

# **APPENDIX 'C'**

# **GEOTECHNICAL REPORT**



420 Turenne Street, Winnipeg, Manitoba R2J 3W8  
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www.eng-tech.ca

*"Engineering and Testing Solutions That Work for You"*

**Date:** May 9, 2024 **File No.:** 24-035-02  
**Client:** WSP Canada Inc.  
**Address:** 1600 Buffalo Place  
Winnipeg, Manitoba  
R3T 6B8  
**Attention:** Mark Vogt, P. Eng.  
**Project:** Sargent Avenue and Ellice Avenue Pavement Renewals

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## Introduction

ENG-TECH Consulting Limited (ENG-TECH) was retained by WSP Canada Inc. (WSP) to complete a pavement coring and compressive strength testing program for a future rehabilitation project along sections of Sargent Avenue and Ellice Avenue in Winnipeg, Manitoba.

## Scope of Work

The scope of work for the project entailed recovering a total of twenty-two (22) cores through the existing pavement structure, documenting findings in accordance with Appendix B – Site Investigation Requirements for Public Works Street Projects and providing a report outlining the work conducted, including photographs and pavement core summary tables showing the pavement core thicknesses and locations using UTM coordinates.

The sections of road from which cores were recovered were as follows:

- Sargent Avenue (Erin Street to Empress Street) – 11 cores
- Ellice Avenue (Erin Street to Empress Street) – 11 cores

## Field Program

ENG-TECH conducted the coring program on the local streets between April 29<sup>th</sup> and May 2<sup>nd</sup>, 2024, across the site locations previously stated. The cores were obtained by ENG-TECH at locations determined by WSP using a 100mm and 150mm diameter diamond end core barrels. ENG-TECH repaired the core apertures with a City of Winnipeg approved material (cold mix asphalt) that has been accepted on previous street renewal projects.

## Laboratory Program

ENG-TECH measured core thicknesses and photographed the pavement structure. The core thicknesses, pavement structure and UTM coordinates are outlined in Tables 1 and 2 below. Photographs of each core are shown in the attached Photographs 1 to 22. ENG-TECH also determined concrete compressive strengths in accordance with CSA A23.2-14C – moist condition on select cores from locations determined by WSP. The compressive strength results are shown on the attached Obtaining and Testing Drilled Cores reports.



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## Closure

ENG-TECH trusts this is all the information required. If you have any questions, please contact the undersigned.

Sincerely,  
ENG-TECH Consulting Limited

A handwritten signature in blue ink, appearing to read 'D. Babisky', is positioned below the typed name.

Darci Babisky, C.E.T.  
Operations Manager - Laboratory

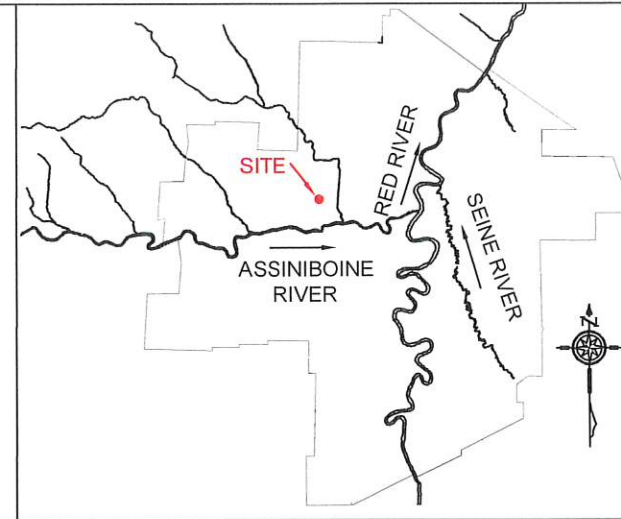
Enclosures: Coring Location Plan - Figures 1 and 2  
Table 1 – Summary of Pavement Structure – Ellice Avenue (Erin Street to Empress Street)  
Table 2 – Summary of Pavement Structure – Sargent Avenue (Erin Street to Empress Street)  
Obtaining and Testing Drilled Cores report (Ref. No. 24-35-2-1) (3 pages)  
Photographs of Cores (22 cores) (22 pages)

Email: WSP Canada Inc. Contact Group



PAVEMENT CORE LOCATION TABLE

HOLE NUMBER	CORING COMPLETED ON APRIL 29 & 30, 2024		LOCATION DESCRIPTIONS
	UTM COORDINATE		
	UTM	14U	
PC1	5528409	629612	EB ELLICE AVE CURB LANE
PC2	5528410	629691	EB ELLICE AVE MEDIAN LANE
PC3	5528414	629719	WB ELLICE AVE CURB LANE
PC4	5528407	629834	EB ELLICE AVE MEDIAN LANE
PC5	5528402	629855	EB ELLICE AVE CURB LANE
PC6	5528408	629940	WB ELLICE AVE MEDIAN LANE
PC7	5528399	630032	EB ELLICE AVE CURB LANE
PC8	5528398	630107	EB ELLICE AVE CURB LANE
PC9	5528407	630185	WB ELLICE AVE CURB LANE
PC10	5528397	630261	EB ELLICE AVE MEDIAN LANE
PC11	5528402	630350	WB ELLICE AVE CURB LANE



KEYMAP

**LEGEND**

 PC PAVEMENT CORE LOCATION



NOTES:

NO.	DATE	ISSUE / REVISION



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**ENG-TECH**  
CONSULTING LIMITED

ENGINEERS  
GEOSCIENTISTS  
MANITOBA  
Certificate of Authorization  
ENG-TECH Consulting Limited  
No.2475

CLIENT:  
WSP CANADA INC.

