APPENDIX A
GEOTECHNICAL REPORT

Stantec Consulting Ltd.

2026 St. Mary's Road (N) Package 26-C-03

Prepared for:
Ron Bruce, P.Eng.
Stantec Consulting Ltd.
500-311 Portage Ave
Winnipeg, MB
R3B 2B9

Project Number: 1000-240-06

Date: February 10, 2026

www.trekengineering.ca
1712 St. James Street | Winnipeg, Manitoba R3H 0L3 | Tel 1.204.975.9433 | Fax 1.204.975.9435

February 10, 2026 Our File No. 1000-240-06

Ron Bruce, P.Eng.
Stantec Consulting Ltd.
500-311 Portage Ave
Winnipeg, MB
R3B 2B9

RE: 2026 St. Mary's Road (N) Package 26-C-03

TREK Engineering Inc. is pleased to submit our Final Report for the road investigation for 2026 St. Mary's Road (N) Package 26-C-03.

Please contact the undersigned should you have any questions.

Sincerely,

TREK Engineering Inc.
Per:

Nelson John Ferreira, Ph.D., P.Eng.
Senior Geotechnical Engineer

Encl.

Revision History

Revision No.	Author	Issue Date	Description
0	TG	February 10, 2026	Final Report

Authorization Signatures

Prepared By:
Tyler Green
Intermediate Technician

Reviewed By:
Kate Franklin M.Sc. (Geotechnical Engineering)
Technical Support Specialist

PROVINCE OF MANITOBA
FERREIRA
Member
22892
REGISTERED PROFESSIONAL ENGINEER

ENGINEERS GEOSCIENTISTS MANITOBA
Certificate of Authorization
TREK GEOTECHNICAL INC.
No. 4877

Reviewed By:
Nelson John Ferreira, Ph.D., P.Eng.
Senior Geotechnical Engineer

Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 Introduction

This report summarizes the results of the road investigation completed for the 2026 St. Mary's Rd (N) Package 26-C-03. The investigation was carried out along St. Mary's Road between Abinojii Mikanah and Fermor Avenue. Information collected describes the asphalt and concrete pavement structure. The investigation was carried out in accordance with the City of Winnipeg RFQ No. 331-2024.

2.0 Road Investigation

The investigation included coring of pavement at 60 locations on St. Mary's Road between Abinojii Mikanah and Fermor Avenue. The investigation locations are shown on Figures 01 to 05 (attached).

The road investigation was conducted between January 14, 2026 to January 22, 2026. The pavement structure (asphalt/concrete) was cored by Tyler Green of TREK Engineering Inc. (TREK) using a portable coring press equipped with a hollow 150mm diameter diamond core drill bits. Core samples were also retrieved and logged at TREK's material testing laboratory. A summary table of the pavement cores and photographs of the cores are included in Appendix A.

Core locations are noted on the summary tables and are based on UTM coordinates obtained using a hand-held GPS, and their location relative to the nearest address or intersection, measured distance from the edge of pavement, or other permanent features.

Six concrete cores were selected for concrete compressive strength breaks and the length to diameter ratio ranged between 1.17 to 1.42 for the cores collected. The core compressive strength tests were tested in accordance with CSA A23.2-14C – wet dried condition. The measured compressive strengths were also corrected based on an adapted ACI 214.4R-03 Standard to estimate the in-place concrete strengths. Table 01 summarizes the compressive strength results while the compressive strength testing details and the correction factor methodology are included in Appendix A.

Table 1: Concrete Core Compressive Strength Results

Core ID (Location)	Uncorrected Compressive Strength (MPa)	Corrected Compressive Strength (MPa)
PC26-01	50.21	54.73
PC26-13	44.92	48.12
PC26-27	59.14	64.91
PC26-34	68.02	74.54
PC26-44	46.20	48.84
PC26-57	46.21	53.78

3.0 Closure

The information provided in this report is in accordance with current engineering principles and practices (Standard of Practice). The findings of this report were based on information provided (field investigation).

All information provided in this report is subject to our standard terms and conditions for engineering services, a copy of which is provided to each of our clients with the original scope of work, or a mutually executed standard engineering services agreement. If these conditions are not attached, and you are not already in possession of such terms and conditions, contact our office and you will be promptly provided with a copy.

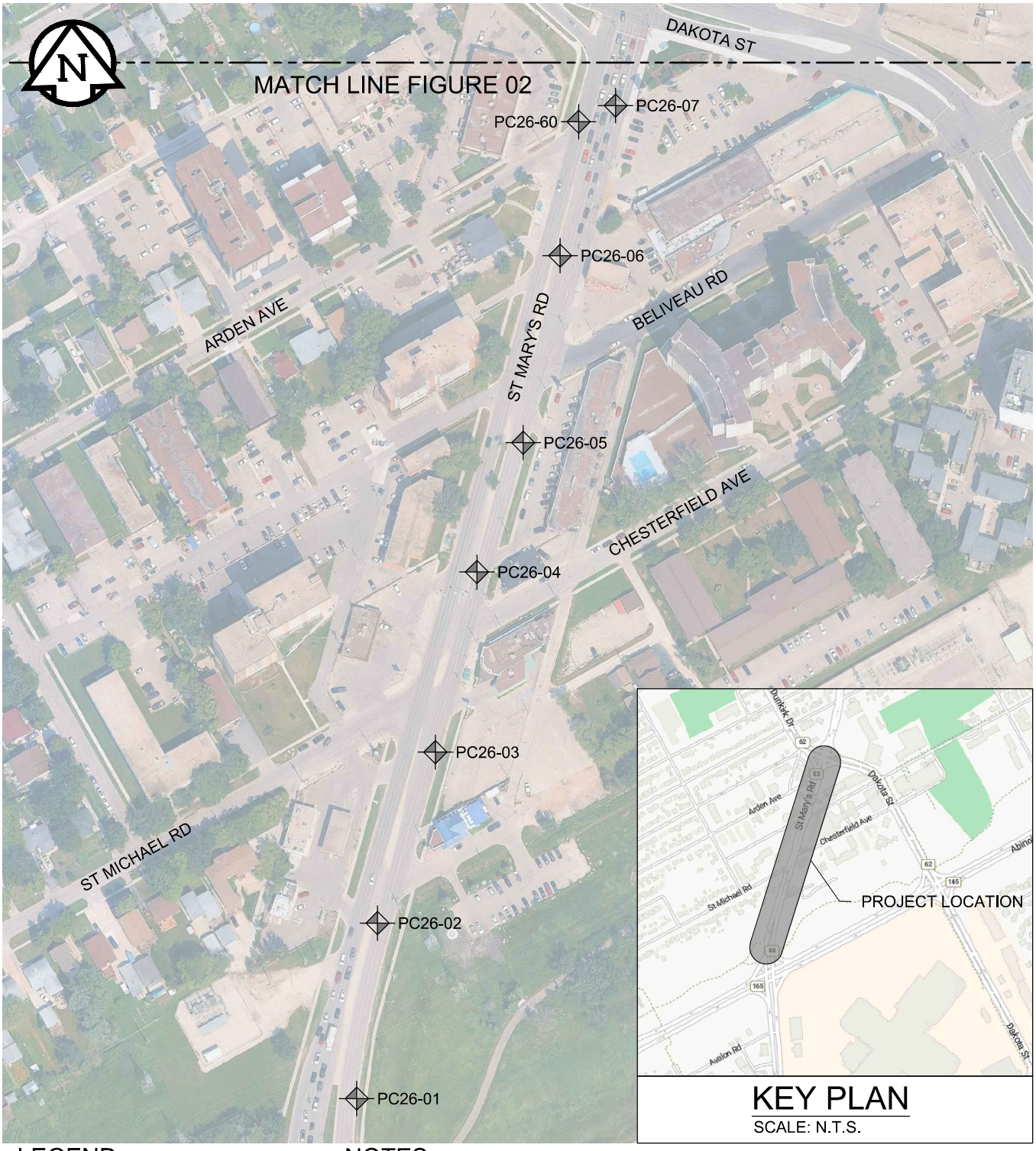
This report has been prepared by TREK Engineering Inc. (the Consultant) for the exclusive use of Stantec Consulting Ltd. (the Client) and their agents for the work product presented in the report. Any findings or recommendations provided in this report are not to be used or relied upon by any third parties, except as agreed to in writing by the Client and Consultant prior to use.

Figures

1000 240 06

Stantec Consulting Ltd.

