

APPENDIX 'A'

GEOTECHNICAL REPORT



wood.

Pavement Investigation

City of Winnipeg Street Investigation

Winnipeg, Manitoba

WX19433

8 September 2021



Environment & Infrastructure Solutions
 440 Dovercourt Drive, Winnipeg Manitoba, Canada R3Y 1N4
 Phone: (204) 488-2997
www.woodplc.com

Pavement Investigation
City of Winnipeg Street Investigation
Wood Project Number - WX19433

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Third Party:			
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Other Technical Contributors			
Rev.	Date	Revision Notes	
0	8 Sept 2021	Issued Final to Client	
Permit Stamp		Engineer Seal	



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Appendix A

Grant Avenue Core Location Plan and Core Logs



1.0 Introduction

At the authorization of Mr. Ron Bruce, P. Eng., of Morrison Hershfield, Wood Environment & Infrastructure Solutions, a division of Wood Canada Limited (Wood), completed a pavement coring program at a total of eleven (11) street locations on Grant Avenue in the City of Winnipeg, Manitoba. At 10 of the locations, a total of three cores (two at mid-slab and one at the adjacent joint) were obtained, while at the 11th location a single core was obtained as requested by Morrison Hershfield.

The geotechnical investigation was completed in accordance with the Scope of Work and Terms and Conditions outlined in Wood Proposal No. WPG2021.487, dated 2 July 2021.

2.0 Geotechnical Investigation

Between 11 and 25 August 2021, Wood supervised the coring of thirty-one core holes along Grant Avenue. Coring locations were pre-selected by Morrison Hershfield and marked both on drawings provided to Wood and directly on the road surface. No deviations to the pre-selected coring locations were required. Locations of each core are shown on Appendix A, Figures A1-A to A1-C, attached. All locations were cored using a 150 mm diameter core barrel.

Mid-slab core locations are denoted with the suffices "A" and "B" while those obtained from joints are denoted with the suffix "C."

During coring, Wood field personnel identified pavement types and thicknesses, as well as underlying granular structure. All pavement core samples were shipped to Winnipeg laboratory to be photographed and measured and weighed for thickness and density evaluation, while select cores (those obtained from mid-slab) were tested for compressive strength. The core photos, core measurements, core densities and underlying pavement structure information are provided in Appendix A, Figures A2 – A32. It should be noted that core compressive strength and density evaluations could only be completed on mid-slab cores (ie A and B cores), those obtained from joints did not remain intact following extraction, precluding density and strength evaluations.

3.0 Closure

The findings of this report were based on the results of field and laboratory investigations at core hole locations determined based on the requirements provided by Morrison Hershfield.

The site investigation was conducted for the sole purpose of profiling the pavement and subsurface conditions. Although no environmental issues were identified during the fieldwork, this does not indicate that no such issues exist. If the owner or other parties have any concern regarding the presence of environmental issues, then an appropriate level environmental assessment should be conducted.

Soil conditions, by their nature, can be highly variable across a site. The placement of fill and prior construction activities on a site can contribute to the variability especially near surface soil conditions. A contingency should always be included in any construction budget to allow for the possibility of variation in soil conditions, which may result in modification of any potential design and construction procedures which may arise from this factual investigative report.