PROJECT:  
ELLICE AVENUE AND SARGENT AVENUE PAVEMENT RENEWALS, WINNIPEG, MANITOBA

DWG DESCRIPTION:  
CORING LOCATION PLAN

SCALE:  
N.T.S.

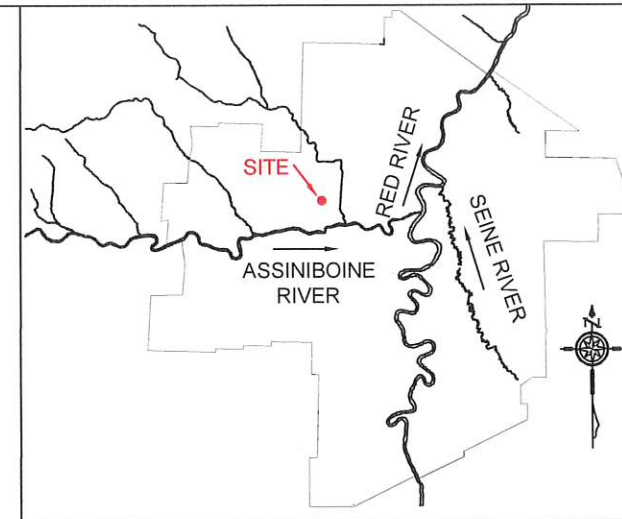
DRAWN BY: DB	DATE: MAY 2024
FILE No.: 24-035-02	CLIENT DWG/FIG. No.:
ENG-TECH DWG/FIG. No.:	NO.:

1 of 2



PAVEMENT CORE LOCATION TABLE

HOLE NUMBER	CORING COMPLETED ON MAY 1 & 2, 2024		LOCATION DESCRIPTIONS
	UTM COORDINATE		
	UTM	14U	
PC12	5528807	629621	EB SARGENT AVE CURB LANE
PC13	5528809	629716	EB SARGENT AVE MEDIAN LANE
PC14	5528816	629756	WB SARGENT AVE CURB LANE
PC15	5528807	629842	EB SARGENT AVE MEDIAN LANE
PC16	5528801	629879	EB SARGENT AVE CURB LANE
PC17	5528806	629954	WB SARGENT AVE MEDIAN LANE
PC18	5528798	630042	EB SARGENT AVE CURB LANE
PC19	5528800	630113	EB SARGENT AVE MEDIAN LANE
PC20	5528805	630190	WB SARGENT AVE CURB LANE
PC21	5528795	630278	EB SARGENT AVE MEDIAN LANE
PC22	5528799	630319	WB SARGENT AVE CURB LANE



KEYMAP

LEGEND

 PAVEMENT CORE LOCATION



NOTES:

NO.	DATE	ISSUE / REVISION



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CLIENT:  
WSP CANADA INC.

PROJECT:  
ELLICE AVENUE AND SARGENT AVENUE PAVEMENT RENEWALS, WINNIPEG, MANITOBA

DWG DESCRIPTION:  
CORING LOCATION PLAN

SCALE:  
N.T.S.

DRAWN BY:  
DB

DATE:  
MAY 2024

FILE No.:  
24-035-02

CLIENT DWG/FIG. No.:

ENG-TECH DWG/FIG. No.:

NO.:

2 of 2



Table 1 - Summary of Pavement Core Structure  
 Ellice Avenue (Erin Street to Empress Street)

Core No.	Date Collected	Lane	Test Hole Location		Pavement Surface		
			UTM (N)	14U (E)	Type	Core Diameter (mm)	Thickness (mm)
PC1	April 29, 2024	Eastbound Curb	5528409	629612	Asphalt	150	158
					Concrete	150	167
PC2	April 29, 2024	Eastbound Median	5528410	629691	Asphalt	100	87
					Concrete	100	202
PC3	April 29, 2024	Westbound Curb	5528414	629719	Asphalt	150	71
					Concrete	150	201
PC4	April 29, 2024	Eastbound Median	5528407	629834	Asphalt	150	64
					Concrete	150	240
PC5	April 29, 2024	Eastbound Curb	5528402	629855	Asphalt	150	100
					Concrete	150	220
PC6	April 29, 2024	Westbound Median	5528408	629940	Asphalt	150	67
					Concrete	150	220
PC7	April 30, 2024	Eastbound Curb	5528399	630032	Asphalt	150	76
					Concrete	150	195
PC8	April 30, 2024	Eastbound Curb	5528398	630107	Asphalt	100	108
					Concrete	100	190
PC9	April 29, 2024	Westbound Curb	5528407	630185	Asphalt	100*	99
					Concrete	100*	284
PC10	April 30, 2024	Eastbound Median	5528397	630261	Asphalt	150	70
					Concrete	150	205
PC11	April 29, 2024	Westbound Curb	5528402	630350	Asphalt	100*	132
					Concrete	100*	203

\*Cores 9 and 11 were drilled using 100mm diameter barrel as they were intended for compressive strength testing however, recovered specimens did not meet the CSA criteria for testing.