2026 St. Mary's Road (N) Package 26-C-03



LEGEND:

PAVEMENT CORE (TREK, 2026)

NOTES:

1. AERIAL IMAGERY FROM GOOGLE EARTH (2024).

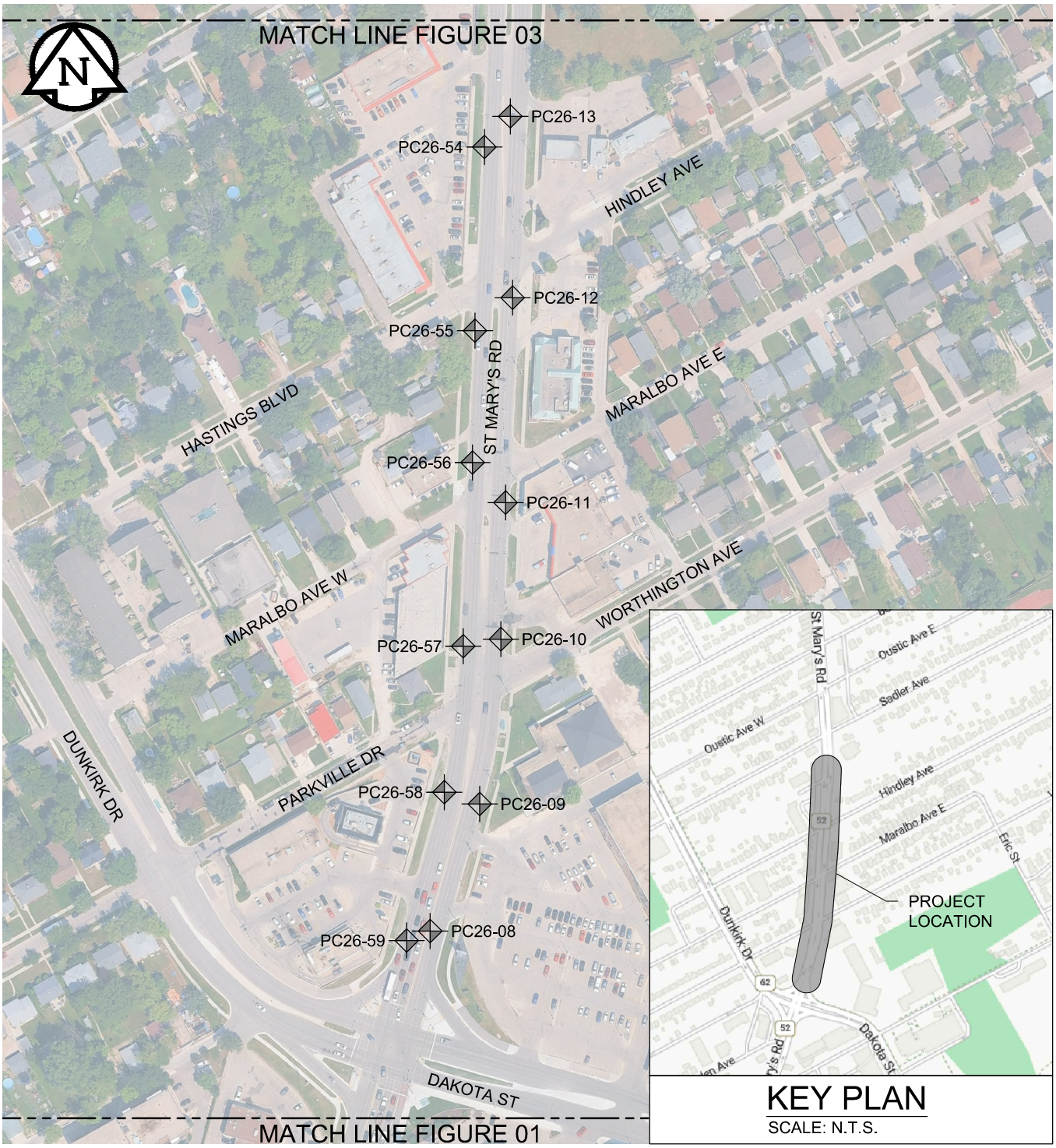
0 50 100 150 m

SCALE = 1 : 2 500 (216 mm x 279 mm)

Figure 01

Pavement Core Location Plan

Z:\Projects\1000 Soils Lab\1000 Lab Projects\1000-240 Stantec\1000-240-06 2026 St. Mary's Rd (N) Package 26-C-03\3 Survey and Dwg\3.4 CAD\3.4.3 Working Folder\Figs 01 to 05 2026-02-05 St.Mary's Rd 0_A 1000-240-06.dwg, 2026-02-05 9:10:37 AM



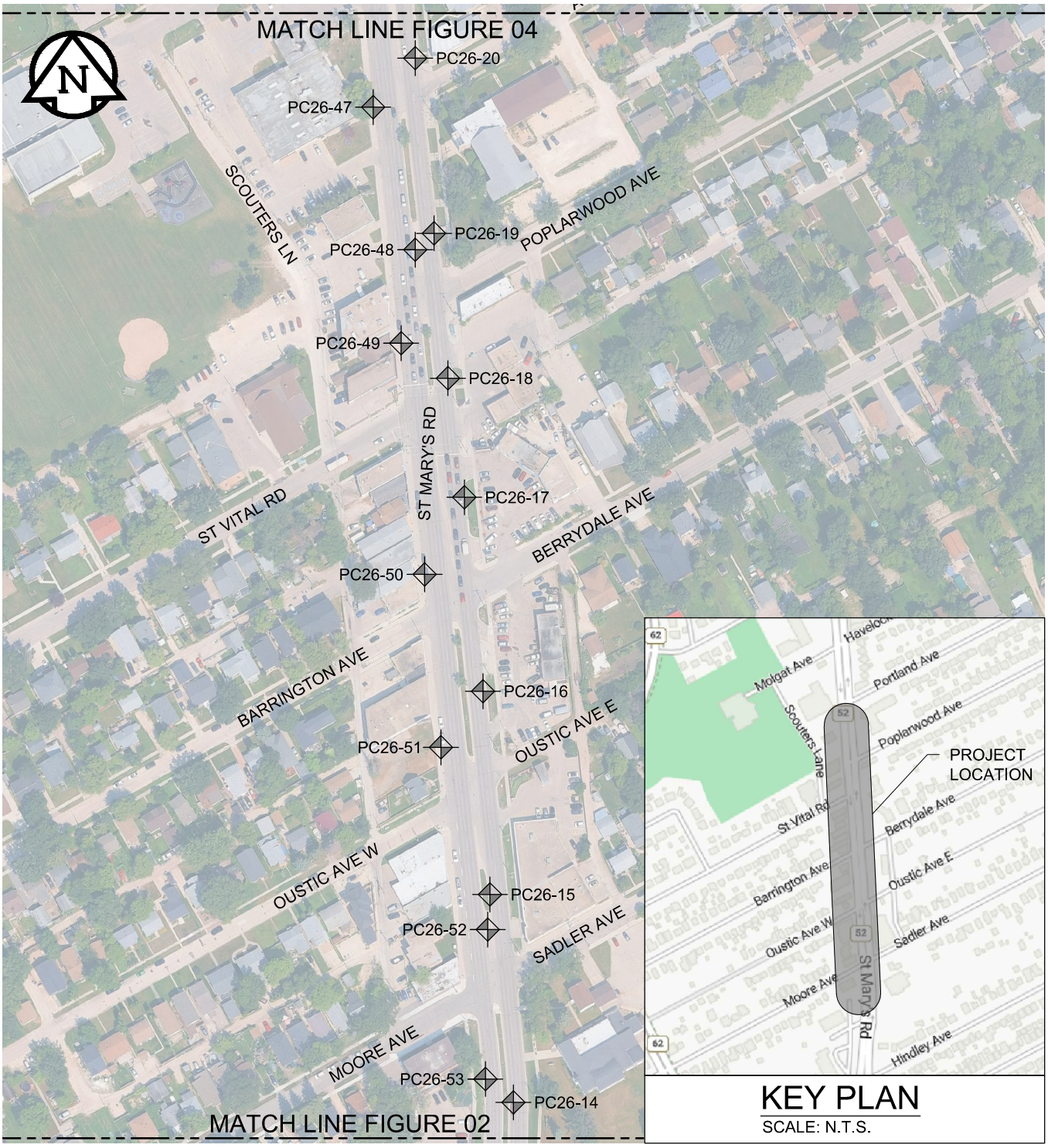
KEY PLAN
SCALE: N.T.S.

LEGEND:
PAVEMENT CORE (TREK, 2026)

NOTES:
1. AERIAL IMAGERY FROM GOOGLE EARTH (2024).

