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

Client: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No: 112-2501
Attention: Ryan Cunningham	Lab No: HM 16
Project Local Streets Package 25-R-03 (60743827)	

SAMPLE DATA		SPECIMEN DATA		
Sample Type: Clay		DESCRIPTION	Before Soaking	After Testing
Source: Poole Crescent, TH 1 & TH2 (1.5-3.5ft)		Moisture Content (MC), %	28.3	31.2
Sampled by: TS		MC of top 25mm layer, %		35.8
Optimum Moisture Content: 28.5 %		Dry Density, kg/m ³	1364	
Maximum Dry Density: 1418 kg/m ³		Compaction, %	96%	
Method of Compaction: Standard Proctor		CBR, %	2.6	2.4
Tested by: JJ	Date Tested: Feb 18, 2025	Swell, %	2.26	



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	0.25	0.25	-	2.4

Remarks:


 Reviewed by: Paul Bevel

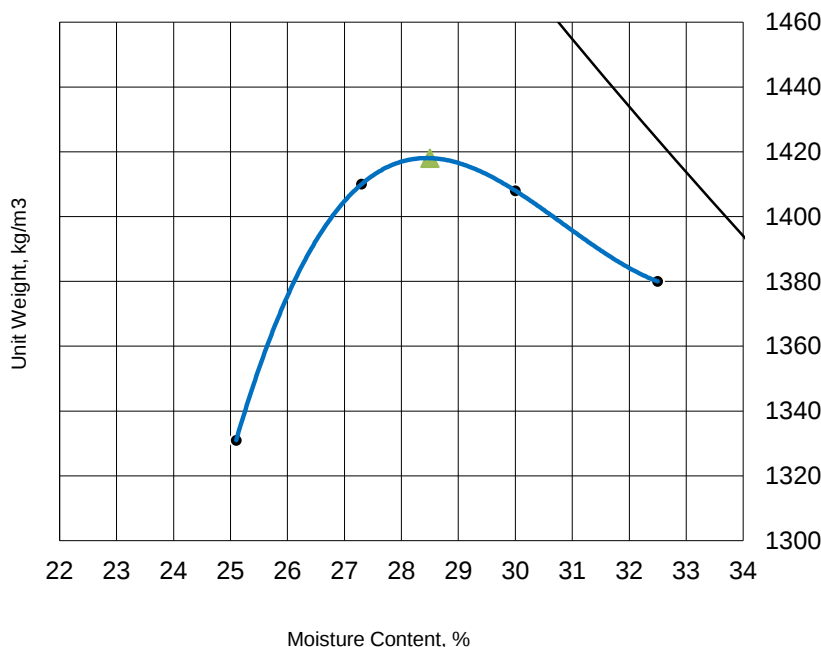
MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2501
ATTENTION:	Ryan Cunningham	Lab No.:	HM 16
PROJECT:	Local Streets Package 25-R-03 (60743827)		

Date Sampled:	Feb 11, 2025	Date Received:	Feb 11, 2025	PROCEDURE	A
Sampled By:	TS	Date Tested:	Feb 12, 2025	PREPARATION	Dry
MATERIAL INFORMATION Material Type: Clay Material Use: Subgrade Material Supplier: Poole Crescent Material Source: TH 1 & 2 (1.5-3.5ft) Maximum Size:				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
				NO. OF LAYERS	3
				MOLD SIZE	100
				MOLD VOLUME	935
				WEIGHT OF HAMMER	2.5 kg

Test No.	1	2	3	4
Wet Density	1665	1795	1830	1829
Moisture Content	25.1	27.3	30.0	32.5
Dry Density	1331	1410	1408	1380

Moisture - Density Relationship



Maximum Dry Density (MDD):
1418 kg/m³
Optimum Moisture Content
28.5 %

STONE CORRECTION (ASTM D 4718)

Retained on 4.75mm sieve:
_____%
Corrected Moisture:
28.5 %
Corrected Maximum Dry Density:
1418 kg/m³

Remarks:

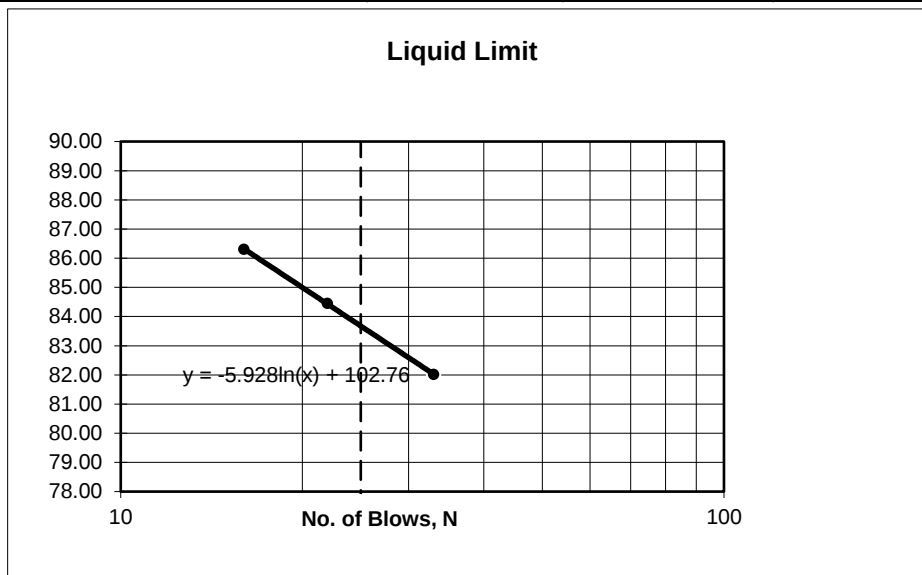
Tested by: Jaehang Jeong

Reviewed by: 
Paul Bevel

Atterberg Limits (ASTM D4318)

Client:	AECOM Canada Ltd.	Project No.:	112-2501
	99 Commerce Drive, Winnipeg		
	MB R3P 0Y7	Lab No.:	HM 16
Attention.:	Ryan Cunningham		
Project:	Local Streets Package 25-R-03 (60743827)		
	Tender No. 8-2025	Date Tested / By:	Feb 15, 2025 G. Manalo

Liquid Limit Determination				Liquid Limit 25 Blows
Dish No.:	1	2	3	
Wet Soil + Dish:	14.40	13.63	13.33	
Dry Soil + Dish:	9.93	9.50	9.17	
Moisture:	4.47	4.13	4.16	
Dish:	4.48	4.61	4.35	
Dry Soil:	5.45	4.89	4.82	
% Moisture:	82.02	84.46	86.31	
No. of Blows:	33	22	16	
Liquid Limit:				83



Material Identification:

TH1
Poole Cres

Depth: **1-2ft**

Liquid Limit, %: **83**
Plastic Limit, %: **26**
Plasticity Index: **57**
(LL-PL)

Plastic Limit Determination				
Dish No.:	1	2	3	
Wet Soil + Dish:	10.72	11.03	10.08	
Dry Soil + Dish:	9.47	9.68	8.97	
Moisture:	1.25	1.35	1.11	
Dish:	4.58	4.68	4.63	
Dry Soil:	4.89	5	4.34	
% Moisture:	25.56	27.00	25.58	
				Average: 26

Test Method : ASTM: D4318, D2216

Remarks:

P. Bevel

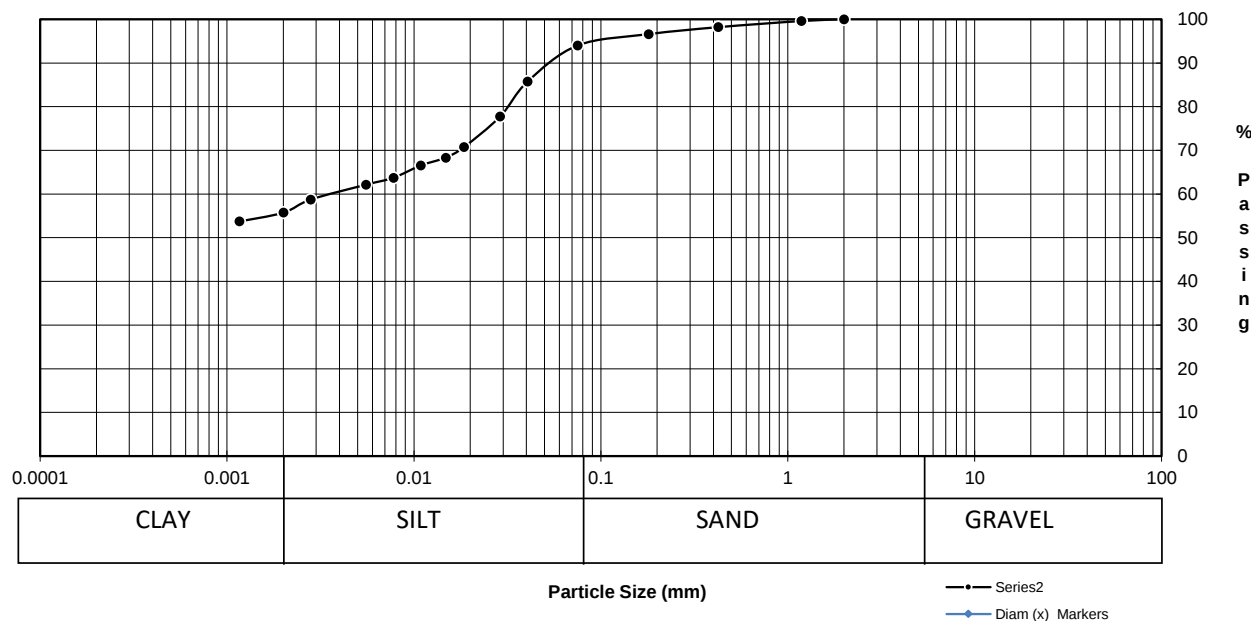
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd.	Project No.: 112-2501
99 Commerce Drive, Winnipeg	
MB R3P 0Y7	Lab No.: HM 16
ATTENTION: Ryan Cunningham	
PROJECT: Local Streets Package 25-R-03 (60743827)	
Tender No. 8-2025	