Table 2 - Summary of Pavement Core Structure  
 Sargent Avenue (Erin Street to Empress Street)

Core No.	Date Collected	Lane	Test Hole Location		Pavement Surface		
			UTM (N)	14U (E)	Type	Core Diameter (mm)	Thickness (mm)
PC12	May 1, 2024	Eastbound Curb	5528807	629621	Asphalt	100	0
					Concrete	100	217
PC13	May 1, 2024	Eastbound Median	5528809	629716	Asphalt	150	55
					Concrete	150	198
PC14	May 1, 2024	Westbound Curb	5528816	629756	Asphalt	150	175
					Concrete	150	181
PC15	May 1, 2024	Eastbound Median	5528807	629842	Asphalt	150	240
					Concrete	150	224
PC16	May 2, 2024	Eastbound Curb	5528801	629879	Asphalt	150	96
					Concrete	150	224
PC17	May 2, 2024	Westbound Median	5528806	629954	Asphalt	150	100
					Concrete	150	225
PC18	May 2, 2024	Eastbound Curb	5528798	630042	Asphalt	150	112
					Concrete	150	215
PC19	May 2, 2024	Eastbound Median	5528800	630113	Asphalt	150	137
					Concrete	150	230
PC20	May 1, 2024	Westbound Curb	5528805	630190	Asphalt	150	115
					Concrete	150	218
PC21	May 2, 2024	Eastbound Median	5528795	630278	Asphalt	150	144
					Concrete	150	187
PC22	May 1, 2024	Westbound Curb	5528799	630319	Asphalt	100	140
					Concrete	100	189





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**OBTAINING AND TESTING  
 DRILLED CORES**



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WSP Canada Inc.  
 1600 Buffalo Place  
 Winnipeg, Manitoba  
 R3T 6B8

**File No.:** 24-035-02  
**Ref. No.:** 24-35-2-1

**Attention:** Mark Vogt, M. Sc., P. Eng.

**Project:** SARGENT AVENUE AND ELLICE AVENUE PAVEMENT RENEWALS


Date Cored: See Comments Cored By: ENG-TECH (Kyle Zebiere) Page: 1 of 3  
 Date Received: May 3/24 Received By: ENG-TECH (Kyle Zebiere) Structure: Road pavement  
 Age of Concrete: - Concrete Design Strength: 32 MPa Direction of Load: Parallel  
 Core Conditioning: As per CSA A23.2-14C Clause 7.2.3 (moist) Test Method: CSA A23.2-14C, 9C  
 Strength Specification: Minimum 85% of design strength on an average of 3 cores - no single core less than 75% as per CSA A23.1 Clause 4.4.2.2.2

Core No.	Location on Structure	Length		Average Diameter (mm)	Date Tested (m/d/y)	Compressive Strength (MPa)	Type of Fracture	Tested By ENG-TECH
		Cored (mm)	Tested (mm)					
PC1	Eastbound Ellice Avenue curb lane, Northing: 5528409, Easting: 629612	167	-	150	-	-	-	-
PC2	Eastbound Ellice Avenue median Lane Northing: 5528410, Easting: 629691	202	190	100	May 6/24	63.14*	1	Kyle Zebiere
PC3	Westbound Ellice Avenue curb lane, Northing: 5528414, Easting: 629719	201	-	150	-	-	-	-
PC4	Eastbound Ellice Avenue median lane, Northing: 5528407, Easting: 629834	240	-	150	-	-	-	-
PC5	Eastbound Ellice Avenue curb lane, Northing: 5528402, Easting: 629855	220	-	150	-	-	-	-
PC6	Westbound Ellice Avenue median lane, Northing: 5528408, Easting: 629940	220	-	150	-	-	-	-

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.  
 \*Denotes corrected strength for Length/Diameter ratio less than 2.0 to 1.0. Type of fracture indicated when cylinder fails to meet 85% of design strength or if different than CSA A23.2-19-9C Table 3 Type 1.

Deviations from test procedure: None  
 Email: WSP Canada Inc. Contact Group

**ENG-TECH Consulting Limited**

Per   
 Darci Babisky, C.E.T.  
 Operations Manager - Laboratory  
 Ph: (204) 233-1694 Fx: (204) 235-1579

Supplementary information may be provided upon request.  
 Restrictions and additional fees may apply.





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Project: SARGENT AVENUE AND ELLICE AVENUE PAVEMENT RENEWALS  
File No.: 24-305-02  
Ref. No.: 24-35-2-1  
Date Cored: See Comments  
Page: 2 of 3

Core No.	Location on Structure	Length		Average Diameter (mm)	Date Tested (m/d/y)	Compressive Strength (MPa)	Type of Fracture	Tested By ENG-TECH
		Cored (mm)	Tested (mm)					
PC7	Eastbound Ellice Avenue curb lane, Northing: 5528399, Easting: 630032	195	-	150	-	-	-	-
PC8	Eastbound Ellice Avenue curb lane, Northing: 5528398, Easting: 630107	190	177	100	May 6/24	60.02*	1	Kyle Zebiere
PC9	Westbound Ellice Avenue curb lane, Northing: 5528407, Easting: 630185	284	-	100	-	-	-	-
PC10	Eastbound Ellice Avenue median lane, Northing: 5528397, Easting: 630261	205	-	150	-	-	-	-
PC11	Westbound Ellice Avenue curb lane, Northing: 5528402, Easting: 630350	203	-	100	-	-	-	-
PC12	Eastbound Sargent Avenue curb lane, Northing: 5528807, Easting: 629621	217	182	100	May 6/24	37.30*	1	Kyle Zebiere
PC13	Eastbound Sargent Avenue median lane, Northing: 5528809, Easting: 629716	198	-	150	-	-	-	-
PC14	Westbound Sargent Avenue curb lane, Northing: 5528816, Easting: 629756	181	-	150	-	-	-	-
PC15	Eastbound Sargent Avenue median lane, Northing: 5528807, Easting: 629842	224	-	150	-	-	-	-
PC16	Eastbound Sargent Avenue curb lane, Northing: 5528801, Easting: 629879	224	-	150	-	-	-	-

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\*Denotes corrected strength for Length/Diameter ratio less than 2.0 to 1.0. Type of fracture indicated when cylinder fails to meet 85% of design strength or if different than CSA A23.2-19-9C Table 3 Type 1.