0 50 100 150 m
SCALE = 1 : 2 500 (216 mm x 279 mm)

Figure 02
Pavement Core Location Plan



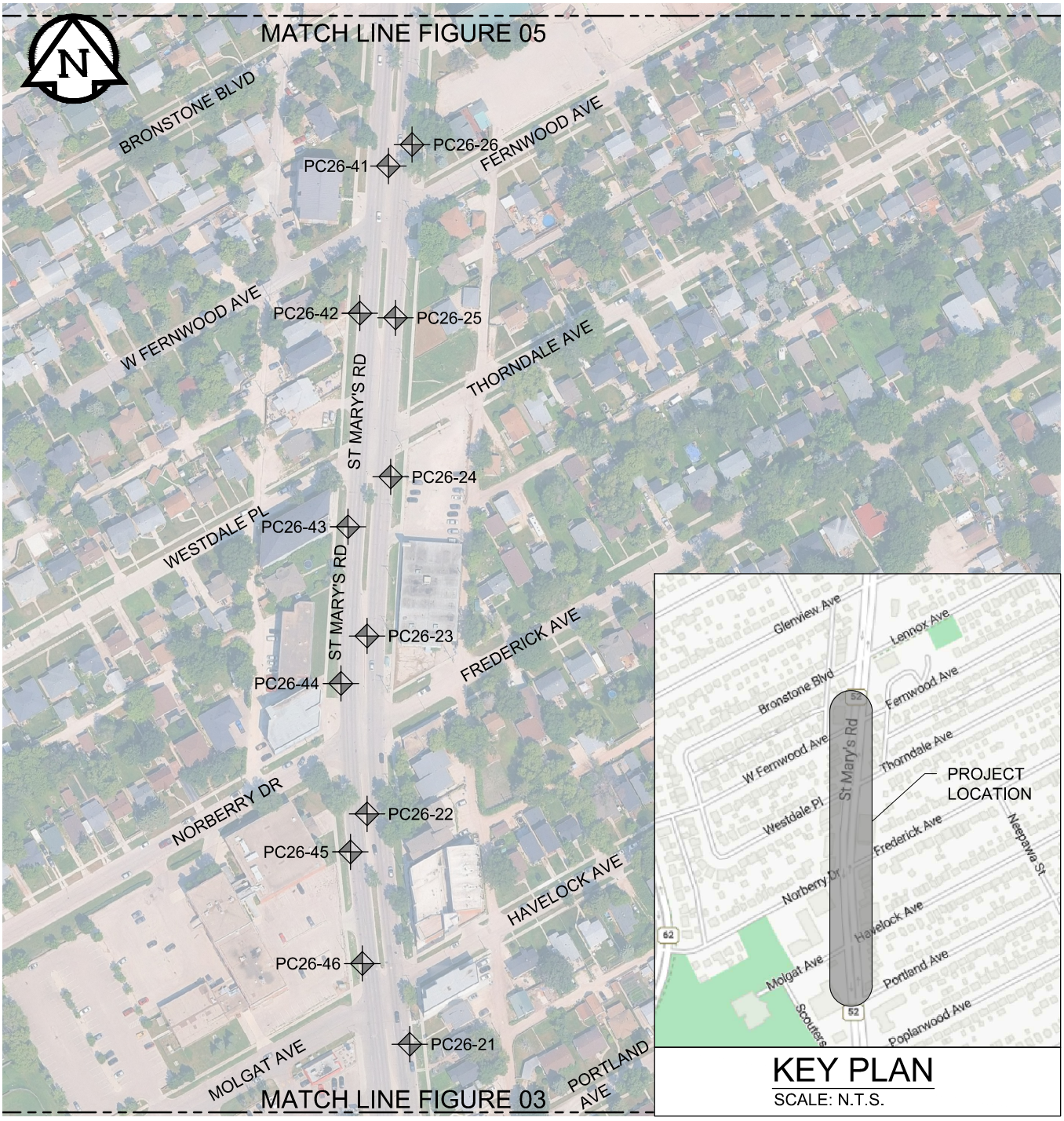
KEY PLAN
SCALE: N.T.S.

LEGEND:
PAVEMENT CORE (TREK, 2026)

NOTES:
1. AERIAL IMAGERY FROM GOOGLE EARTH (2024).

0 50 100 150 m
SCALE = 1 : 2 500 (216 mm x 279 mm)

Figure 03
Pavement Core Location Plan



LEGEND:

PAVEMENT CORE (TREK, 2026)

NOTES:

1. AERIAL IMAGERY FROM GOOGLE EARTH (2024).

0 50 100 150 m

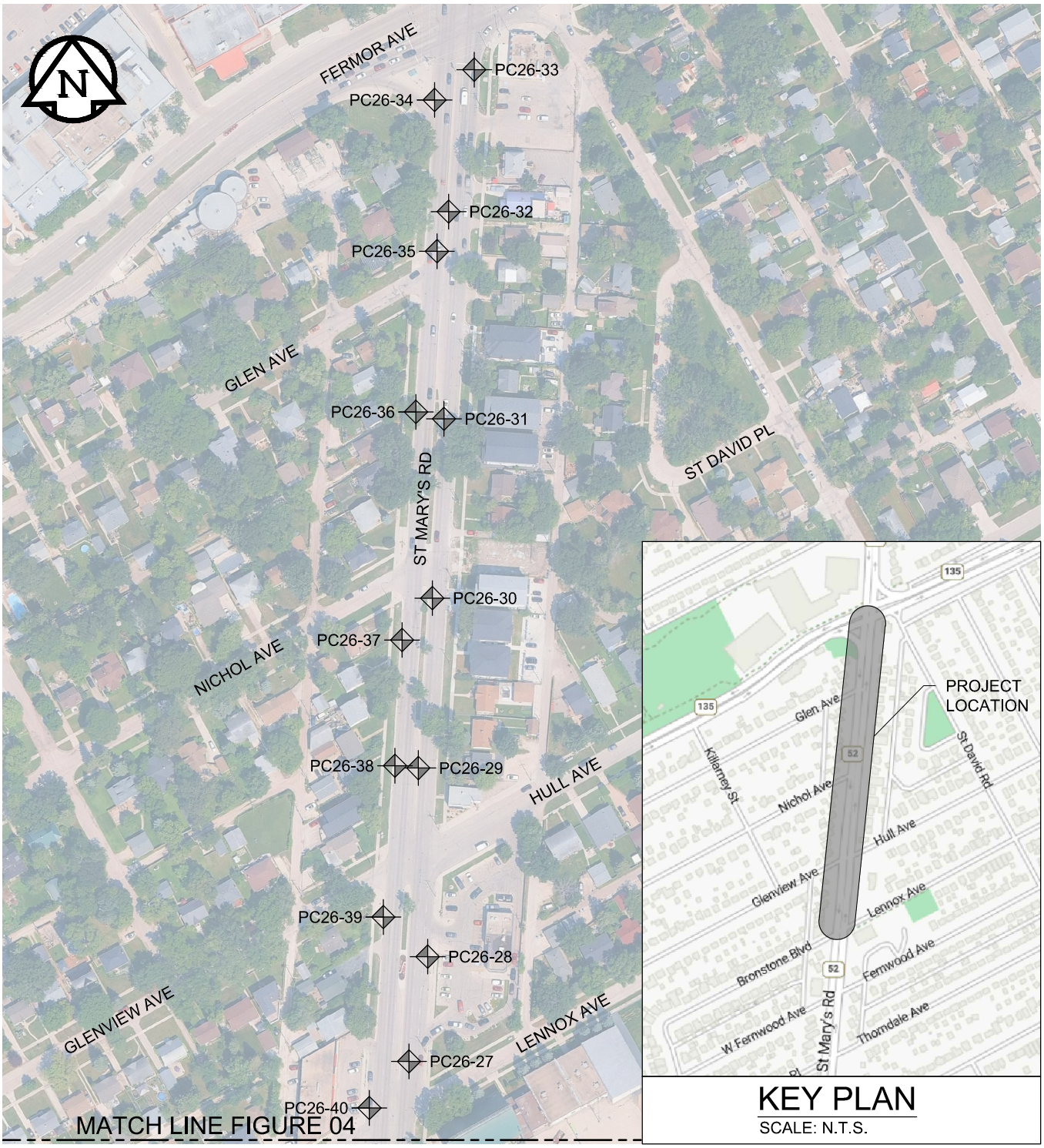
SCALE = 1 : 2 500 (216 mm x 279 mm)

Figure 04
Pavement Core Location Plan

1000 240 06

Stantec Consulting Ltd.

2026 St. Mary's Road (N) Package 26-C-03



KEY PLAN

SCALE: N.T.S.