Date Sampled: Feb 11, 2025	Date Received: Feb 11, 2025	Sieve Analysis		Hydrometer Analysis	
Sampled By: JJ	Date Tested: Feb 16, 2025	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH1, 1-2ft Sample Source Poole Cres		50.00	100.0		
		37.50	100.0		
		25.00	100.0		
		19.00	100.0		
		16.00	100.0		
		12.50	100.0	0.0405	85.7
		9.50	100.0	0.0289	77.7
		4.75	100.0	0.0185	70.7
		2.00	100.0	0.0148	68.3
		1.18	99.6	0.0109	66.5
		0.425	98.2	0.0078	63.7
		0.180	96.6	0.0055	62.1
		0.075	94.0	0.0012	53.7

Grain Size Analysis



% Composition		D10
6.00	Gravel	D30
38.28	Sand	D60
55.72	Silt	Cu
	Clay	Cc

Remarks:

P. Bevel

Technician: Greg Manalo

Reviewed by Paul Bevel

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada ULC	Project No:	112-2501
	99 Commerce Drive, Winnipeg	Test No.:	2
	MB R3P 0Y7	Lab No.:	HM 16
Attention:	Ryan Cunningham	Date Sampled / By:	Feb 11, 2025 H. Abedinzadeh
Project:	Pavement Investigation	Date Received:	Feb 11, 2025
	Program - Residential	Date Tested / By:	Feb 13, 2025 Carla Labadan
	Streets Package 1		

Test Hole No.	PC TH1	PC TH1	PC TH1	PC TH1	PC TH1
Depth	1'	2'	3'	4'	5'
Tare No.	KD22	M31	M10	T105	M24
Wt Wet Sample + Tare	216.5	208.8	213.5	222.7	217
Wt Dry Sample + Tare	192	158.5	159.9	167.1	161.9
Wt Water	24.5	50.3	53.6	55.6	55.1
Wt Tare	4.4	4.6	4.7	4.4	4.9
Wt Dry Sample	187.6	153.9	155.2	162.7	157.0
Moisture Content (%)	13.1	32.7	34.5	34.2	35.1
Test Hole No.	PC TH1	PC TH1	PC TH1		
Depth	6'	7'	8'		
Tare No.	SE4	M101	T8		
Wt Wet Sample + Tare	222.3	238.2	217.4		
Wt Dry Sample + Tare	156.7	164.7	152.3		
Wt Water	65.6	73.5	65.1		
Wt Tare	4.4	4.3	5.3		
Wt Dry Sample	152.3	160.4	147.0		
Moisture Content (%)	43.1	45.8	44.3		
Test Hole No.	PC TH2	PC TH2	PC TH2	PC TH2	PC TH2
Depth	1'	2'	3'	4'	5'
Tare No.	M50	TX	M16	M4	M52
Wt Wet Sample + Tare	220.7	205.5	216.3	223.2	209
Wt Dry Sample + Tare	204.7	156.8	158	159.9	152.9
Wt Water	16.0	48.7	58.3	63.3	56.1
Wt Tare	4.8	4.9	5.2	4.7	4.9
Wt Dry Sample	199.9	151.9	152.8	155.2	148.0
Moisture Content (%)	8.0	32.1	38.2	40.8	37.9
Test Hole No.	PC TH2	PC TH2	PC TH2		
Depth	6'	7'	8'		
Tare No.	Y066	KD8	M36		
Wt Wet Sample + Tare	221.7	241.3	281.6		
Wt Dry Sample + Tare	152.7	168.5	192.6		
Wt Water	69.0	72.8	89.0		
Wt Tare	4.2	4.9	4.6		
Wt Dry Sample	148.5	163.6	188.0		
Moisture Content (%)	46.5	44.5	47.3		

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

Client: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No: 112-2501
Attention: Ryan Cunningham	Lab No: HM 17
Project: Local Streets Package 25-R-03 (60743827)	

SAMPLE DATA		SPECIMEN DATA	
Sample Type: Clay		DESCRIPTION	Before Soaking After Testing
Source: Pebblewood Lane, TH1& TH2 (1.5-3.5ft)		Moisture Content (MC), %	27.2 27.1
Sampled by: TS		MC of top 25mm layer, %	36.4
Optimum Moisture Content: 27.0 %		Dry Density, kg/m ³	1388
Maximum Dry Density: 1463 kg/m ³		Compaction, %	95%
Method of Compaction: Standard Proctor		CBR, %	2.2 2.2
Tested by: JJ	Date Tested: Feb 18, 2025	Swell, %	2.13

LOAD DATA		LOAD PENETRATION CURVE
PENETRATION mm	STRESS MPa	
0	0.000	
0.64	0.045	
1.27	0.085	
1.91	0.125	
2.54	0.155	
3.18	0.185	
3.81	0.210	
4.45	0.225	
5.08	0.230	
6.35	0.240	
7.62	0.240	
8.89	0.245	

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	0.16	0.16	2.2	-
5.08	10.3	0.23	0.23	-	2.2

Remarks:


 Reviewed by: Paul Bevel

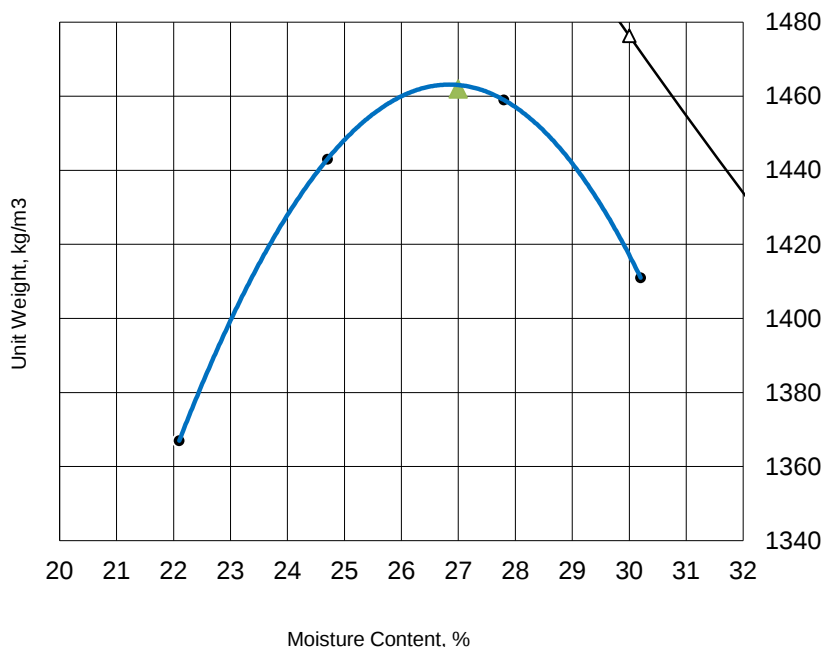
MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2501
ATTENTION:	Ryan Cunningham	Lab No.:	HM 17
PROJECT:	Local Streets Package 25-R-03 (60743827)		

Date Sampled:	Feb 11, 2025	Date Received:	Feb 11, 2025	PROCEDURE	A
Sampled By:	TS	Date Tested:	Feb 12, 2025	PREPARATION	Dry
MATERIAL INFORMATION Material Type: Clay Material Use: Subgrade Maximum Size: Material Supplier: Pebblewood Lane Material Source: TH1 & TH2 (1.5 -3.5ft)				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
				NO. OF LAYERS	3
				MOLD SIZE	100
				MOLD VOLUME	935
				WEIGHT OF HAMMER	2.5 kg

	Test No.	1	2	3	4
Wet Density		1669	1799	1865	1837
Moisture Content		22.1	24.7	27.8	30.2
Dry Density		1367	1443	1459	1411

Moisture - Density Relationship



Maximum Dry Density (MDD):
1462 kg/m³
Optimum Moisture Content
27.0 %

STONE CORRECTION (ASTM D 4718)

Retained on 4.75mm sieve:
%
Corrected Moisture:
27.0 %
Corrected Maximum Dry Density:
1462 kg/m³

Remarks:

Tested by: Jaehang Jeong

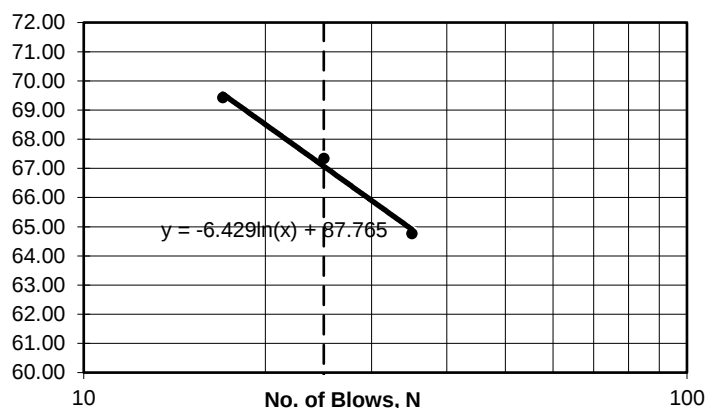
Reviewed by: Paul Bevel

Atterberg Limits (ASTM D4318)