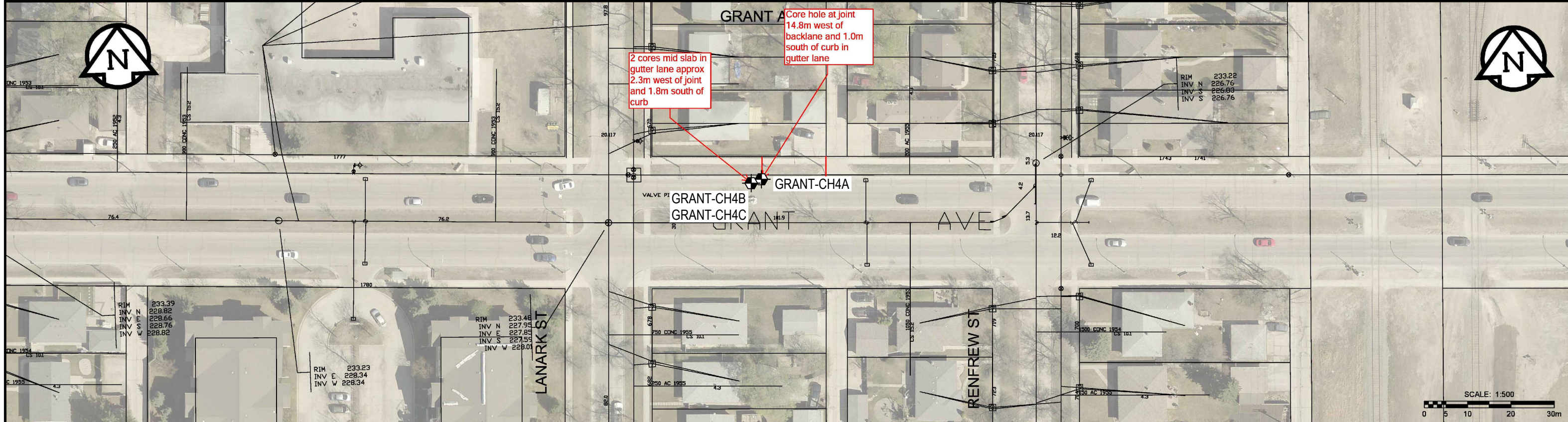
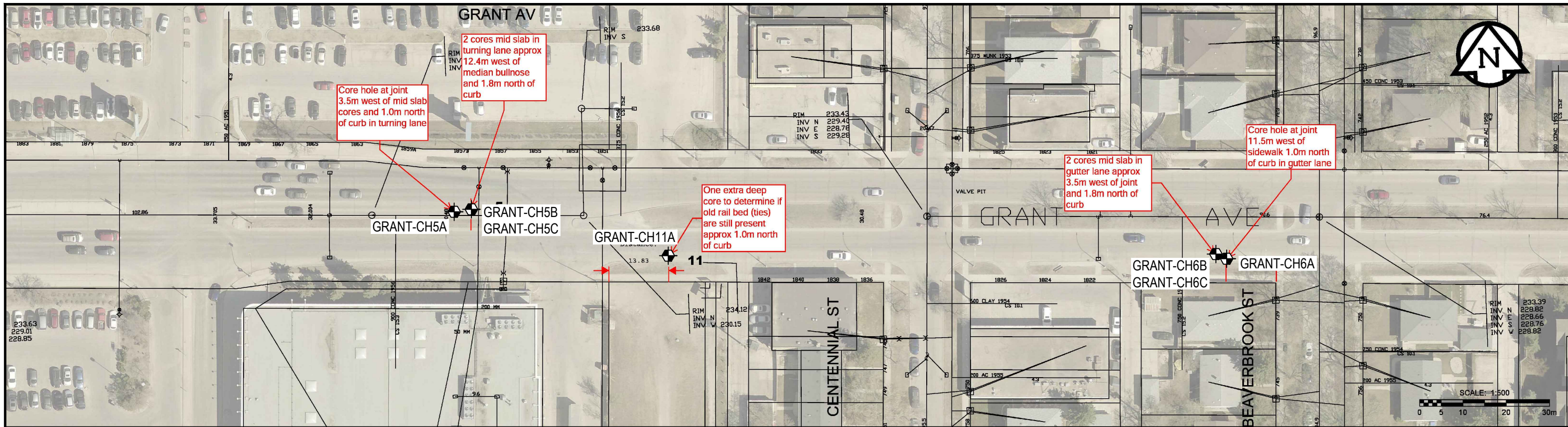
Respectfully submitted,

**Wood Environment & Infrastructure Solutions,
a Division of Wood Canada Limited**

Appendix A

Grant Avenue Core Location Plan and Core Logs





LEGEND:

CORE LOCATIONS

REVISION	BY	DATE
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REVISION	BY	DATE
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CLIENT:

MORRISON HERSFIELD

wood.