LEGEND:

PAVEMENT CORE (TREK, 2026)

NOTES:

1. AERIAL IMAGERY FROM GOOGLE EARTH (2024).

0 50 100 150 m

SCALE = 1 : 2 500 (216 mm x 279 mm)

Figure 05

Pavement Core Location Plan

Appendix A

Summary Tables and Photographs of Pavement Core Samples

St. Mary's Road – Abinojii Mikanah and Fermor Avenue

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2026 St. Mary's Road (N) Package 26-C-03

St. Mary's Road - Abinojii Mikanah to Fermor Avenue

Pavement Core No.	Pavement Core Location	Pavement Surface		Pavement Structure Material		
		Type	Thickness (mm)	Type	Thickness (mm)	Corrected Compressive Strength (Mpa)
PC26-01	UTM : 5521610 m N, 635570 m E; Located 115 m North of Abinojii Mikanah, Northbound curb lane, 1.5 m West of East curb.	Asphalt	100	Concrete	210	54.73
PC26-02	UTM : 5521686 m N, 635579 m E; Located at #1134 St. Mary's Rd, Northbound median lane, 1.8 m East of West curb.	Asphalt	105	Concrete	205	
PC26-03	UTM : 5521760 m N, 635604 m E; Located 58 m N of Craddock Ave, Northbound curb lane, 0.7 m West of East curb.	Asphalt	90	Concrete	150	
PC26-04	UTM : 5521838 m N, 635622 m E; Located at #1127 St. Mary's Rd, Northbound median lane, 1.7 m East of West curb.	Asphalt	150	Concrete	200	
PC26-05	UTM : 5521894 m N, 635642 m E; Located at #1119 St. Mary's Rd, Northbound curb lane, 1.6 m West of East curb.	Asphalt	110	Concrete	190	
PC26-06	UTM : 5521975 m N, 635658 m E; Located at #1109 St. Mary's Rd, Northbound median lane, 3.5 m East of West curb.	Asphalt	120	Concrete	200	
PC26-07	UTM : 5522040m N, 635682 m E; Located 33 m South of Dakota Ave, Northbound middle lane, 4.2 m West of East curb.	Asphalt	90	Concrete	140	
PC26-08	UTM : 5522138 m N, 635705 m E; Located at #1078 St. Mary's Rd, Northbound median lane, 1.7 m East of West curb.	Asphalt	70	Concrete	190	
PC26-09	UTM : 5522192 m N, 635726 m E; Located at #1073 St. Mary's Rd, Northbound curb lane, 1.5 m West of East curb.	Asphalt	85	Concrete	195	
PC26-10	UTM : 5522262 m N, 635735 m E; Located at #1057 St. Mary's Rd, Northbound curb lane, 1.5 m West of East curb.	Asphalt	40	Concrete	180	
PC26-11	UTM : 5522320 m N, 635737 m E; Located at #1049 St. Mary's Rd, Northbound curb lane, 1.3 m West of East curb.	Asphalt	80	Concrete	180	
PC26-12	UTM : 5522407 m N, 635740 m E; Located 12 m South of Hindley Ave, Northbound curb lane, 1.8 m West of East curb.	Asphalt	80	Concrete	180	
PC26-13	UTM : 5522484 m N, 635739 m E; Located at #1025 St. Mary's Rd, Northbound turn lane, 1.6 m East of West curb.	Asphalt	55	Concrete	200	48.12
PC26-14	UTM : 5522540 m N, 635742 m E; Located at #1009 St. Mary's Rd, Northbound median lane, 1.3 m East of West curb.	Asphalt	135	Concrete	185	

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2026 St. Mary's Road (N) Package 26-C-03

St. Mary's Road - Abinojii Mikanah to Fermor Avenue

Pavement Core No.	Pavement Core Location	Pavement Surface		Pavement Structure Material		
		Type	Thickness (mm)	Type	Thickness (mm)	Corrected Compressive Strength (Mpa)
PC26-15	UTM : 5522629 m N, 635732 m E; Located at #1005 St. Mary's Rd, Northbound median lane, 1.8 m East of West curb.	Asphalt	85	Concrete	195	
PC26-16	UTM : 5522716 m N, 635729 m E; Located at #981 St. Mary's Rd, Northbound curb lane, 1.3 m West of East curb.	Asphalt	75	Concrete	215	
PC26-17	UTM : 5522799 m N, 635721 m E; Located at #967 St. Mary's Rd, Northbound curb lane, 2.0 m West of East curb.	Asphalt	60	Concrete	160	
PC26-18	UTM : 5522850 m N, 635714 m E; Located at #955 St. Mary's Rd, Northbound curb lane, 1.0 m West of East curb.	Asphalt	90	Concrete	190	
PC26-19	UTM : 5522912 m N, 635708 m E; Located 20 m North of Poplarwood Ave, Northbound curb lane, 1.0 m West of East curb.	Asphalt	70	Concrete	195	
PC26-20	UTM : 5522987 m N, 635700 m E; Located at #931 St. Mary's Rd, Northbound curb lane, 1.2 m West of East curb.	Asphalt	80	Concrete	170	
PC26-21	UTM : 5523035 m N, 635695 m E; Located at #923 St. Mary's Rd, Northbound curb lane, 1.0 m West of East curb.	Asphalt	80	Concrete	180	
PC26-22	UTM : 5523132 m N, 635677 m E; Located at #907 St. Mary's Rd, Northbound turn lane, 1.4 m East of West curb.	Asphalt	75	Concrete	225	
PC26-23	UTM : 5523207 m N, 635677 m E; Located at #888 St. Mary's Rd, Northbound median lane, 1.5 m East of West curb.	Asphalt	80	Concrete	200	
PC26-24	UTM : 5523274 m N, 635687 m E; Located 16 m South of Thorndale Ave, Northbound curb lane, 0.6 m West of East curb.	Asphalt	90	Concrete	220	
PC26-25	UTM : 5523341 m N, 635689 m E; Located at #867 St. Mary's Rd, Northbound curb lane, 1.6 m West of East curb.	Asphalt	70	Concrete	200	
PC26-26	UTM : 5523414 m N, 635696 m E; Located at #859 St. Mary's Rd, Northbound curb lane, 1.0 m West of East curb.	Asphalt	70	Concrete	165	
PC26-27	UTM : 5523502 m N, 635698 m E; Located 30 m North of Lennox Ave, Northbound middle lane, 3.8 m West of East curb.	Asphalt	140	Concrete	220	64.91
PC26-28	UTM : 5523547 m N, 635706 m E; Located at #835 St. Mary's Rd, Northbound bus lane, 1.4 m West of East curb.	Asphalt	85	Concrete	145	
PC26-29	UTM : 5523628 m N, 635702 m E; Located at #823 St. Mary's Rd, Northbound median lane, 1.4 m East of West curb.	Asphalt	85	Concrete	185	

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2026 St. Mary's Road (N) Package 26-C-03