Client:	AECOM Canada Ltd.	Project No.:	112-2501
	99 Commerce Drive, Winnipeg		
	MB R3P 0Y7	Lab No.	HM 17
Attention.:	Ryan Cunningham		
Project:	Local Streets Package 25-R-03 (60743827)		
	Tender No. 8-2025	Date Tested / By:	Feb 14, 2025 G. Manalo

Liquid Limit Determination				Liquid Limit 25 Blows
Dish No.:	1	2	3	
Wet Soil + Dish:	13.13	13.63	13.16	
Dry Soil + Dish:	9.73	10.00	9.55	
Moisture:	3.4	3.63	3.61	
Dish:	4.48	4.61	4.35	
Dry Soil:	5.25	5.39	5.2	
% Moisture:	64.76	67.35	69.42	
No. of Blows:	35	25	17	
Liquid Limit:				67

Liquid Limit



Material Identification:

TH 2
Pebblewood Lane

Depth: **1-2ft**

Liquid Limit, %: **67**
Plastic Limit, %: **27**
Plasticity Index: **40**
(LL-PL)

Plastic Limit Determination				
Dish No.:	1	2	3	
Wet Soil + Dish:	11.27	11.62	11.41	
Dry Soil + Dish:	9.77	10.09	9.91	
Moisture:	1.5	1.53	1.5	
Dish:	4.34	4.41	4.45	
Dry Soil:	5.43	5.68	5.46	
% Moisture:	27.62	26.94	27.47	
			Average:	27

Test Method : ASTM: D4318, D2216

Remarks:

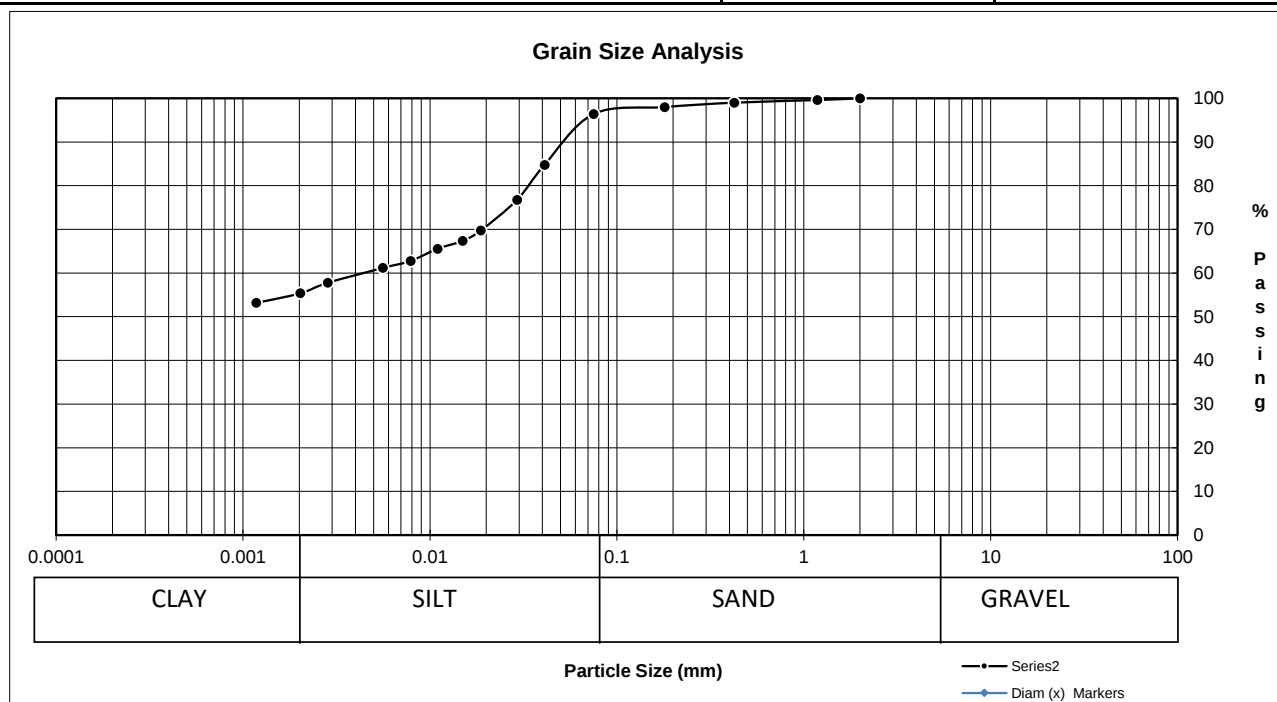
P. Bevel

Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd.	Project No.: 112-2501
99 Commerce Drive, Winnipeg	
MB R3P 0Y7	Lab No.: HM 17
ATTENTION: Ryan Cunningham	
PROJECT: Local Streets Package 25-R-03 (60743827)	
Tender No. 8-2025	

Date Sampled: Feb 11, 2025	Date Received: Feb 11, 2025	Sieve Analysis		Hydrometer Analysis	
Sampled By: TS	Date Tested: Feb 11, 2025	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH2, 1-2ft Sample Source Pebblewood Lane		50.00	100.0		
		37.50	100.0		
		25.00	100.0		
		19.00	100.0		
		16.00	100.0		
		12.50	100.0	0.0410	84.8
		9.50	100.0	0.0292	76.8
		4.75	100.0	0.0187	69.8
		2.00	100.0	0.0149	67.4
		1.18	99.6	0.0110	65.6
		0.425	99.0	0.0079	62.8
		0.180	98.0	0.0056	61.2
		0.075	96.4	0.0012	53.2



% Composition		D10
	Gravel	D30
3.60	Sand	D60
41.10	Silt	Cu
55.30	Clay	Cc

Remarks:



Technician: Greg Manalo

Reviewed by Paul Bevel

MOISTURE CONTENT OF SOIL (ASTM D2216)

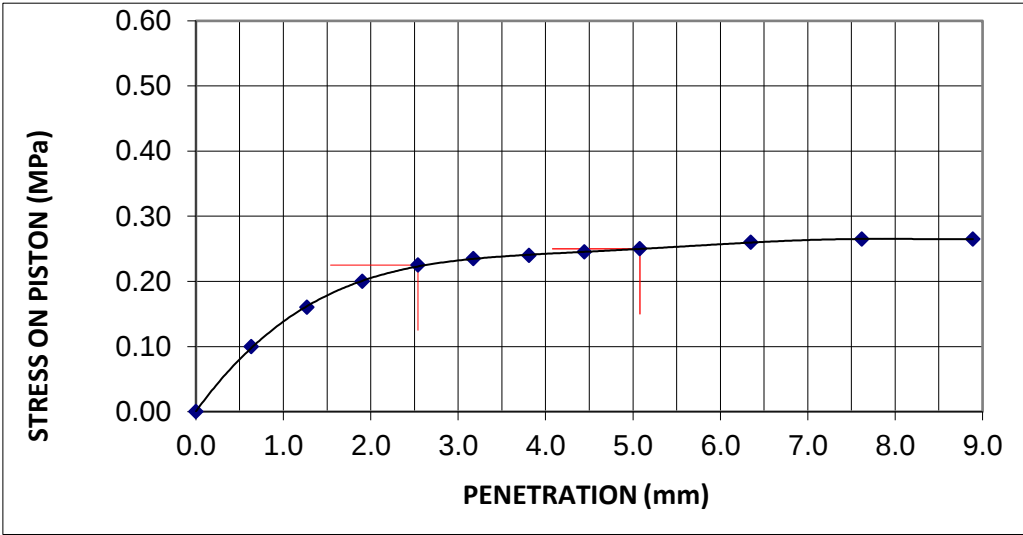
Client:	AECOM Canada ULC	Project No:	112-2501
	99 Commerce Drive, Winnipeg	Test No.:	3
	MB R3P 0Y7	Lab No.:	HM 17
Attention:	Ryan Cunningham	Date Sampled / By:	Feb 11, 2025 H. Abedinzadeh
Project:	Pavement Investigation	Date Received:	Feb 11, 2025
	Program - Residential	Date Tested / By:	Feb 13, 2025 J. Jeong
	Streets Package 1		