440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
PHONE: 204.488.2997 FAX: 204.488.8261

DWN BY: MD

CHKD BY: JW

DATUM: ---

PROJECTION: ---

SCALE: AS SHOWN

CITY OF WINNIPEG STREET CORING
REHABILITATION OF GRANT AVENUE
FROM KENASTON BOULEVARD TO MONTROSE STREET
WINNIPEG, MANITOBA

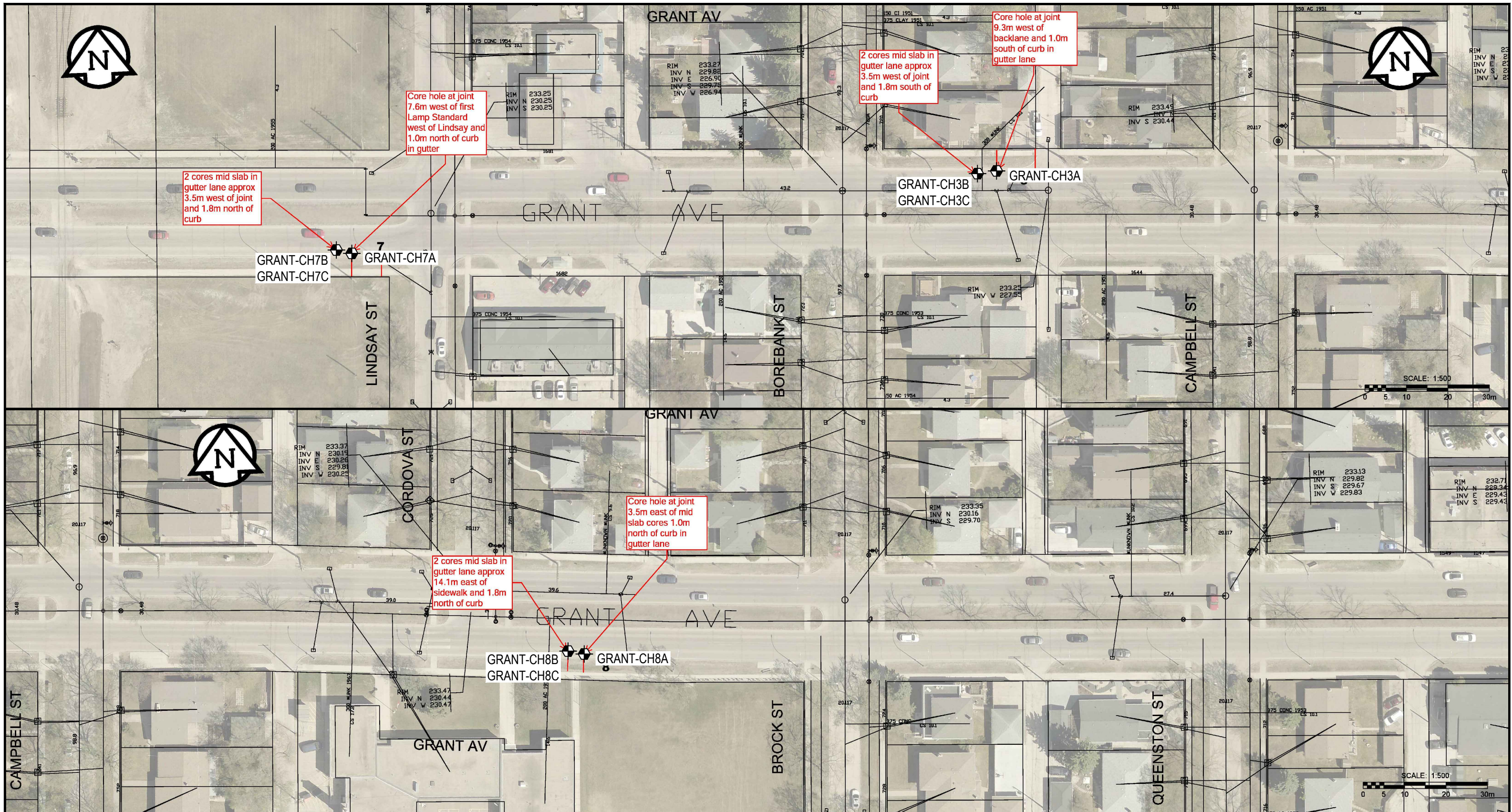
CORE LOCATION PLAN

DATE: SEPTEMBER 2021

PROJECT NO: WX19433

REV. NO.: A

FIGURE NO: FIGURE A1-A



LEGEND:

CORE LOCATIONS

REVISION	BY	DATE
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CLIENT:

MORRISON HERSFIELD

wood.