Deviations from test procedure: None  
Email: WSP Canada Inc. Contact Group

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Project: SARGENT AVENUE AND ELLICE AVENUE PAVEMENT RENEWALS  
 File No.: 24-305-02  
 Ref. No.: 24-35-2-1  
 Date Cored: See Comments  
 Page: 3 of 3

Core No.	Location on Structure	Length		Average Diameter (mm)	Date Tested (m/d/y)	Compressive Strength (MPa)	Type of Fracture	Tested By ENG-TECH
		Cored (mm)	Tested (mm)					
PC17	Westbound Sargent Avenue median lane, Northing: 5528806, Easting: 629954	225	-	150	-	-	-	-
PC18	Eastbound Sargent Avenue curb lane, Northing: 5528798, Easting: 630042	215	-	150	-	-	-	-
PC19	Eastbound Sargent Avenue median lane, Northing: 5528800, Easting: 630113	230	-	150	-	-	-	-
PC20	Westbound Sargent Avenue curb lane, Northing: 5528805, Easting: 630190	218	-	150	-	-	-	-
PC21	Eastbound Sargent Avenue median lane, Northing: 5528795, Easting: 630278	187	-	150	-	-	-	-
PC22	Westbound Sargent Avenue curb lane, Northing: 5528799, Easting: 630319	189	164	100	May 6/24	32.95*	1	Kyle Zebiere

Reporting of these results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided only on written request.  
 \*Denotes corrected strength for Length/Diameter ratio less than 2.0 to 1.0. Type of fracture indicated when cylinder fails to meet 85% of design strength or if different than CSA A23.2-19-9C Table 3 Type 1.

Comments: Pavement Core No.'s PC1, PC2, PC3, PC4, PC5, PC6, PC9 and PC11 were cored April 29, 2024.  
 Pavement Core No.'s PC7, PC8 and PC10 were cored April 30, 2024.  
 Pavement Core No.'s PC12, PC13, PC14, PC15, PC20 and PC22 were cored May 1, 2024.  
 Pavement Core No.'s PC16, PC17, PC18, PC19 and PC21 were cored May 2, 2024.

Deviations from test procedure: None  
 Email: WSP Canada Inc. Contact Group

**ENG-TECH Consulting Limited**

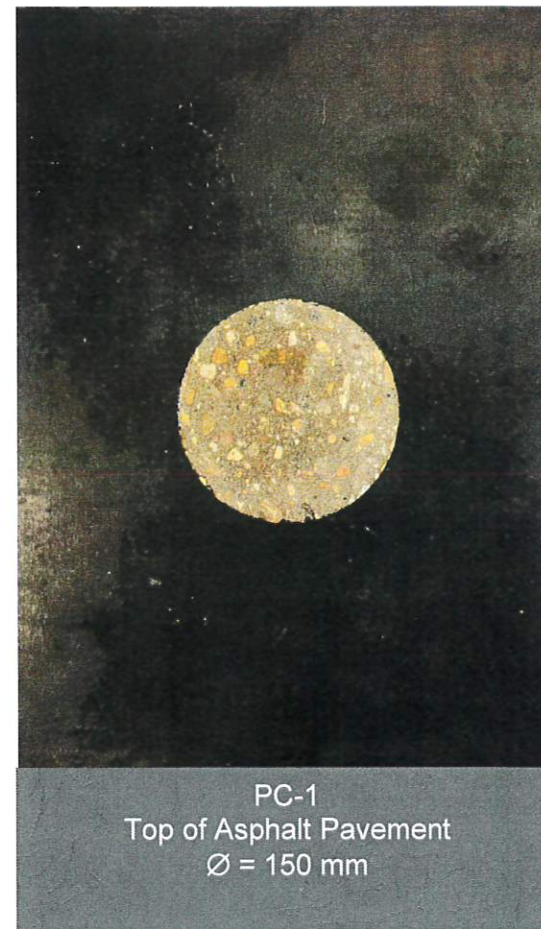
Per 

Darci Babisky, C.E.T.  
 Operations Manager - Laboratory  
 Ph: (204) 233-1694 Fx: (204) 235-1579

Supplementary information may be provided upon request.  
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**Photograph 1: Specimen from Ellice Avenue, Eastbound Curb Lane**