Test Hole No.	PL TH1	PL TH1	PL TH1	PL TH1	PL TH1
Depth	1'	2.5'	3.5'	4'	5'
Tare No.	G-1	SE7	T110	H200	T109
Wt Wet Sample + Tare	241.4	228	238.7	222.2	246.2
Wt Dry Sample + Tare	179.3	165.4	176.8	163.6	174.2
Wt Water	62.1	62.6	61.9	58.6	72.0
Wt Tare	4.3	4.4	4.1	4.3	4.0
Wt Dry Sample	175.0	161.0	172.7	159.3	170.2
Moisture Content (%)	35.5	38.9	35.8	36.8	42.3
Test Hole No.	PL TH1	PL TH1	PL TH1		
Depth	6'	7'	8'		
Tare No.	HM1	S104	B107		
Wt Wet Sample + Tare	236.5	247.6	228.1		
Wt Dry Sample + Tare	164.4	172.1	156.9		
Wt Water	72.1	75.5	71.2		
Wt Tare	4.1	4.7	4.6		
Wt Dry Sample	160.3	167.4	152.3		
Moisture Content (%)	45.0	45.1	46.7		
Test Hole No.	PL TH2	PL TH2	PL TH2	PL TH2	PL TH2
Depth	1'	2'	3'	4'	5'
Tare No.	M42	T119	M35	M56	M1
Wt Wet Sample + Tare	221.1	222.5	226.1	221.2	226.3
Wt Dry Sample + Tare	191.7	158.3	162.2	161.3	159.5
Wt Water	29.4	64.2	63.9	59.9	66.8
Wt Tare	4.8	4.4	4.8	4.9	4.6
Wt Dry Sample	186.9	153.9	157.4	156.4	154.9
Moisture Content (%)	15.7	41.7	40.6	38.3	43.1
Test Hole No.	PL TH2	PL TH2	PL TH2		
Depth	6'	7'	8'		
Tare No.	T106	S512	SE08		
Wt Wet Sample + Tare	224.6	209.3	258.6		
Wt Dry Sample + Tare	153.5	141.6	171.3		
Wt Water	71.1	67.7	87.3		
Wt Tare	4.2	4.3	4.4		
Wt Dry Sample	149.3	137.3	166.9		
Moisture Content (%)	47.6	49.3	52.3		

CALIFORNIA BEARING RATIO (CBR) TEST - ASTM D 1883

Client: AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No: 112-2501
Attention: Ryan Cunningham	Lab No: HM 18
Project: Local Streets Package 25-R-03 (60743827)	

SAMPLE DATA		SPECIMEN DATA		
Sample Type:	Clay	DESCRIPTION	Before Soaking	After Testing
Source:	Oxbow Bend Road, TH1, 1-3ft	Moisture Content (MC), %	24.6	25.4
Sampled by:	TS	MC of top 25mm layer, %		28.1
Optimum Moisture Content:	26.7 %	Dry Density, kg/m ³	1434	
Maximum Dry Density:	1497 kg/m ³	Compaction, %	96%	
Method of Compaction:	Standard Proctor	CBR, %	3.3	2.4
Tested by:	JJ	Swell, %	2.59	
	Date Tested: Feb 17, 2025			

LOAD DATA		LOAD PENETRATION CURVE	
PENETRATION mm	STRESS MPa		
0	0.000		
0.64	0.100		
1.27	0.160		
1.91	0.200		
2.54	0.225		
3.18	0.235		
3.81	0.240		
4.45	0.245		
5.08	0.250		
6.35	0.260		
7.62	0.265		
8.89	0.265		

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	0.23	0.23	3.3	-
5.08	10.3	0.25	0.25	-	2.4

Remarks:


 Reviewed by: Paul Bevel

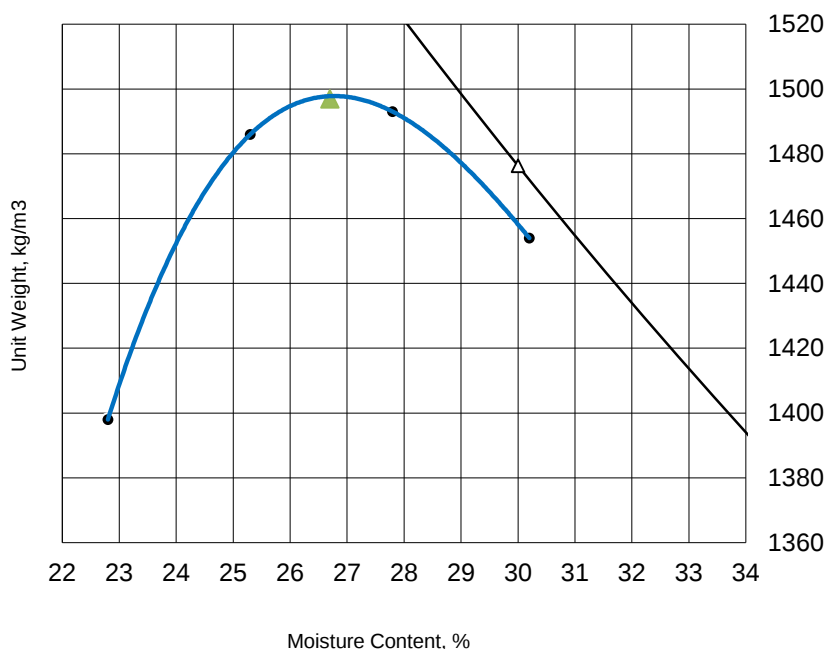
MAXIMUM DRY DENSITY AND MOISTURE CONTENT - Proctor Method (ASTM D698)

CLIENT	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2501
ATTENTION:	Ryan Cunningham	Lab No.:	HM 18
PROJECT:	Local Streets Package 25-R-03 (60743827)		

Date Sampled:	Feb 10, 2025	Date Received:	Feb 10, 2025	PROCEDURE	A
Sampled By:	TS	Date Tested:	Feb 11, 2025	PREPARATION	Dry
MATERIAL INFORMATION Material Type: Clay Material Use: Subgrade Maximum Size: Material Supplier: Oxbow Bend Road Material Source: TH1&2 (1.5-3.5ft)				COMPACTION METHOD	Manual
				BLOWS PER LAYER	25
				NO. OF LAYERS	3
				MOLD SIZE	100
				MOLD VOLUME	935
				WEIGHT OF HAMMER	2.5 kg

Test No.	1	2	3	4
Wet Density	1717	1862	1908	1893
Moisture Content	22.8	25.3	27.8	30.2
Dry Density	1398	1486	1493	1454

Moisture - Density Relationship



Maximum Dry Density (MDD):
1497 kg/m³
Optimum Moisture Content
26.7 %

STONE CORRECTION (ASTM D 4718)

Retained on 4.75mm sieve:
%
Corrected Moisture:
26.7 %
Corrected Maximum Dry Density:
1497 kg/m³

Remarks:

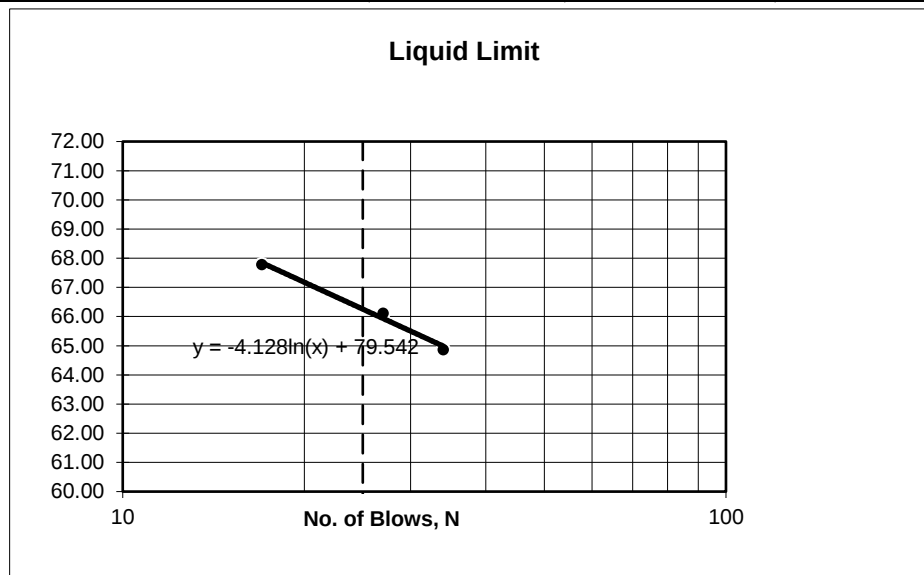
Tested by: Jaehang Jeong

Reviewed by: 
Paul Bevel

Atterberg Limits (ASTM D4318)

Client:	AECOM Canada Ltd. 99 Commerce Drive, Winnipeg MB R3P 0Y7	Project No.:	112-2501
Attention.:	Ryan Cunningham	Lab No.:	HM 18
Project:	Local Streets Package 25-R-03 (60743827)	Date Tested / By:	Feb 14, 2025 G. Manalo
	Tender No. 8-2025		

Liquid Limit Determination				Liquid Limit 25 Blows
Dish No.:	1	2	3	
Wet Soil + Dish:	12.85	13.22	12.93	
Dry Soil + Dish:	9.49	9.61	9.5	
Moisture:	3.36	3.61	3.43	
Dish:	4.31	4.15	4.44	
Dry Soil:	5.18	5.46	5.06	
% Moisture:	64.86	66.12	67.79	
No. of Blows:	34	27	17	
Liquid Limit:				66



Material Identification:

TH1
Oxbow Bend Road

Depth: **1.5-3.5ft**

Liquid Limit, %: **66**
Plastic Limit, %: **24**
Plasticity Index: **42**
(LL-PL)

Plastic Limit Determination				
Dish No.:	1	2	3	
Wet Soil + Dish:	9.76	9.45	9.93	
Dry Soil + Dish:	8.80	8.59	8.93	
Moisture:	0.96	0.86	1	
Dish:	4.88	4.74	4.91	
Dry Soil:	3.92	3.85	4.02	
% Moisture:	24.49	22.34	24.88	
			Average:	24

Test Method : ASTM: D4318, D2216

Remarks:

P. Bevel

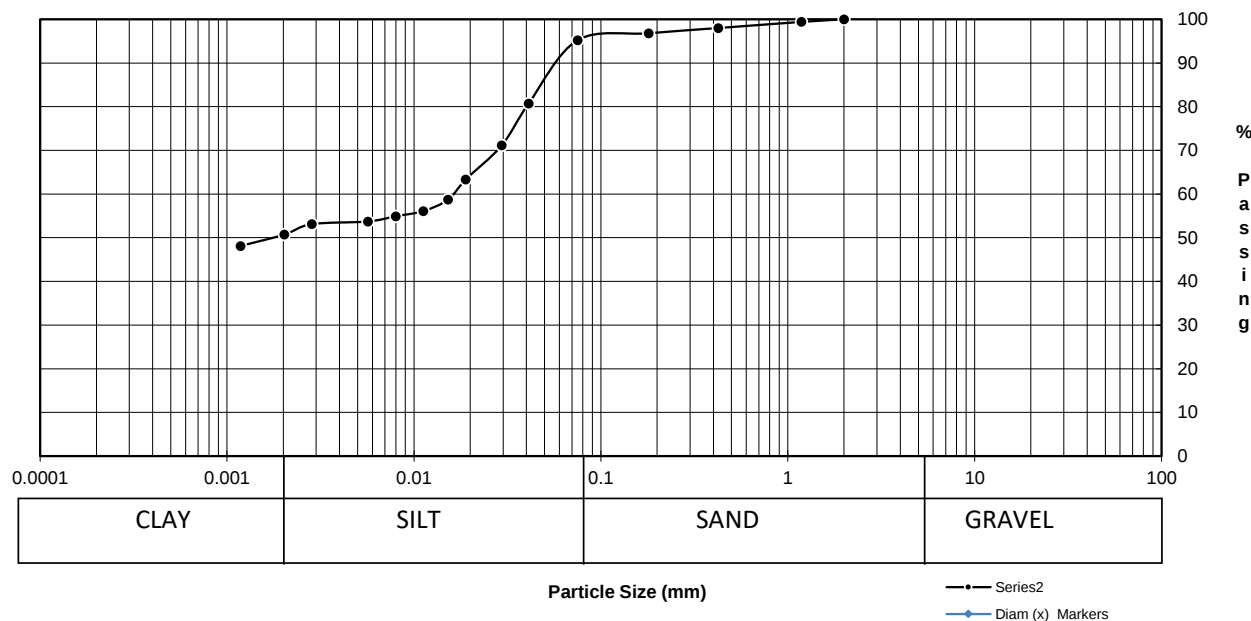
Reviewed by: Paul Bevel

PARTICLE SIZE ANALYSIS OF SOILS TEST REPORT

CLIENT: AECOM Canada Ltd.	Project No.: 112-2501
99 Commerce Drive, Winnipeg	
MB R3P 0Y7	Lab No.: HM 18
ATTENTION: Ryan Cunningham	
PROJECT: Local Streets Package 25-R-03 (60743827)	
Tender No. 8-2025	

Date Sampled: Feb 10, 2025	Date Received: Feb 10, 2025	Sieve Analysis		Hydrometer Analysis	
Sampled By: TS	Date Tested: Feb 15, 2025	Sieve (mm)	% Passing	Diameter	% Finer
Material Identification B.H./T.H. No. TH2, 1.5-3.5ft Sample Source Oxbow Bend Road		50.00	100.0		
		37.50	100.0		
		25.00	100.0		
		19.00	100.0		
		16.00	100.0		
		12.50	100.0	0.0411	80.7
		9.50	100.0	0.0295	71.1
		4.75	100.0	0.0189	63.3
		2.00	100.0	0.0152	58.7
		1.18	99.4	0.0112	56.1
		0.425	98.0	0.0080	54.9
		0.180	96.8	0.0057	53.7
		0.075	95.2	0.0012	48.1

Grain Size Analysis



% Composition		D10
4.80	Gravel	D30
44.56	Sand	D60
50.64	Silt	Cu
	Clay	Cc

Remarks:

P. Bevel

Technician:

Reviewed by Paul Bevel

MOISTURE CONTENT OF SOIL (ASTM D2216)

Client:	AECOM Canada ULC	Project No:	112-2501
	99 Commerce Drive, Winnipeg	Test No.:	4
	MB R3P 0Y7	Lab No.:	HM 18
Attention:	Ryan Cunningham	Date Sampled / By:	Feb 11, 2025 H. Abedinzadeh
Project:	Pavement Investigation	Date Received:	Feb 11, 2025
	Program - Residential	Date Tested / By:	Feb 13, 2025 T. Soneye
	Streets Package 1		

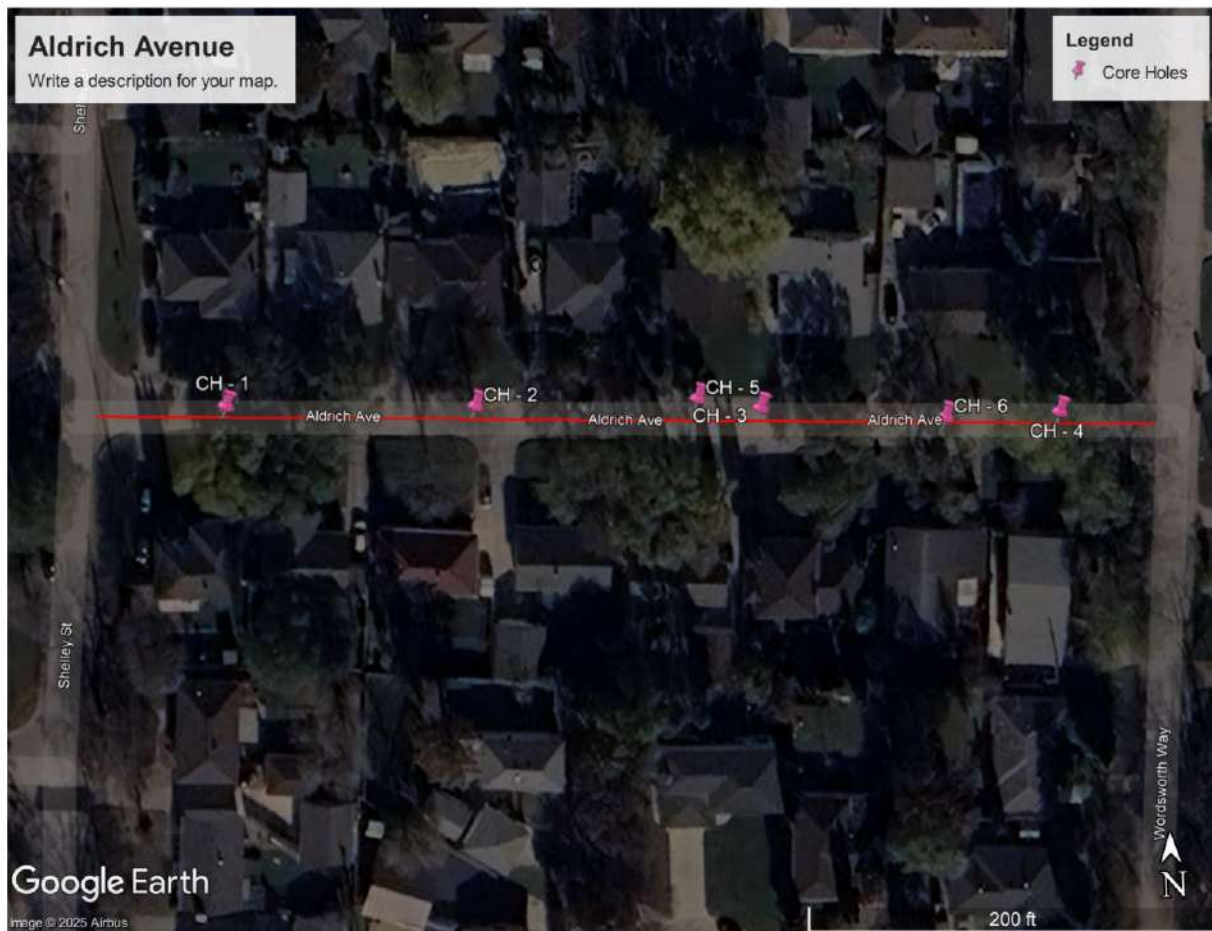
Test Hole No.	OB TH1	OB TH1	OB TH1	OB TH1	OB TH1
Depth	1'	2'	3'	4'	5'
Tare No.	M41	M9	T117	M28	M37
Wt Wet Sample + Tare	210.4	214.6	208.6	219.5	222
Wt Dry Sample + Tare	195.4	160.5	153.5	160.8	159.5
Wt Water	15.0	54.1	55.1	58.7	62.5
Wt Tare	4.7	4.9	4.2	4.6	4.8
Wt Dry Sample	190.7	155.6	149.3	156.2	154.7
Moisture Content (%)	7.9	34.8	36.9	37.6	40.4
Test Hole No.	OB TH1	OB TH1	OB TH1		
Depth	6'	7'	8'		
Tare No.	318	M47	T97		
Wt Wet Sample + Tare	225.2	231.5	207.7		
Wt Dry Sample + Tare	157	163.4	143.9		
Wt Water	68.2	68.1	63.8		
Wt Tare	4.7	4.5	4.4		
Wt Dry Sample	152.3	158.9	139.5		
Moisture Content (%)	44.8	42.9	45.7		
Test Hole No.	OB TH2	OB TH2	OB TH2	OB TH2	OB TH2
Depth	1'	2'	3'	4'	5'
Tare No.	T100	T124	M18	T115	KD10
Wt Wet Sample + Tare	205.5	205.2	206.8	213.3	223.7
Wt Dry Sample + Tare	190.8	174.7	150.5	152.7	159.8
Wt Water	14.7	30.5	56.3	60.6	63.9
Wt Tare	4.1	4.2	4.9	4.5	4.7
Wt Dry Sample	186.7	170.5	145.6	148.2	155.1
Moisture Content (%)	7.9	17.9	38.7	40.9	41.2
Test Hole No.	OB TH2	OB TH2	OB TH2		
Depth	6'	7'	8'		
Tare No.	Y04	M73	T22		
Wt Wet Sample + Tare	221.3	249.3	263.1		
Wt Dry Sample + Tare	163.5	179.1	184.3		
Wt Water	57.8	70.2	78.8		
Wt Tare	4.3	4.3	4.3		
Wt Dry Sample	159.2	174.8	180.0		
Moisture Content (%)	36.3	40.2	43.8		