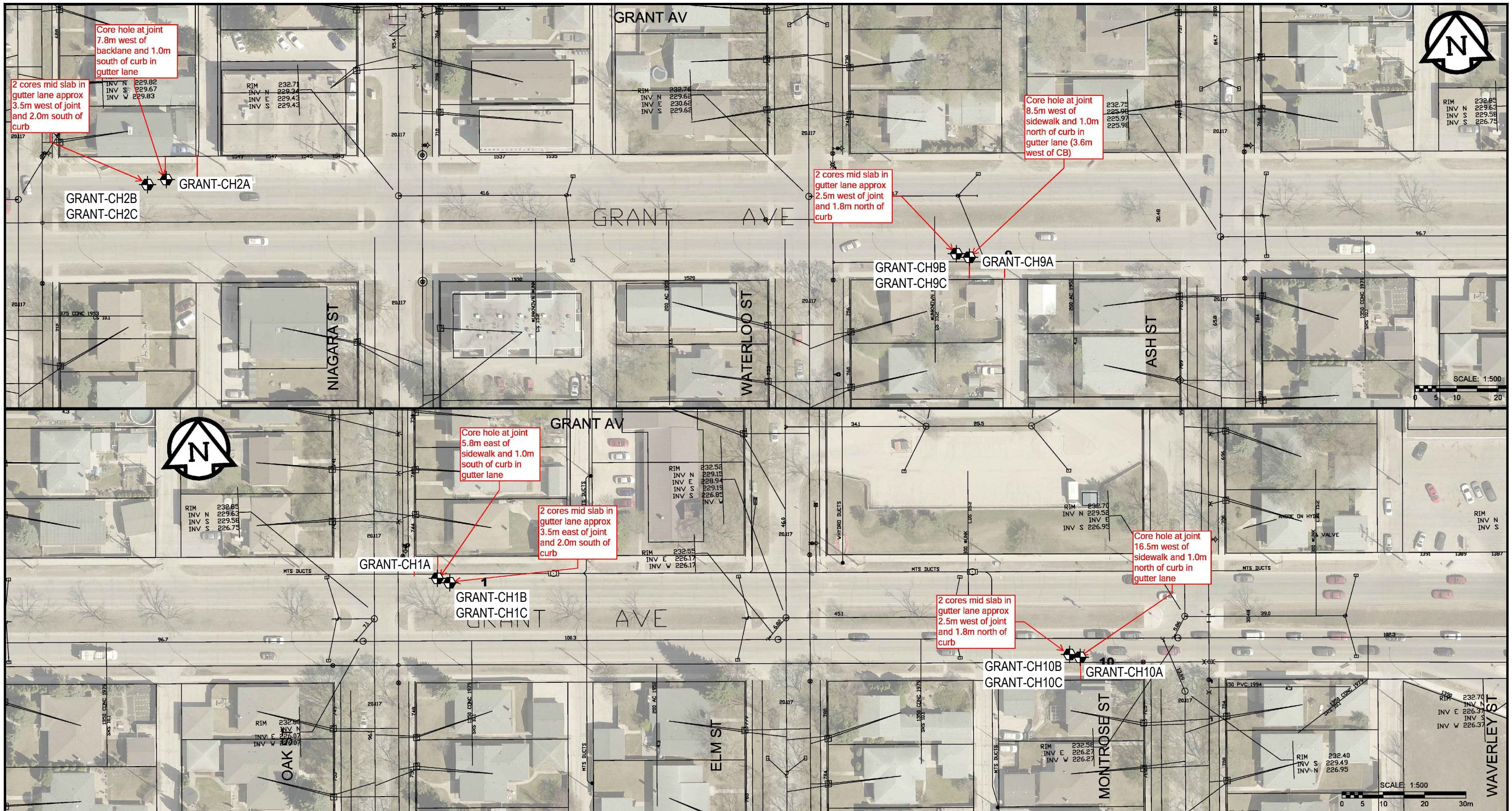
440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
PHONE: 204.488.2997 FAX: 204.488.8261

DWN BY:	MD
CHKD BY:	JW
DATUM:	---
PROJECTION:	---
SCALE:	AS SHOWN

CITY OF WINNIPEG STREET CORING
REHABILITATION OF GRANT AVENUE
FROM KENASTON BOULEVARD TO MONTROSE STREET
WINNIPEG, MANITOBA

CORE LOCATION PLAN

DATE:	SEPTEMBER 2021
PROJECT NO.:	WX19433
REV. NO.:	A
FIGURE NO.:	FIGURE A1-B



LEGEND:

CORE LOCATIONS

REVISION	BY	DATE
----	----	----

CLIENT:

MORRISON HERSFIELD

wood.