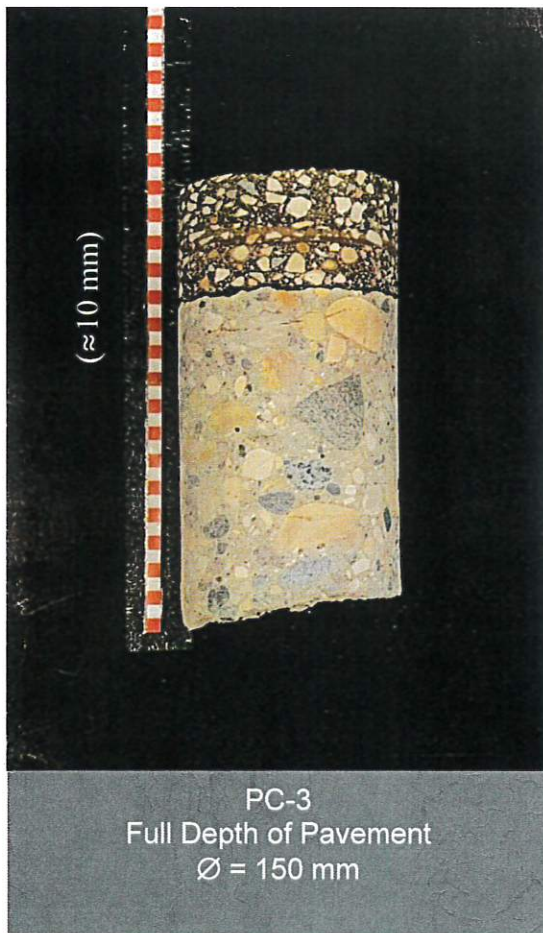




**Photograph 2: Specimen from Ellice Avenue, Eastbound Median Lane**



Photograph 3: Specimen from Ellice Avenue, Westbound Curb Lane



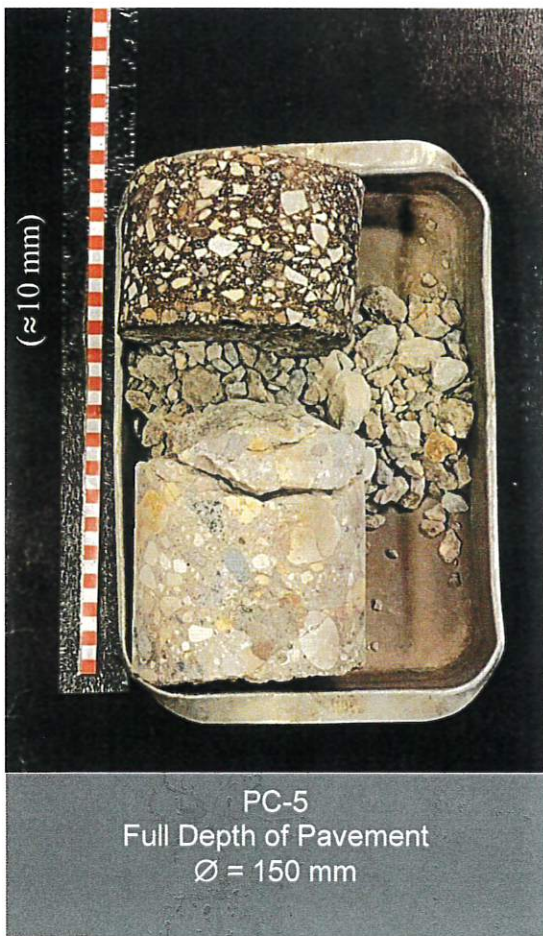


**Photograph 4: Specimen from Ellice Avenue, Eastbound Median Lane**



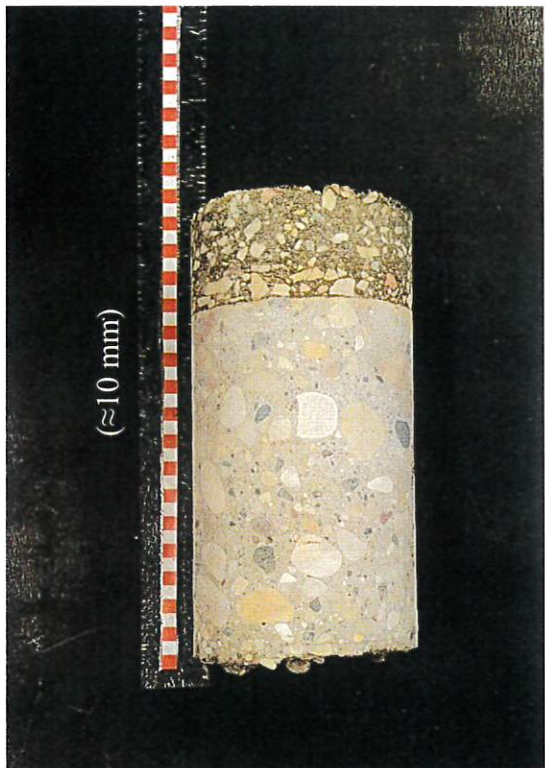


**Photograph 5: Specimen from Ellice Avenue, Eastbound Curb Lane**

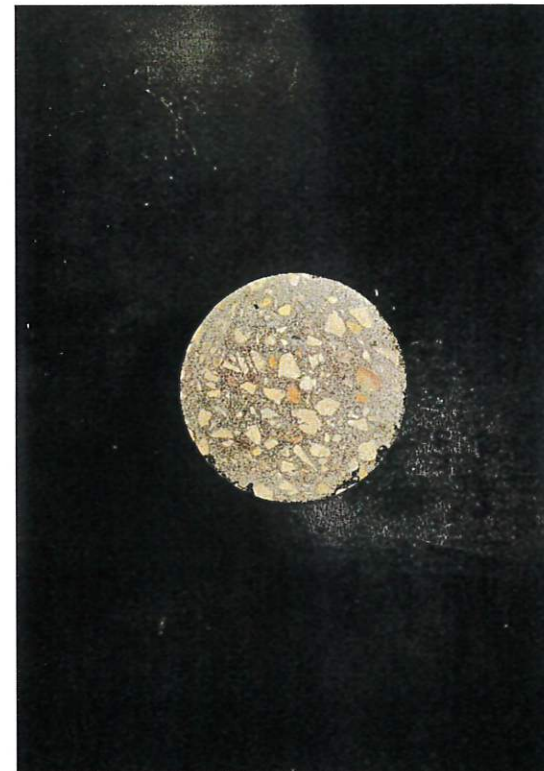




**Photograph 6: Specimen from Ellice Avenue, Westbound Median Lane**



PC-6  