APPENDIX B

Rehabilitation Sites

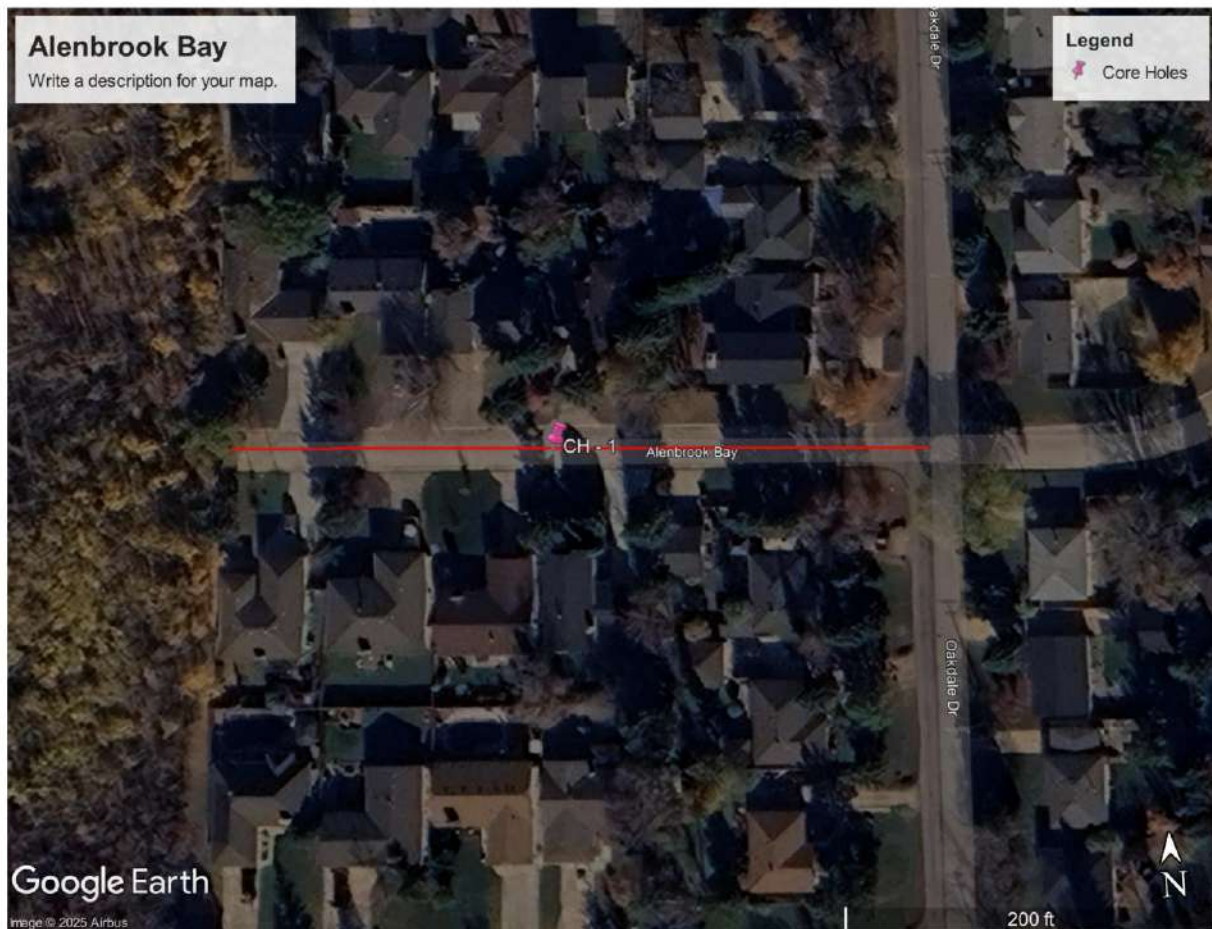
Rehabilitation Sites

Pavement Coring and Subsurface Drilling Locations



Rehabilitation Sites

Pavement Coring and Subsurface Drilling Locations



Rehabilitation Sites

Pavement Coring and Subsurface Drilling Locations



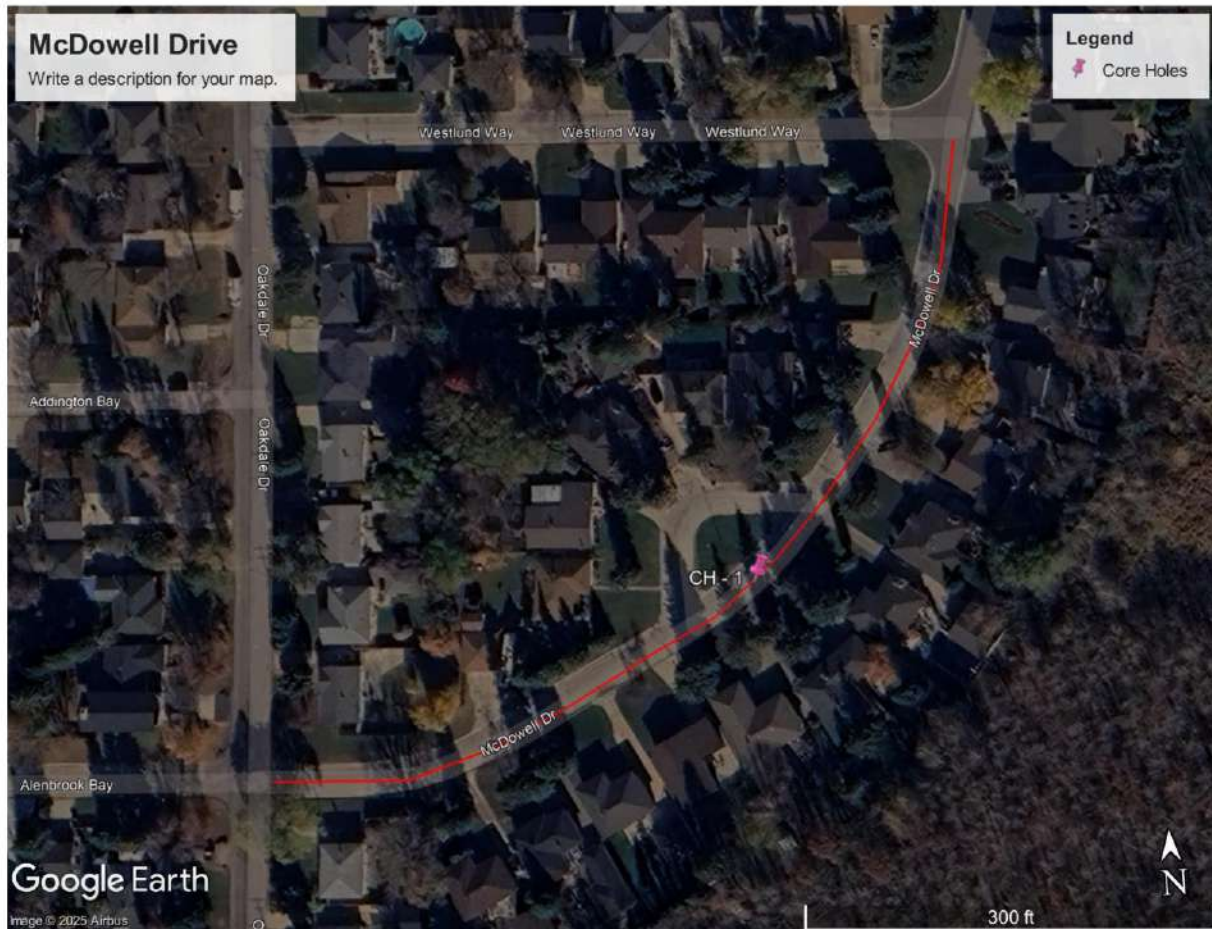
Rehabilitation Sites

Pavement Coring and Subsurface Drilling Locations



Rehabilitation Sites

Pavement Coring and Subsurface Drilling Locations



Rehabilitation Sites

Pavement Coring and Subsurface Drilling Locations



Rehabilitation Sites

Pavement Coring and Subsurface Drilling Locations



Rehabilitation Sites

Pavement Coring and Subsurface Drilling Locations



Rehabilitation Sites**Pavement Structure Measurement**

Aldrich Avenue			
CORE HOLE NO	CORE HOLE LOCATION	PAVEMENT JOINT	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
CH1	Front of House # 2 Aldrich Avenue, 2.5m from the South curb 14 U, 622738 E, 5526049 N		140
CH2	Front of House # 6 Aldrich Avenue, 2.5m from the North curb 14 U, 622775 E, 5526048 N		140
CH3	In between the Front of House # 9 and House #11 Aldrich Avenue, 2.5m from the South curb 14 U, 622818 E, 5526047 N		163
CH4	Front of House # 16 Aldrich Avenue, 2.5m from the North curb 14 U, 622863 E, 5526046 N		168