St. Mary's Road - Abinojii Mikanah to Fermor Avenue

Pavement Core No.	Pavement Core Location	Pavement Surface		Pavement Structure Material		
		Type	Thickness (mm)	Type	Thickness (mm)	Corrected Compressive Strength (Mpa)
PC26-30	UTM : 5523701 m N, 635708 m E; Located at #813 St. Mary's Rd, Northbound median lane, 1.5 m East of West curb.	Asphalt	55	Concrete	155	
PC26-31	UTM : 5523778 m N, 635713 m E; Located at #803 St. Mary's Rd, Northbound curb lane, 2.0 m West of East curb.	Asphalt	65	Concrete	205	
PC26-32	UTM : 5523867 m N, 635715 m E; Located at #791 St. Mary's Rd, Northbound turn lane, 1.3 m East of West curb.	Asphalt	120	Concrete	210	
PC26-33	UTM : 5523928 m N, 635726 m E; Located at #785 St. Mary's Rd, Northbound curb lane, 1.8 m West of East curb.	Asphalt	65	Concrete	255	
PC26-34	UTM : 5523915 m N, 635709 m E; Located 17 m South of Fermor Ave, Southbound curb lane, 2.0 m East of West curb.	Asphalt	70	Concrete	230	74.54
PC26-35	UTM : 5523850 m N, 635710 m E; Located at #792 St. Mary's Rd, Southbound median lane, 1.8 m West of East curb.	Asphalt	105	Concrete	205	
PC26-36	UTM : 5523781 m N, 635701 m E; Located at #800 St. Mary's Rd, Southbound curb lane, 1.2 m East of West curb.	Asphalt	55	Concrete	215	
PC26-37	UTM : 5523683 m N, 635695 m E; Located at #810 St. Mary's Rd, Southbound curb lane, 0.7 m East of West curb.	Asphalt	70	Concrete	200	
PC26-38	UTM : 5523629 m N, 635692 m E; Located at #822 St. Mary's Rd, Southbound curb lane, 1.6 m East of West curb.	Asphalt	90	Concrete	215	
PC26-39	UTM : 5523564 m N, 635687 m E; Located at #828 St. Mary's Rd, Southbound curb lane, 1.1 m East of West curb.	Asphalt	85	Concrete	215	
PC26-40	UTM : 5523482 m N, 635681 m E; Located at #840 St. Mary's Rd, Southbound curb lane, 1.7 m East of West curb.	Asphalt	110	Concrete	160	
PC26-41	UTM : 5523405 m N, 635686 m E; Located at #858 St. Mary's Rd, Southbound turn lane, 1.4 m West of East curb.	Asphalt	110	Concrete	240	
PC26-42	UTM : 5523343 m N, 635674 m E; Located at #864 St. Mary's Rd, Southbound curb lane, 1.8 m East of West curb.	Asphalt	55	Concrete	200	
PC26-43	UTM : 5523253 m N, 635669 m E; Located at #878 St. Mary's Rd, Southbound curb lane, 2.5 m East of West curb.	Asphalt	90	Concrete	200	
PC26-44	UTM : 5523187 m N, 635666 m E; Located at #888 St. Mary's Rd, Southbound curb lane, 1.0 m East of West curb.	Asphalt	95	Concrete	200	48.84
PC26-45	UTM : 5523116 m N, 635670 m E; Located at #907 St. Mary's Rd, Southbound median lane, 1.8 m West of East curb.	Asphalt	65	Concrete	225	

TREK ENGINEERING

2026 St. Mary's Road (N) Package 26-C-03

St. Mary's Road - Abinojii Mikanah to Fermor Avenue

Pavement Core No.	Pavement Core Location	Pavement Surface		Pavement Structure Material		
		Type	Thickness (mm)	Type	Thickness (mm)	Corrected Compressive Strength (Mpa)
PC26-46	UTM : 5523069 m N, 635675 m E; Located 20 m North of Molgat Ave, Southbound curb lane, 1.4 m East of West curb.	Asphalt	100	Concrete	200	
PC26-47	UTM : 5522966 m N, 635682 m E; Located at #930 St. Mary's Rd, Southbound curb lane, 1.6 m East of West curb.	Asphalt	105	Concrete	210	
PC26-48	UTM : 5522905 m N, 635700 m E; Located 13 m North of Poplarwood Ave, Southbound turn lane, 1.6 m West of East curb.	Asphalt	90	Concrete	230	
PC26-49	UTM : 5522865 m N, 635694 m E; Located at #946 St. Mary's Rd, Southbound curb lane, 2.0 m East of West curb.	Asphalt	100	Concrete	210	
PC26-50	UTM : 5522766 m N, 635704 m E; Located at #970 St. Mary's Rd, Southbound curb lane, 2.0 m East of West curb.	Asphalt	100	Concrete	210	
PC26-51	UTM : 5522692 m N, 635711 m E; Located at #986 St. Mary's Rd, Southbound curb lane, 1.3 m East of West curb.	Asphalt	90	Concrete	205	
PC26-52	UTM : 5522614 m N, 635731 m E; Located at #1004 St. Mary's Rd, Southbound turn lane, 2.3 m West of East curb.	Asphalt	130	Concrete	100	
PC26-53	UTM : 5522550 m N, 635730 m E; Located at #1009 St. Mary's Rd, Southbound curb lane, 1.8 m East of West curb.	Asphalt	85	Concrete	160	
PC26-54	UTM : 5522471 m N, 635728 m E; Located at #1025 St. Mary's Rd, Southbound curb lane, 1.6 m East of West curb.	Asphalt	100	Concrete	205	
PC26-55	UTM : 5522393 m N, 635724 m E; Located at #1034 St. Mary's Rd, Southbound curb lane, 2.2 m East of West curb.	Asphalt	85	Concrete	225	
PC26-56	UTM : 5522337 m N, 635723 m E; Located at #1046 St. Mary's Rd, Southbound curb lane, 1.5 m East of West curb.	Asphalt	95	Concrete	210	
PC26-57	UTM : 5522259 m N, 635719 m E; Located at #1064 St. Mary's Rd, Southbound curb lane, 1.5 m East of West curb.	Asphalt	110	Concrete	225	53.78
PC26-58	UTM : 5522197 m N, 635711 m E; Located at #1070 St. Mary's Rd, Southbound curb lane, 1.7 m East of West curb.	Asphalt	75	Concrete	215	
PC26-59	UTM : 5522134 m N, 635695 m E; Located at #1074 St. Mary's Rd, Southbound curb lane, 2.0 m East of West curb.	Asphalt	90	Concrete	210	
PC26-60	UTM : 5522033 m N, 635666 m E; Located at #1086 St. Mary's Rd, Southbound curb lane, 1.6 m East of West curb.	Asphalt	60	Concrete	200	

www.trekengineering.ca
1712 St. James Street
Winnipeg, MB R3H 0L3
Tel: 204.975.9433

Concrete Core Compressive Strength Report

CSA A23.2-14C

Project No. 1000-240-06 **Date** January 30, 2026

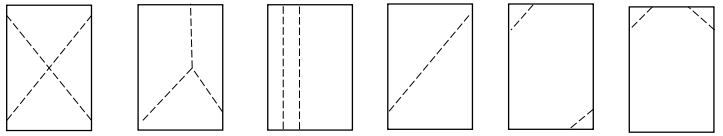
Project St. Mary's Rd (N) Package 26-C-03 **Technician** T. Green

Client Stantec Consulting Ltd.

Core Location	Core ID	Date Received	Date of Break	Age at Break	Diam. (mm)	Length (mm)	Moisture Conditioning	Compressive Strength (MPa)		Break Type	Correction Factors*				
								Uncorrected f_{conc}	Corrected* f_c		$F_{l/d}$	F_{dia}	F_{mc}	F_D	F_{reinf}
St. Mary's Ave	PC26-01	2026-01-14	2026-01-30	-	145	199	Soaked 48 h	50.21	54.73	1	0.9624	0.9802	1.0900	1.0600	1.0000
St. Mary's Ave	PC26-13	2026-01-15	2026-01-30	-	145	182	Soaked 48 h	44.92	48.12	1	0.9458	0.9802	1.0900	1.0600	1.0000
St. Mary's Ave	PC26-27	2026-01-16	2026-01-30	-	145	206	Soaked 48 h	59.14	64.91	1	0.9693	0.9802	1.0900	1.0600	1.0000
St. Mary's Ave	PC26-34	2026-01-19	2026-01-30	-	145	202	Soaked 48 h	68.02	74.54	1	0.9677	0.9802	1.0900	1.0600	1.0000
St. Mary's Ave	PC26-44	2026-01-20	2026-01-30	-	145	170	Soaked 48 h	46.20	48.84	1	0.9335	0.9802	1.0900	1.0600	1.0000
St. Mary's Ave	PC26-57	2026-01-21	2026-01-30	-	145	174	Soaked 48 h	46.21	53.78	1	0.9378	0.9802	1.0900	1.0600	1.0958

Comments

*Correction factors $F_{l/d}$, F_{dia}, F_{mc}, and F_D calculated as per ACI 214.4R-03, and correction factor F_{reinf} calculated as per Khoury et al. (2014): $f_c = f_{conc}F_{l/d}F_{dia}F_{mc}F_DF_{reinf}$



Type 1 Type 2 Type 3 Type 4 Type 5 Type 6

Reviewed by (print): _____ Signature: _____

Table 1 Factors involved in interpretation of core results by different codes.

List	Code/standard	Edition	Factors Considered					
			Aspect ratio	Diameter	Reinforcing	Moisture	Damage	Direction
1	Egyptian Code/Standard Specification	2008	√		√			√
2	British Code/Standard Specification	2003	√		√			√
3	American Concrete Institute ACI	1998	√					
		2012	√	√		√	√	
4	European Standard Specification	1998	√	√	√		√	
		2009	√		√			
5	Japanese Standard	1998	√					
6	Concrete Society	1987	√		√		√	√

In addition, for core specimen containing two bars no further apart than the diameter of the larger bar, only the bar corresponding to the higher value of $(\Phi_r * d)$ is considered. If the bars are further apart, their combined effect should be assessed by replacing the term $(\Phi_r * d)$ by the term $(\sum \Phi_r * d)$.