Full Depth of Pavement  
Ø = 150 mm

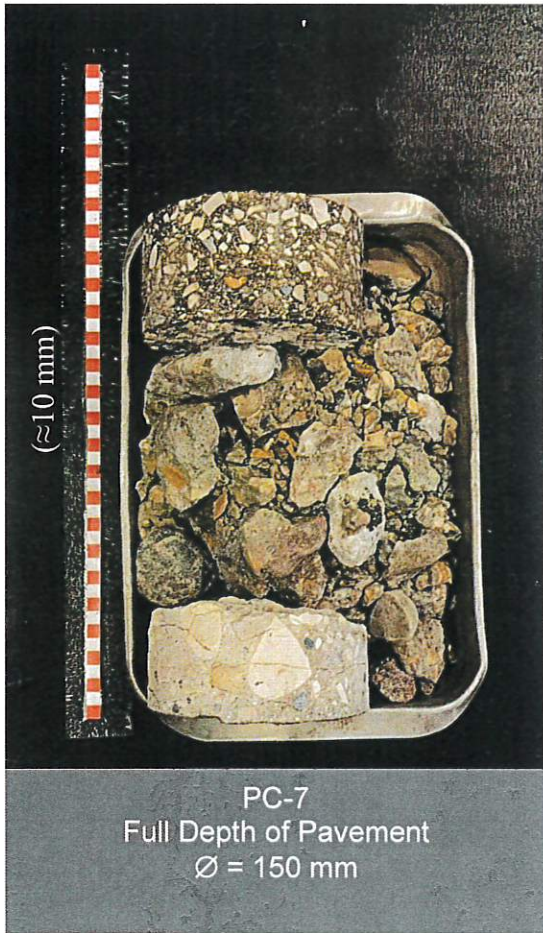


PC-6  
Top of Asphalt Pavement  
Ø = 150 mm





**Photograph 7: Specimen from Ellice Avenue, Eastbound Curb Lane**



**Photograph 8: Specimen from Ellie Avenue, Eastbound Curb Lane**

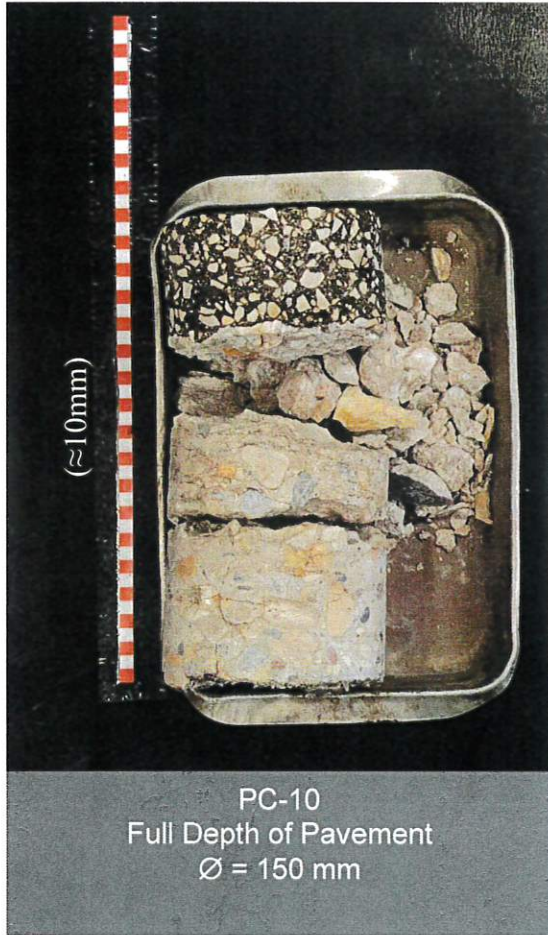




**Photograph 9: Specimen from Ellice Avenue, Westbound Curb Lane**

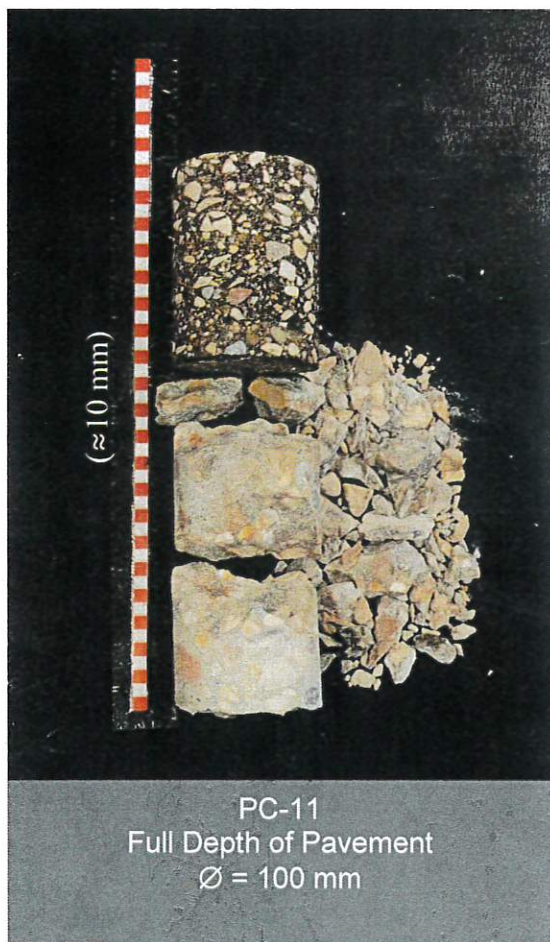


**Photograph 10: Specimen from Ellice Avenue, Eastbound Median Lane**

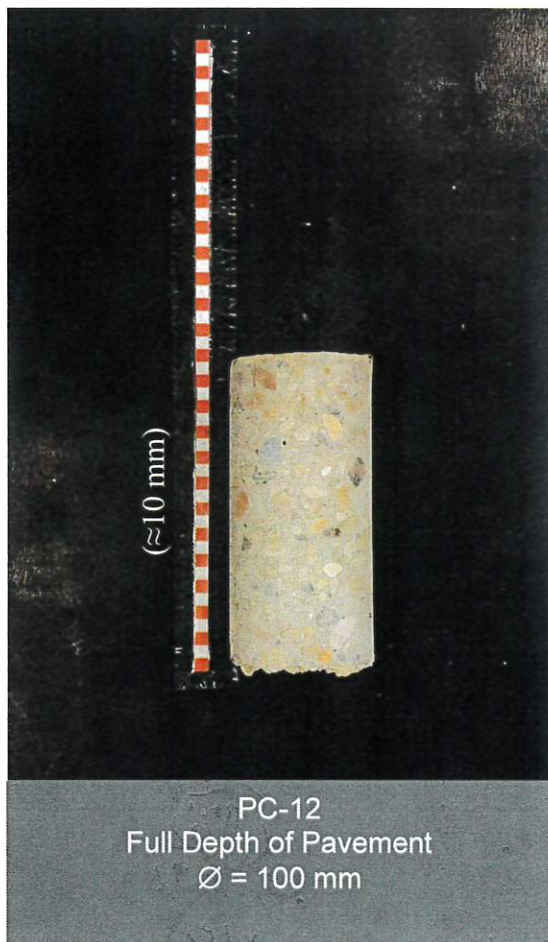