Aldrich Avenue			
CORE HOLE NO	CORE HOLE LOCATION	MID SLAB	
		CONCRETE THICKNESS (mm)	COMPRESSIVE STRENGTH (MPa)
CH5	Front of House # 9 Aldrich Avenue, 14 U, 622808 E, 5526052 N	135	46.6
CH6	Front of House # 14 Aldrich Avenue, 14 U, 622846 E, 5526046 N	140	48.6

Rehabilitation Sites

Pavement Structure Measurement

Alenbrook Bay - SUMMARY TABLE			
CORE HOLE NO	CORE HOLE LOCATION	PAVEMENT JOINT	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
CH1	Between the Front of House # 11 and House # 15 Alenbrook Bay, 14 U, 624176 E, 5523075 N		130

Rehabilitation Sites**Pavement Structure Measurement**

Allard Avenue - SUMMARY TABLE			
CORE HOLE NO	CORE HOLE LOCATION	PAVEMENT JOINT	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
CH1	Between the Front of House # 439 and House # 433 Allard Avenue, 14 U, 620600 E, 5526562 N		150
CH2	side of House # 502 St. Charles Street, 14 U, 620650 E, 5526559 N		165
CH3	side of House # 503 St. Charles Street, 14 U, 620700 E, 5526558 N		150
CH4	Front of Stewart / St. Charles Park, 14 U, 620746 E, 620746 N		145
CH5	side of House # 492 Stewart Street, 14 U, 620793 E, 5526554 N		135
CH6	side of House # 495 Stewart Street, 14 U, 620843 E, 5526551 N		150
CH7	side of House # 488 Buchanan Blvd, 14 U, 620892 E, 5526549 N		150

Allard Avenue - SUMMARY TABLE			
CORE HOLE NO	CORE HOLE LOCATION	MID SLAB	
		CONCRETE THICKNESS (mm)	COMPRESSIVE STRENGTH (MPa)
CH8	60 m east of St Charles Street 14 U, 620729 E, 5526556 N	160	42.1
CH9	70 m west of Buchanan Blvd 14 U, 620835 E, 5526553 N	170	36.3

Rehabilitation Sites

Pavement Structure Measurement

Haultain Crescent - SUMMARY TABLE			
CORE HOLE NO	CORE HOLE LOCATION	PAVEMENT JOINT	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
CH1	South side of House #283 Raquette Street, 2.5m from the Curb. 14 U, 621750 E, 5525922 N		152

McDowell Drive - SUMMARY TABLE			
CORE HOLE NO	CORE HOLE LOCATION	PAVEMENT JOINT	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
CH1	Front of House # 171 McDowell Drive, 14 U, 624355 E, 5523111 N		150

Oxbow Bend Road - SUMMARY TABLE			
CORE HOLE NO	CORE HOLE LOCATION	PAVEMENT JOINT	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
CH1	Back of House # 97 Downs Village, 14 U, 620371 E, 5526500 N	180	
CH2	Back of House # 85 Downs Village, 14 U, 620427 E, 5526565 N	100	
CH3	near Parking lot and Apartment Building # 95 Oxbow Bend Road, 14 U, 620482 E, 5526634 N	80	
CH4	near Apartment Building # 119 Oxbow Bend Road, 14 U, 620571 E, 5526672 N	110	

Rehabilitation Sites

Pavement Structure Measurement

Raquette Street - SUMMARY TABLE			
CORE HOLE NO	CORE HOLE LOCATION	PAVEMENT JOINT	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
CH1	Front of House # 253 Raquette Street, 2.5m from the West curb, 14 U, 621736 E, 5525839 N		185
CH2	Front of House # 267 Raquette Street, 2.5m from the West curb, 14 U, 621739 E, 5525894 N		145
CH3	near Parking lot and Apartment Building # 95 Oxbow Bend Road, 14 U, 621741 E, 5525948 N		170
CH4	Front of House # 299 Raquette Street, 14 U, 621744 E, 5526002 N		150
CH5	Front of House # 311 Raquette Street, 14 U, 621746 E, 5526058 N		164
CH6	Front of House # 327 Raquette Street, 14 U, 621748 E, 5526110 N		150
CH7	Front of House # 334 Raquette Street, 14 U, 621751 E, 5526160 N		140

Raquette Street - SUMMARY TABLE			
CORE HOLE NO	CORE HOLE LOCATION	MID SLAB	
		CONCRETE THICKNESS (mm)	COMPRESSIVE STRENGTH (MPa)
CH8	Front of House # 302 14 U, 621743 E, 5526021 N	175	39.1
CH9	Front of House # 261 14 U, 621738 E, 5525875 N	185	33.4

Rehabilitation Sites

Pavement Structure Measurement

Westlund Way - SUMMARY TABLE			
CORE HOLE NO	CORE HOLE LOCATION	PAVEMENT JOINT	
		ASPHALT THICKNESS (mm)	CONCRETE THICKNESS (mm)
CH1	side of House # 811 Oakdale Dr, 14 U, 624253 E, 5523218 N		135
CH2	Front of House # 11 Westlund Way, 14 U, 624299 E, 5523217 N		130
CH3	Between the Front of House # 19 and House # 23 Westlund Way, 14 U, 624346 E, 5523216 N		125
CH4	Front of House # 31 Westlund Way, 14 U, 624394 E, 5523214 N	110	

Westlund Way - SUMMARY TABLE			
CORE HOLE NO	CORE HOLE LOCATION	MID SLAB	
		CONCRETE THICKNESS (mm)	COMPRESSIVE STRENGTH (MPa)
CH5	Front of House # 18 Westlund Way, 14 U, 624344 E, 5523216 N	120	46.3
CH6	Front of House # 27 Westlund Way, 14 U, 624379 E, 5523216 N	125	58.4