It should be pointed out that above equations used to interpret the core concrete strength to the in-situ concrete cube strength have been developed based on a set of assumptions and through many converting process. It is also of interest to note that the damage effect is considered in the development of the formulas in indirect way. The subject derivation and detailed formulas may be seen elsewhere [14].

3.2. American Concrete Institute (ACI)

3.2.1. Former ACI Code (2002) & Current ASTM (2009)

The methodology of core interpretation given in the former ACI code was remained without changes for decades and up to Year (2003). The in-place strength of concrete cylinder at the location from which a core test specimen was extracted can be computed using the equation:

$$f_{cy} = F_{l/d} \cdot f_{core} \tag{4}$$

where f_{cy} is the equivalent in-place concrete cylinder strength, f_{core} is concrete core strength, and $F_{l/d}$ is the strength correction factor for aspect ratio.

The former ACI code does not include any equation to calculate the correction factor ($F_{l/d}$); however, the code gives different values for this term that is associated with different aspect ratios (l/d) as given in Table 2. It should also be noted that the approach of current ASTM is similar to that mentioned above. The only considered variable is the aspect ratio (l/d). It should be noted that identical approach to that mentioned above is still effective in ASTM C42/C42M-03 [10].

3.2.2. Current ACI Code (2012) [15]

Starting from Year 2003, significant changes have been made to the relevant ACI Code provisions regarding the interpretation of core strength test results. New factors have been considered. These include core diameter, moisture content of core sample, core damage associated with drilling, in addition to the effect of aspect ratio that was previously considered in the former ACI edition (1998). According to the ACI 214.4R-03, the in-place concrete strength can be computed using the equation:

$$f_c = F_{l/d} \cdot F_{dia} \cdot F_{mc} \cdot F_D \cdot f_{core} \tag{5}$$

where f_c is the equivalent in-place concrete cylinder strength, f_{core} is concrete core strength, $F_{l/d}$ is strength correction factor for aspect ratio, F_{dia} is strength correction factors for diameter, F_{mc} is strength correction factor for moisture condition of core sample, and F_D is the strength correction factor that accounts for effect of damage sustained during core drilling including micro-cracking and undulations at the drilled surface and cutting through coarse-aggregate particles that may subsequently pop out during testing.

The ACI committee considered the correction factors presented in Table 3 for converting core strengths into equivalent in-place strengths based on the work reported by Bartlett and MacGregor [6]. It should be noted that the magnitude of

Table 2 Mean values for factor $F_{l/d}$ according to ACI Code (1998) and ASTM.

	Specimen length-to-diameter ratio, l/d			
	1.00	1.25	1.50	1.75
$F_{l/d}$	0.87	0.93	0.96	0.98

Table 3 Strength correction factors according to ACI 214.4R-03.

List	Factors	Mean values
(1)[b]	$F_{l/d}$: l/d ratio	
	As-received	$1 - \{0.130 - \alpha f_{core}\}(2 - \frac{l}{d})^2$
	Soaked 48 h	$1 - \{0.117 - \alpha f_{core}\}(2 - \frac{l}{d})^2$
	Air dried[a]	$1 - \{0.144 - \alpha f_{core}\}(2 - \frac{l}{d})^2$
(2)	F_{dia}: core diameter	
	50 mm	1.06
	100 mm	1.00
	150 mm	0.98
(3)	F_{mc}: core moisture content	
	As-received	1.00
	Soaked 48 h	1.09
	Air dried[a]	0.96
(4)	F_D: damage due to drilling	1.06

[a] Standard treatment specified in ASTM C 42/C 42M.
[b] Constant α equals $4.3(10^{-4})$ 1/MPa for f_{core} in MPa.

Table 6 List of comparisons between tested cores to determine.

	A18	A17	A16	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1
A1	♦●	●	♦●	■●	■●		●				●			▲	▲	■	▲	
A2																		
A3						■●				■●								
A4																		
A5																		
A6								■▲●	■▲●			■▲						
A7								■▲●	■▲●									
A8		●	♦	●	●													
A9																		
A10								■▲●										
A11																		
A12		●		●	●													
A13																		
A14		●		●														
A15		●																
A16	●♦																	
A17	♦																	
A18																		

● Diameter of steel bar.
▲ Distance of steel bar from nearly end of core.
■ Number of steel bars and spacing between bars.
♦ Distance of steel bar from vertical axis of specimen.

This brief review indicated that the various proposed relationships for correction factors are all nonlinear. It should be noted that the equations given by the Egyptian Code takes into account most variables that may affect the interpretation of the results; however, the code ignores the deterioration of steel–concrete bond that may occur and also the position of the reinforcement from vertical axis of core specimens.

Weighted nonlinear regression analysis has been performed to determine the factor (F_{reinf}) with the use of the software "SAS" package and "Data Fit." This shows that the correction factor for reinforcement (F_{reinf}) is given by the following expression:

- For cores containing a single bar:

$$F_{reinf} = \left[1 + 1.5\frac{[\Phi_r \times r + \Phi_r \times (S/10)]}{\Phi_c * L}\right] \times \frac{1.13}{f_{core}^{0.015}} \quad (12)$$

- For core specimen containing two bars no further apart than the diameter of the larger bar, only the bar corresponding to the higher value of ($\Phi_r * d$) is considered. If the bars are further apart, their combined effect is assessed by replacing the term ($\Phi_r * r$) by ($\sum \Phi_r * r$ as follows:

$$F_{reinf} = \left[1 + 1.5\frac{\sum[\Phi_r \times r + \Phi_r \times (S/10)]}{\Phi_c * L}\right] \times \frac{1.13}{f_{core}^{0.015}} \quad (13)$$

where F_{reinf} is the correction factor for reinforcement, Φ_r is the diameter of the reinforcement, Φ_c is the diameter of the concrete specimen, r is the distance of axis of bar from nearer end of specimen, S is the distance of axis of bar from axis of core specimen, L is the length of the specimen after end preparation by grinding or capping, and f_{core} is the concrete core strength (kg/cm^2).

6.1.6. *Effect of moisture condition of core*

Results of about 100 cores indicate that the strength of cores left to dry in air for 7 days is on average 13% greater than that of cores soaked at least 40 h before testing. The strength of cores with negligible moisture gradient and tested after cutting is found to be 7–9% larger than that of soaked cores as shown in Fig. 20. The authors strongly recommend to use a correction factor accounting for moisture condition (F_m) equals to 1.09 and 0.96, respectively, for cores tested after 48 h soaked in water and for those tested after 7 days dry in air.

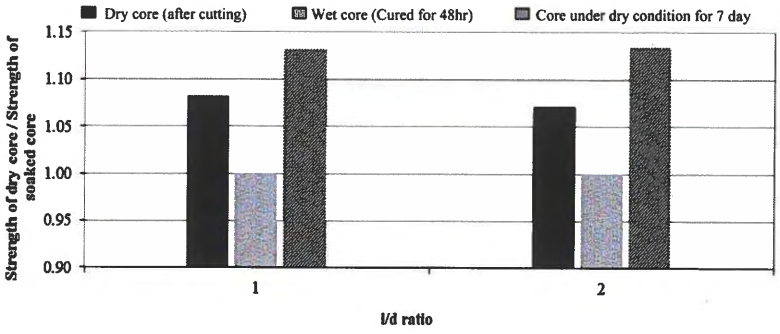


Figure 20 Effect of core moisture condition on core strength for different aspect ratios (l/d).