**Photograph 11: Specimen from Ellice Avenue, Westbound Curb Lane**



**Photograph 12: Specimen from Sargent Avenue, Eastbound Curb Lane**





**Photograph 13: Specimen from Sargent Avenue, Eastbound Median Lane**



**Photograph 14: Specimen from Sargent Avenue, Westbound Curb Lane**

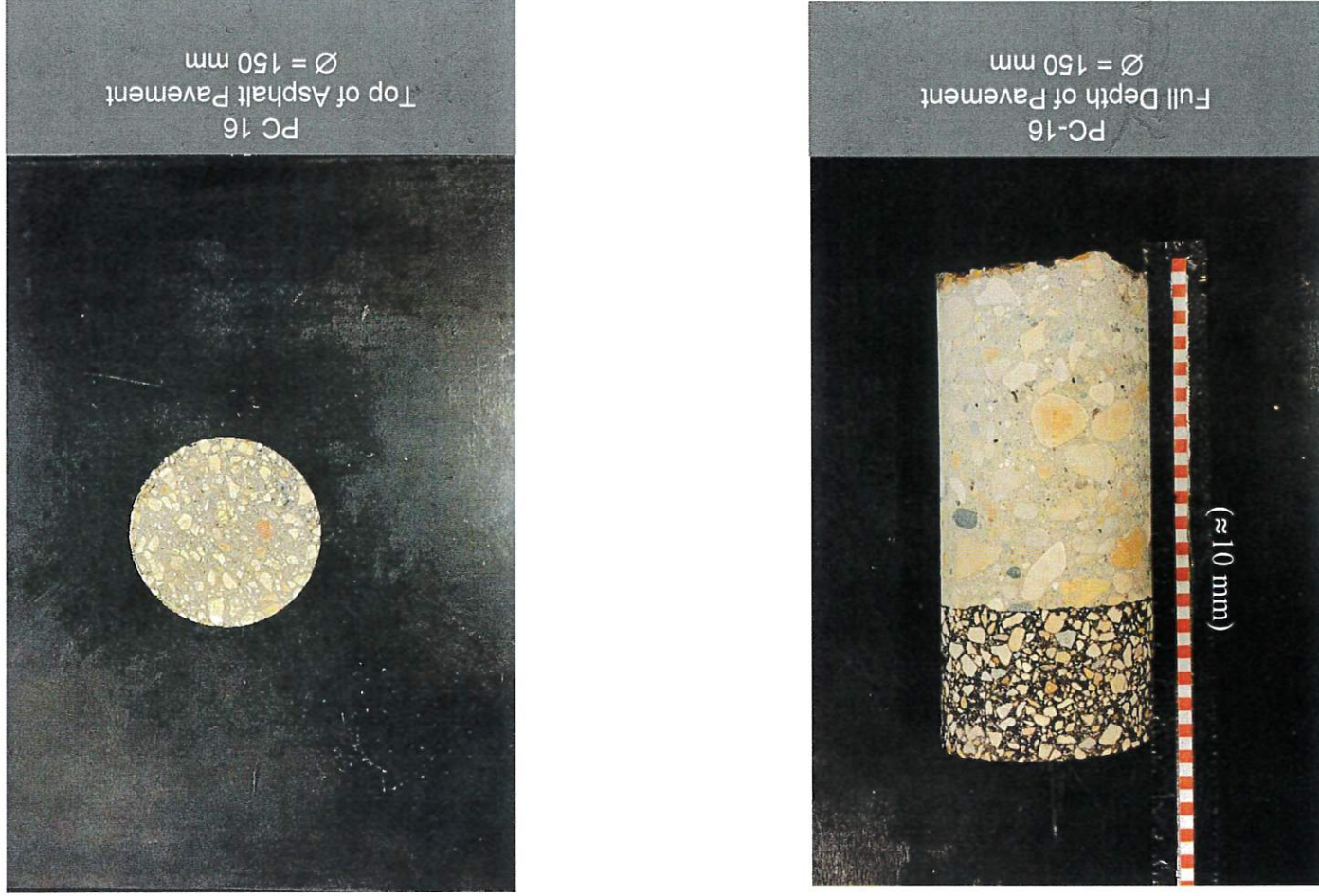




Photograph 15: Specimen from Sargent Avenue, Eastbound Median Lane



Photograph 16: Specimen from Sargent Avenue, Eastbound Curb Lane

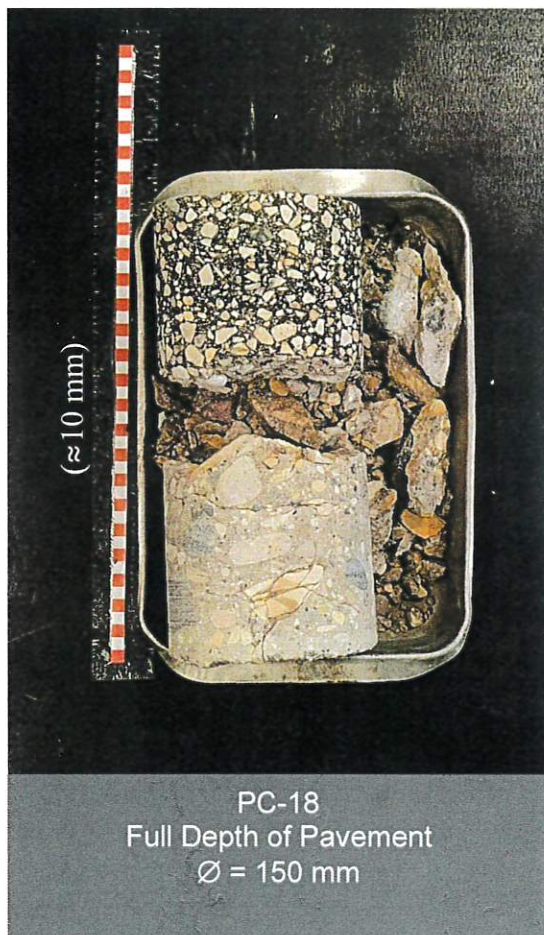