Rehabilitation Sites

Picture of Cores

ALDRICH AVENUE PICTURE OF CORES



CH1 - Front of House # 2 Aldrich Avenue



CH2 - Front of House # 6 Aldrich Avenue

Rehabilitation Sites

Picture of Cores

ALDRICH AVENUE PICTURE OF CORES



CH3 - Between the Front of House # 9 and House #11 Aldrich



CH4 - Front of House # 16 Aldrich Avenue

Rehabilitation Sites

Picture of Cores

ALENBROOK BAY PICTURE OF CORES



CH1 - Between the Front of House # 11 and House # 15 Alenbrook Bay



CH4 - Front of House # 16 Aldrich Avenue

Rehabilitation Sites

Picture of Cores

ALDRICH AVENUE PICTURE OF CORES



CH5 - Front of House # 9 Aldrich Avenue

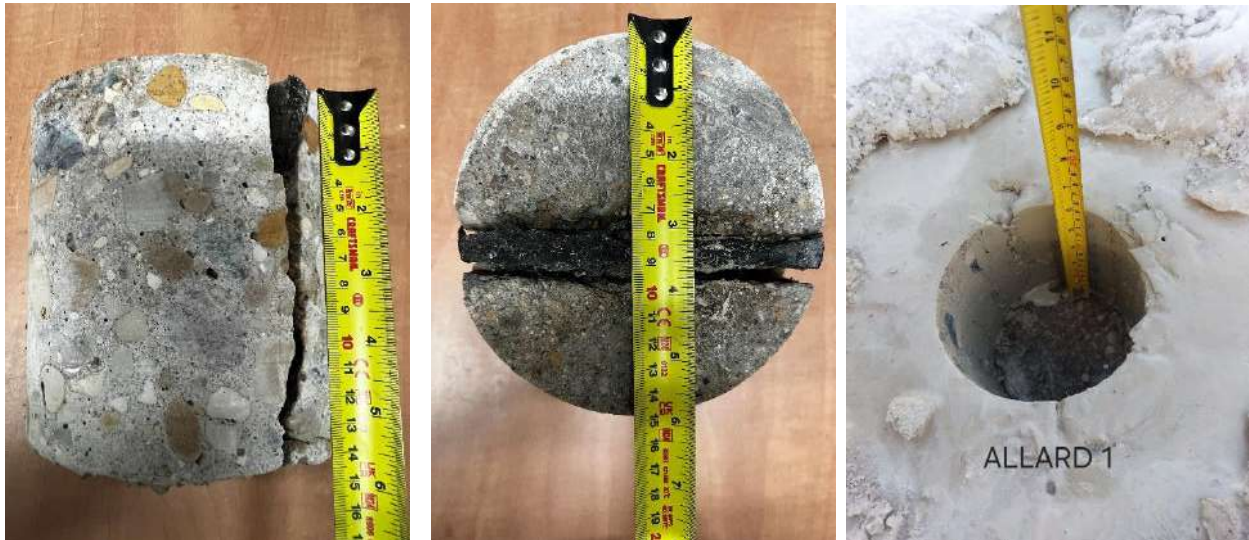


CH6 - Front of House # 14 Aldrich

Rehabilitation Sites

Picture of Cores

ALLARD AVENUE PICTURE OF CORES



CH1 - Between the Front of House # 439 and House # 433 Allard Avenue



CH2 - Side of House # 502 St. Charles Street

Rehabilitation Sites

Picture of Cores

ALLARD AVENUE PICTURE OF CORES



CH3 - Side of House # 503 St. Charles Street



CH4 - Front of Stewart / St. Charles Park

Rehabilitation Sites

Picture of Cores

ALLARD AVENUE PICTURE OF CORES



CH5 - Side of House # 492 Stewart Street



CH6 - Side of House # 495 Stewart Street

Rehabilitation Sites

Picture of Cores

ALLARD AVENUE PICTURE OF CORES



CH7 - Side of House # 488 Buchanan Blvd



CH8 – 60 m east of St Charles Street

Rehabilitation Sites

Picture of Cores

ALLARD AVENUE PICTURE OF CORES



CH9 - 70 m west of Buchanan Blvd

Rehabilitation Sites

Picture of Cores

HAULTAIN CRESCENT PICTURE OF CORES



CH3 - South side of House #283 Raquette Street

Rehabilitation Sites

Picture of Cores

MCDOWELL DRIVE PICTURE OF CORES



CH1 - Front of House # 171 McDowell Drive

Rehabilitation Sites

Picture of Cores

OXBOW BEND ROAD (MAJOR REHAB) PICTURE OF CORES



CH1 - Back of House # 97 Downs Village



CH2 - Back of House # 85 Downs Village

Rehabilitation Sites

Picture of Cores

OXBOW BEND ROAD (MAJOR REHAB) PICTURE OF CORES



CH3 - Near Parking lot and Apartment Building # 95 Oxbow Bend Road



CH4 - near Apartment Building # 119 Oxbow Bend Road

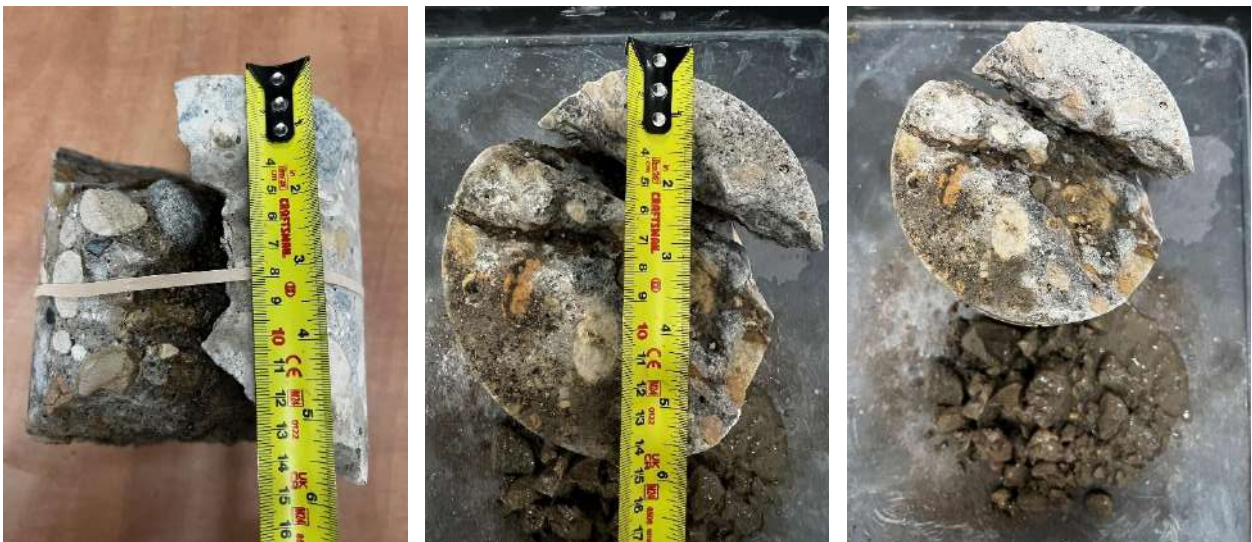
Rehabilitation Sites

Picture of Cores

RAQUETTE STREET PICTURE OF CORES



CH1 - Front of House # 253 Raquette Street



CH2 - Front of House # 267 Raquette Street

Rehabilitation Sites

Picture of Cores

RAQUETTE STREET PICTURE OF CORES



CH3 - Between the Front of House # 283 and House # 287 Raquette Street



CH4 - Front of House # 299 Raquette Street

Rehabilitation Sites

Picture of Cores

RAQUETTE STREET PICTURE OF CORES



CH5 - Front of House # 311 Raquette Street



CH6 - Front of House # 327 Raquette Street

Rehabilitation Sites

Picture of Cores

RAQUETTE STREET PICTURE OF CORES



CH7 - Front of House # 334 Raquette Street



CH8 - Front of House # 302 Raquette Street

Rehabilitation Sites

Picture of Cores

RAQUETTE STREET PICTURE OF CORES



CH9 - Front of House # 261 Raquette Street

Rehabilitation Sites

Picture of Cores

WESTLUND WAY PICTURE OF CORES



CH1 - Front of House # 811 Oakdale Dr



CH2 - Front of House # 11 Westlund Way

Rehabilitation Sites

Picture of Cores

WESTLUND WAY PICTURE OF CORES



CH3 - Between the Front of House # 19 and House # 23 Westlund Way



CH4 - Front of House # 31 Westlund Way

Rehabilitation Sites

Picture of Cores

WESTLUND WAY PICTURE OF CORES



CH5 - Front of House # 18 Westlund Way



CH6 - Front of House # 27 Westlund Way

Rehabilitation Sites

Compressive Strength Test Reports

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

CLIENT:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	DATE:	24-Feb-25
ATTENTION:	Ryan Cunningham	FILE NO:	112-2501
PROJECT:	Pavement Investigation Program Residential Streets Package 1 B. Rehabilitation Sites	REPORT NO:	25-001
STRUCTURE:	Road Slab	TECHNOLOGIST:	M.V.
		DATE CORES TAKEN:	21-Feb-25
		DOCUMENT NO:	25-236
		DATE RECEIVED IN LAB:	21-Feb-25

Core Location	Length as Drilled (mm)	Core Diameter (mm)	Core Length (mm)	Length / Diameter (mm)	Correctio n Factor	Mass (kg)	Date of Break	Type of Fracture	Comp. Strength as Calculated (MPa)	Comp. Strength as Corrected (MPa)
Core No. CH 5 - House No. 9 Aldrich Ave	140	101	127	1.25	0.93	2.4	Feb 24, 2025	2	50.1	46.6
Core No. CH 6 - House No.14 Aldrich Ave	135	101	117	1.15	0.90	2.2	Feb 24, 2025	2	53.5	48.6

Remarks:

The cores were tested in wet condition in accordance with CSA A23.2 14C.

Reviewed by:



Mayumi Kawano, Supervisor
Field & Lab Testing Services

Approved by:



Paul Bevel, Manager
Field & Lab Testing Services



1402 Notre Dame Avenue, Winnipeg, MB R3E 3G5
Phone: 204-697-3854 Cell: 204-997-1355 Email: hermie@hmanalo.ca

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

CLIENT:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	DATE:	21-Feb-25
ATTENTION:	Ryan Cunningham	FILE NO:	112-2501
PROJECT:	Pavement Investigation Program Residential Streets Package 1 B. Rehabilitation Sites	REPORT NO:	25-002
STRUCTURE:	Road Slab	TECHNOLOGIST:	P.B.
		DATE CORES TAKEN:	20-Feb-25
		DOCUMENT NO:	25-236
		DATE RECEIVED IN LAB:	20-Feb-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)
Along Allard Avenue										
Core No. CH 8 - 60m East of St Charles St	160	101	157	1.55	0.96	2.1	Feb 21, 2025	2	43.7	42.1
Core No. CH 9 - 70m West of Buchanan Blvd	170	101	167	1.65	0.97	2.2	Feb 21, 2025	2	37.3	36.3

Remarks:
The cores were tested in wet condition in accordance with CSA A23.2 14C.

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)

CLIENT:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	DATE:	21-Feb-25
ATTENTION:	Ryan Cunningham	FILE NO:	112-2501
PROJECT:	Pavement Investigation Program Residential Streets Package 1 B. Rehabilitation Sites	REPORT NO:	25-003
STRUCTURE:	Road Slab	TECHNOLOGIST:	P.B.
		DATE CORES TAKEN:	20-Feb-25
		DOCUMENT NO:	25-236
		DATE RECEIVED IN LAB:	20-Feb-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)
Core No. CH 8 - 302 Raquette St.	175	101	172	1.7	0.97	2.1	Feb 21, 2025	2	40.1	39.1
Core No. CH 9 - 261 Raquette St.	185	101	182	1.8	0.98	2.2	Feb 21, 2025	2	33.9	33.4

Remarks:

The cores were tested in wet condition in accordance with CSA A23.2 14C.

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)

CLIENT:	AECOM Canada ULC 99 Commerce Drive, Winnipeg MB R3P 0Y7	DATE:	24-Feb-25
ATTENTION:	Ryan Cunningham	FILE NO:	112-2501
PROJECT:	Pavement Investigation Program Residential Streets Package 1 B. Rehabilitation Sites	REPORT NO:	25-004
STRUCTURE:	Road Slab	TECHNOLOGIST:	M.V.
		DATE CORES TAKEN:	21-Feb-25
		DOCUMENT NO:	25-236
		DATE RECEIVED IN LAB:	21-Feb-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)
Core No. CH 5 -House No. 18 Westlund Wy	120	101	114	1.12	0.9	2.1	Feb 24, 2025	2	51.4	46.3
Core No. CH 6 -House No. 27 Westlund Wy	125	101	109	1.07	0.88	2.1	Feb 24, 2025	2	65.7	58.4

Remarks:

The cores were tested in wet condition in accordance with CSA A23.2 14C.

Reviewed by:



Mayumi Kawano, Supervisor
Field & Lab Testing Services

Approved by:



Paul Bevel, Manager
Field & Lab Testing Services