Photo 1: Pavement Core Sample at PC26-01

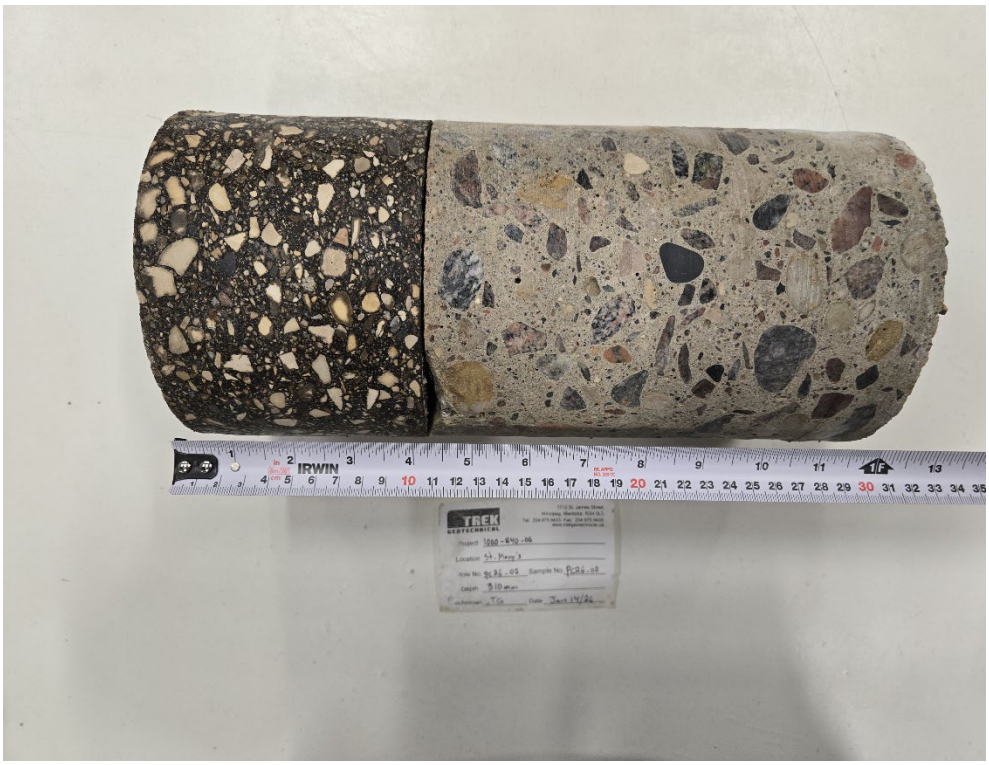


Photo 2: Pavement Core Sample at PC26-02

Photo 3: Pavement Core Sample at PC26-03

Photo 4: Pavement Core Sample at PC26-04

Photo 5: Pavement Core Sample at PC26-05

Photo 6: Pavement Core Sample at PC26-06

Photo 7: Pavement Core Sample at PC26-07

Photo 8: Pavement Core Sample at PC26-08

Photo 9: Pavement Core Sample at PC26-09

Photo 10: Pavement Core Sample at PC26-10

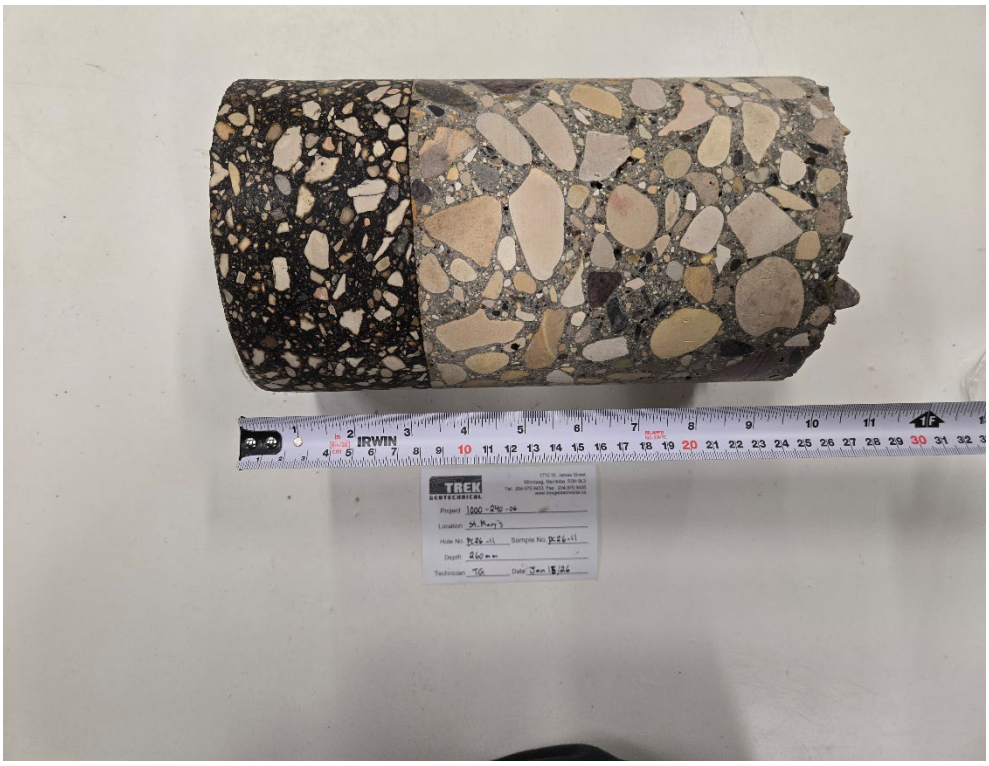


Photo 11: Pavement Core Sample at PC26-11

Photo 12: Pavement Core Sample at PC26-12

Photo 13: Pavement Core Sample at PC26-13

Photo 14: Pavement Core Sample at PC26-14

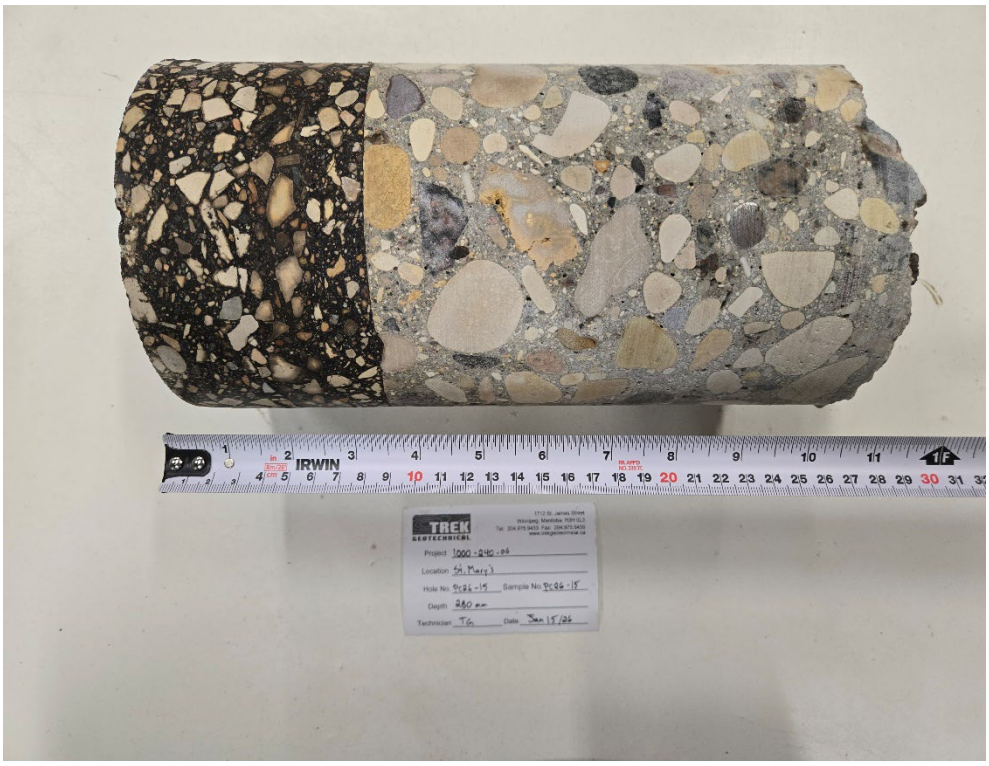


Photo 15: Pavement Core Sample at PC26-15

Photo 16: Pavement Core Sample at PC26-16

Photo 17: Pavement Core Sample at PC26-17

Photo 18: Pavement Core Sample at PC26-18

Photo 19: Pavement Core Sample at PC26-19

Photo 20: Pavement Core Sample at PC26-20

Photo 21: Pavement Core Sample at PC26-21

Photo 22: Pavement Core Sample at PC26-22

Photo 23: Pavement Core Sample at PC26-23

Photo 24: Pavement Core Sample at PC26-24

Photo 25: Pavement Core Sample at PC26-25

Photo 26: Pavement Core Sample at PC26-26

Photo 27: Pavement Core Sample at PC26-27

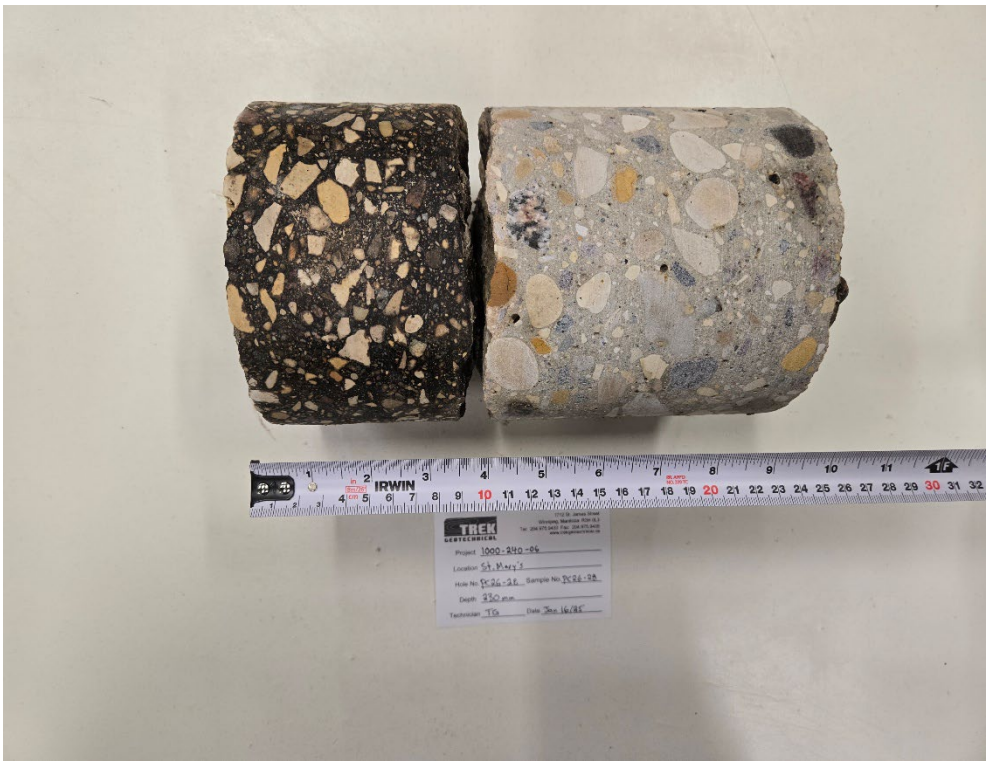


Photo 28: Pavement Core Sample at PC26-28

Photo 29: Pavement Core Sample at PC26-29