**Photograph 17: Specimen from Sargent Avenue, Westbound Median Lane**

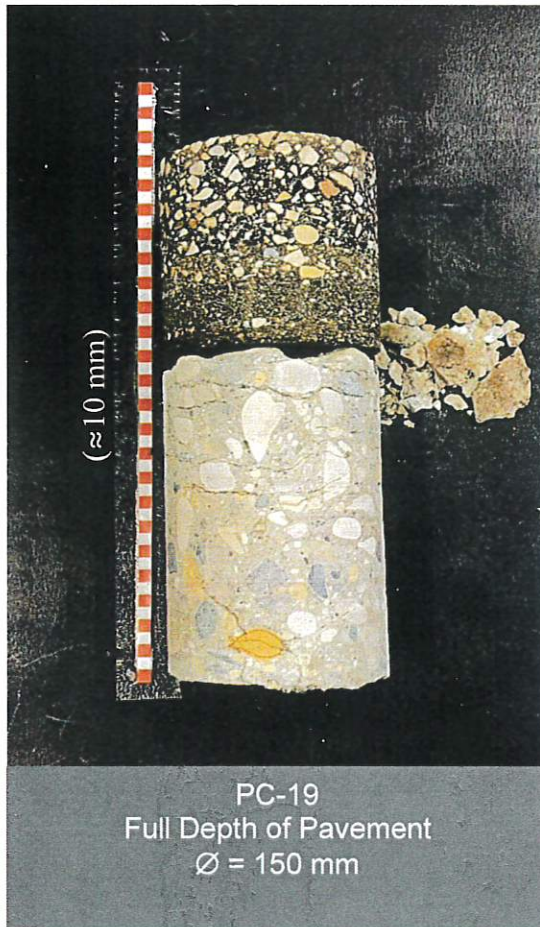


Photograph 18: Specimen from Sargent Avenue, Eastbound Curb Lane

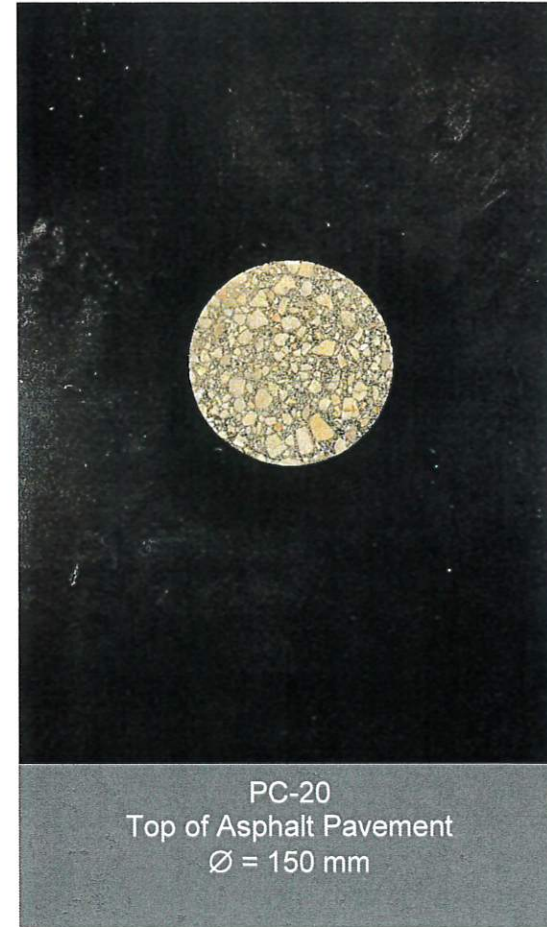




Photograph 19: Specimen from Sargent Avenue, Eastbound Median Lane



**Photograph 20: Specimen from Sargent Avenue, Westbound Curb Lane**





**Photograph 21: Specimen from Sargent Avenue, Eastbound Median Lane**



**Photograph 22: Specimen from Sargent Avenue, Westbound Curb Lane**