440 DOVERCOURT DRIVE
WINNIPEG, MANITOBA R3Y 1N4
PHONE: 204.488.2997 FAX: 204.489.8261

DWN BY: MD

CHKD BY: JW

DATUM: ---

PROJECTION: ---

SCALE: AS SHOWN

CITY OF WINNIPEG STREET CORING
REHABILITATION OF GRANT AVENUE
FROM KENASTON BOULEVARD TO MONTROSE STREET
WINNIPEG, MANITOBA

CORE LOCATION PLAN

DATE: SEPTEMBER 2021

PROJECT NO: WX19433

REV. NO.: A

FIGURE NO: FIGURE A1-C



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
138	2370	200.0	2357	50.0
Underlying Structure:		Clay Fill – gravelly, silty, high plastic, moist, stiff, brown		




Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
138	2363	200.0	2278	49.6
Underlying Structure:		Clay Fill – gravelly, silty, high plastic, moist, stiff, brown		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
138	N/A	200.0	N/A	N/A
Underlying Structure:		Clay Fill – gravelly, silty, high plastic, moist, stiff, brown		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
112	2387	209	2367	49.7
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		

	CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE GRANT-CH2A WINNIPEG, MANITOBA			
Wood Environment and Infrastructure Solutions	MID-SLAB			
Drawn: JW	Scale: N/A	Date: 7 September 2021	Project No.: WX19433	Figure: A5



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
112	2366	222	2381	52.0
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
121	N/A	200	N/A	N/A
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		




Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
110	2394	226	2404	56.3
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
110	2389	215	2421	49.3
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
150	N/A	198	N/A	N/A
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		

		CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE GRANT-CH3C WINNIPEG, MANITOBA		
Wood Environment and Infrastructure Solutions		JOINT		
Drawn: JW	Scale: N/A	Date: 7 September 2021	Project No.: WX19433	Figure: A10




Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
112	2364	215	2337	45.8
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
90	2365	222	2318	33.2
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
110	N/A	230	N/A	N/A
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		

	CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE GRANT-CH4C WINNIPEG, MANITOBA			
Wood Environment and Infrastructure Solutions	JOINT			
Drawn: JW	Scale: N/A	Date: 7 September 2021	Project No.: WX19433	Figure: A13



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
91	2362	221	2312	41.7
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
93	2350	210	2317	35.2
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
85	N/A	230	N/A	N/A
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		




Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
90	2389	257	2332	44.0
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
86	2388	236	2337	40.8
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
95	N/A	210	N/A	N/A
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		

	CORE PHOTOGRAPHS PAVEMENT CORE SAMPLE GRANT-CH6C WINNIPEG, MANITOBA			
	JOINT			
Wood Environment and Infrastructure Solutions	Drawn: JW	Scale: N/A	Date: 7 September 2021	Project No.: WX19433
				Figure: A19



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
111	2367	254	2227	32.1
Underlying Structure:		Clay – Silty, High Plastic, Moist, Stiff, Brown		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
113	2386	263	2316	34.2
Underlying Structure:		Clay – Silty, High Plastic, Moist, Stiff, Brown		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
112	N/A	250	N/A	N/A
Underlying Structure:		Clay – Silty, High Plastic, Moist, Stiff, Brown		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
71	2401	205	2368	39.7
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
66	2419	200	2356	47.4
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
70	N/A	200	N/A	N/A
Underlying Structure:		Clay – Silty, High Plastic, Moist, Stiff, Brown		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
96	2342	226	2425	47.1
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
93	2349	222	2405	41.5
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
87	N/A	225	N/A	N/A
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
83	2392	217	2390	40.2
Underlying Structure:		Clay Fill – Gravelly, Silty, High Plastic, Moist, Stiff, Brown		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
80	2401	211	2386	39.5
Underlying Structure:		Clay – Silty, High Plastic, Moist, Stiff, Brown		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
80	N/A	200	N/A	N/A
Underlying Structure:		Clay Fill – Gravelly, Silty, High Plastic, Moist, Stiff, Brown		



Asphalt		Concrete		
Thickness (mm)	Density (kg/m ³)	Thickness (mm)	Density (kg/m ³)	Compressive Strength (MPa)
73	2348	244	2284	50.5
Underlying Structure:		Gravel Fill – poorly graded, medium grained, moist, compact to dense (inferred), brown (20mm Limestone)		