Photo 30: Pavement Core Sample at PC26-30

Photo 31: Pavement Core Sample at PC26-31

Photo 32: Pavement Core Sample at PC26-32

Photo 33: Pavement Core Sample at PC26-33

Photo 34: Pavement Core Sample at PC26-34

Photo 35: Pavement Core Sample at PC26-35

Photo 36: Pavement Core Sample at PC26-36

Photo 37: Pavement Core Sample at PC26-37

Photo 38: Pavement Core Sample at PC26-38

Photo 39: Pavement Core Sample at PC26-39

Photo 40: Pavement Core Sample at PC26-40

Photo 41: Pavement Core Sample at PC26-41

Photo 42: Pavement Core Sample at PC26-42

Photo 43: Pavement Core Sample at PC26-43

Photo 44: Pavement Core Sample at PC26-44

Photo 45: Pavement Core Sample at PC26-45

Photo 46: Pavement Core Sample at PC26-46

Photo 47: Pavement Core Sample at PC26-47

Photo 48: Pavement Core Sample at PC26-48

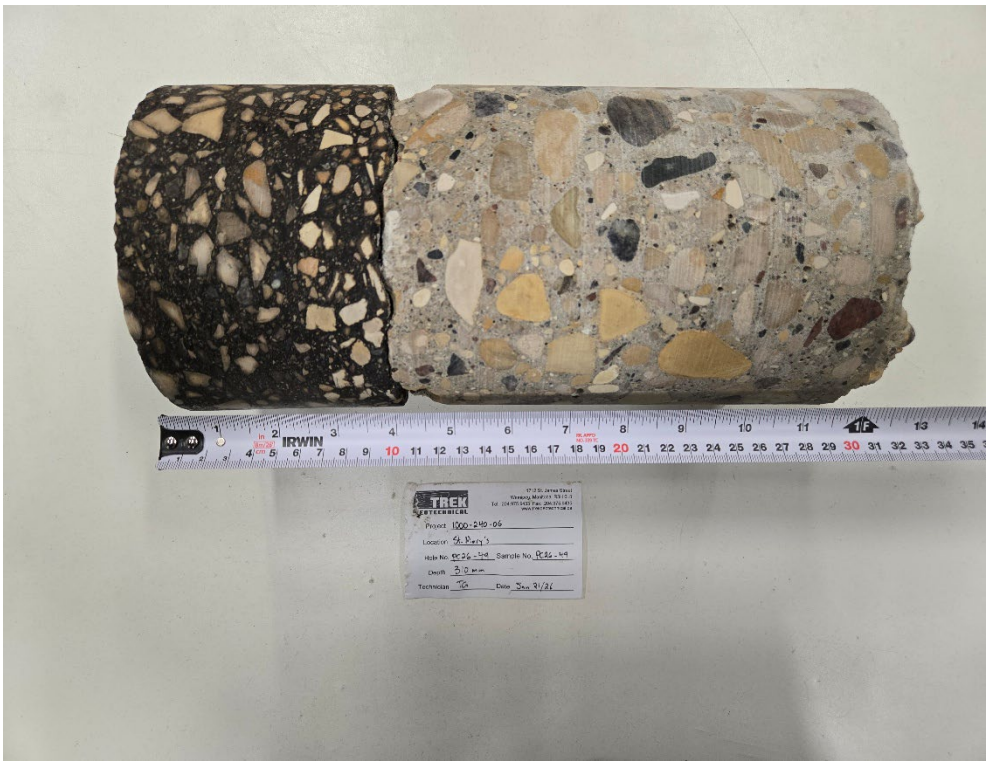


Photo 49: Pavement Core Sample at PC26-49

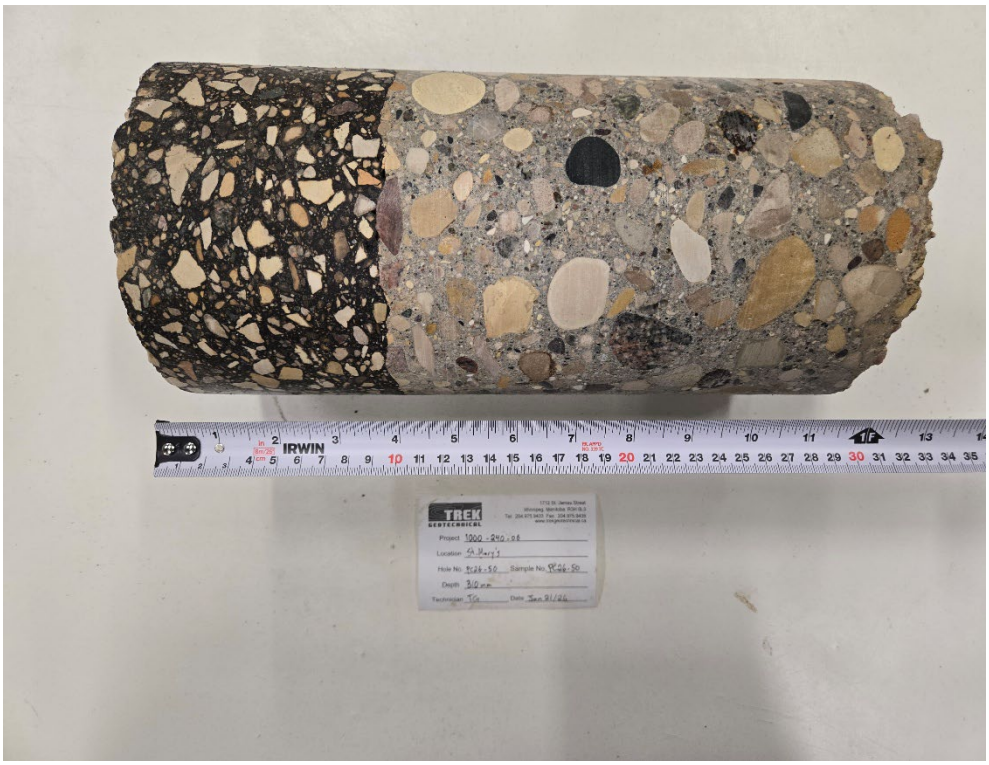


Photo 50: Pavement Core Sample at PC26-50

Photo 51: Pavement Core Sample at PC26-51

Photo 52: Pavement Core Sample at PC26-52

Photo 53: Pavement Core Sample at PC26-53

Photo 54: Pavement Core Sample at PC26-54

Photo 55: Pavement Core Sample at PC26-55

Photo 56: Pavement Core Sample at PC26-56

Photo 57: Pavement Core Sample at PC26-57

Photo 58: Pavement Core Sample at PC26-58

Photo 59: Pavement Core Sample at PC26-59

Photo 60: Pavement Core Sample at PC26-60